OECD Fiscal Federalism Studies

Bricks, Taxes and Spending

SOLUTIONS FOR HOUSING EQUITY ACROSS LEVELS OF GOVERNMENT

Edited by Sean Dougherty and Hyun-A Kim

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Foreword

Government decisions, especially at the subnational level, have a significant impact on the affordability and quality of housing. As house prices have increased rapidly in most OECD countries over recent decades, housing has become less affordable for many households, pushing the issue to the forefront of the policy debate. Affordability and quality gaps are particularly severe among low-income households, private market renters and youth. Well-designed policy reforms at both national and local levels can promote more affordable, equitable housing markets. Subnational governments have major housing policy responsibilities including the provision of social housing, land use regulation and property taxation. Aligning national and local approaches is key to address housing equity challenges comprehensively. However, trade-offs exist between housing policy objectives like efficiency, sustainability and inclusiveness. Careful policy design and close co-ordination of national and subnational policies are essential to balance competing goals and facilitate the smooth functioning of inclusive and responsive housing markets.

This volume is the product of the OECD's Network on Fiscal Relations across Levels of Government – "The Fiscal Network" – that was founded in 2003. The Network is a unique high-level body at the OECD that "horizontally" brings together the expertise of multiple fields as well as four substantive departments – the Centre for Tax Policy and Administration (CTP), the Economics Department (ECO), the Public Governance Directorate (GOV) and the Centre for Entrepreneurship, SMEs, Regions and Cities (CFE) – as well as their principal committees (the CFA, EDRC, EPC, PBO, SBO and RDPC). The Fiscal Network, chaired by Junghun Kim of Korea, addresses a wide range of challenges for intergovernmental fiscal relations, whether macroeconomic, structural and administrative, and seeks to contribute to stronger, fairer and more stable economies as well as improving the well-being of citizens.

In this 10th edition of the OECD Fiscal Federalism Studies Series, the volume delves into the fiscal dynamics that underlie housing markets and the distributional consequences. Drawing on the work of the Fiscal Network and the indicators that it has developed, the studies provide an in-depth examination of how fiscal policies at various levels of government intersect with housing equity. This exploration is underpinned by cross-country analyses and a series of country studies, spanning the effects of the COVID-19 pandemic on housing demand to a proposed green land value tax, effectively linking fiscal instruments to housing outcomes. The chapters in this volume include those of OECD researchers and academic experts, and are meant to provide ideas for discussion. The analyses and studies draw upon a workshop organised by the Fiscal Network together with the Korea Institute of Public Finance (KIPF) – who initiated the project – in Paris during November 2022. The chapters were revised and shared with delegates of the Fiscal Network and relevant sister committees, as well as various expert discussants. The principal volume editors, Sean Dougherty and Hyun-A Kim, were aided by the invaluable feedback of Peter Hoeller on all chapters. While many colleagues also provided valuable inputs, special thanks go to Luiz de Mello and Boris Cournède (OECD Economics Department), David Bradbury, Bert Brys and Sarah Perret (OECD Centre for Tax Policy and Administration), Andoni Montes Nebreda (UPV/EHU – Spain), Xavier Timbeau (OFCE, SciencesPo), Edo Omic and Jana Strien (Council of Europe Development Bank), Vera Holenstein (Treasury – Australia) and Reetta Varjonen-Ollus (Ministry of Finance – Finland). Extensive editorial support was provided by Meral Gedik, who carried out the layout and typesetting. Finally, a special thank-you goes to KIPF, whose generous financial support made this volume possible.

Table of contents

FIGURES

TABLES

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Executive summary

This volume of OECD Fiscal Federalism Studies provides analysis and evidence on ways to reduce housing inequities. The chapters develop insights regarding intergovernmental fiscal relations and how to resolve certain key policymaking trade-offs, delving into the following:

- Changes in urban geography due to the COVID-19 pandemic;
- The impact of increased inequality on property tax receipts and housing outlays;
- Korea's history of progressive property taxation;
- The effect of the local US property tax on housing affordability and equity;
- The pros and cons of introducing a green land value tax;
- Fiscal autonomy and boosting housing supply;
- Housing policy and housing inequality;
- Inter-regional migration and housing costs.

Key findings and recommendations

Chapter 1: Rising housing costs have made homeownership unaffordable for many low-income households across the OECD. Subnational governments play major roles in housing policy through social housing provision, land use regulation, and property taxes. Greater decentralization of housing responsibilities creates opportunities for tailored local solutions but requires coordination across levels of government. Well-designed reforms in areas like social housing investment, dense zoning near transit, and progressive property taxes can promote affordable and equitable housing markets. Policymakers should pursue integrated approaches that balance competing efficiency, sustainability, and equity objectives. Effective affordable housing strategies require thoughtful policy design along with close collaboration between national and subnational governments.

Chapter 2: The COVID-19 pandemic appears to have accelerated a shift in housing demand away from urban cores toward suburban and rural areas with more indoor and outdoor space. Using novel data, this chapter explores these demand changes, finding larger shifts in cities with high pre-pandemic price disparities, better suburban amenities, and stricter pandemic restrictions. Policy flexibility that allows housing supply to respond smoothly to changing demand patterns is beneficial. However, more research is needed to better understand post-pandemic shifts and inform responsive policy frameworks. As remote work persists, aligned policy reforms across levels of government will be essential to promote housing affordability.

Chapter 3: In Norway, increased income inequality does not affect property tax revenues or housing spending, but greater housing wealth inequality raises both. This contrasts with other evidence that income inequality drives property tax changes. The results indicate that different inequality types have distinct effects on housing policies. Policymakers seeking to address housing affordability should account for impacts of not just income inequality but also rising disparities in housing wealth. Property tax reforms may need to incorporate protections for lower-wealth homeowners. Holistic affordable housing strategies require considering multiple channels through which inequality affects housing.

Chapter 4: Korea’s progressive National Property Tax aims for equity but lags in underlying property valuations undermine effectiveness. More regular revaluations aligned with market prices could improve fairness and economic efficiency. Tax burden shifts between land and buildings may encourage housing development as well. Property tax reforms should weigh potential impacts on lower-income homeowners. Effectively designed reforms also require coordination across levels of government. There are opportunities to improve the equity and housing market impacts of Korea's property tax system through revaluation, coordination, and balanced policy design.

Chapter 5: In the United States, property taxes raise housing costs but may support affordability if capitalised into prices. Inequitable administration, regressive assessments, and inadequate relief worsen unequal burdens. Systemic reforms to property tax administration, valuation, and relief alongside targeted policies could mitigate regressivity. Equitable access to homeownership necessitates modernizing outdated property tax systems while expanding targeted relief programs. State and local coordination is essential for coherent, comprehensive reforms.

Chapter 6: A progressive green land value tax (LVT) could reconcile climate goals with housing affordability and intergenerational equity objectives. Regular reassessments based on land values avoid speculation and volatility. Protections for asset-rich, cash-poor households are vital. Phasing in LVT implementation while linking unpaid tax liability to future home sales can facilitate a measured transition. If thoughtfully designed, a green LVT could meet multiple housing and environmental policy objectives. But successful implementation requires balancing priorities across generations, income levels, and geography.

Chapter 7: Greater local control over housing spending reduces supply elasticity, while increased local property tax autonomy raises it, likely by incentivizing development. Balancing local knowledge with revenue motivations can improve supply responsiveness and affordability. Aligning spending authority and tax incentives across government levels should be part of comprehensive housing reform strategies. Effective affordable housing policies require attending to policy interactions between different levels of government.

Chapter 8: In Belgium, national housing policies like transaction tax cuts have highly variable local impacts on housing inequality. Enhancing data granularity could help better target future reforms to assist disadvantaged neighbourhoods. International evidence remains limited on policy effectiveness at reducing housing inequality, pointing to an important research need. The local nature of housing means even national measures may affect regions unequally.

Chapter 9: Korea’s balanced national development plan may have inadvertently increased local housing inequality by restricting supply in popular areas. Metropolitan coordination powers and property tax reforms could improve local responsiveness. Truly equitable housing requires aligning national and local perspectives. Korea's experience highlights the need for integrated policy approaches spanning all levels of government.

Chapter 10: High housing costs discourage migration towards jobs and opportunities. Regularly updating urban boundaries, coordinating governance, and balancing regulations with flexible supply can improve housing market responsiveness. However, place-based supports remain important to assist prospective movers and stayers. Policy alignment across government levels is essential to enable mobility in response to changing economic conditions. Removing barriers to efficient housing markets should be paired with place-based and transitional supports.

1 Reducing housing inequity: What can governments do?

Sean Dougherty, Peter Hoeller and Junghun Kim

Housing affordability and quality are pressing policy concerns in most OECD countries. Rising house prices have worsened housing inequality, with low-income households facing major housing affordability and quality gaps. Subnational governments play critical roles in housing policy through responsibilities like social housing provision, land use regulation and property taxation. There has been a trend towards greater decentralisation of housing functions, and well-designed policy reforms by national and local governments can promote more affordable, equitable housing markets. However, trade-offs exist between objectives like efficiency, sustainability and inclusiveness. Key to effective housing policy is aligning national and local approaches to address housing challenges comprehensively. Thoughtful policy design and coordination of national and subnational policies are essential to balance competing goals and facilitate inclusive, responsive housing markets.

The authors are Senior Advisor to the OECD Network on Fiscal Relations across Levels of Government, Consultant to the Network and Chair of the Network, respectively. This introductory chapter is based on the large volume of work done in the context of the OECD Horizontal Project on Housing. Two volumes (*Brick by Brick*, Volumes 1 and 2) have summarised this work. Apart from these two volumes, the OECD Housing Policy Toolkit also includes a Housing Dashboard and Country Snapshots that allow comparing indicators of outcomes and policy settings across countries.

1.1. The housing equity challenge

OECD governments, whether local, regional or national, pursue multiple housing policy objectives, such as promoting or providing good-quality, affordable shelter or reducing the carbon footprint of housing. However, less than half of the OECD population reports that it is satisfied with the availability of good, affordable housing (OECD, 2021[1]). Affordability is a pressing challenge and central objective of housing policy in many OECD countries. Housing-related equity concerns are also the focus of this book.

As house prices have increased rapidly in most countries over the last decades, housing is, on average, the largest spending item in household budgets and its share has grown over time. Housing has become less affordable for many households in the OECD area, pushing the issue to the forefront of the policy debate. Many low-income households spend over 40% of their income on housing and are more likely to live in lower-quality dwellings. Affordability gaps are particularly severe among low-income households, renters in the private market and youth. Housing affordability also tends to be more challenging in job-rich urban areas relative to rural areas, with some countries recording large differences in house prices across cities and regions. For example, house prices have risen twice as much in inner London compared to the rest of the United Kingdom since 1995; similarly, over the same period, house prices in the Los Angeles metropolitan area increased twice as fast as those in the Chicago metropolitan area. More recently, with work-from-home becoming more prevalent after the pandemic, gains have been concentrated on the peripheries of major cities, a trend analysed in Chapter 2. Ahrend et al. (Chapter 2) show that this trend shift of housing demand was more pronounced in certain cities that had larger house price disparities, more green space access at the periphery and better high-speed internet availability.

Many low-income households face both housing affordability and quality gaps. Low-income households are also more likely to live in poor-quality dwellings. They may not be able to afford regular maintenance or improvements to their dwellings, while at the same time facing barriers to move to better-quality housing. In nearly all countries, households in the bottom quintile have a higher rate of overcrowding than those in the middle or top-income quintiles.

Affordable housing shortages can contribute to homelessness, which, before the COVID-19 pandemic, had increased in a third of OECD countries over recent years (2023[2]). Rising housing costs are among the many factors that lead to homelessness, which before the COVID-19 crisis affected at least 1.9 million people in the OECD. Official statistics are likely to underestimate the extent of homelessness.

Rising house prices mean that many households are missing out on the benefits of owning a home. Developments in housing markets have repercussions for household consumption and the macroeconomy via wealth effects. Rising house prices also have implications for wealth inequality. Indeed, housing is an essential part of wealth as it is the single and biggest asset for a majority of households. Changes in house prices translate into changes in household wealth and this can in turn redistribute wealth between different types of households such as renters and homeowners. Given the importance of housing and mortgage debt in household balance sheets, especially for the middle class, housing contributes to equalising the net wealth distribution. This is because housing is more equally distributed than other assets, such as financial assets, which are concentrated at the top of the income distribution (OECD, 2022[3]).

These issues raise the question of what is the best level of government to apply a property tax, which is usually a local tax. The unusual case of Korea's progressive national property tax is explored by Kim in Chapter 4. According to Kim, Korea implemented a progressive property tax system as early as 1973, a response to the rapid increase in land values that outpaced income (GDP) growth during the economic boom of the late 1960s and early 1970s. The progressivity of property taxes was further strengthened during periods of significant land value appreciation, ultimately leading to the introduction of a highly progressive national property tax in 2005. Kim argues that while a high ratio of land value to GDP justifies the implementation of progressive national property taxation to a certain extent, such taxation should be kept at a modest level due to its limitations as a tool for wealth taxation or housing price stabilisation.

Box 1.1. Key messages: finding good solutions for housing equity across levels of government

1. *Aligning national and local policies is essential for effective housing equity*

   National policies aim to address housing inequality, but local policies and implementation shape how they play out in practice. Coordination of national and local policies is key for a comprehensive approach.

2. *Subnational governments play a key role in helping to ensure housing affordability and quality*

   Government responsibilities like land use regulation and property taxes significantly influence housing outcomes. Well-designed policies at the subnational level can improve affordability and access.

3. *Reforms in social housing provision, land use regulations and property taxation can promote affordable, equitable housing*

   These reform areas shape housing supply, demand and costs. Well-designed policies can enhance affordability and access for lower-income households.

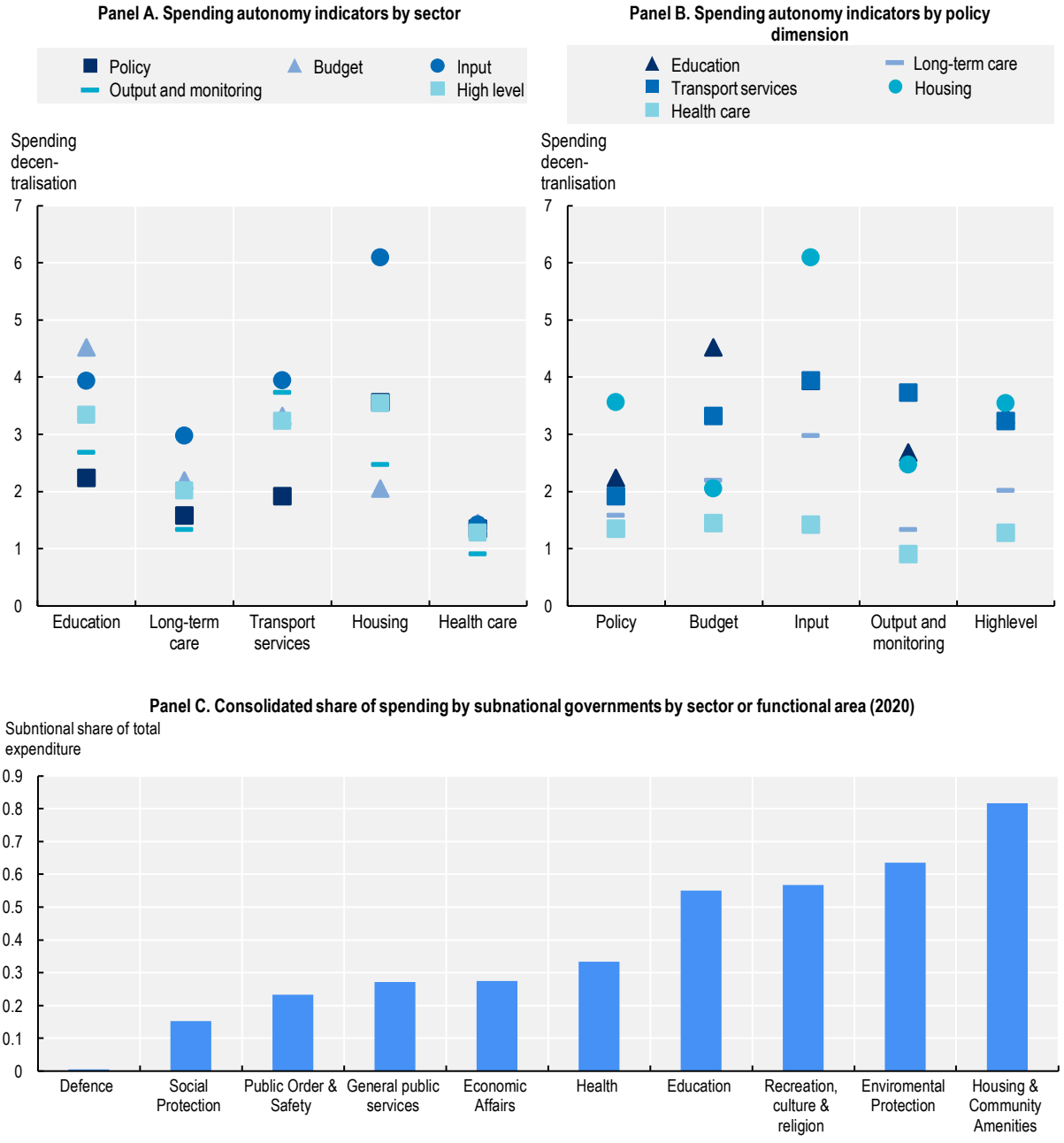
1.2. The governance of the housing sector

In addition to national governments, local and regional governments are essential in the overall governance of the housing sector, with the bulk of spending on housing being carried out by subnational governments. Yet housing spending is often supported by central governments. The provision of social housing together with land-use regulations are two housing-related instruments where subnational governments play critical roles (Phillips, 2020[4]). For social housing in particular, decisions regarding inputs, outputs and monitoring are mainly under the purview of subnational governments and housing providers, while for land-use issues, local governments set regulations and rules that adhere to general national standards.

While the organisation of the housing market varies a lot across the OECD and partner countries, a broadly shared trend has been to allocate more housing responsibilities to the local or regional government level (Figure 1.1, Panels A and B). Over the last 30 years, many national governments have implemented policy reforms that allow local governments to assume a larger role in developing, co-ordinating and implementing housing policies, including those focused on housing equity concerns. Subnational spending on housing and community amenities is the most decentralised area of expenditure (Figure 1.1, Panel C). The trend towards decentralisation experienced by most OECD countries in the last 30 years has resulted in subnational governments being responsible for more than 80% of outlays on housing and community amenities. While current spending on housing has been rising, investment in social housing has been on a declining trend. Chapter 7 examines the effect of housing spending policies on housing supply.

In their cross-country study, Hoenselaar et al. (Chapter 7) find that greater local control over housing spending policies leads to lower housing supply elasticities, whereas increased control of property taxation leads to higher elasticities. This finding is interesting evidence of the incentive effects that local fiscal autonomy has on spending and taxing decisions. As the authors note, new development is often discouraged by local residents because it imposes a fiscal burden on them, particularly in the case of social housing. On the other hand, new development can raise local property tax revenues. This study suggests that, on balance, the fiscal autonomy of local governments may enhance housing affordability.

Figure 1.1. Government spending on housing is highly decentralised



Note: COFOG classifies government expenditure data from the System of National Accounts by the purpose for which the funds are used.
Source: Dougherty and Phillips (2019[5]); Dougherty and Montes Nebreda (2023[6]); OECD Fiscal Decentralisation and COFOG databases.

Taxes on immovable property are typically levied by local governments. Recurrent taxes on immovable property play a role in attaining an efficient allocation of resources, a less unequal distribution of income and even wealth. Chapters 3, 5 and 7 explore these issues in studies of Norway and the United States, as well as a cross-country study. In the case of Norway, Borge and Krehic (Chapter 3) find that an increase in income inequality does not affect property tax receipts or local public spending on housing. However, they find that housing wealth inequality increases both the property tax revenue from wealthier households and housing spending for poorer households. This finding suggests that the redistributive nature of local property taxation is at play in Norway, albeit at a modest level.

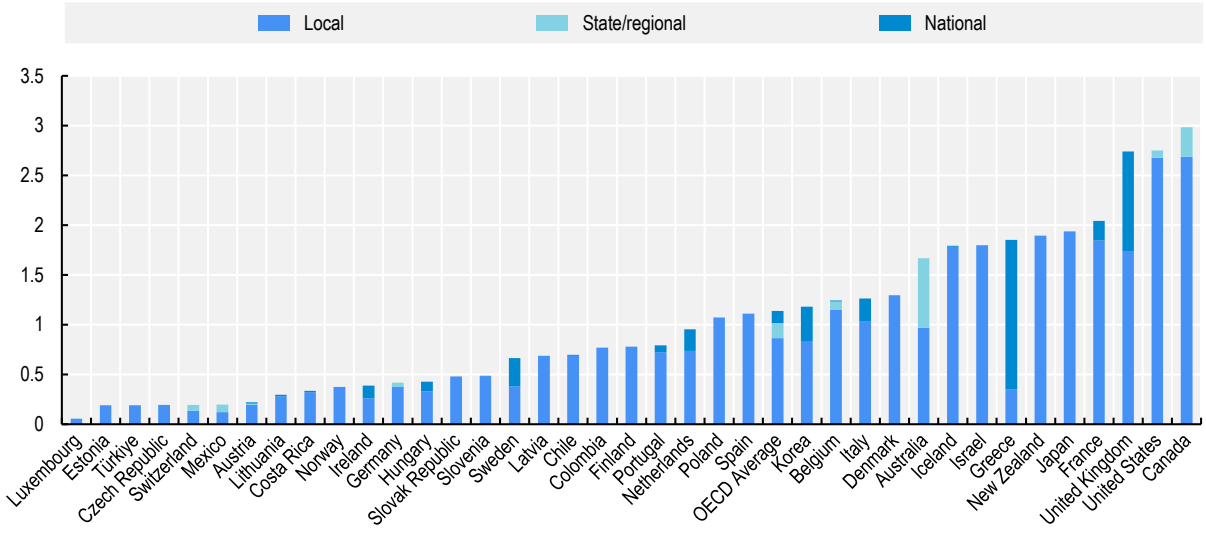
Unlike in the cases of Korea and Norway, Reschovsky (Chapter 5) finds that the property tax levied on homeowners in the United States is regressive. However, the potential impact of the property tax on housing costs varies dramatically across states, as states are responsible for property tax administration, assessment procedures, tax reliefs and limitations. Therefore, he emphasises that high-quality property tax administration and well-designed property tax relief by the states are important fiscal tools for mitigating the regressivity of property taxes.

The overall implication of these studies is as follows. As a result of the relative inelasticity of property taxes – taxpayers usually react little to changes in tax policy because their tax base is immovable – they are relatively efficient and among the taxes that are least detrimental to economic growth (OECD, 2022[3]). In the case of residential property taxation, there is also a close link between taxes paid and public services received, which follows from the benefit principle of taxation in public finance, with expenditure often having a high degree of progressivity.

Many countries raise little revenue from recurring property taxes, a situation that offers scope to make greater use of them (Figure 1.2). Other housing-related taxes, such as transactions taxes tend to be set by central government, while the terms of mortgage interest deductibility are also usually set by central government.

Figure 1.2. Recurrent taxes on immovable property

% of GDP, 2021 or most recent



Source: OECD Revenue Statistics database.

1.3. The policy levers

Policy action in many areas, ranging from housing policies to government spending and taxation, influences housing outcomes. Reforms can aim at multiple objectives: making the housing market more efficient, more sustainable or more inclusive. The latter is the focus of this book. National preferences can vary considerably across these objectives, which will lead to different policy choices. Furthermore, the legacy of past choices strongly shapes today's needs and possibilities because path dependency is very strong due to the slow renewal of the housing stock.

1.3.1. Reforms of housing-related local government spending

Investment in social housing – directly or indirectly through non-profit profit associations – increases housing supply. It results in greater affordability for eligible low-income tenants and also for the rest of the housing market because of the increase in housing supply. Eligibility for social housing should be portable across cities and regions to ensure the mobility of low-income workers. Removing obstacles for people to follow jobs is an essential aspect of resource reallocation. Related issues are analysed in Chapter 10.

Causa et al. (Chapter 10) address the issue of inter-regional mobility of workers, an important aspect of labour market dynamism that contributes to the efficient allocation of labour across regions. They find that inter-regional migrants move in search of higher income and better employment opportunities. However, their decisions are influenced by several factors affecting housing costs, such as housing supply elasticities, rental regulations and housing-related social transfers. The study also reveals significant heterogeneity across countries in the patterns of inter-regional migration. An important implication is that structural policies should be complemented by place-based strategies, including the provision of public services, transport and digital infrastructure, as governments need to support both movers and stayers.

Providing social housing that is developed or refurbished in line with high energy efficiency standards contributes to reducing the housing sector's carbon footprint. It can also contribute to reducing energy poverty among social housing tenants. Doing so can have a demonstration effect, encouraging the broader deployment of environmentally ambitious building standards and facilitating the transition of the entire economy towards the attainment of emission reduction objectives. Finally, if social housing investment is well integrated into environmentally and socially ambitious urban strategies, it also contributes to improving the quality of the local environment and to the development of inclusive, socially mixed neighbourhoods. Care should be taken to avoid unforeseen effects, as Chapter 9 shows.

Park (Chapter 9) examines the interplay between national policy initiatives for balanced inter-regional economic development and their consequences on housing inequality at the local level in Korea. In response to over-agglomeration in the Seoul metropolitan region, the central government established planned communities, known as Innovative Cities, across several provinces. Park finds that municipalities hosting Innovative Cities experienced a significant increase in housing price inequality compared to those in more distant control municipalities. This study suggests that it is crucial for national policymakers to understand and mitigate the unintended negative effects of community development projects, demanding close collaboration between national authorities and local stakeholders.

Unlike the provision of social housing with limited benefit portability, housing allowances seldom restrict residential and job mobility. However, a critical difference between the provision of social housing and housing allowances is that the latter supports demand while the former contributes to expanding supply. Where supply is rigid, an increase in housing allowances may have the unintended consequence of putting upward pressure on house prices and rents. This pressure can offset the intended effect of allowances on affordability for beneficiaries while making housing more expensive for households who are not receiving them. Dealing with this trade-off calls for complementary measures to enhance the housing supply responsiveness to changes in demand. Belgium's experience in this area is examined in Chapter 8. Domènech-Arumí (Chapter 8) notes that housing inequality in Belgium is relatively low, but heterogeneity across subnational entities is substantial. An important aspect of housing policies is therefore the local nature of housing, as even national policies have significantly distinct impacts across space. Therefore, he emphasises that enhancing the granularity of housing and income inequality estimates may assist governments in improving their policies' design, targeting and implementation.

1.3.2. Reforms of housing-related taxation

Shifting housing taxation away from transaction-based levies towards recurrent taxes on immovable property would enhance housing market efficiency. They have the advantage of not discouraging residential mobility, which is closely linked to job mobility. Recurrent property taxes have also empirically been found to be supportive of economic growth, by comparison with other taxes, especially transaction-based levies. In countries where the valuation of the property, for tax purposes, lags well behind the market value, there is also scope to align the valuation for tax purposes with the market value, which should reduce inequities that have accumulated over time.

In addition, a move of the recurring property tax basis towards land, rather than structures, would have the benefit of encouraging more efficient uses of land and therefore greater environmental quality. A proposal for a new split-rate property tax which also supports environmental objectives is developed in Chapter 6. Muellbauer (Chapter 6) addresses several fundamental challenges, including the climate crisis, equity, housing affordability and intergenerational injustice. As a solution, he proposes a green land value tax, an innovative approach to property taxation. While a land tax has long been advocated for its positive effects on efficiency and equity, it often encounters political resistance in practice. Importantly, Muellbauer suggests several measures to enhance public acceptability. These include methods for accurately measuring land values, offering green property tax discounts, allowing property tax deferral for cash-poor households owning expensive properties, as well as sharing property tax revenue across government levels to enable redistribution among local authorities. By reducing the extent to which recurring housing taxes discourage investment in dwellings, a shift towards the taxation of land should also make the supply of housing more responsive to changes in demand and thus improve affordability in the long run. Whether the recurring property tax is progressive or regressive, depends on the design of the tax: tax rates can be flat rate or progressive, the tax rate can be split between land and housing structures, tax relief can be granted and valuation plays a role.

Phasing out mortgage interest relief can reduce house prices by substantial amounts in countries, where supply lacks flexibility, because much of the value of mortgage interest relief gets capitalised into land prices in areas where supply is rigid. In the long term, lower house prices make housing markets more inclusive by facilitating homeownership of a larger share of the population and by driving down rents. Providing mortgage interest relief also raises pressing distributional issues, because mortgage interest relief primarily benefits higher-income groups. Furthermore, because mortgage interest relief does not remove primary barriers to first buyers such as downpayments and credit scores, its reform is also likely to have limited effects on homeownership even over the medium term. Increasing the effective taxation of residential property through the removal of mortgage interest relief or other advantages offers the additional benefit of contributing to smooth housing cycles.

1.3.3. Other policy areas

Reforms of housing-related spending and taxation, which are typically enacted at the local level, are the primary focus of most chapters in this book. Two other policy areas are usually at least partly the purview of lower levels of government: land use and rental market regulation.

Reforms of strict land use regulations can raise the supply responsiveness of the housing market, which reduces upward pressure on prices, thus improving affordability. Furthermore, reforming land-use regulations can have broader positive consequences for the economy. Flexible land-use regulation within integrated planning frameworks can facilitate the efficient reallocation of labour and capital by allowing housing supply to adjust to the demand for relocation to high-productivity areas: such flexibility boosts investment, productivity and thus economic growth.

One way of doing so is to regularly revisit the geographic boundaries for urban development to accommodate city growth while ensuring forms of expansion compatible with environmental objectives. Moreover, land-use governance arrangements that avoid overlap in the allocation of housing policy functions across the different levels of administration and favour planning at the metropolitan level rather than lower levels of government can facilitate the matching of supply and demand within broader catchment areas. This can increase the responsiveness of supply to evolving demand, mitigating upward pressure on prices and making housing more affordable.

Making rental market regulation such as rent control and tenure security more flexible, in combination with reforms to allow more responsive supply, have the potential to make housing markets more efficient and affordable in the long term. Still, they could undermine affordability for some households in the short term, especially for incumbents. But stringent rent controls also reduce the rates of return on real estate investment. The related uncertainty discourages developers and lenders from investing in real estate, making the supply of housing considerably less responsive to changes in demand. At the same time, tight rental contract restrictions could also affect vulnerable renters adversely, which poses obstacles for residential and labour mobility. Indeed, excessive protection of tenants often implies that renters with uncertain labour market prospects, such as low-wage or non-standard workers, find it difficult to sign a lease, because landlords, who anticipate a difficult eviction in case of non-payment, require evidence about the stability of tenants' income. There nonetheless remains a case for providing tenants with reasonable security over tenure and rent levels: a compromise can be a system of rent stabilisation, whereby rents can be varied for new contracts and renewals but regulated in line with market developments during the duration of the contract.

References

Dougherty, S. and A. Montes Nebreda (2023), *Consolidated expenditure by government function: an extension of the Fiscal Decentralisation database*, https://oe.cd/FFbyF. [6]

Dougherty, S. and L. Phillips (2019), "The spending power of sub-national decision makers across five policy sectors"*, OECD Working Papers on Fiscal Federalism*, No. 25, OECD Publishing, Paris, https://doi.org/10.1787/8955021f-en. [5]

OECD (2023), *Brick by Brick (Volume 2): Better Housing Policies in the Post-COVID-19 Era*, OECD Publishing, Paris, https://doi.org/10.1787/e91cb19d-en. [2]

OECD (2022), *Housing Taxation in OECD Countries*, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/03dfe007-en. [3]

OECD (2021), *Brick by Brick: Building Better Housing Policies*, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en. [1]

Phillips, L. (2020), "Decentralisation and inter-governmental relations in the housing sector"*, OECD Working Papers on Fiscal Federalism*, No. 32, OECD Publishing, Paris, https://doi.org/10.1787/2d3c3241-en. [4]

2 Changes in the geography of housing demand after the onset of COVID-19

By Rudiger Ahrend, Manuel Bétin, Maria Paula Caldas, Boris Cournède, Marcos Díaz Ramírez, Pierre-Alain Pionnier, Daniel Sanchez Serra, Paolo Veneri and Volker Ziemann, OECD

This chapter presents a new house-price dataset from a network of public and private data providers, exploring housing market shifts following the COVID-19 pandemic. As remote work gained prominence, many people sought larger spaces, potentially further away from city centres due to reduced commuting needs. The study's results indicate a trend shift in housing demand from major city centres to urban peripheries. However, this shift is not consistent everywhere. It is more pronounced in cities with larger pre-pandemic house price disparities, more green space access at the periphery, better high-speed internet availability or where COVID-19 containment measures were more stringent. The chapter concludes by discussing policy implications, including the benefits of flexible policy settings that allow supply to adjust smoothly to new demand patterns, and makes suggestions for future work planned to better understand the shifts with the new data.

Rudiger Ahrend, and Marcos Díaz Ramírez are members of the OECD Centre for Entrepreneurship, SMEs, Regions and Cities. Manuel Bétin, Maria Paula Caldas, Boris Cournède, Pierre-Alain Pionnier and Volker Ziemann are members of the OECD Economics Department. Daniel Sanchez Serra is member of the OECD Directorate for Science, Technology and Innovation. Paolo Veneri is now Professor at the Gran Sasso Science Institute. The authors are indebted to Federica de Pace, Young-Hyun Shin (OECD Economics Department), Andres Fuentes Hutfilter (Centre for Entrepreneurship, SMEs, Regions and Cities) and Johannes Schuffels (European Commission, formerly OECD Statistics and Data Directorate) for their contributions to the preparation of the project before they left the project team for new responsibilities. Earlier versions of this chapter were discussed by the Working Party No. 1 on Macroeconomic and Structural Policy Analysis of the OECD Economy Policy Committee on 10 March 2022 and a workshop co-organised by the OECD Network on Fiscal Relations Across Levels of Government and the Korea Institute of Public Finance on 28 November 2022. The authors are grateful to the Chair of Working Party No. 1, Arent Skjaeveland (Norwegian Ministry of Finance), WP1 Delegates and OECD-KIPF workshop participants for their comments. They would also like to thank Luiz de Mello and Alain de Serres (OECD Economics Department) for their comments on earlier drafts and guidance and insights throughout the project and Celia Rutkoski for administrative support.

2.1. Introduction and main findings

The COVID-19 crisis has profoundly modified people's views of their own homes. Lockdowns, school closures, mandates and encouragements to work from home, as well as social distancing, meant that most people spent much more time in their homes for work, education and leisure. This experience is likely to have changed housing preferences: many want more space, notably to accommodate more teleworking, even if this implies living further away. Simultaneously, the value of proximity to jobs and consumer services has diminished amid the rise of teleworking and online services.

The OECD, through a team spanning across its Centre for Entrepreneurship, SMEs, Regions and Cities, the Economics Department and the Statistics and Data Directorate, launched an activity to document the extent to which the geography of housing demand has changed since the onset of COVID-19 and investigate the role of potential drivers. This activity relies on a specially assembled dataset of housing transactions and prices at a granular geographical level, which, at the time when this chapter was prepared, covered 13 OECD countries. The authors would like to extend their gratitude to all private and public data providers who have contributed to collecting and designing this novel and innovative database.

In 2020, at the onset of the COVID-19 pandemic, many OECD governments required people to work from home. Since then, many workers have returned to their workplaces (including partially, e.g., three days per week), and more will probably do so once the pandemic finally retreats, but not all. It is safe to say that the COVID-19 shock has accelerated the transition to working-from-home practices enabled by the digital revolution (Criscuolo et al., 2021[1]). As a result, more workers can afford to live further from their workplace amid a reduced number of commuting days, fundamentally altering a key criterion for the choice of residence. By fuelling fears of infectious diseases, the pandemic might also instil a greater appetite for living in lower-density areas, where contagion is less likely. Lockdowns and other restrictions on consumer services also reduce the desirability of living in big cities (Glaeser, 2021[2]).

Across the OECD, the COVID-19 shock has led to a massive quasi-natural experiment whereby the maximum possible share of remote work was implemented for several months. The share of employees working occasionally or regularly from home jumped from 16% before the COVID-19 crisis to 37%, or even nearly 50%, according to some surveys, in March-April 2020 (OECD, 2021[3]; Ker, Montagnier and Spiezia, 2021[4]). This unprecedented experience implies that the possibilities of change in working habits enabled by digitalisation, which, in normal times, would have been tried and tested gradually over years if not decades, were explored all at once in 2020. Mandates for telework also removed the stigma associated with working from home (Barrero, Bloom and Davis, 2021[5]; Criscuolo et al., 2021[1]).

This experience will likely have lasting consequences even as the COVID-19 crisis recedes, primarily because it has revealed previously unknown or uncertain benefits of working-from-home practices for both employers and employees (Criscuolo et al., 2021[1]). It may have also challenged previous ideas of the costs of teleworking for employers. Even if the COVID-19 crisis recedes completely, managerial attitudes are likely to have changed in favour of greater flexibility, which would encourage more people to work from home. Evidence from 20 OECD countries shows that online job postings in September 2021 advertised teleworking three times as frequently as they did in January 2020 (Adrjan et al., 2021[6]). A survey of 22 500 US citizens uncovered that 22% of workdays are likely to be carried out from home after COVID-19, compared with 5% before (Barrero, Bloom and Davis, 2021[5]).

Teleworking opens options to relocate, notably within large cities, which tend to concentrate the largest share of jobs amenable to remote working (OECD, 2020[7]) and the highest Internet quality (OECD, 2021[8]). This might imply that, unlike after previous epidemics or disasters, high-density urban centres would not have the same level of attractiveness after COVID-19 (Glaeser, 2021[2]). In extreme cases, former office workers become so-called "digital nomads" who can work from where they want, though preferably in the same jurisdiction or time zone as their employer. A survey suggests that the number of "digital nomads" has risen from 3.5% of the US working-age population in 2019 to 7.5% in 2021 (MBO Partners, 2021[9]).

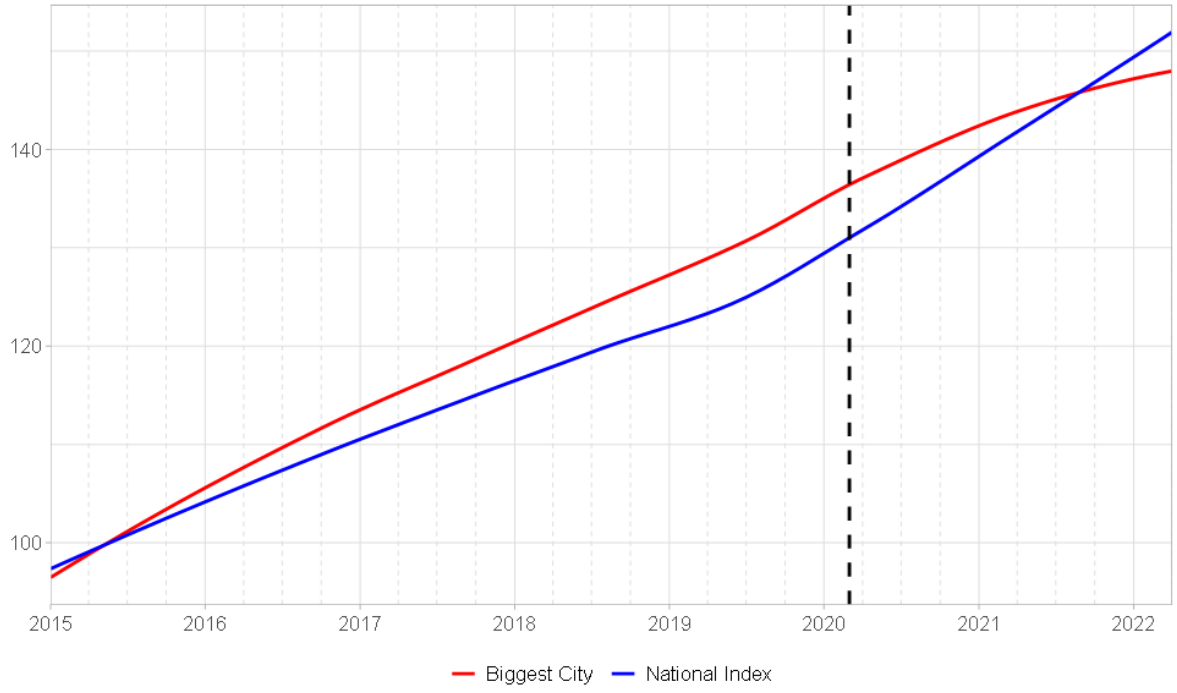
To work remotely most of the time or regularly would reduce commuting. Such arrangements make it possible to live further away from the workplace, enabling relocation towards areas that offer lower prices (or more space for the same price), higher-quality environmental amenities, or both. However, one drawback of relocations is that the distance to cultural and leisure activities often increases.

Further key benefits of moving away from high-density urban areas often include better access to green space and better air quality. Indeed, high levels of local air pollution recorded in high-density areas prompt large numbers of premature deaths (OECD, 2016[10]). The COVID-19 crisis may also have fuelled the desire to relocate towards lower-density areas where people feel more at ease to keep themselves away from infectious diseases at a time when the amenities of life in big cities were diminished.

In contrast to pre-pandemic trends, many OECD countries have, since the onset of COVID-19, seen their most-populated cities experience less house price growth than the national average (Figure 2.1). For instance, the moderate increases observed in Budapest, London, Mexico City, Paris or New York City contrast with strongly rising national house prices in Hungary, the United Kingdom, Mexico, France and the United States.

Figure 2.1. House prices rise faster outside major cities

House price index (2015=100)



Note: City-level indices according to OECD National and Regional House Price Indices. Averages across nine countries that figure in this study and provide valid city- or small-region-level house price data are shown: AUT, DNK, FIN, FRA, GBR, HUN, IRL, NOR, USA. Absent the city level index, corresponding small region indices have been used for GBR (Inner London) and DNK (Byen København). For ESP, only large region indices are available, which impedes a precise mapping to biggest cities. EST, DEU, PRT do not publish official regional house price indices.
Source: OECD National and Regional House Price Indices (http://dotstat.oecd.org/Index.aspx?DataSetCode=RHPI).

The provision of regional and city-based house price indices has helped gauge regional differences and detect divergences. The OECD stands at the forefront of this progress with the production of the OECD Database on National and Regional House Price Indices. Yet, anecdotal evidence hints at heterogeneous effects within urban areas due to the disruptions perpetuated by the pandemic. More granular house price data are necessary to understand recent developments better. Unfortunately, harmonised cross-country

datasets for that purpose are unavailable and most studies, if not all, focus on individual countries or cities. This paper provides the first results from the activity undertaken to fill this gap. The main findings of the first explorations of the data are:

- The novel database of disaggregated house price data across a broad range of countries paves the way for structural assessments of national and local housing markets. The comprehensive country coverage enables new analytical work to enrich the policy discussion.
- Spatial changes in transaction intensity and prices since the onset of COVID-19 indicate that many large metropolitan areas (of more than 1.5 million inhabitants) have experienced a shift in housing demand from the city centres towards their peripheries.
- This effect has, however, been far from universal or uniform. The house price curve that links prices to the distance to the city centre has flattened more in large metropolitan areas where:
  - Wide gaps separated house prices in city centres and commuting zones pre-COVID-19;
  - Peripheral areas provide substantially better access to green spaces than the urban core;
  - Good high-speed internet coverage extends to the periphery;
  - The metropolitan area's population and population density are larger; and
  - COVID-19 containment measures were more stringent.

These first results seem to corroborate the "doughnut effect" for many, though not all, large metropolitan areas (Ahrend et al., 2023[11]). Working-from-home practices appear to modify housing preferences and contribute to a shift in housing demand away from higher-density, typically central, toward more peripheral areas. This shift offers the potential to relieve price pressures in central areas, reduce within-city spatial disparities and redirect demand to places where it can be better accommodated.

These developments underscore the case for flexible housing supply policies at the level of metropolitan areas. If greater demand for peripheral areas cannot be accommodated, including through densification, the risks are twofold: steep housing price increases in these areas and/or urban sprawl. The occurrence of such a shift also requires policies that enable widespread access to high-speed internet, including in peripheral areas.

The next section of this chapter describes the dataset and highlights stylised facts. The third section provides econometric analyses to identify how the geography of housing demand has evolved following the COVID-19 shock. The fourth and final section discusses policy implications.

2.2. A novel cross-country dataset for disaggregated house prices

The establishment of regional and city-level house price indices has enabled the identification of the build-up of house price divergences and policymakers to address the resulting challenges for housing affordability and equality of opportunity. However, the possible reshaping of housing demand within urban areas requires more disaggregated data.

Most empirical studies assessing spatial shifts of housing demand in the COVID-19-era have focused on the United States. Analysis of data from the online real estate platform Zillow has revealed that the house price difference between zip codes close to and far from the central business districts of the largest US metropolitan areas has narrowed following the onset of COVID-19 (Brueckner, Kahn and Lin, 2021[12]). A similar study, also relying on Zillow data, confirmed this conclusion for prices and identified a similar flattening effect on rent differences (Gupta et al., 2021[13]). A third inquiry using Zillow data corroborated these results, finding stronger effects in areas with large shares of telework-compatible jobs and amenities such as restaurants (Liu and Su, 2021[14]). Another US study documented that the short-lived sharp fall in listings in the second quarter of 2020 had a temporary effect on prices (Bhutta, Raajkumar and van

Straelen, 2021[15]). Analysis of individual-level property transactions found direct evidence of some population redistribution from densely populated areas to nearby locations in the New York area following the COVID-19 outbreak (Li, Liu and Tang, 2021[16]).

At the time of writing, a single econometric study had been identified that investigates within-urban-area shifts in house prices after the onset of COVID-19 outside the United States. Transaction data from Wuhan, China, show a narrowing of spatial house price differences in the immediate aftermath of COVID-19 but say little about post-COVID-19 effects as the time period covered stops in July 2020 (Cheung, Yiu and Xiong, 2021[17]).

2.2.1. Data sources and limitations

The data are based on housing transactions. One exception is the United States, where the numbers are model-based Zillow estimates, but the Zillow model primarily draws on sales data. Relying on transacted prices (and the number of transactions) rather than rents or survey responses ensures that the data reflect long-term commitments of housing choices rather than transitory ones. Innovative collaborations and data collection efforts have been mobilised to gather the necessary data to study this question over as many OECD countries as possible (Box 2.1). The investigation requires data at a sufficiently disaggregated level to distinguish between central, close-periphery, suburban, semi-rural and rural areas. This requirement typically means having house price data at the zip code level (or equivalent when the aggregation unit was too large). For three countries, France, Ireland and the United Kingdom, transaction-by-transaction data are available, allowing re-aggregating at the zip code in dense urban areas or community level in more sparsely populated rural areas.

This study uses the dwelling floor area as a proxy for quality. Indeed, in the absence of sufficiently detailed information on the sold properties, the data do not allow computing hedonic house price indices including additional quality attributes in the same way as official house price indices do. The floor area is available for all countries except the United Kingdom, Ireland and the United States. However, the data allow stratification by type of dwelling in the United Kingdom and the number of bedrooms in the United States. Beyond its usefulness to build a proxy for quality-adjusted house prices, size information also yields valuable information regarding changing preferences in the wake of the pandemic. Indeed, living in a bigger dwelling can be a key reason for moving away from central urban areas.

Box 2.1. A new network of independent data providers

A network of independent data providers has shared quantitative information on housing transactions with the OECD. National statistical organisations comprise the largest group in the network (Austria, Denmark, Finland, Hungary, Norway). Specific property authorities provide the data for three countries (Property Service Regulatory Authority in Ireland, HM Land Registry in the United Kingdom, Estonian Land Board in Estonia, General Council of Notaries in Spain). A number of private partners are also sharing information pro bono (Zillow in the United States, Confidential Imobiliario in Portugal and Vdp Research in Germany). The dataset for France, which covers all transactions, comes from an open-data programme managed by the Ministry of Finance.

The source data cover the COVID-19 period and at least two years before the pandemic at a within-urban-area level of granularity (Table 2.1). This level of detail allows analysing geographical changes since the onset of COVID-19.

Deep gratitude goes to the providers for their work to produce the data and share them.

Table 2.1. Data providers and coverage

	Source	Geographical units	Period covered
AUT	Statistik Austria	955 municipalities	2015Q1 - 2021Q2
DEU	vdpResearch	4 191 postal codes + 154 districts	2018Q1 - 2021Q2
DNK	Statistics Denmark	529 postal codes	1992Q1 - 2021Q2
ESP	Centro de information estadistica del notariado & INE	4 283 municipalities + 31 districts	2011Q2 - 2021Q2
EST	Estonian Land Board transactions database	45 towns + 13 districts	2003Q1 - 2021Q4
FIN	Statistics Finland	225 municipalities	2010Q1 - 2021Q1
FRA	Demande de valeurs foncieres (data.gouv.fr)	10 065 communes + 180 districts	2014Q1 - 2021Q2
GBR	UK Government Price Paid data	8 131 postcode sectors	1995Q1 - 2021Q3
HUN	Hungarian Central Statistics Office	2 704 communes + 23 districts	2008Q1 - 2021Q2
IRL	Property Services Regulatory Authority	119 local electoral areas + 331 communes	2015Q1 - 2021Q2
NOR	Statistics Norway	56 municipalities	2006Q1 - 2021Q3
PRT	Confidencial Imobiliário	496 parishes	2009Q1 - 2021Q2
USA	Zillow Research Institute	29 823 zip codes	1996Q1 - 2021Q1

Note: Geographical units reflect the final aggregation and may differ from the granularity of the original data set to allow for a sufficient number of transactions per geographical unit.

Building a database of disaggregated house price data entails challenges. While the following issues make cross-country comparisons of prices difficult, they should not affect the comparability of spatial house price differences or their evolution over time:

- Official house price statistics, which would include cleaning, stratifications and quality adjustment, are generally not available at the required level of disaggregation. The data used in this study differ both conceptually and methodologically from standard house price indices (Pionnier and Schuffels, 2021[18]).
- There is substantial heterogeneity in the type of data sources across countries. The data originate from stamp duty requirements, property tax collection, land registries or financial information,

depending on the country. This heterogeneity results in differences in coverage across countries: for instance, the dataset excludes transactions that do not involve mortgages in Germany; contains only transactions published online for Portugal and uses statistical smoothing in the United States. It also results in different sets of variables (price, floor area, type of building, total value) and the absence in some cases of the floor area of each unit or the inclusion of value-added tax or notarial fees in the final price.

- Owing to privacy concerns, transactions, even if aggregated at the level of small administrative units, are usually not communicated when the number of transactions is below a minimum threshold. This reduces the sample, especially in rural areas. For countries where all the raw information is available (France, Ireland and the United Kingdom), this study applies a similar treatment: at least five transactions during the quarter are required for an observation to enter the dataset. This correction aims at limiting artificial volatility created by changes in the composition of the observed transactions.

The noise embedded in the source data can vary depending on the collection method and cleaning applied by the data provider. In the United States, for instance, the Zillow Home Value Index is a smoothed, seasonally-adjusted measure of the typical home value and market changes for a given region and housing type. It reflects the typical value of homes in the 35th-65th percentile range. The heterogeneity in the production of source data contributes to differences in patterns such as the relative smoothness of price changes in the United States as compared with Portugal or Ireland, where the data exhibit greater volatility.

2.2.2. Geographical units and coverage by country

Table 2.2 illustrates the granularity of the house price dataset based on geographical units with valid house price data for the first half of 2021. In the case of Spain, notary data were only available up to 2020 at the time of writing, and only district data for Barcelona and Madrid could enter the analysis, which explains the limited coverage. In terms of population and area, the size of geographical units is quite different in some instances (e.g., Norway compared with Ireland). Box 2.2 provides more detail on the country-specificities of the collected data.

Table 2.2. Main characteristics of the geographical units in the database

	Population coverage	Area coverage	Population per unit			Surface in km2			Population density		
	% of total	% of total	P5	P50	P95	P5	P50	P95	P5	P50	P95
AUT	66	30	1433	4628	31360	5.4	30.4	143.7	24	163	1845
DEU	85	84	2548	12536	46081	2.4	26.6	203.2	63	389	5188
DNK	68	36	2585	15760	59492	5.4	48.2	285.2	40	286	4778
ESP	10	<1	71200	146076	289585	4.4	10.2	49.1	3633	13175	20649
EST	63	2	794	5714	58532	2.0	10.0	36.0	137	782	3566
FIN	82	41	3829	11849	88080	44.6	487.0	2501.8	3	29	726
FRA	89	80	244	1468	27087	3.4	13.3	68.6	17	97	1808
GBR	86	62	1266	6882	13753	0.4	4.2	87.0	47	1839	9401
HUN	92	74	330	1780	20222	8.4	29.9	122.5	18	57	389
IRL	96	100	535	2889	43689	0.1	0.7	935.0	30	3118	8933
NOR	63	12	20183	33711	159329	71.2	440.5	2229.1	16	133	582
PRT	45	8	2976	16442	48470	2.6	14.4	95.1	76	1118	8007
USA	97	65	191	3547	42359	2.6	97.6	689.3	2	35	2104

Note: P5, P50, P95 refer to 5th, 50th (median) and 95th percentiles of the variable's distribution across geographical units. Population density is in people per square km.

Box 2.2. Metadata by country

Austria: Quarterly housing transactions, limited to purchases by households, were aggregated at the municipal level. Transactions between relatives, partial transactions and acquisitions for demolition are removed when possible. Missing or implausible data, as well as tail ends of prices and areas, are removed.

Denmark: Average prices per square meter for three property categories: i) detached and townhouses, ii) condominiums, and iii) holiday homes. Properties with exceptionally high or low realised trading prices and postal codes with less than five transactions are discarded to limit measurement errors. The final average prices are computed as unweighted averages across property categories for each location.

Estonia: Data aggregated at the municipal level.

Finland: Geometric averages of square metre prices based on asset transfer tax statements from the Finnish Tax Administration's asset transfer tax data are reported. The preliminary quarterly data include around two-thirds of all housing transactions, though coverage varies by area.

France: All property transactions in France, excluding Alsace, Moselle and Mayotte, were recorded in notarial acts and cadastral registers. Median square meter prices are aggregated to the commune or district (arrondissement) level depending on the number of observations: if 80% of the communes in a district report fewer than five observations, all communes of that district are aggregated.

Germany: Quarterly transaction data were gathered by around 600 credit institutions. The data are aggregated at the postal code level in metropolitan areas of cities with more than 500 000 inhabitants. Outside these areas, house price transactions are aggregated at the municipal level.

Hungary: Quarterly house price data based on stamp duty receipts provided by the National Tax and Customs Administration (NAV). Average and median per square meter prices are calculated after excluding 5% of cases identified as outliers and 1% of cases where prices are missing. Available original floor areas are supplemented by estimated values where the actual information is missing (40% of all cases are estimated).

Ireland: House price data as declared to the Revenue Commissioners for stamp duty purposes. Properties not sold at full market price are excluded. Geocoded addresses were retrieved from a third-party aggregator (propertypriceregisterireland.com).

Norway: Number of transactions and average per square meter prices are at the commune level. The nomenclature from 2021 is used (major mergers in 2021 and before were back-casted).

Portugal: The transaction price does not include taxes. In the case of transactions resulting from the action of a real estate agent, the price corresponds to the amount on which the mediation commission is calculated.

Spain: Municipal and, for Barcelona and Madrid only, more granular district data are used from the General Council of Notaries. Outside Barcelona and Madrid, more granular data were provided by INE. The 2021 update came too late for this report but will be incorporated in subsequent work.

United Kingdom: The data include information on all residential property sales in England and Wales that are sold for value and are lodged with HM Land Registry. The dataset excludes all commercial transactions as well as sales without market value.

United States: The study uses the Zillow Home Value Index, a smoothed, seasonally adjusted estimated sale price (Zestimates) for the typical value for homes in the 35th to 65th percentile price range computed based on proprietary statistical and machine learning models. This model-based rather than transaction-based nature of the index reduces the spatial and intertemporal noise observed in other countries' data that are based on actual transactions.

The bulk of the statistical analysis throughout the study refers to urban areas and the impact of COVID-19 on urban house price gradients, defined as the slope of the curve depicting house prices as a function of the distance to the city centre. An increase in the house price gradient means that the curve of house prices according to distance flattens (because the slope is negative, adding a positive number to it makes the curve less steep).

For the sake of harmonisation, urban areas relate to OECD's classification of Functional Urban Areas (FUAs) (Dijkstra, Poelman and Veneri, 2019[19]). FUAs consist of an urban core, a contiguous set of local units with a high population density accommodating at least 50 000 people, and a commuting zone defined as the contiguous set of local units surrounding the urban core and in which at least 15% of the employed residents work in the urban core (city). The distribution of geographical units by FUA size varies a lot across countries (Table 2.3). The OECD Metropolitan database is used to perform the mapping from small geographical units (such as zip codes or municipalities) to more comparable statistical units (including FUAs) and to estimate geospatial variables such as area, population density and distance to the city centre.

Table 2.3. Distribution of geographical units by FUA size

Country	50K-100k FUA (%)	100k-250k FUA (%)	250k-1.5M FUA (%)	>1.5M FUA (%)	Outside FUA (%)
AUT	0	0	26.5	26.2	47.3
DEU	0.2	5.1	37.0	35.7	22.0
DNK	0	0	23.2	21.5	55.3
ESP	0	0	0	100	0
EST	4.0	0	16.3	0	79.7
FIN	0	14.1	23.4	0	62.5
FRA	0.2	5.6	32.5	16.6	45.1
GBR	1	8.1	36.2	31.6	23.2
HUN	0.9	19.5	9.5	11.3	58.9
IRL	8.4	13.4	16.3	45.0	16.8
NOR	1.7	1.7	35.6	0.0	61.0
PRT	1.0	4.7	22.5	38.9	32.9
USA	0	3.2	18.7	23.3	54.9

Source: OECD calculations.

2.2.3. Testing the monocentric model

Despite its simplicity, the monocentric model developed by Alonso (1964[20]), Mills (1967[21]) and Muth (1969[22]) correctly predicts fundamental forces underlying urban form and the spatial distribution of dwellings and their characteristics. According to the model, jobs and other amenities are concentrated in the city centre (central business district, CBD). Urban residents incur commuting costs that increase with the distance to the CBD. As compensation for longer commutes, land prices become lower as the distance to the CBD increases. As a result of lower land prices, residents substitute other consumer goods in favour of land resulting in larger dwelling sizes. As a corollary, the model also stipulates that population density and building height declines as distance increases (Brueckner, Mills and Kremer, 2001[23]).

In line with the OECD definition of functional urban areas, the geographical units' distance to high-density clusters (HDC) within FUAs are computed based on each area's population-weighted centroid. FUAs can contain one or several HDCs. Accordingly, two different measures of distance are used: the distance to the largest HDC and the distance to the closest HDC. The former will be the default measure for distances, while the latter allows for relaxing the standard assumption of monocentricity when assessing house price gradients, a useful option for future work.

Table 2.4 suggests that the dwelling size gradient is positive in large metropolitan areas up to 30km from the FUA centre. In contrast, the dwelling size–distance curve seems flat in metropolitan areas of 250 000-1.5 million people. Importantly, unconditional averages mix between and within-FUA effects. The within-FUA analysis suggests that size gradients also exist in smaller FUAs, albeit only up to a distance of 10km.

Table 2.4. Dwelling size gradient by FUA size

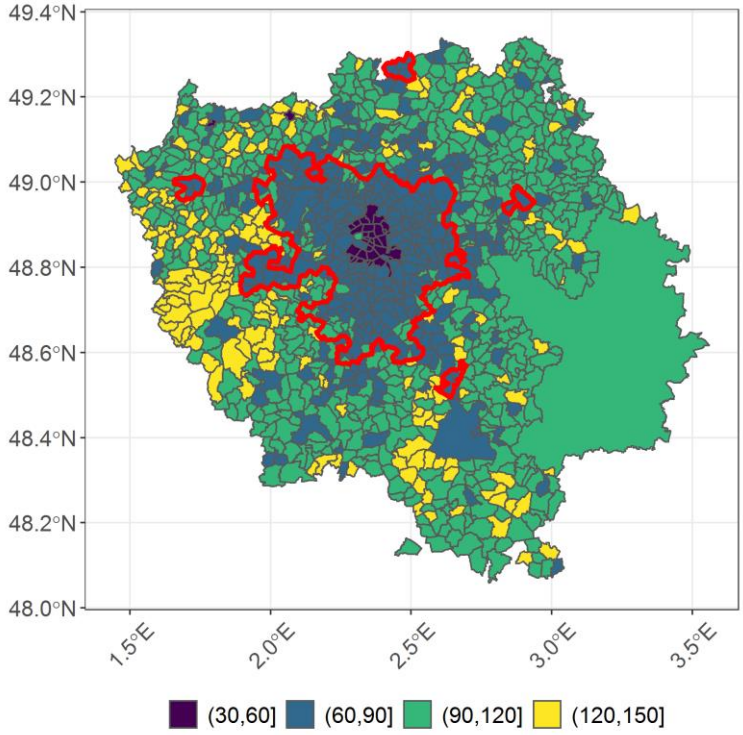
Distance brackets	[0,5)	[5,10)	[10,20)	[20,30)	[30,40)
Unconditional average					
50K-250K people	98	110	108	98	93
250K-1.5M people	95	107	112	115	119
1.5M people or more	84	92	107	110	113
Differences with respect to FUA average (within)					
50K-250K people	-16	4	3	-1	-2
250K-1.5M people	-24	-5	2	5	5
1.5M people or more	-28	-19	-3	3	7

Note: Based on registered housing transactions in 2019. Only geographical units with at least 10 transactions have been included.
Source: OECD calculations.

Even within FUAs, the granular data reveal a high level of spatial entropy (see one example on Figure 2.2). Spatial entropy can be loosely defined as measuring the heterogeneity of adjacent or nearby observations (Altieri, Cocchi and Roli, 2018[24]). It describes the randomness (disorder) of the spatial distribution of indicators (average dwelling size by zip code in Paris in Figure 2.2). High entropy inevitably creates statistical noise for the econometric analysis.

Figure 2.2. Dwellings are typically larger further from the centre: The example of Paris

Average dwelling size by small geographic area, square-meter brackets



Note: The figure displays the average dwelling size brackets in m^2 for the period 2018-2021. The large uniformly coloured area in the East of Paris reflects the aggregation at the TL3 level due to the lack of sufficient transactions (less than 5 transactions) for more than 80% of the communes in that TL3 zone. The red line illustrates the border between the core metropolitan area and its commuting zone.
Source: OECD calculations.

The data also confirm the monocentric model's prediction that house prices tend to decline with increasing distance to the city (Table 2.5). The relationship appears to differ by size bracket (Table 2.5). Up to 10km, house prices decline exponentially in large metropolitan areas, while the house price-distance curves appear flat in smaller FUAs. Beyond a distance of 10km, house prices decline at a slower pace in large metropolitan areas, while the decline typically accelerates in small and medium-sized FUAs. Figure 2.3 suggests some non-linearities in the house price to distance relationship, notably for smaller urban areas where prices tend to be lower in the city centre. This finding justifies focussing on large metropolitan areas when investigating the presence of a "doughnut effect".

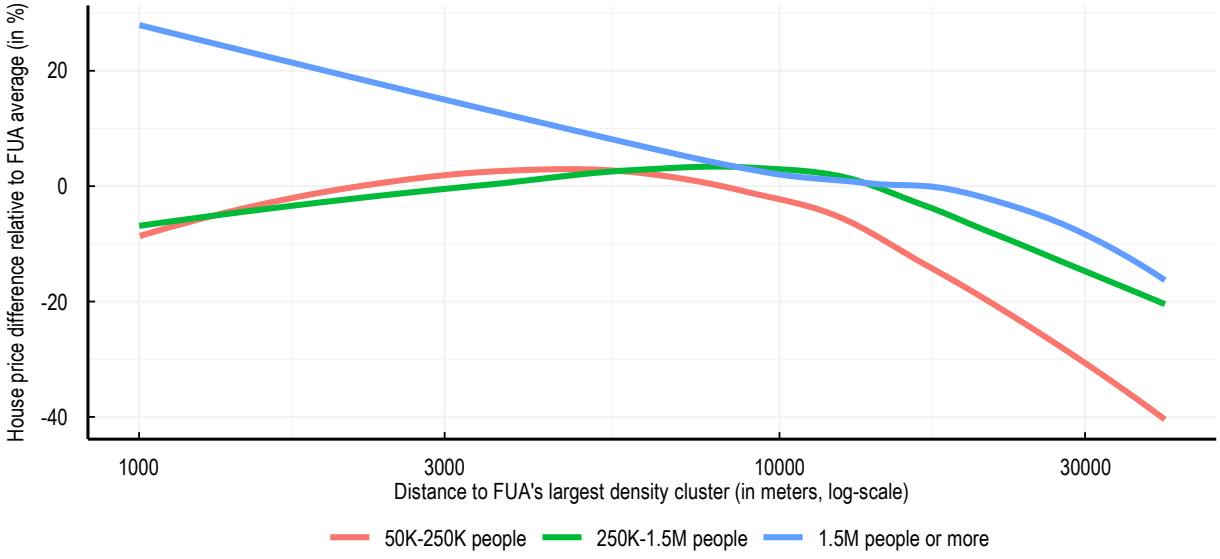
Table 2.5. House price gradients are more negative in large urban areas

Result of regressing house prices on the log-distance to the city centre

	Small and medium-sized urban areas 50K-250K people	Metropolitan areas 250K-1.5M people	Large metropolitan areas 1.5M people or more
log-distance	-6.101***	-4.863***	-20.640***
	(1.003)	(0.454)	(0.556)
Num. Obs.	2 462	13 373	13 098
R^2	0.050	0.034	0.152
Std. Errors	Heteroskedasticity-robust	Heteroskedasticity-robust	Heteroskedasticity-robust
FUA fixed effects	yes	yes	yes

* p < 0.05, ** p < 0.01, *** p < 0.001.
Source: OECD calculations.

Figure 2.3. House prices decline when moving away from city centres in large metropolitan areas



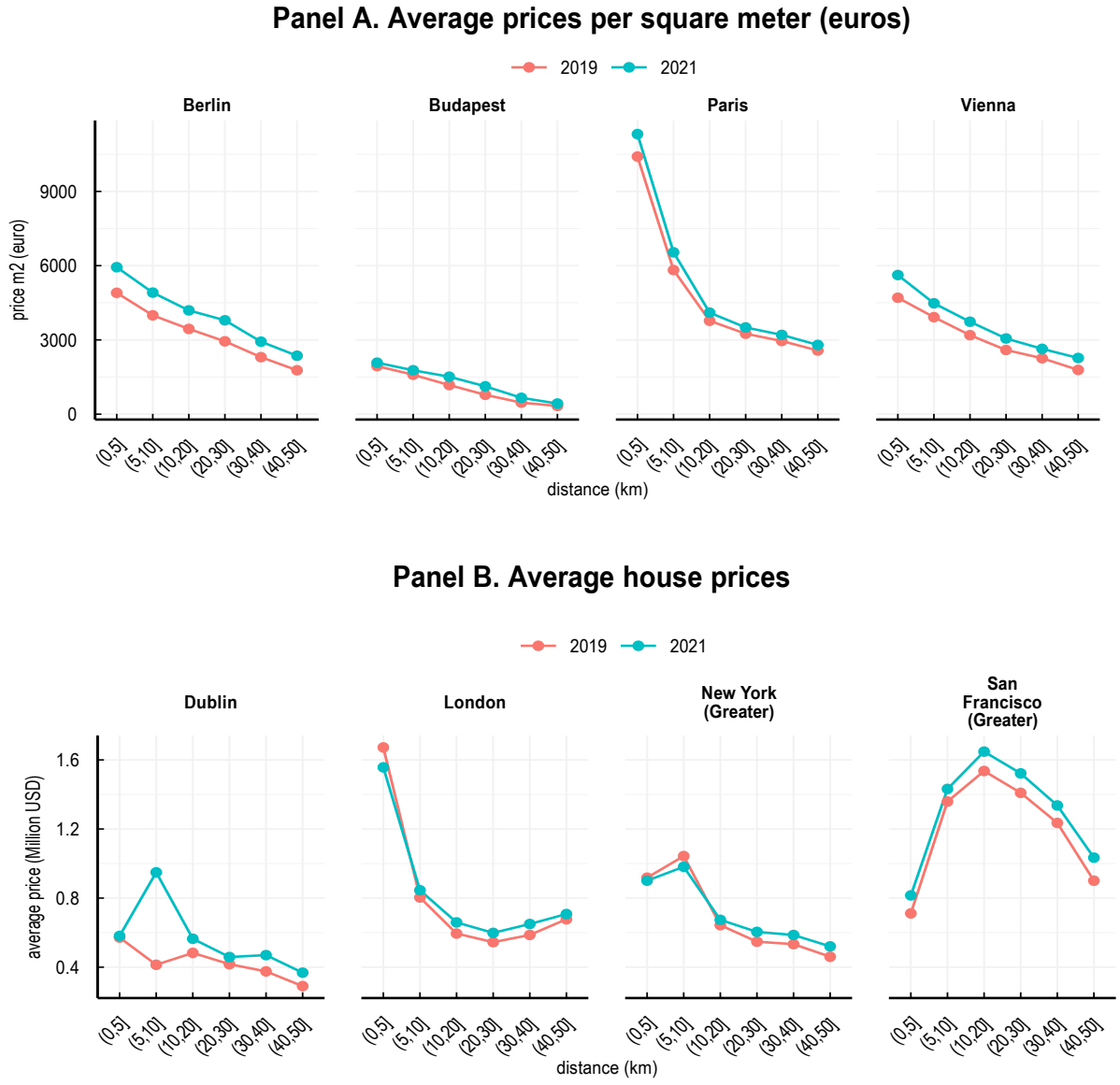
Note: The curves show within-FUA prices relative to population-weighted average FUA prices, smoothed by a non-linear LOESS filter.
Source: OECD calculations.

Figure 2.4 shows the house price gradient for a selected number of large metropolitan areas in Europe and the United States. Panel A suggests a negative house price gradient for four European capital cities, Berlin, Budapest, Paris and Vienna. In Paris, the house price curve is particularly steep, with an average price per square meter of EUR 10 500 in a 5km radius around the city centre and less than EUR 4 500 per square meter in a 10 to 20km radius. The gradients for Berlin and Vienna are similar. Top prices reach an

average of close to EUR 5 000 per square meter in the city centre (within 5km) and around EUR 1 500 per square meter in a radius of 40 to 50km.

Figure 2.4 Panel B shows house price gradients for average house prices for countries with no information on per square meter prices. In Dublin, the slope of the curve is similar to the one found in other European capital cities such as Berlin or Vienna. In contrast, London displays a steeper house price curve, similar to the one observed in Paris. Flats are sold on average for around USD 2 million within a 5km radius around the city centre but only USD 500 000 within 20 to 30km and stabilise further away. In New York, flats are sold for an average price of USD 911 000 within 5km, USD 1 million within 5 to 10km and USD 650 000 within 10 to 20km. This inverse U-shape gradient is also observed in San Francisco and many other metropolitan areas in the United States where top house prices are observed in the closer suburbs within 5 to 20km of the city centres rather than downtown as is observed in most European countries.

Figure 2.4. House prices as a function of distance to the city centre: Selected urban areas

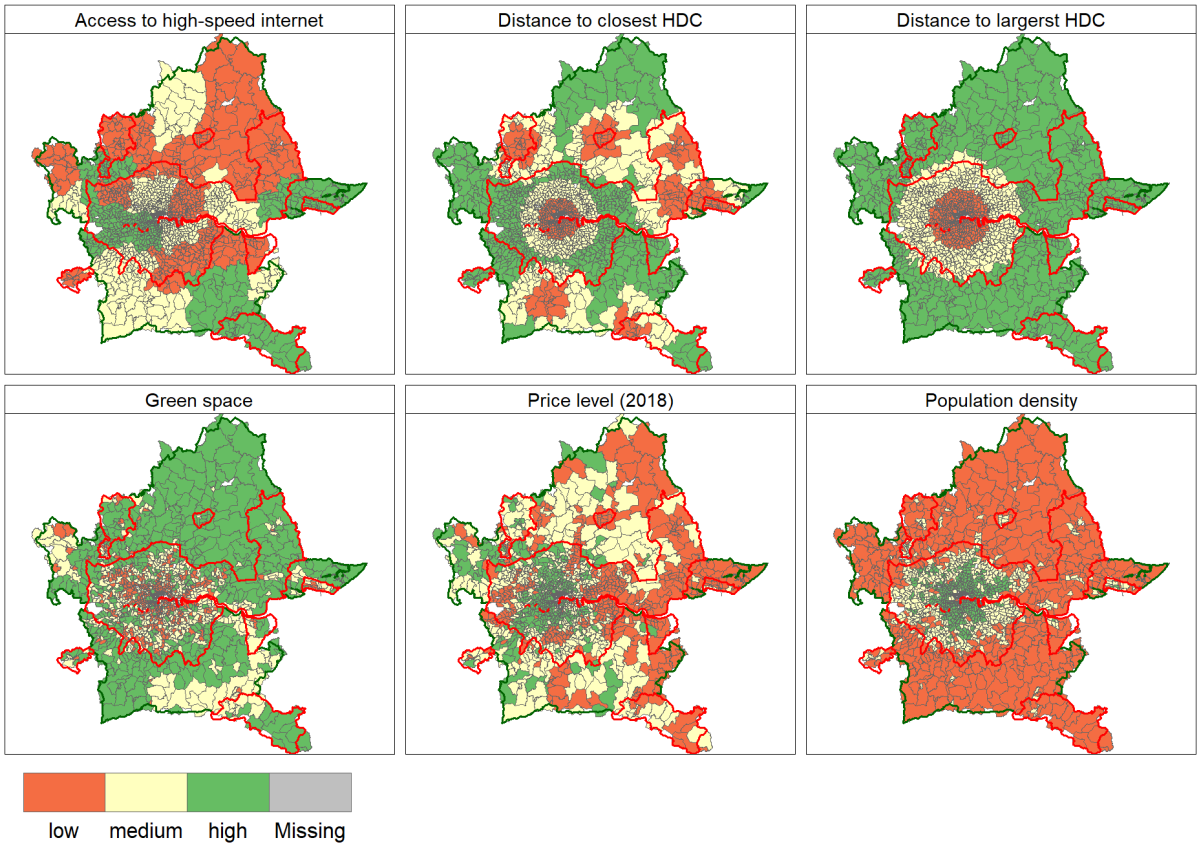


Note: Panel A displays the relationship between the average price per square meter and the distance to the largest urban centre. Panel B displays the average house price and the distance to the closest urban centre for the selected metropolitan areas. Averages are computed over the period 2018Q1-2021Q2.
Source: OECD calculations.

Several covariates have been collected to investigate drivers and co-determinants of urban house price developments. The share of green space has been computed using OpenStreetMap following the tag classification by (Novack, Wang and Zipf, 2018[25]).[1] Internet download speeds are obtained from Ookla's geolocalised data (OECD, 2020[26]). Figure 2.5 illustrates these data for London, depicting how distance influences the availability of different amenities (transport, internet connection and green space).

Figure 2.5. The geography of housing in London

Zip codes partitioned by tercile for the selected indicator



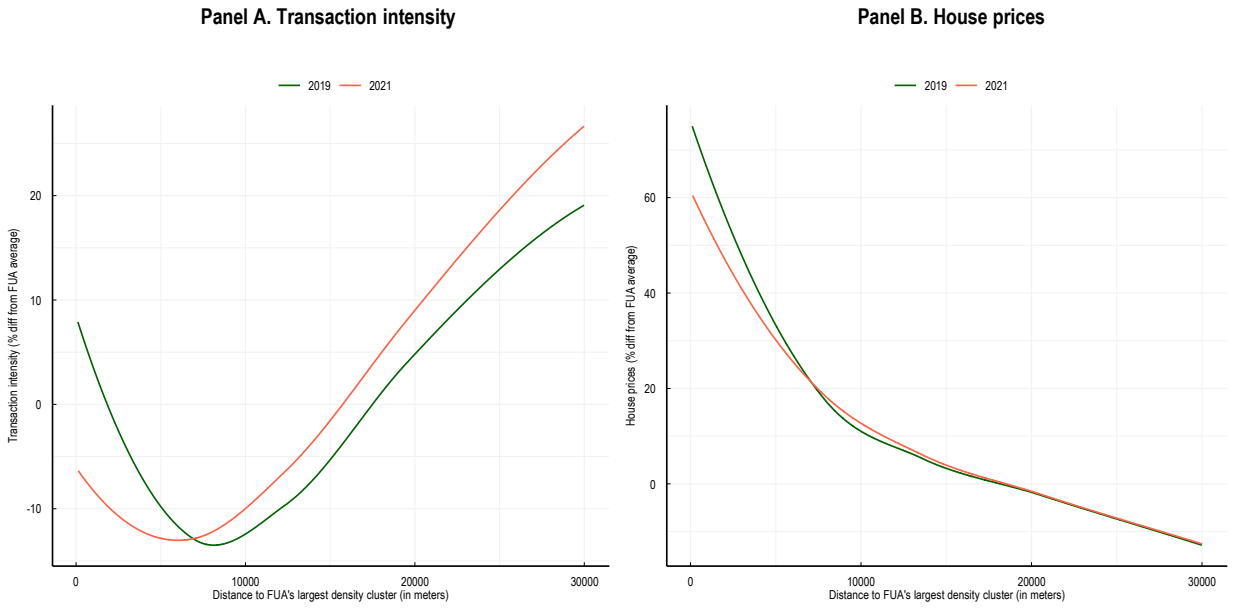
Note: Distance expressed with respect to population-weighted centroid of HDCs ("high-density cluster").
Source: OECD calculations.

2.3. Indications of shifts in the geography of housing demand since COVID-19

This section looks at signs of changes in the geography of house price changes and transaction intensity. In particular, it investigates how the gradients of price and transaction intensity have evolved following the start of the COVID-19 crisis, and then second controlling for more factors through econometric regressions. As the data run to mid-2021, the results mix potentially transitory effects with permanent ones. Yet, the house price analysis arguably reflects some lasting preference changes, especially as current house prices embed today's anticipations of future housing market conditions. Indeed, house prices are generally considered forward-looking, while rents reflect current demand-supply interactions (Gupta et al., 2021[13]). The persistence of the established results will nonetheless have to be confirmed as more data become available (covering the second half of 2021 and beyond).

The reshuffling of demand that depends on the distance to the centre is most likely to occur in large metropolitan areas, where affordable housing in the proximity of well-paying jobs is scarce, forcing many workers to trade off commuting time against the size of their homes. Figure 2.6 illustrates that transaction intensity has increased beyond the 10km radius in large metropolitan areas (Panel A). Simultaneously, the house price curve has become, on average, less steep, mostly because of a reduction of the inner-city price premia relative to the FUA average.

Figure 2.6. COVID has reduced inner-city price premia in large metropolitan areas



Note: Only geographical units in large metropolitan areas (>1.5m people) are considered. Non-linear loess smoother for each year is displayed.
Source: OECD calculations.

Timely spatial data about construction permits would also provide direct indications about demand shifts, except for areas where supply is rigid. However, such data are unavailable across a sufficient number of countries to allow an analysis. In Canada, the spatial distribution of building permits in 2021 indicates a shift away from large metropolitan areas towards smaller urban areas (Statistics Canada, 2021[27]).

2.3.1. Econometric assessment of a shift in housing demand

In the long-run equilibrium, house prices reflect the interplay of housing demand and supply. In the short run, however, given the sluggish supply response to changes in demand, house price movements are more likely to reflect changes in housing demand. Yet, the price elasticity of housing demand also depends on the supply elasticity through the expectation that supply will also adjust and bring new homes later. Hence, house prices alone are an imperfect measure of housing demand. The number of housing transactions is complementary to the price information. Transaction intensity (*TI*), defined as the number of sales per 100 000 people, can shed further light on spatial shifts in housing demand over time as it is not affected by the price elasticity of demand. There are, nonetheless, caveats to this indicator, too. First, it is also endogenous to the availability of housing units and thus to the supply elasticity. Second, a transaction can reflect selling and buying pressure (e.g., "fire sales").

A shift in housing demand from the city centre to the periphery would be reflected by an increasing number of people selling their dwellings in the city centre and buying a bigger dwelling in the outskirts of the same agglomeration. Theoretically, such an urban shift would lead to peaks in transaction intensity at both

places. While this would arguably lead to an increase in the transaction intensity in more remote areas, the impact on the level of transaction intensity in the city centre is less clear. Overall, assuming that traditional pull factors have weakened, the narrative would be consistent with an increase in the transaction intensity gradient (somewhat lower intensity in the core, and higher intensity in the periphery) corroborated by average developments depicted in Figure 2.6 (Panel A). The impact on the house price gradient should be similar on average but also depends on the scarcity of supply in both the city centre and the periphery. Importantly, the following investigations do not control for interregional migration, new construction, office-to-residential building conversions, or initial vacancy rates, all of which affect supply patterns and, thereby, house price movements and transaction intensity.

According to the two housing demand measures (house prices and housing transaction intensity), two specifications are tested to identify potential spatial housing demand shifts during the COVID-19 pandemic:

$$\Delta \boldsymbol{TI_{ij}} = \boldsymbol{\alpha_1} + \boldsymbol{\delta_1 \ln D_i} + \boldsymbol{\mu_{1,j}} + \boldsymbol{e_{1,i}} \quad (1)$$

$$\Delta \boldsymbol{p_{ij}} = \boldsymbol{\alpha_2} + \boldsymbol{\delta_2 \ln D_i} + \boldsymbol{\mu_{2,j}} + \boldsymbol{e_{2,i}} \quad (2)$$

where p_{ij} denotes the house price metric[2] in location *i* of FUA *j*, TI_{ij} the corresponding transaction intensity, defined as the number of sales per 100 000 people, D_i the distance between the geographical unit *i* and the FUA's largest high-density cluster, μ_j dummies for FUA *j* (based on OECD functional urban areas). The inclusion of FUA fixed effects means that the equation only looks at changes in each zip code relative to FUA-wide changes. The Δ operator denotes the percentage change from the first half of 2019 to the first half of 2021.[3] The δ_1 and δ_2 coefficients therefore estimate 2019H1-2021H1 changes in the gradients of transaction intensity and house prices.

Estimating a model with changes rather than levels as dependent variables has the advantage of isolating the effect of unobserved variables on levels, which cannot be controlled for by individual fixed effects since the key dependent variable, distance, is time-invariant. As a result, even the inclusion of time-fixed effects cannot control for level-determining characteristics that are correlated with distance (e.g., economic, cultural and environmental amenities). The specification in differences avoids this potential source of bias.

The results in Table 2.6 corroborate the visual impression from Figure 2.6 that the house price and transaction intensity gradients have increased from the first half of 2019 to the same period of 2021. While both coefficients are statistically significant, economically, the estimated coefficients signal a quantitatively limited effect on the respective gradients. A 10 percentage point increase in the distance to the FUA centre is associated with one additional transaction per quarter per 100 000 residents and a 0.06 percentage point increase in the house price.

Table 2.6. Estimated COVID-19 changes in transaction intensity and price gradients

Large metropolitan areas (population greater than 1.5 million people)

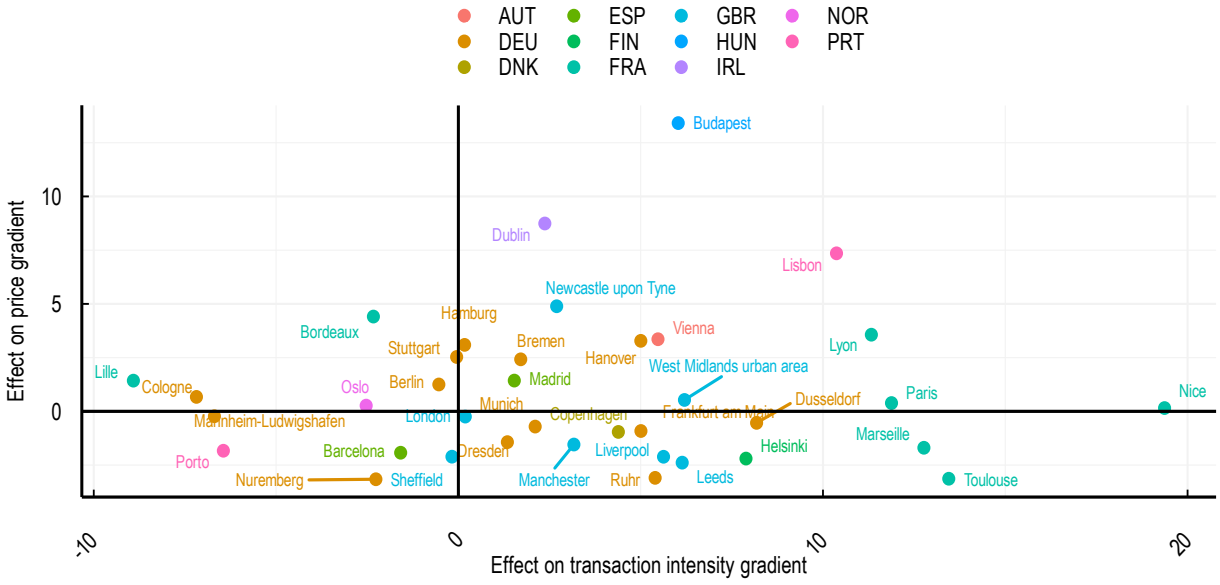
	Transaction intensity equation (1)	House price equation (2)
Distance (log)	3.018***	0.623***
	(0.620)	(0.166)
Num. Obs.	5 700	12 349
R^2 adj.	0.166	0.156
FUA FE	X	X

Note: Three stars denote 99.9% statistical significance (* p < 0.05, ** p < 0.01, *** p < 0.001). Distance is taken from largest high-density cluster within the FUA. No transaction data are available for the United States.
Source: OECD calculations.

Figure 2.7 shows city-by-city estimates of post versus pre-COVID-19 changes in transaction intensity and house prices. The results suggest differentiated impacts across and within countries. The most notable changes are estimated to have occurred in Budapest, Dublin, Lisbon and Lyon, where house price and transaction intensity gradients have increased significantly (implying that the curves linking transaction intensity and prices to distance to the centre have flattened). Paris and Liverpool exhibit an increased concentration of housing transactions at their peripheries without, however, a statistically significant impact on price gradients.

Figure 2.7. Transaction intensity and house price gradients have evolved far from uniformly across cities

Metropolitan areas of more than one million inhabitants



Note: The chart shows estimates of δ_1 on the x-axis and $\delta_2$on the y axis from equations (1) and (2) run separately for each FUA of more than one million inhabitants. By comparison with the rest of the paper, which focuses on large urban areas defined as having more than 1.5 million inhabitants, the threshold of one million was chosen to show more cities. Coverage is limited to the countries listed on the right-hand-side legend.
Source: OECD calculations.

2.3.2. Determinants of housing demand shifts

A range of factors can influence how housing preferences have shifted in the wake of the pandemic. Assuming that most people stick to their current job, benefits from lower housing costs must outweigh the disutility from longer though more infrequent commutes. Against this backdrop, this section investigates potential drivers of shifts in housing transactions intensity and price gradients. Accordingly, equations (1) and (2) are augmented with interactions between distance to the urban centre on the one hand and *i*) initial house price differences between the core and the commuting zone, *ii*) the difference in access to green space, *iii*) the availability of high-speed internet, *iv*) the stringency of COVID-19 containment measures, as well as city characteristics such as size and density. The specifications are as follows:

$$\Delta \boldsymbol{TI}_{i,j} = \boldsymbol{\alpha}_1 + \boldsymbol{\delta}_{1,0}\ln \boldsymbol{D}_i + \boldsymbol{\delta}_{1,x}(\ln \boldsymbol{D}_i * \boldsymbol{X}) + \boldsymbol{\mu}_{1,j} + \boldsymbol{e}_{1,i} \quad (3)$$

$$\Delta \boldsymbol{p}_{i,j} = \boldsymbol{\alpha}_2 + \boldsymbol{\delta}_{2,0}\ln \boldsymbol{D}_i + \boldsymbol{\delta}_{2,x}(\ln \boldsymbol{D}_i * \boldsymbol{X}) + \boldsymbol{\mu}_{2,j} + \boldsymbol{e}_{2,i} \quad (4)$$

where $\mathbf{X}$ denotes one of the described characteristics that could be related to potential shifts in housing demand. The standalone contribution of these covariates is absorbed by the inclusion of FUA-fixed effects. The Δ operator denotes the percentage change from the first half of 2019 to the first half of 2021.[4] The results are summarised in Table 2.7.

Table 2.7. Estimated links between large-FUA characteristics and COVID-19 changes in transaction intensity and house price gradients

Covariate	Transaction intensity		House prices	
	$\widehat{\delta}_{1,0}$	$\widehat{\delta}_{1,x}$	$\widehat{\delta}_{2,0}$	$\widehat{\delta}_{2,x}$
Initial house price (Core/Commuting) ratio	3.107***	-2.452*	0.602***	3.011***
	(0.627)	(1.417)	(0.173)	(0.512)
Green space (Core/Commuting zone) ratio	3.034***	0.353	0.656***	-0.970***
	(0.622)	(1.375)	(0.175)	(0.103)
High-speed internet access (Core/Core+Commuting) ratio	3.040***	0.596	0.627***	-1.277**
	(0.616)	(1.275)	(0.166)	(0.516)
FUA population size	2.954***	-1.491*	0.656***	0.495**
	(0.618)	(0.871)	(0.169)	(0.217)
FUA population density	3.062***	-0.009*	0.660***	0.007***
	(0.617)	(0.005)	(0.173)	(0.002)
Oxford containment and health index	2.954***	0.210	0.656***	0.181**
	(0.618)	(0.145)	(0.169)	(0.075)

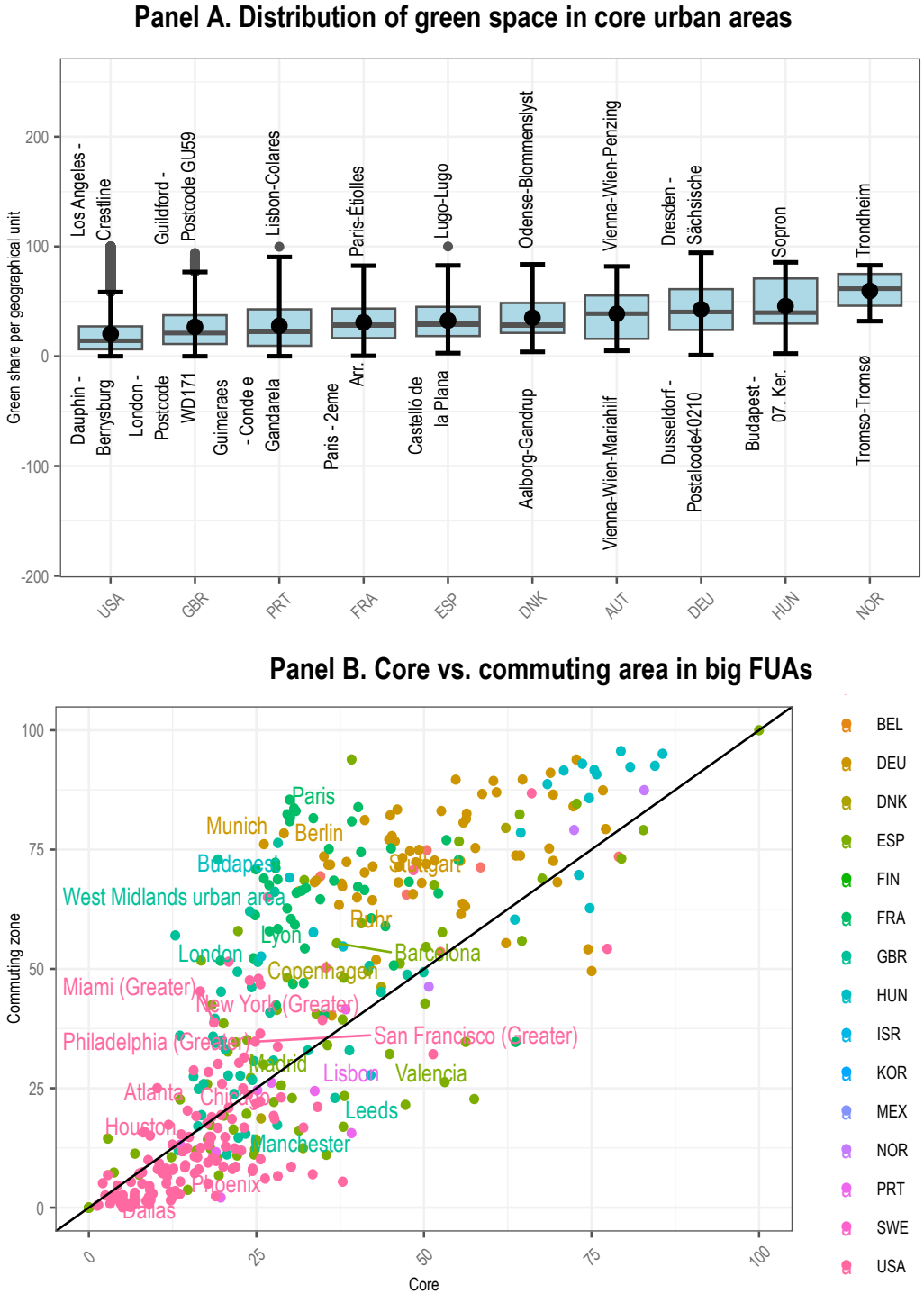
Note: Three, two and one stars denote 99.9%, 99% and 95%statistical significance (* p < 0.05, ** p < 0.01, *** p < 0.001). Equations (3) and (4) are estimated for each covariate X. Log-distances are centred for each FUA so that the sign of the estimated interaction effect can be interpreted. The sample includes observations located in functional urban areas of more than 1.5 million inhabitants.
Source: OECD calculations.

Incentives to relocate to the periphery can be anticipated to be stronger where movers can benefit from a larger price gap between the centre and the periphery. Indeed, house price gradients have gone up more in large urban areas that exhibited wider pre-COVID-19 house price differentials between the core and commuting areas (positive coefficient in the last column of the first row of Table 2.7). The negative effect on the transaction intensity gradient is difficult to interpret but could reflect a particularly strong increase in transactions in the centre as a result of the reallocation.

Access to green space

People have stronger incentives to move away from the city centre if the suburbs are considerably greener, all else being equal. Available GIS data can be used to compare green space in urban areas across countries (Figure 2.8, Panel A) and within FUAs, comparing core areas to commuting zones (Figure 2.8, Panel B). Indeed, the scarcer the availability of green space in the core area relative to the commuting zone, the more housing demand shifts away from the city centre (second row, last column of Table 2.7).

Figure 2.8. The share of green space in urban areas differs considerably across and within countries



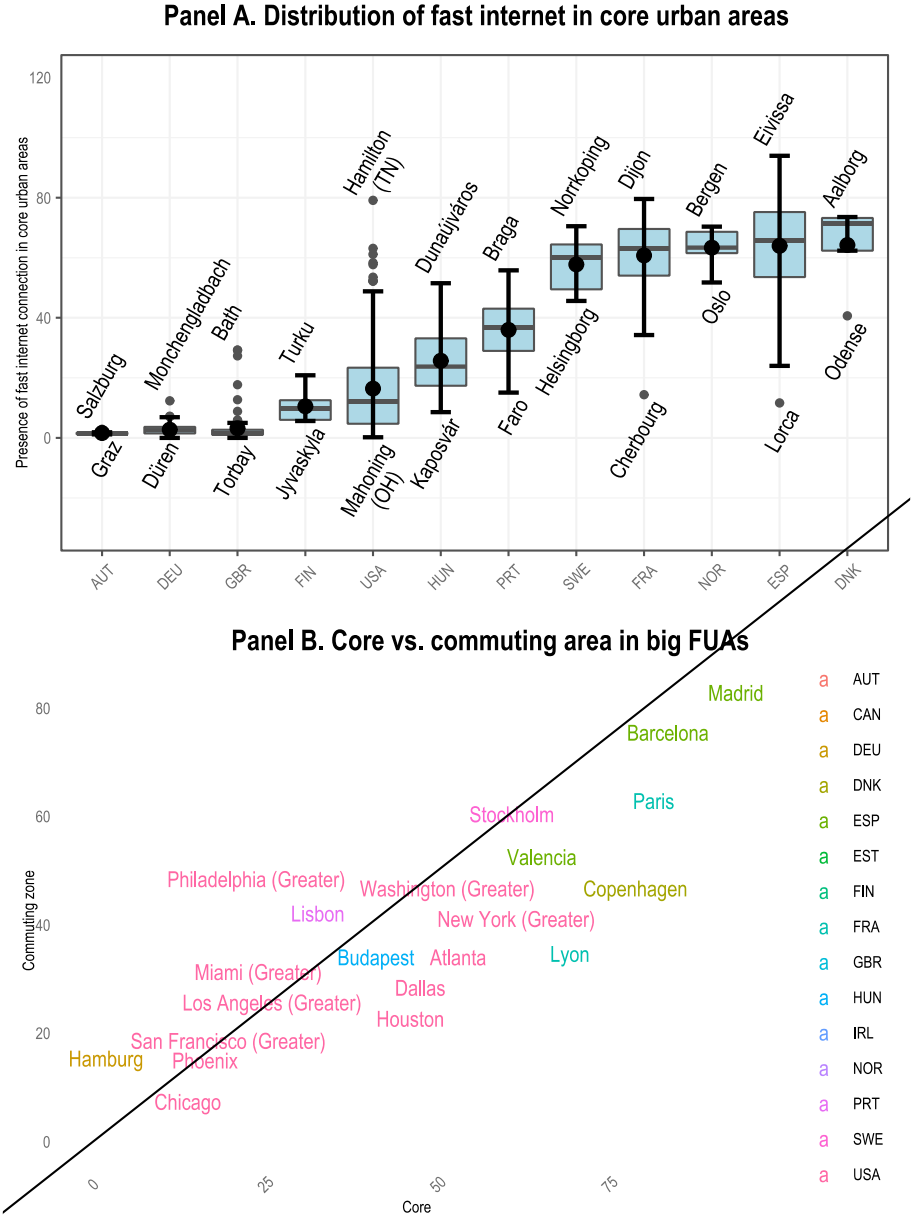
Note: Green areas are defined by the following tags: i) amenity (graveyard), ii) land use (allotments, cemetery, farmland, forest, grass, greenfield, meadow, orchard, recreation ground, village green, vineyard), iii) leisure (garden, golf course, nature reserve, park, pitch), iv) natural (wood, scrub, heath, grassland, wetland, water) and v) tourism (campsite). Only geographical units with available house price data are considered. Panel B includes FUAs with a population above 1.5 million (USA: >5 million).
Source: OpenStreetMap and OECD calculations.

Availability of high-speed internet

Increased use of working from home practices requires sufficient availability of high-speed internet. Measurements from Ookla and other speed test providers offer indications of real-world Internet speeds experienced by users (OECD, 2021[8]; Paula Caldas, Veneri and Marshalian, 2023[28]). The data suggest that the provision of high-speed internet is generally very good in urban cores but less so in some commuting areas, notably in smaller FUAs (Figure 2.9). The insufficiently widespread availability of fast internet, therefore impeding working-from-home in more remote areas, might be one of the reasons why a shift in housing demand is not observed in a number of cities (Figure 2.7).

Figure 2.9. Presence of fast internet in urban areas differs widely across and within countries

Percentage of the area where download speed averages 50Mbps or more



Note: The indicator on the availability of fast internet is based on average download speed across web Mercator tiles at zoom level 16. Panel B labels FUAs with a population above 1.5 million (USA: >5 million).

Source: OECD calculations based on Speedtest by Ookla Global Fixed and Mobile Network Performance Maps. Based on analysis by Ookla of Speedtest Intelligence data for 2021Q2.

The results indicate that, as expected, house price gradients have increased more in urban areas where access to high-speed internet is more evenly spread between the core and commuting areas (third row, last column of Table 2.7). This means that a lower coverage of high-speed internet in the commuting zone reduces the magnitude of the shift in housing towards the suburbs, as anticipated.

This empirical investigation could be enhanced by assessing the share of jobs that can be done from home for each FUA. Dingel and Neiman (2020[29]) show that this number varies considerably in the United States and across countries. For the United States, Bloom and Ramani (2021[30]) find evidence that the share of residents that can work from home is positively associated with home price changes following the onset of the pandemic.

Population size and density

As expected, the drive towards the periphery has been stronger in more populated cities (fourth row, last column of Table 2.7). Similarly, greater density is also accompanied by a sharper post-COVID-19 flattening of house price gradients (fifth row, last column of Table 2.7).

Stringency of COVID-19 containment measures

Tighter lockdowns and generally more restrictive COVID-19 containment measures are likely to reduce the attractiveness of amenities in the centre (such as restaurants, theatres, dance floors, etc.) by more than in the periphery (parks, forests, etc.). To the extent that inhabitants may consider these measures likely to come back to some degree if COVID-19 becomes endemic, they may durably alter their location preferences. Estimating this effect is empirically difficult, as no internationally comparable measure of restrictiveness has been identified at the city level. Despite the limited number of countries, using the national-level Oxford containment and health index suggests that, indeed, house price differences between city centres and their peripheries have narrowed by more in urban areas located in countries that have applied more stringent measures (last row, last column of Table 2.7).

2.4. Policy implications

The shift from centres towards peripheries to which the new dataset is pointing in many large cities offers an opportunity for housing markets. A flattening of the house price curve (i.e., increase in the house price gradient) could help offset some of the spatial inequalities that have been building up over past decades. Before the pandemic, many cities had faced increasingly unaffordable housing in central urban areas, which had acted as a brake to agglomeration effects and productivity gains (Glaeser and Gyourko, 2018[31]).

Policies have an important role to play to realise the potential created by shifts in demand toward the periphery for more inclusive and sustainable housing. However, if housing supply is not allowed to expand in areas receiving new demand, the result could be steep price increases in these areas, offsetting the affordability benefits. An inadequate supply response could also increase urban sprawl, exacerbating the challenge of reducing greenhouse gas emissions. Accordingly, the benefits of the shift in demand are magnified by land-use policies that allow some densification of the peripheral areas that face greater demand while also adjusting the provision of infrastructure and public services.

The OECD Housing Policy Toolkit outlines avenues for public policy to enhance the responsiveness of housing supply (OECD, 2021[32]). In particular, residential construction is generally more responsive to price signals when land-use governance systems avoid overlap in responsibilities and place decision authority at the metropolitan level. Indeed, by comparison with more highly decentralised decision-making processes that can give rise to "not-in-my-backyard" pressures, decisions made at the metropolitan level are better able to incorporate functional-area-wide externalities and urban policy objectives.

Furthermore, balanced policies that protect tenants while leaving sufficient flexibility in the setting of rents between contracts have shown to be supportive of housing supply, as they create a more favourable environment for the provision of rental housing. In addition, there is also a role for social housing policy in ensuring affordable supply that matches the emerging new geography of housing demand.

The effective use of working-from-home practices requires a widespread coverage of high-speed broadband internet, notably covering peripheral and more remote areas. The OECD Recommendation on Broadband Connectivity emphasises the importance of investing in broadband deployment and eliminating digital divides, notably by fostering innovation and competition in deploying broadband internet infrastructure (OECD, 2021[33]). A regular assessment of the state of connectivity at a granular geographical level through collecting, analysing and publishing data on the availability, performance and adoption of connectivity services and infrastructure deployment would help to guide public decisions in the direction of better equipping underserved areas.

References

Adrjan, P. et al. (2021), "Will it stay or will it go? Analysing developments in telework during COVID-19 using online job postings data", *OECD Productivity Working Papers*, No. 30, OECD Publishing, Paris, https://doi.org/10.1787/aed3816e-en. [6]

Ahrend, R. et al. (2023), "Expanding the doughnut? How the geography of housing demand has changed since the rise of remote work with COVID-19", *OECD Regional Development Papers*, No. 54, OECD Publishing, Paris, https://doi.org/10.1787/cf591216-en. [11]

Alonso, W. (1964), *Location and land use. Toward a general theory of land rent.*, Cambridge, Mass.: Harvard Univ. Pr., https://www.cabdirect.org/cabdirect/abstract/19641802976. [20]

Altieri, L., D. Cocchi and G. Roli (2018), "A new approach to spatial entropy measures", *Environmental and Ecological Statistics*, Vol. 25/1, pp. 95-110, https://doi.org/10.1007/S10651-017-0383-1/TABLES/5. [24]

Barrero, J., N. Bloom and S. Davis (2021), *Why Working from Home Will Stick*, NBER, p. 28731, http://www.nber.org/papers/w28731. [5]

Bhutta, N., A. Raajkumar and E. van Straelen (2021), *Have Pandemic-Induced Declines in Home Listings Fueled House Price Growth?*, Board of Governors of the Federal Reserve System, https://doi.org/10.17016/2380-7172.2968. [15]

Bloom, N. and A. Ramani (2021), "The Donut Effect of Covid-19 on Cities", No. w28876, NBER Working Paper Series, http://www.nber.org/papers/w28876 (accessed on 14 February 2022). [30]

Brueckner, J., M. Kahn and G. Lin (2021), *A New Spatial Hedonic Equilibrium in the Emerging Work-From-Home Economy?*, NBER Working Paper Series, http://www.nber.org/papers/w28526. [12]

Brueckner, J., E. Mills and M. Kremer (2001), "Urban Sprawl: Lessons from Urban Economics [with Comments]", *Wharton Papers on Urban Affairs*, pp. 65-97, https://about.jstor.org/terms (accessed on 10 February 2022). [23]

Cheung, K., C. Yiu and C. Xiong (2021), "Housing Market in the Time of Pandemic: A Price Gradient Analysis from the COVID-19 Epicentre in China", *Journal of Risk and Financial Management*, Vol. 14/3, p. 108, https://doi.org/10.3390/jrfm14030108. [17]

Criscuolo, C. et al. (2021), "The role of telework for productivity during and post-COVID-19: Results from an OECD survey among managers and workers", *OECD Productivity Working Papers*, No. 31, OECD Publishing, Paris, https://doi.org/10.1787/7fe47de2-en. [1]

Dijkstra, L., H. Poelman and P. Veneri (2019), "The EU-OECD definition of a functional urban area", *OECD Regional Development Working Papers*, No. 2019/11, OECD Publishing, Paris, https://doi.org/10.1787/d58cb34d-en. [19]

Dingel, J. and B. Neiman (2020), "How many jobs can be done at home?", *Journal of Public Economics*, Vol. 189, p. 104235, https://doi.org/10.1016/J.JPUBECO.2020.104235. [29]

Glaeser, E. (2021), "Urban Resilience", *Urban studies*, Vol. 59/1, pp. 3-35, https://doi.org/10.1177/00420980211052230. [2]

Glaeser, E. and J. Gyourko (2018), "The Economic Implications of Housing Supply", *Journal of Economic Perspectives*, Vol. 32/1, pp. 3-30, https://doi.org/10.1257/jep.32.1.3. [31]

Gupta, A. et al. (2021), *Flattening the Curve: Pandemic Induced Revaluation of Urban Real Estate.*, p. No. 28675, http://www.nber.org/papers/w28675. [13]

Ker, D., P. Montagnier and V. Spiezia (2021), "Measuring telework in the COVID-19 pandemic", *OECD Digital Economy Papers*, No. 314, OECD Publishing, Paris, https://doi.org/10.1787/0a76109f-en. [4]

Li, M., P. Liu and C. Tang (2021), "The Exodus from New York City during COVID-19: Evidence from Out-of-Town Home Purchases", https://doi.org/10.2139/ssrn.3960625. [16]

Liu, S. and Y. Su (2021), "The impact of the COVID-19 pandemic on the demand for density: Evidence from the U.S. housing market", *Economics Letters*, Vol. 207, p. 110010, https://doi.org/10.1016/j.econlet.2021.110010. [14]

MBO Partners (2021), *The Digital Nomad Search Continues*, https://info.mbopartners.com/rs/mbo/images/MBO_Partners_2021_Digital_Nomad_Research_Brief.pdf. [9]

Mills, E. (1967), "An Aggregative Model of Resource Allocation in a Metropolitan Area", *The American Economic Review*, Vol. 57/2, pp. 197-210, https://doi.org/10.2307/2981088. [21]

Muth, R. (1969), *Cities and Housing. The Spatial Pattern of Urban Residential Land Use*, Cambridge University Press, https://doi.org/10.1017/s0770451800027500. [22]

Novack, T., Z. Wang and A. Zipf (2018), *A System for Generating Customized Pleasant Pedestrian Routes Based on OpenStreetMap Data*, https://doi.org/10.3390/s18113794. [25]

OECD (2021), *Brick by Brick: Building Better Housing Policies*, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en. [32]

OECD (2021), *OECD Employment Outlook 2021: Navigating the COVID-19 Crisis and Recovery*, OECD Publishing, Paris, https://doi.org/10.1787/5a700c4b-en. [3]

OECD (2021), *Promoting high-quality broadband networks in G20 countries*, OECD Publishing, Paris, https://doi.org/10.1787/cf0093dc-en. [8]

OECD (2021), *Recommendation of the Council on Broadband Connectivity*, OECD/LEGAL/0322, https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0322. [33]

OECD (2020), *A roadmap toward a common framework for measuring the digital economy*, http://www.oecd.org/termsandconditions. [26]

OECD (2020), "Capacity for remote working can affect lockdown costs differently across places", *OECD Policy Responses to Coronavirus (COVID-19)*, https://www.oecd.org/coronavirus/policy-responses/capacity-for-remote-working-can-affect-lockdown-costs-differently-across-places-0e85740e/. [7]

OECD (2016), *The Economic Consequences of Outdoor Air Pollution*, OECD Publishing, Paris, https://doi.org/10.1787/9789264257474-en. [10]

Paula Caldas, M., P. Veneri and M. Marshalian (2023), "Assessing spatial disparities in Internet quality using speed tests", *OECD Regional Development Papers*, No. 47, OECD Publishing, Paris, https://doi.org/10.1787/77c42f5e-en. [28]

Pionnier, P. and J. Schuffels (2021), "Estimating regional house price levels: Methodology and results of a pilot project with Spain", *OECD Publishing, Paris,*, Vol. 2021/03/OECD Statistics Working Papers, https://doi.org/10.1787/b9fec1b2-en. [18]

Statistics Canada (2021), *Building permits, December 2021*, https://www150.statcan.gc.ca/n1/daily-quotidien/220202/dq220202a-eng.htm?CMP=mstatcan. [27]

Notes

[1] The OpenStreetMap tags classified as green space are *i*) amenity: grave yard; *ii*) land use: allotments, cemetery, farmland, forest, grass, greenfield, meadow, orchard, recreation ground, village green, vineyard; *iii*) leisure: garden, golf course, nature reserve, park, pitch; *iv*) natural: wood, scrub, heath, grassland, wetland, water; and *v*) tourism: camp site.

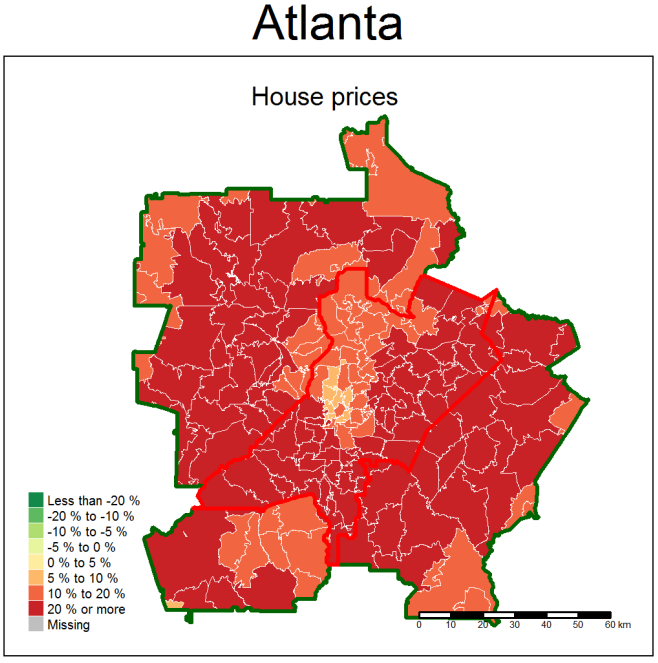
[2] Per square meter price in countries where square footage is available and per dwelling type in the other ones.

[3] $\Delta y = 100 * [(y_{2021Q1} + y_{2021Q2})/(y_{2019Q1} + y_{2019Q2}) - 1]$.

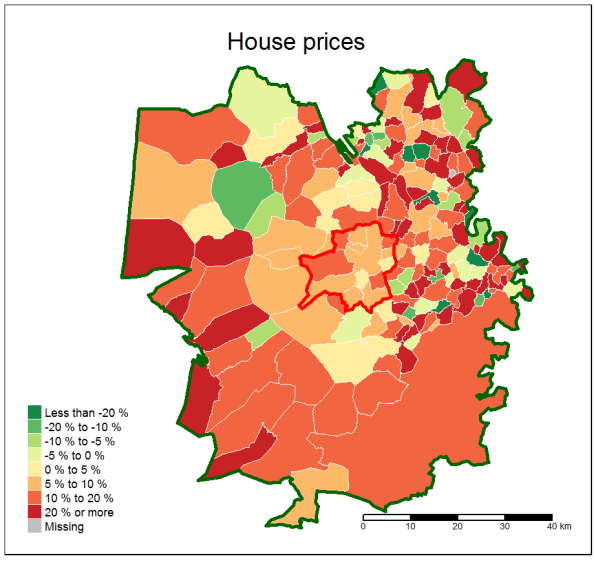
[4] $\Delta y = 100 * [(y_{2021Q1} + y_{2021Q2})/(y_{2019Q1} + y_{2019Q2}) - 1]$.

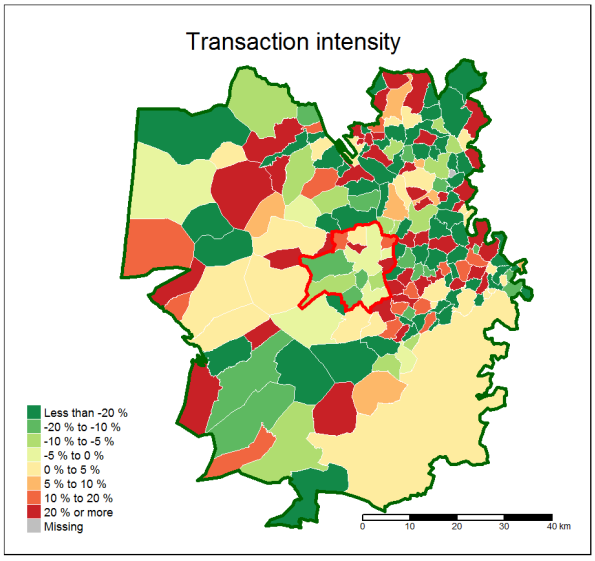
Annex 2.A. Changes in house prices and transaction intensity gradients for selected metropolitan areas

The following maps illustrate changes in house prices and transaction intensity from the first half of 2019 to the first half of 2021. Transaction intensity is defined as the number of transactions per 100 000 population. The red line represents the border of the core urban area, while the green line is the commuting zone's border.

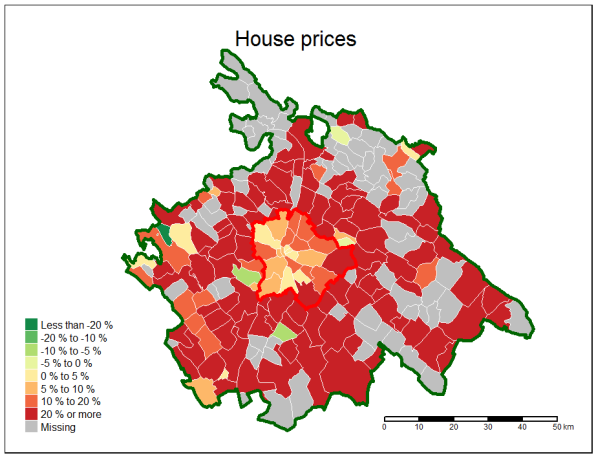


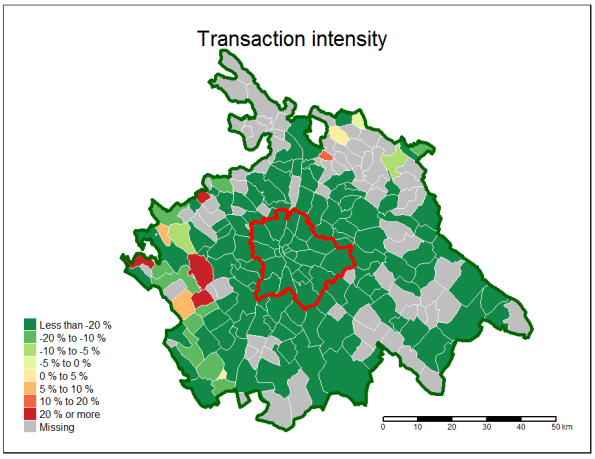
Bordeaux



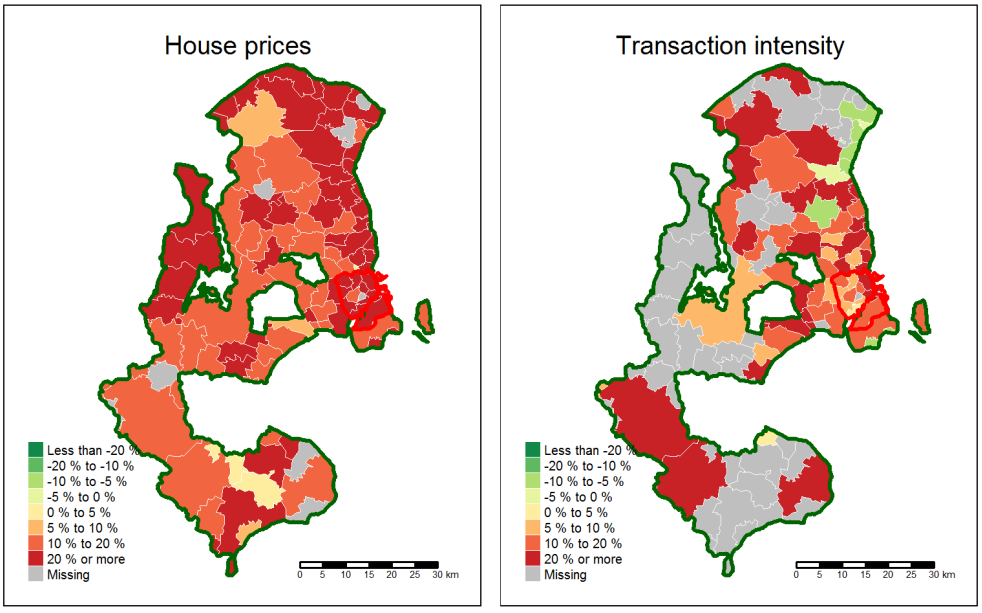


Budapest

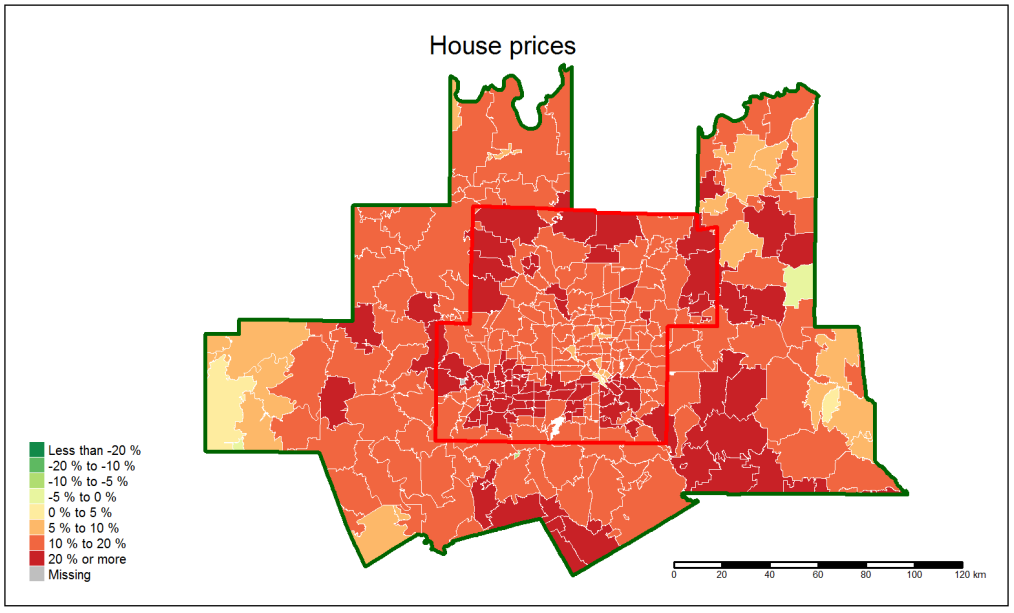




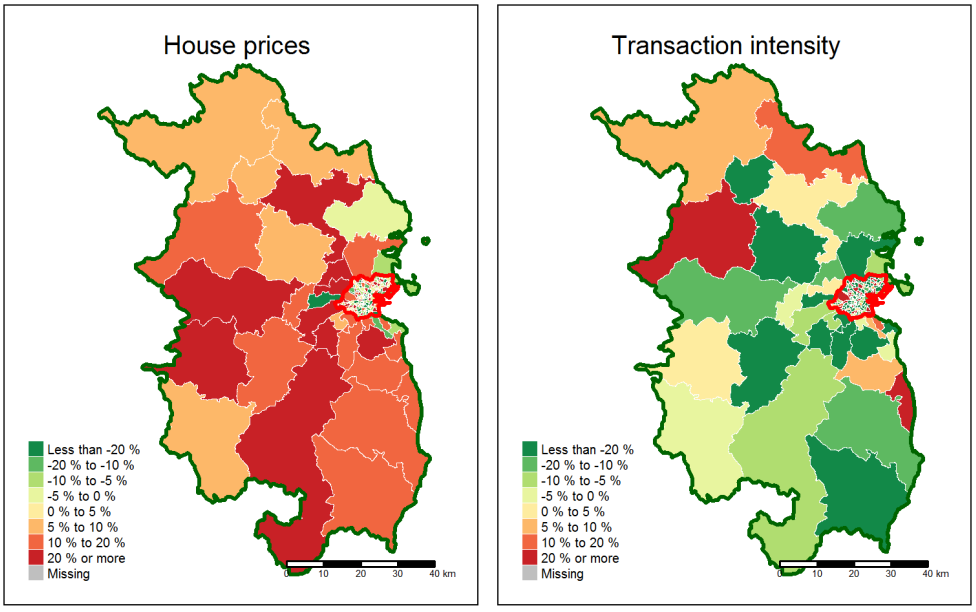
Copenhagen



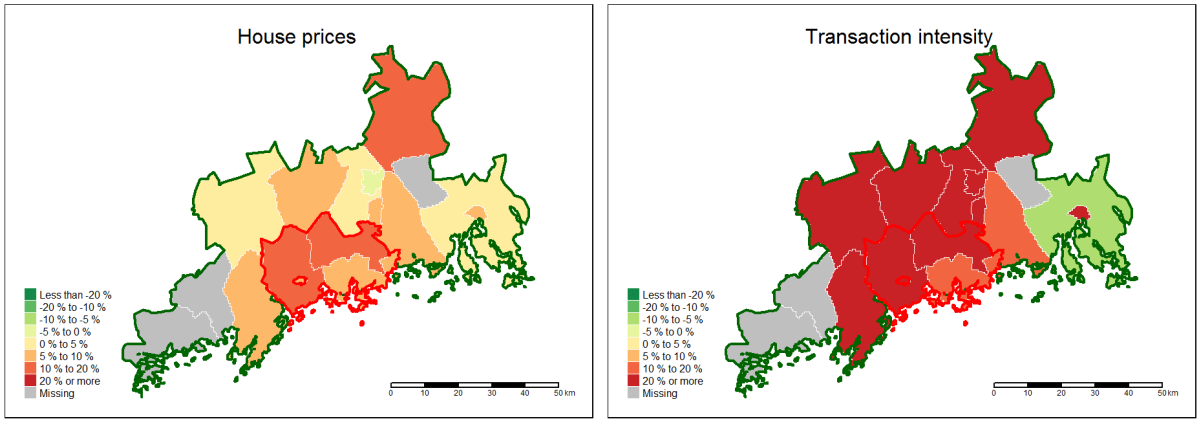
Dallas



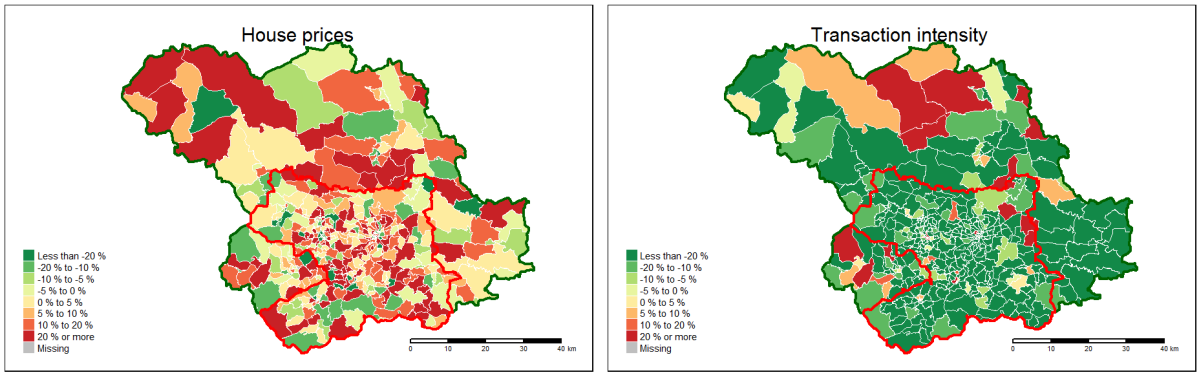
Dublin



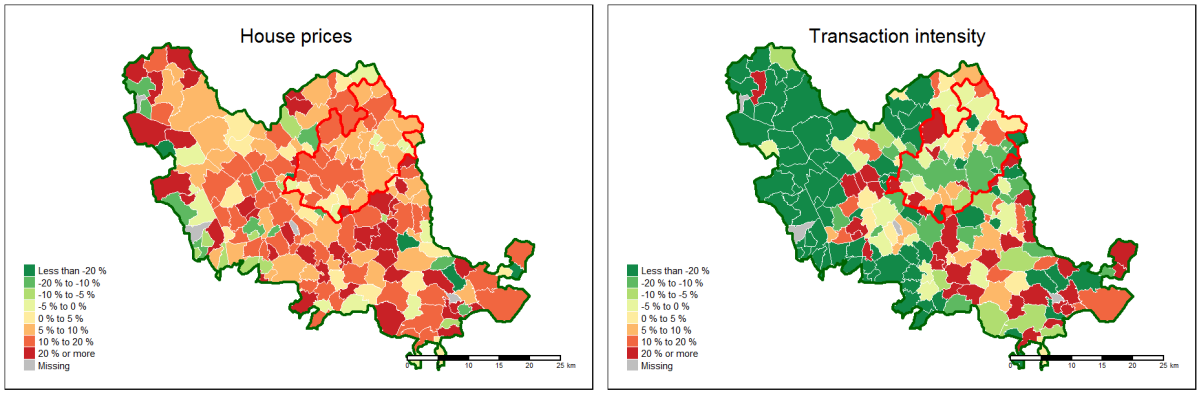
Helsinki



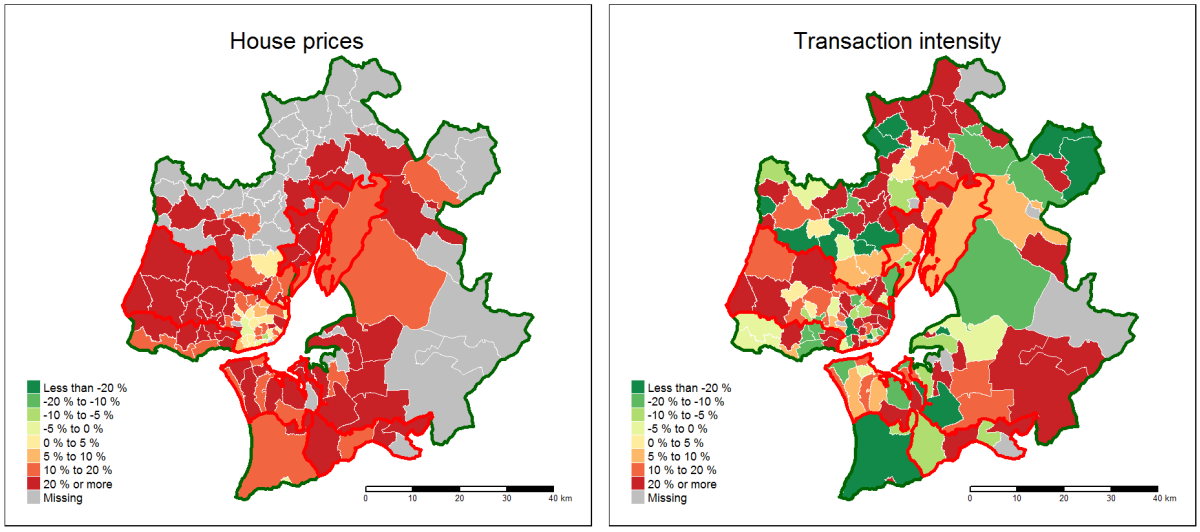
Leeds



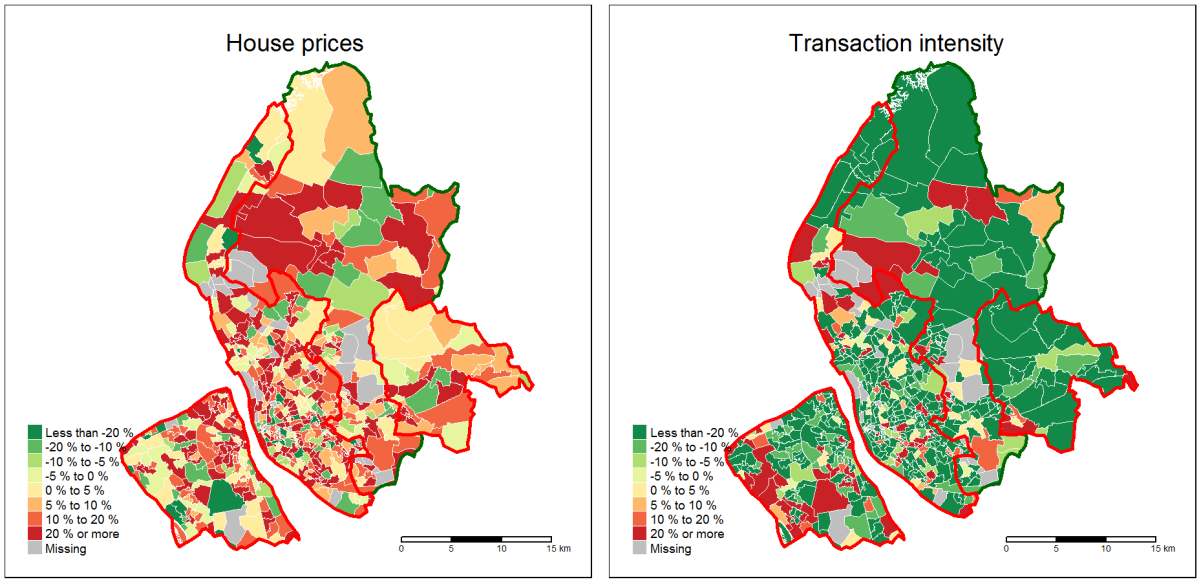
Lille



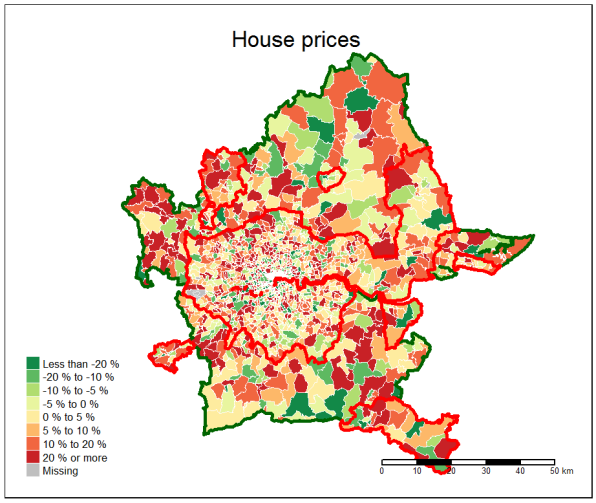
Lisbon

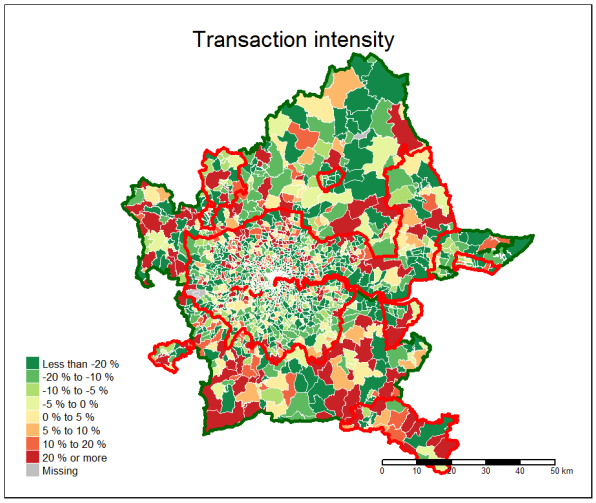


Liverpool

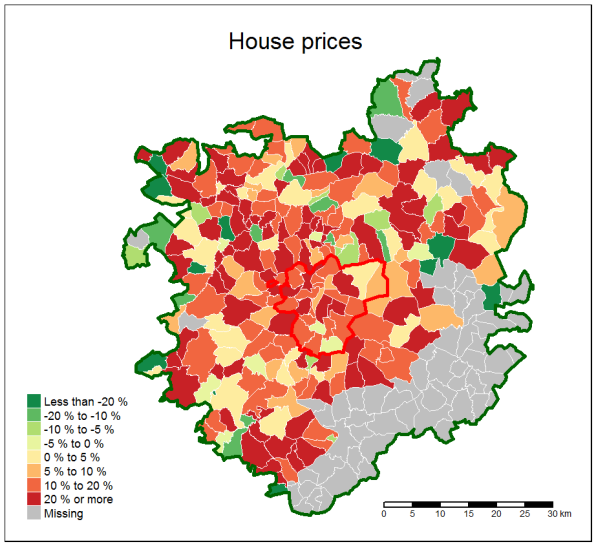


London


House prices
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0 10 20 30 40 50 km


Transaction intensity
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0 10 20 30 40 50 km

Lyon


House prices
Less than -20 %
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10 % to 20 %
20 % or more
Missing
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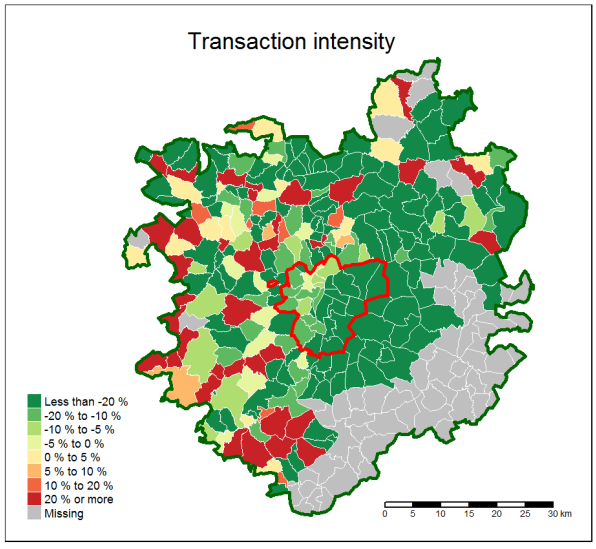
Transaction intensity
Less than -20 %
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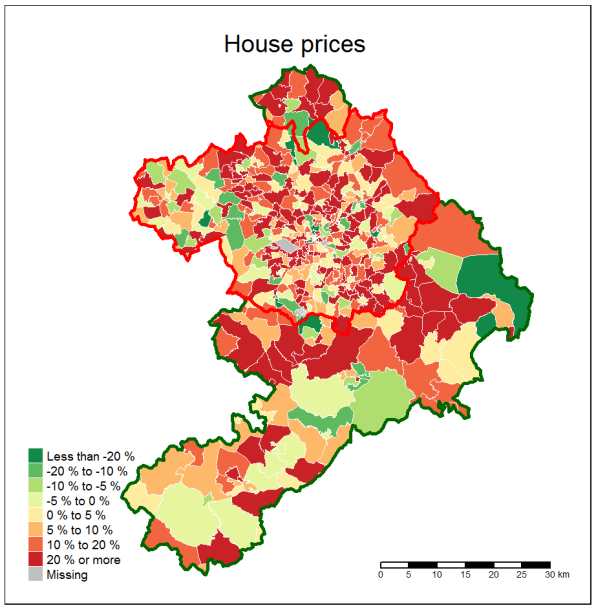
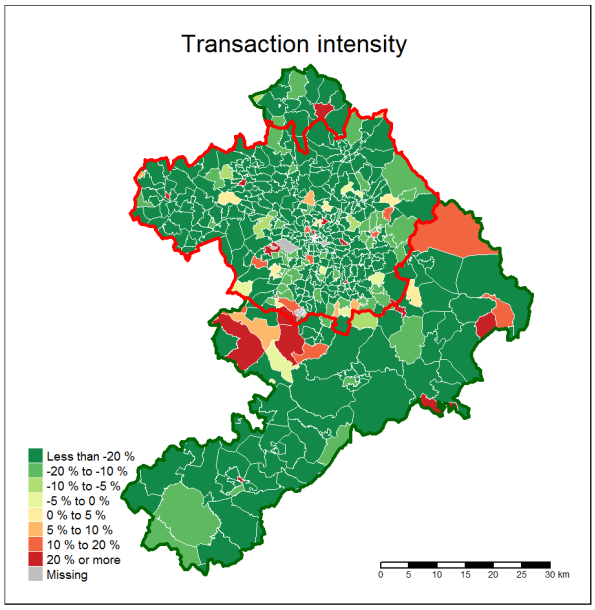
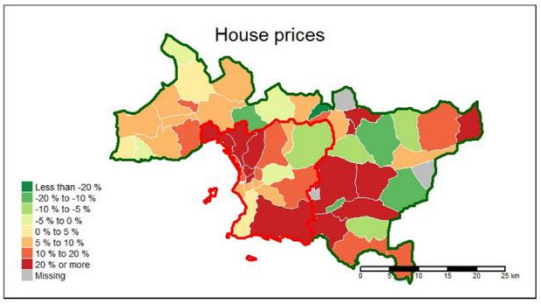
20 % or more
Missing
0 5 10 15 20 25 30 km

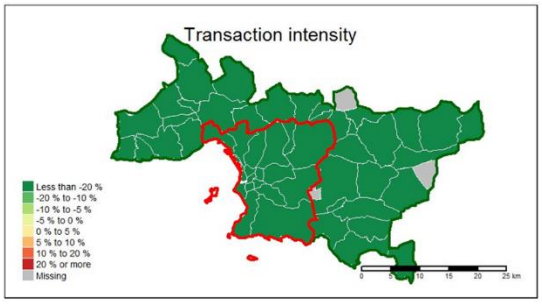
Manchester



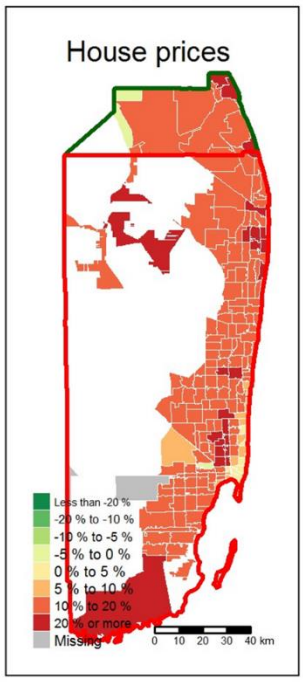


Marseille

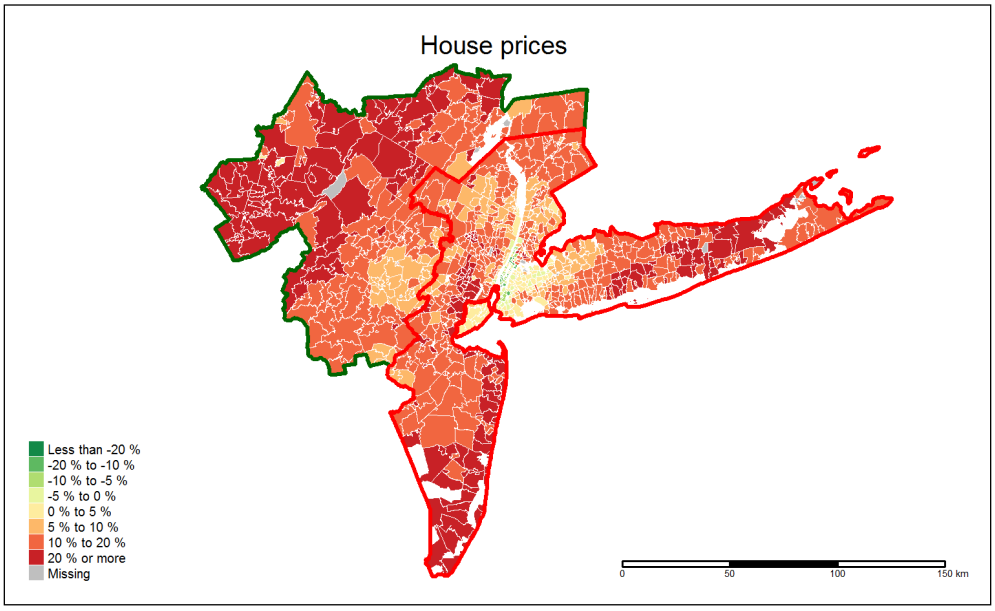




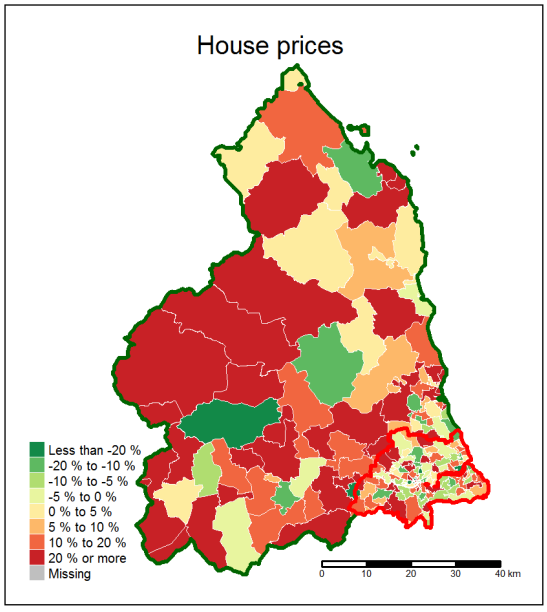
Miami (Greater)

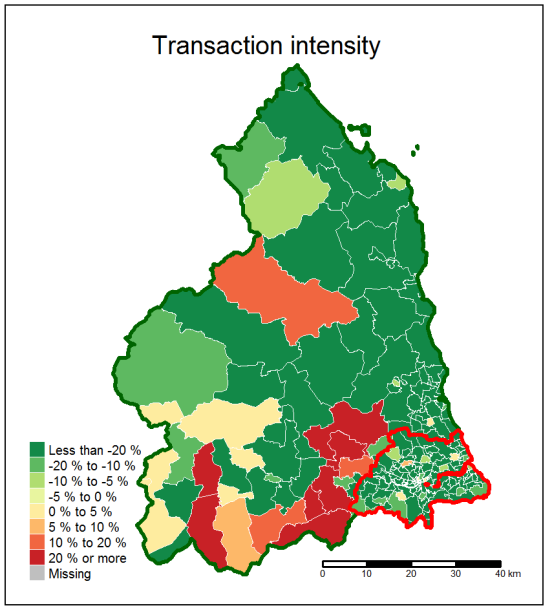


New York (Greater)

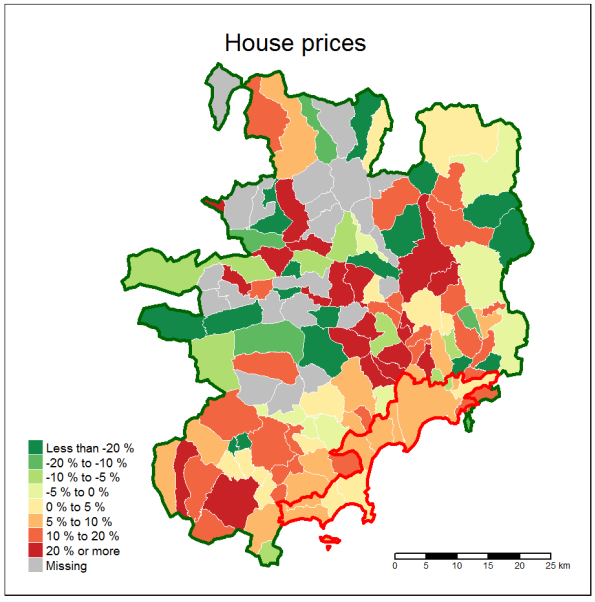


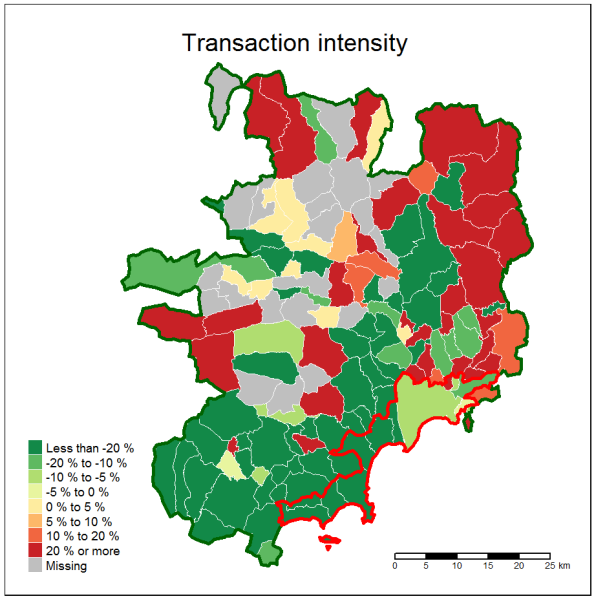
Newcastle upon Tyne



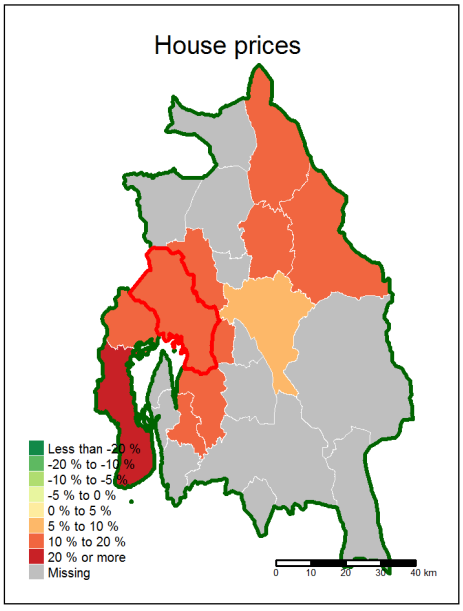


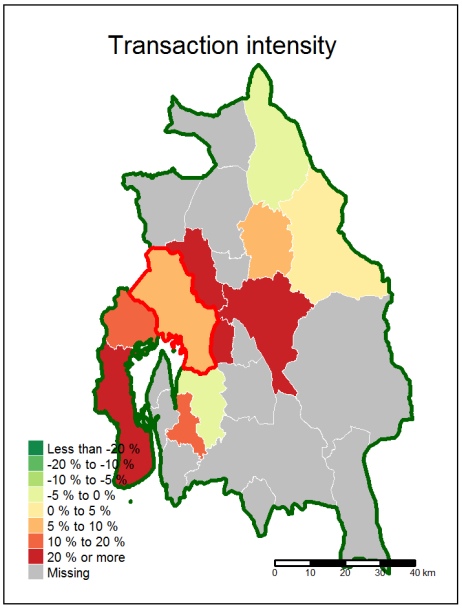
Nice



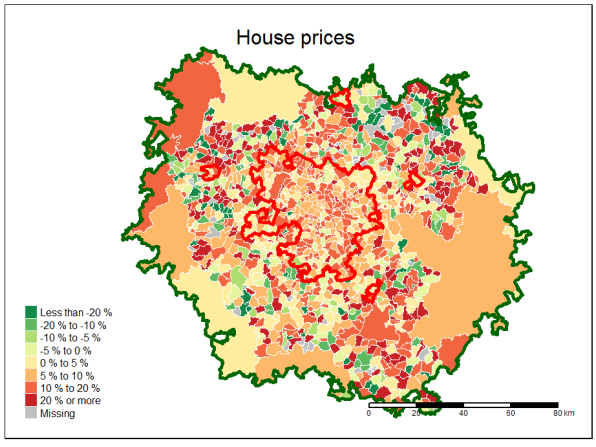


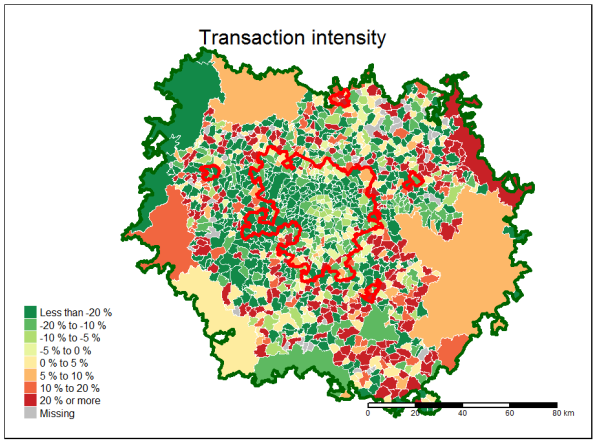
Oslo


House prices
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0
10
20
30
40 km

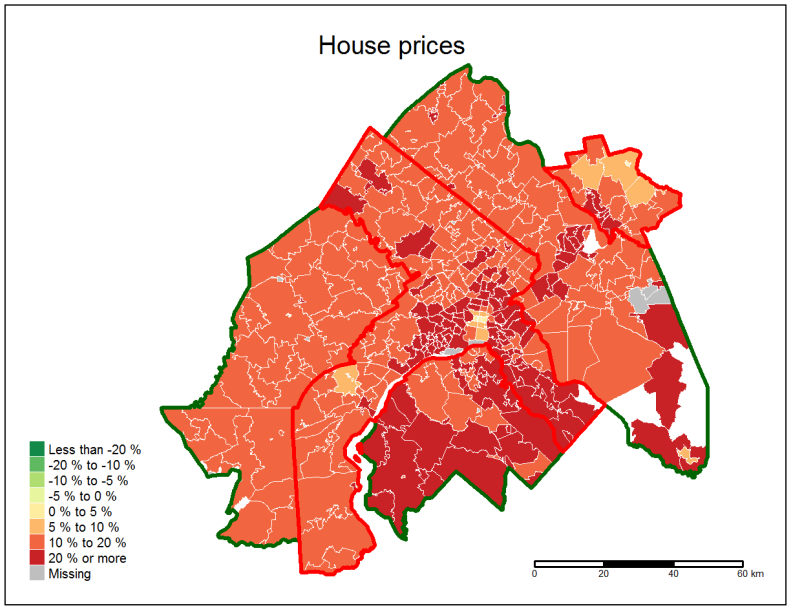

Transaction intensity
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0
10
20
30
40 km

Paris

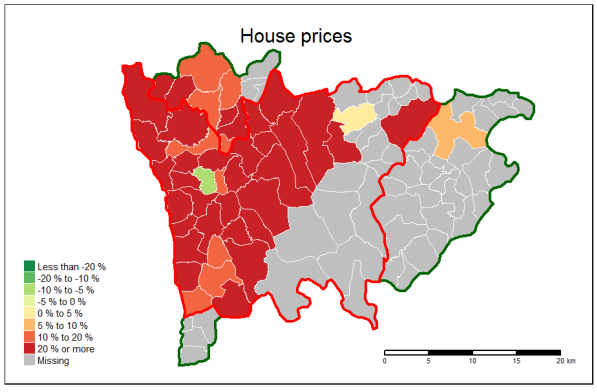

House prices
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0
20
40
60
80 km

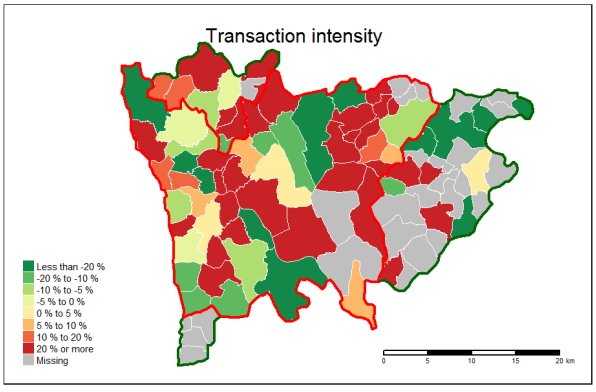

Transaction intensity
Less than -20 %
-20 % to -10 %
-10 % to -5 %
-5 % to 0 %
0 % to 5 %
5 % to 10 %
10 % to 20 %
20 % or more
Missing
0
20
40
60
80 km

Philadelphia (Greater)

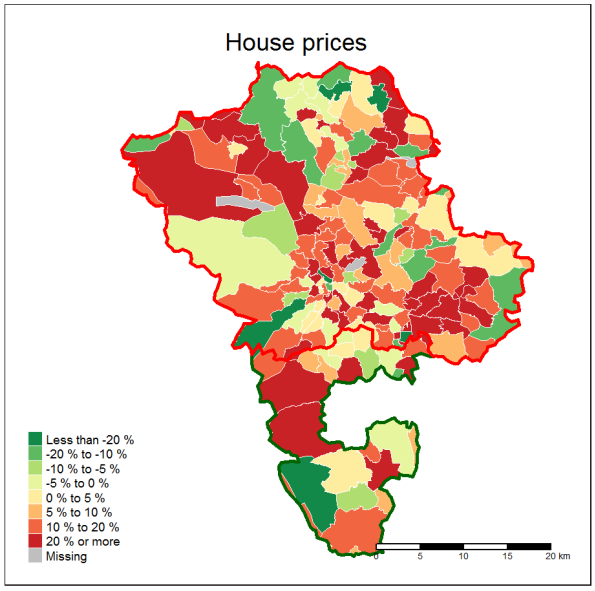


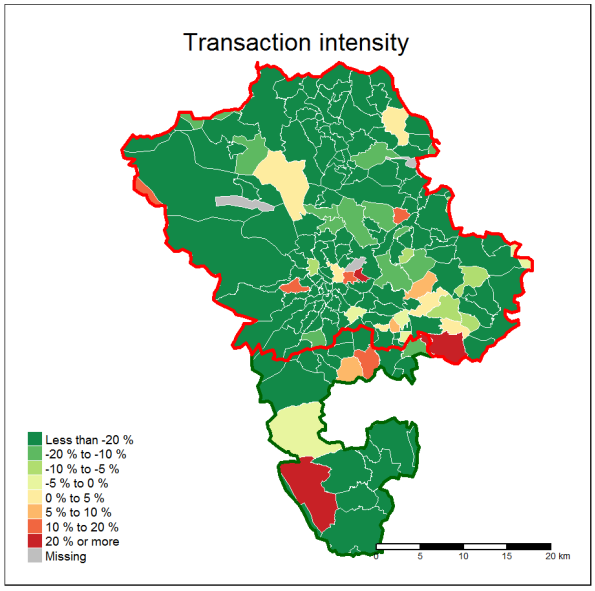
Porto



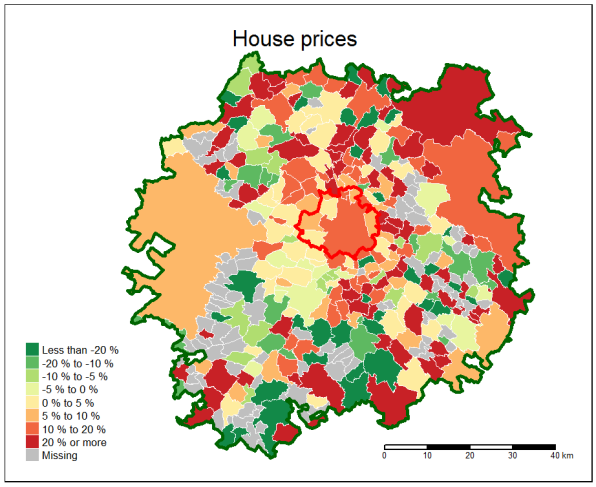


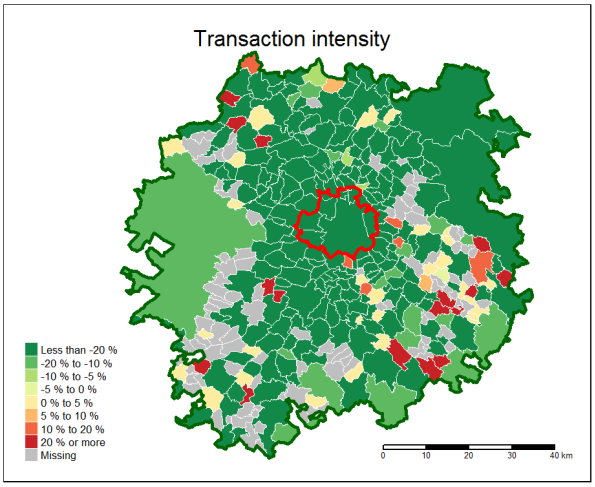
Sheffield



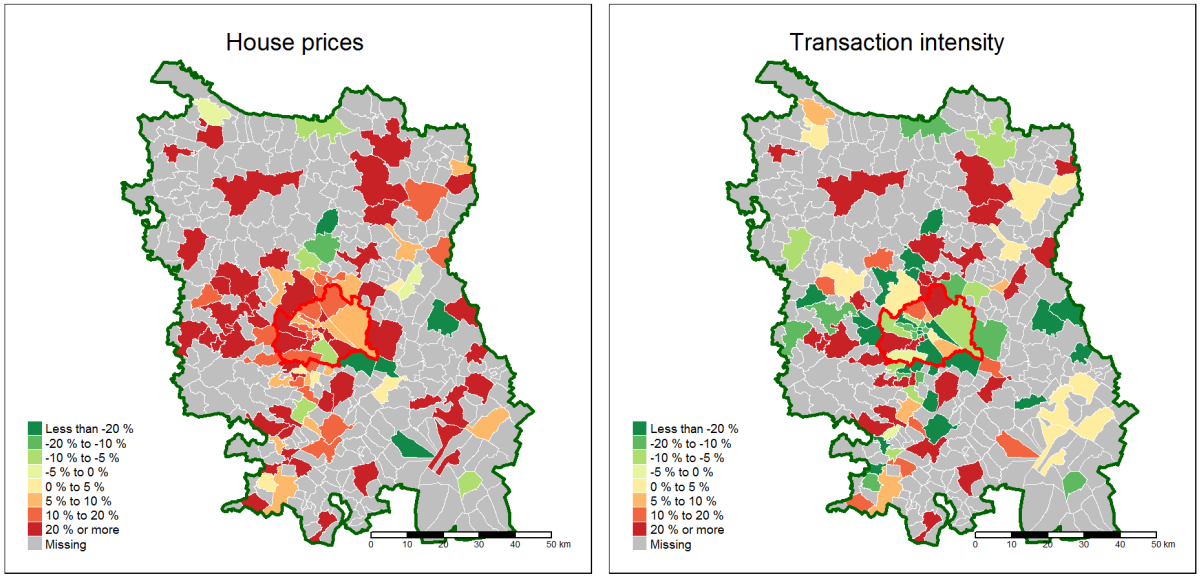


Toulouse

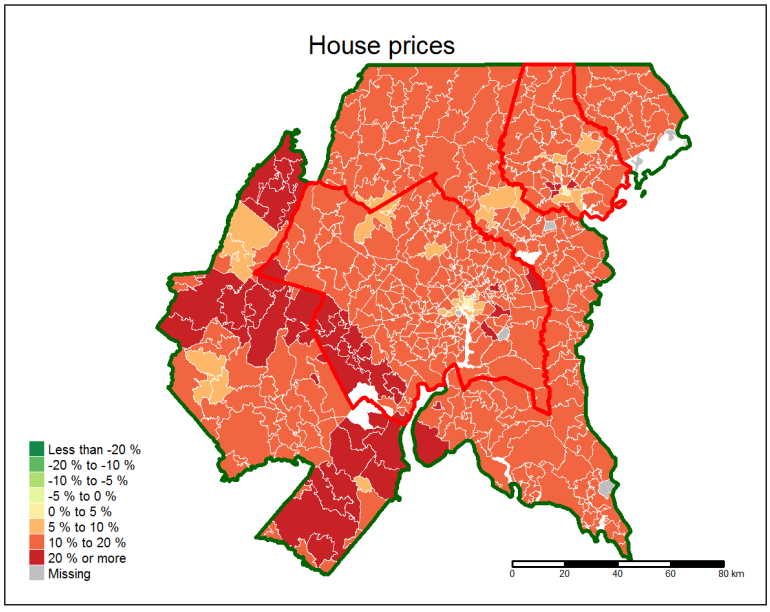




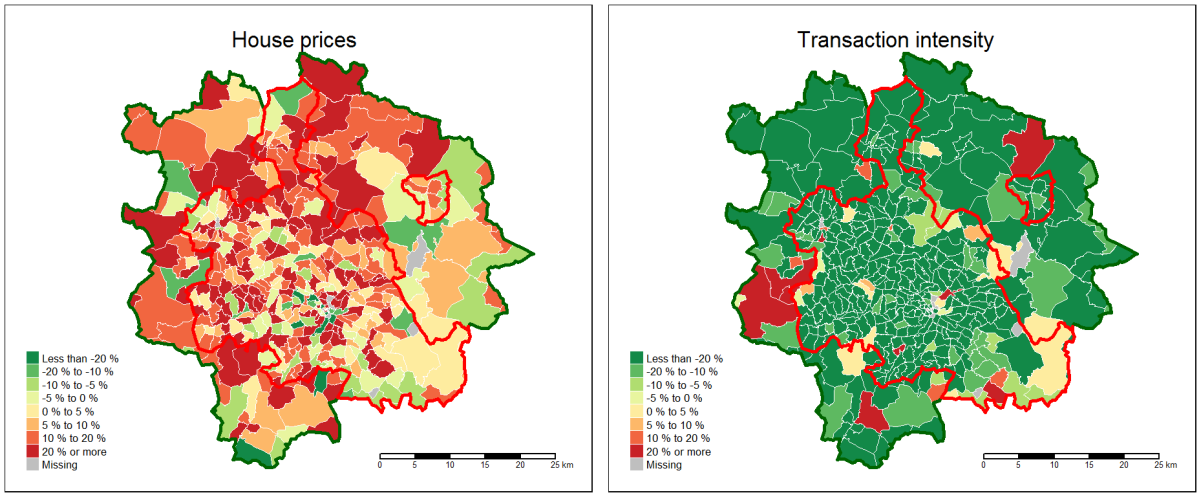
Vienna



Washington (Greater)



West Midlands urban area



3 Inequality, property taxation and local public spending on housing

Lars-Erik Borge, Department of Economics, Norwegian University of Science and Technology (NTNU)

Lana Krehic, Center for Economic Research, NTNU Social Research

In most Western countries, income and wealth inequality have increased during the last decades. We study the impact of increased inequality on property tax receipts and housing outlays by Norwegian local governments. In Norway, both income inequality and housing wealth inequality have increased between 2010 and 2017. Our main findings are: (*i*) increased income inequality does not affect property tax receipts, nor local public spending on housing, (*ii*) housing wealth inequality increases the level of the property tax and (*iii*) housing wealth inequality increases housing-related spending. Interestingly, the two types of inequality have different effects. Compared to earlier studies, which find that income inequality increases property tax receipts, we only find an effect of housing wealth inequality. Surprisingly, we also find that neither income nor housing wealth inequality has any impact on the distributional effects of the property tax measured by the size of the basic deduction.

The opinions expressed and arguments employed herein are those of the authors and do not necessarily reflect the official views of the OECD, its Member countries, or the KIPF. We are grateful for comments from participants at the OECD workshop Local Housing Inequity and its Implications for the Role of Government held in Paris on 28 November 2022. We also appreciate funding from the Norwegian Research Council through the project Financing Local Governments (project number 255608).

3.1. Introduction

In most Western countries income and wealth inequality have increased during the last decades (Piketty, 2017[1]). Rising inequality may have negative effects on mortality, health, civic engagement, trust and economic growth. Rising inequality may also affect public spending and revenues, either to reduce the negative consequences of inequality or to collect revenues in a fairer way.

Inequality has also increased in Norway. The first aim of this paper is to analyse the level and distributional effects of the local property tax. Have local governments[1] responded to increased inequality by increasing or reducing the property tax? And has increased inequality contributed to a more progressive property tax? Second, we investigate how local public spending on housing is affected by greater inequality. In Norway, a high share of the population owns their house or apartment and public housing is mainly for individuals with weak attachment to the labour market. It is, therefore, of great interest to analyse how public spending on housing is affected by rising inequality. In both the analyses of property tax receipts and housing spending, we focus on two types of inequality, i.e., income inequality and housing wealth inequality.

In Norway, the property tax base is the assessed value of land and buildings. Local governments can decide to apply a basic deduction, which reduces the taxable value before the tax rate is applied. A higher basic deduction makes the property tax more progressive. Since the basic deduction is the same across all households within a municipality, an increase in housing wealth inequality implies that higher valued properties make up a larger share of the total tax base. Consequently, for a given total revenue target, the average tax payment increases with a more unequal distribution of housing values.

The rest of the paper is organised as follows. In the next section we discuss the theoretical background and develop hypotheses. Then we present the Norwegian institutional context and describe the residential property tax, local public spending on housing and the measures of income and housing wealth inequality. Following this, we discuss econometric challenges, while the estimation results are presented after. Finally, the revenue and spending responses, the design of the property tax and whether municipalities should have more responsibility for spending related to housing are discussed. The last section concludes.

3.2. Theoretical background and hypotheses

The theoretical literature related to the relationship between government size and inequality is ambiguous. One view, emphasised by Roberts (1977[2]) and Meltzer and Richard (1981[3]), is that rising inequality will lead to higher tax rates and more redistributive spending. These contributions rely on the median voter theorem, which assumes that the voter with median income or wealth is decisive. A reduction in the ratio of median to mean income or wealth (increased inequality) means that the median voter's tax price for higher spending becomes lower. Consequently, the median voter will demand a higher level of overall public spending.

Epple and Romano (1996[4]) and Bénabou (2000[5]) develop models with opposite predictions, where rising inequality may reduce government size. Epple and Romano (1996[4]) investigate a setting where there are private alternatives to public services. According to their theory, households with middle income or wealth can be blocked by a coalition of voters at both ends of the income or wealth distribution. Voters with low income or wealth prefer low levels of public services because they are not willing to pay high taxes, while voters with high income or wealth prefer private alternatives. An increase in the number of voters at the two ends of the distribution (increased inequality) will then reduce the provision of public services. The model developed by Bénabou (2000[5]) has two long-run steady states. One with high inequality and little redistribution, while another with less inequality and more redistribution.

Given that the theoretical literature is ambiguous, estimated effects could go in either direction. However, most empirical analyses using local data (Alesina, Baqir and Easterly, 2000[6]; Borge and Rattsø, 2004[7];

Corcoran and Evans, 2010[8]; Boustan et al., 2013[9]; Fabre, 2018[10]) tend to find that inequality increases government size or taxation. These studies focus only on income inequality, not on housing wealth inequality. In this chapter, we study the relationship between inequality and the property tax. In the Norwegian context, where the property tax is the only tax over which local governments have real tax discretion, income inequality can be interpreted as a socioeconomic indicator not directly related to the property tax base. If anything, we expect housing wealth inequality to have a larger impact on property taxes than income inequality. This implies that we expect municipalities that experience rising housing wealth inequality to enact policies that aim to lower the top part of the distribution.

As in many other countries, the Norwegian property tax is controversial and unpopular. One reason is that the demand for housing is inelastic with respect to income, implying that the property tax base makes up a larger fraction of income in low-income households than in high-income households. Another reason that the tax is disliked is that low-income households may find it difficult to pay the property tax. To address this issue, Norwegian local governments have the opportunity to introduce a basic deduction. The basic deduction is subtracted from the property value before the tax is calculated. We expect that municipalities react to increasing inequality, both in income and housing wealth, by increasing the size of the basic deduction.

Previous findings suggest that rising inequality tends to increase the support for local government spending. Municipalities that experience increasing inequality in either income or housing wealth may want to lift the bottom part of the distribution by increasing public spending related to social welfare. Norway is a homeowner society where most citizens (around 82%) own their main residence. Consequently, public housing is mostly directed towards individuals outside, or with weak connections, to the labour market. These households will typically have low income and no or low housing wealth. Consequently, we expect that both income and housing wealth inequality will increase local government spending on housing.

3.3. The Norwegian institutional context

3.3.1. The property tax

The Norwegian system of financing local governments is quite centralised. Most revenue comes in the form of local taxes, grants from the central government and user fees. The personal income tax is the tax that generates the most revenue. Formally, local governments have substantial discretion over the income tax. There is a maximum tax rate, determined by the national parliament, that varies from year to year. Municipalities are free to set a tax rate below the maximum. However, since 1978 all local governments have used the maximum tax rate. In addition, local governments levy a wealth tax and a natural resource tax on power plants. The maximum local wealth tax rate is also determined at the national level and all local governments are applying the maximum rate.[2] The tax on power production is set nationally with no local discretion. Neither the wealth tax nor the natural resource tax generates much revenue in the aggregate, but they are important for individual local governments.

The property tax, which makes up around 3% of total revenue, is the only tax over which local governments have real discretion. The property tax is an optional tax for local governments and it is administered locally. This means that – contrary to other local taxes – property tax revenues are not a part of the tax equalisation scheme between local governments. Moreover, the revenues from the property tax are not earmarked for any particular purpose.

The property tax base is the value of land and buildings combined, while there is no separate taxation of the two components. The tax cannot be deferred, e.g., for elderly people with low pensions. Local governments can choose what type of property to tax, i.e., residential and business property, or only one of them. If a local government chooses to have a property tax, the tax rate must be between 0.2% and 0.7%. The minimum and maximum rates refer to the period under study (2010-2017). The maximum rate

has recently been reduced for residential property, but not for business property, to 0.5% in 2020 and further to 0.4% in 2021. The minimum tax rate was reduced to 0.1% in 2020.

Local governments that choose to tax residential property, can decide to have a basic deduction. This is a measure used by municipalities to make the taxation of property less regressive. Here we describe in more detail the distributional effects of the basic deduction. In general, residential property tax is given as:

$$PT = t(V - E) \tag{1}$$

where PT is the property tax for the residence, t is the property tax rate, V is the assessed value of the property and E is the basic deduction. Since E is the same for all households in a municipality, the basic deduction will reduce the property tax payment relatively more for less valuable residences compared to more valuable residences.[3] Little is known about whether the property tax is regressive or progressive. As far as we know, the only study of the distributional effects of the residential property tax in Norway, is Borge and Nyhus (2012[11]). In a sample of nine municipalities, they find that the property tax is regressive in five, roughly proportional in three and progressive in one. It may come as a surprise that the distributional effects vary across municipalities, but it is likely to reflect variation in assessment practice, variation in the impact of income on housing demand in the local housing markets and variation in the basic deduction.

In 2017, the last year of our study, 28% of the local governments with a residential property tax had a basic deduction. The deduction varies greatly between municipalities, with an average of NOK 325 439.[4] The lowest deduction is NOK 10 000, whereas Oslo, the capital, has a basic deduction of NOK 4 million. The second highest was NOK 1.8 million. Interestingly, Oslo was taken to court because of the high basic deduction. Plaintiffs argued that it was against the law since the high deduction rate led to only a low share of residences (around 20%) that had to pay property tax. The Supreme Court decided in favour of the municipality, but also stated that such a high deduction was a borderline case.

Finally, the practice of assessing residential properties (V) can take two different forms. Local governments can choose to assess the properties within their municipality themselves, usually carried out with an inspection and appraisal. Alternatively, they can rely on the values from the Norwegian Tax Administration, which is also used for wealth taxation. In 2017, 69% of the local governments used the values from the wealth taxation also for the property tax. Municipalities that assess properties themselves could potentially come up with a more precise appraisal, but municipal appraisal makes it difficult to compare the value of properties across municipalities.

It is important to note that the property tax rate, t, is not very informative about the level of property taxation. There are several reasons for this. First, property values are reassessed every 10th year. Because reassessment tends to increase property values, local governments reduce the property tax rate the first year after reassessment. This is to avoid a sharp and sudden increase in the property tax burden for households. After the property tax rate reduction, the rate gradually increases over time. Furthermore, local governments reassess at different times. The tax rate does not take into account differences in assessment practice nor the basic deduction. This means that a 0.7% tax rate in one municipality can represent a very different tax burden compared to the same tax rate in another municipality.

In this paper, we rely on an alternative measure of the property tax burden. It is the property tax payment for a household that owns a standard detached house of 120m^2. The property tax paid by a standard house is our preferred measure of tax burden because it takes into account the regional variation in housing values and the size of the basic deduction. It is also quite representative for the type of house most households live in throughout the country.

Table 3.1 reports the average property tax for a standard house of 120m^2, with the average basic deduction and the percentage of local governments that levy a residential property tax. It is evident that the average property tax for a standard house and the percentage of local governments with residential property tax increased between 2010 and 2017. The average tax has increased steadily, leading to a doubling in size

during the sample period. On the other hand, the average basic deduction has been roughly stable until 2015. After 2015 the deduction increased with relatively large, yearly jumps. The average basic deduction has increased by 30% since 2010.

Table 3.1. Property tax for a standard house, basic deduction and share of local governments with a residential property tax

Averages in NOK, 2010-2017

	Average property tax for a standard house of 120m	Average deduction	% of local governments with residential property tax
2010	1,503	251,319	42.0
2011	1,620	248,173	45.1
2012	1,721	248,024	46.2
2013	1,924	245,094	48.4
2014	2,209	237,103	53.5
2015	2,457	270,797	57.1
2016	2,836	314,250	62.7
2017	3,012	325,439	63.7

Note: Average property tax and average basic deduction are both in current Norwegian kroner (NOK) and are calculated for local governments with a residential property tax and with a basic deduction respectively. At the time of writing one Euro equalled NOK 11.36.
Source: Statistics Norway.

3.3.2. Housing-related public spending

Norwegian local governments are responsible for welfare services like childcare, primary and lower secondary education, care for the elderly (homes and institutions), primary health care, child custody, social assistance and housing. Other important tasks are culture, roads and infrastructure. As discussed in Section 3.1, Norwegian local governments face quite strict regulations on the revenue side of their budgets. On the expenditure side, they have more discretion and there is a large variation in priorities across local governments. Local governments can freely allocate most of their revenues between service sectors.

Norway is a homeowner society, with a high share of the population (around 82%) owning their home. Except for the larger cities, the professional renting market is limited. Public housing is mostly for citizens outside, or with weak attachment to, the labour market. Local governments are responsible for providing housing for their citizens and support for establishing private housing. The latter is part of social assistance. In addition to support from the local government, the central government has a responsibility to support low-income households by providing housing allowances. We analyse spending related to two local government housing policies, namely spending on public housing and support for private housing. These are analysed separately.

Table 3.2. Local government spending on housing

Average expenditure in NOK per capita, 2010-2017

	Local government housing spending	Local government support for private housing
2010	765	106
2011	755	91
2012	771	99
2013	796	116
2014	836	129
2015	877	130
2016	985	127
2017	1052	133

Note: Measured in current NOK per capita. At the time of writing one Euro equalled NOK 11.36.
Source: Statistics Norway.

Table 3.2 reports the development in average local government housing spending and average support for private housing. The first column shows that spending on local government housing has increased by almost 40% between 2010 and 2017, and growth was particularly strong in 2016 and 2017. On the other hand, the expenditure related to support for private housing has increased less (25%), even experiencing a decrease on average in 2011 and 2012 compared to 2010.

3.3.3. Measuring inequality

We measure income and housing wealth inequality using Gini-coefficients, which increase as inequality increases. The Norwegian Tax Administration (*Skatteetaten*) has provided data for each local government during the years 2010-2017. More precisely, the Norwegian Tax Administration has provided data at the household level for 25% of the households in each local government for each year. The random sample varies from year to year.

Income is measured as ordinary income (*alminnelig inntekt*). This is an income concept that includes labour income (wages and self-employment), pensions, social security benefits and capital income (including interests and dividends) net of deductions (interest payments and a minimum deduction among others). The approach of calculating the tax base for personal income is identical across all local governments.

For housing wealth, we use the same values as the Tax Administration uses for wealth taxation[5] based on an empirical model developed by Statistics Norway. The model predicts the market value of all residential housing in Norway, which is then included as part of an individual's wealth. We utilise this valuation because it allows for a comparable measure of housing wealth inequality, both for local governments that appraise properties themselves and for local governments that do not levy a residential property tax.[6] We measure housing wealth as the (predicted) values of the primary residence. In cases where a person or a household owns several residences, it is included as a part of their housing wealth if these secondary residences are located in the same municipality as their primary residence.

Ideally, we would like to adjust the inequality indicators for differences in the size and composition of households – for example, the number of adults and children. However, we do not have this information and are thus unable to adjust the inequality indicators. It can be argued that the inability to adjust for household size and composition is most important for comparisons across local governments. Therefore, to compensate for this in the empirical analysis, we include local government fixed effects and only use time-series variation in the data. As the composition of household types is not likely to change greatly during our period of study, for example going from a high share of four-person households to a high share of two-person households, the inclusion of municipality fixed effects should absorb the effect that household composition may have on local government property taxation and housing spending.

Table 3.3. Gini-coefficients for income inequality and housing wealth inequality

Average Gini-coefficients, 2010-2017

	Income inequality	Housing wealth inequality
2010	43.44	60.98
2011	43.95	61.15
2012	44.16	60.58
2013	44.81	62.11
2014	45.45	62.99
2015	46.46	63.53
2016	46.38	64.18
2017	46.72	65.01

Note: The Gini-coefficients are normalised to vary between 0 and 100.
Source: Norwegian Tax Administration.

Table 3.3 reports the development of income and housing wealth inequality. It appears that both income and housing wealth inequality have increased over time. However, there are some exceptions. Housing wealth inequality was stable during 2010-2012, while income inequality was stable during 2015-2017. Moreover, housing wealth inequality is substantially higher than income inequality. Rather surprisingly, the two measures of inequality are practically uncorrelated, both across local governments and over time.

The Gini-coefficients for income reported in Table 3.3 are substantially higher than the official OECD numbers. In 2017 the Gini for income reported by OECD was around 26. We believe that the main reasons for the discrepancy is that our income measure is not adjusted for household size and composition (see the discussion above) and that it is measured before tax. However, the trend of rising income inequality is similar to the findings in other Norwegian studies (Aaberge, Atkinson and Modalsli, 2020[12]).

3.4. Econometric specification

The specification of the property tax equations, i.e., for a standard house and the basic deduction, are similar to Borge and Rattsø (2004[7]). For housing expenditure, we rely on a demand approach (Inman, 1979[13]; Rubinfeld, 1987[14]) and applied to Norwegian local governments by Borge and Rattsø (1995[15]) and Borge, Brueckner and Rattsø (2014[16]). The econometric specification is given by:

$$y_{it} = \beta GINI_{it} + \gamma X_{it} + \alpha_i + \delta_{tc} + \varepsilon_{it}, \quad (2)$$

where y_{it} is the dependent variable (property tax for a standard house, basic deduction or housing expenditure per capita), $GINI_{it}$ is either income or housing wealth inequality, X_{it} is a vector of (time-varying) controls, α_i is a local government fixed effect, δ_{tc} are county-specific trends and ε_{it} is an error term. The coefficient of main interest is β. If $\beta > 0$, more inequality leads to higher property taxation for a standard house, a higher basic deduction, or higher municipal housing expenditure. If $\beta < 0$, more inequality leads to decreases in the dependent variables.

Several control variables are expected to influence the evolution of property tax payments and housing spending. First, we include municipal per capita revenue which consists of lump-sum grants and local tax revenues. The latter includes regulated income, wealth and natural resource taxes, as well as property tax revenue from business property. Since the local governments use the maximum rate for most of these taxes and lump-sum grants are distributed by objective criteria, this revenue measure can be treated as exogenous. We expect that higher local government revenue increases housing spending and reduces the property tax.

We also include an indicator of fiscal distress, Robek, a dummy variable that is equal to one if the municipality is being supervised by the county governor because of budgetary problems. An earlier study by Hopland (2013[17]) shows that local governments on the Robek list increase the property tax and reduce spending. In addition, we control for average private disposable income per capita in the municipality. We expect that higher private income increases the demand for local public services, while higher expenditures are financed by higher property taxation.

Moreover, we include two political variables that the previous literature (Kalseth and Rattsø, 1998[18]; Borge, 2005[19]; Fiva and Rattsø, 2007[20]) has shown to influence policy outcomes in Norwegian local governments. The first political variable is the effective number of parties (inverted Herfindahl index) in the local council. This index was developed by Laakso and Taagepera (1979[21]) and may be interpreted as an indicator of political fragmentation. We expect that increased political fragmentation increases both the property tax and housing spending. Second, we control for ideology by including the share of socialists in the local council. We expect that socialists prefer a larger public sector than non-socialists, implying that an increased share of socialists in the council may contribute to higher property taxation and housing spending.

Furthermore, we control for the age composition of the population by including the share of children (0-5 years), youths (6-15 years) and the elderly (above 80 years). These variables represent demand for childcare, education and care for the elderly, respectively. These services compete with housing on the expenditure side and may also affect the property tax. We also control for municipal population size and the share of the population living in urban areas. These variables capture background characteristics that may influence policy decisions.

Finally, in the property tax equations, we include a dummy variable that indicates whether the local government performed a reassessment of their properties during the sample period. The variable takes the value 1 in the year the new assessment is applied and in all subsequent years. Reassessments will in most cases lead to an increase in assessed property value and is thus an alternative to increasing the tax rate. Reassessments are therefore likely to have a negative effect on the property tax rate, whereas they will have a positive effect on the property tax for a standard house.

Even though we have included many controls, there is a concern that some time-invariant factors are left out. For instance, there is variation in the housing price level, housing standard and housing type, which simultaneously influence the property tax and municipal housing spending. Some local governments are rural and characterised by mostly detached houses with lower market values. On the other hand, the property base in urban areas is more diversified, which in turn can produce more variation and inequality in both income and housing wealth. Failing to control for these factors can lead to standard OLS estimations being biased. This is our motivation for including local government fixed effects.

A further concern, not mitigated by the fixed effects approach, is the potential for time-varying effects correlated with both inequality and policy outcomes. For instance, international or nationwide shocks, such as financial crises, could induce municipalities to increase revenue through property taxes. These shocks can also affect inequality and housing spending. Regional housing market shocks are also an example of factors that can have simultaneous effects on inequality, property taxes and housing spending. To cope with these potential biases, we include county-specific trends in all our regressions.

We use data between 2010 and 2017, with most Norwegian local governments included in the estimations. For the property tax for a standard house and housing expenditure, we have access to data for an average of 419 (of about 430) local governments. For the basic deduction analyses, where we only include local governments with a residential property tax, we only have data for an average of 219 local governments. The standard errors are clustered at the municipal level, to account for potential correlation over time within municipalities.

3.5. The determinants of property taxation for a standard house and basic deduction

In Table 3.4, we report the estimation results for the effect of inequality on the property tax for a standard house and the basic deduction. Models A and C show the results with income inequality as the main explanatory variable, while models B and D show the results with housing wealth inequality as the main explanatory variable.

For the property tax for a standard house (columns A and B), the effect of inequality on the tax depends on the type of inequality. Income inequality comes out as negative and not statistically significant, while housing wealth inequality comes out as positive and statistically significant. An increase in the Gini-coefficient of 4 (roughly corresponding to the average increase in Table 3.3) increases the property tax for a standard house by NOK 100. This constitutes an increase of nearly 6% from the average. Since housing wealth is closely related to the property tax base, the impact of housing wealth inequality may be interpreted as a tax price effect.

Other empirical studies (Alesina, Baqir and Easterly, 2000[6]; Borge and Rattsø, 2004[7]; Corcoran and Evans, 2010[8]; Boustan et al., 2013[9]; Fabre, 2018[10]) find that income inequality increases the property tax but have not analysed the effect of housing wealth inequality. It is a bit surprising that our results differ from the Norwegian study of Borge and Rattsø (2004[7]). On the other hand, their analysis is based on an earlier period (1996-1998) and may not hold for the period we analyse (2010-2017).

Second, economic variables and fiscal distress have a statistically significant effect on the property tax. An increase in local government revenue per capita by NOK 5 000 per capita reduces the property tax for a standard house by nearly NOK 315. This effect is similar to that of Borge and Rattsø (2004[7]) and can be interpreted as revenue substitution in the sense that high revenues from other sources give room for a lower property tax. Local governments on the Robek-list increase the property tax for a standard house by a bit more than NOK 250, which is consistent with earlier findings by Hopland (2013[17]). An increase in private disposable income increases the property tax for a standard house by nearly NOK 100. The underlying mechanism is most likely that higher private income increases demand for local public services, while more public services are financed by a higher property tax. The modest effects of local government revenue and private income point towards a substantial flypaper effect. Money tends to stick where it hits.

Third, reassessments of property values that increase assessed values contribute to a higher property tax for a standard house. The most likely interpretation of this effect is that the property tax rate has reached the maximum rate, and that a reassessment gives room for higher property taxation for a standard house. Fourth, we do not find any statistically significant effect of political variables, age composition of the population, population size, or the share of the population living in urban areas.

For the basic deduction, both income and housing wealth inequality come out with positive signs. However, none of the estimated coefficients are statistically significant. Given that the deduction reduces the regressivity of the property tax, it is surprising that inequality has no statistically significant effect on the basic deduction.

However, the positive effect of the share of the elderly may reflect distributional concerns. Many of the elderly live on (low) pensions, and some of them in high-valued residences, benefitting from a large basic deduction. An increase in the share of the elderly by one percentage point increases the deduction by nearly NOK 23 000.

Table 3.4. Property tax for a standard house and basic deduction: Estimation results

Estimates with clustered standard errors, t-values in parentheses

	Property tax for a standard house		Basic deduction	
	A	B	C	D
Income inequality	-4.42 (-0.46)		579.4 (0.74)	
Housing wealth inequality		24.9 (2.72)		543.3 (0.46)
Local government revenue (NOK 1000)	-65.1 (-5.69)	-62.5 (-5.56)	1054.5 (0.97)	1068.4 (1.00)
Robek	244.5 (2.13)	252.4 (2.20)	1610.6 (0.21)	1945.8 (0.25)
Private disposable income (NOK 1000)	10.0 (1.96)	9.4 (1.91)	-625.4 (-1.69)	-598.3 (-1.60)
Effective number of parties	83.59 (1.52)	78.7 (1.48)	6808.0 (1.07)	6912.2 (1.08)
Share of socialists in the local council	-105.2 (-0.30)	-63.1 (-0.18)	54591.3 (0.931)	53046.4 (0.90)
Share of children (0-5 years)	-5859.3 (-0.77)	-5647.3 (-0.75)	-4898.6 (-0.01)	-15446.6 (-0.02)
Share of youths (6-15 years)	-11071.5 (-1.55)	-10659.1 (-1.54)	-133243.4 (-0.22)	-158305.2 (-0.27)
Share of elderly (above 80 years)	-3051.7 (-0.32)	-5015.0 (-0.55)	2202430.6 (2.24)	2271001.7 (2.21)
Population (10000)	1267.6 (1.78)	1223.9 (1.71)	202787.1 (1.88)	202690.8 (1.89)
Share urban	1413.5 (1.31)	1340.5 (1.26)	-94486.1 (-0.97)	-94896.9 (-0.97)
Reassessment	1455.3 (10.18)	1474.9 (10.42)	81170.2 (2.09)	82069.2 (2.11)
Estimation period	2010-2017	2010-2017	2010-2017	2010-2017
# of observations	3354	3344	1753	1744
R^2	0.385	0.388	0.172	0.172

Note: Local government fixed effects and county-specific trends are included in all regressions but are not reported in the table.

We find a significant effect of the population size and more populous local governments have a larger basic deduction. An increase in population size by 1 000 inhabitants increases the basic deduction by a bit more than NOK 20 000. Again, the reassessment dummy comes out as positive and statistically significant. This suggests that the deduction increases when assessed housing values increase. Other things equal, increased valuation makes the property tax more regressive. An increase in the basic deduction works in the direction of neutralising the increased regressivity.

Finally, we are not able to document any statistically significant effects of other variables capturing fiscal conditions, private income, politics, the younger part of the population and settlement pattern for the size of the basic deduction.

3.6. The determinants of housing spending

In Table 3.5, we report estimation results for local government housing spending and support for establishing private housing. First, we discuss the determinants of public housing spending in columns A and B. Similar to the property tax for a standard house, the type of inequality we study is of importance. While housing wealth inequality comes out positive and statistically significant, income inequality is not statistically significant. An increase in the Gini-coefficient of 4 (again corresponding to the average increase in Table 3.3) increases public housing spending by NOK 40, which corresponds to 0.5% of the average. We also estimate a positive and statistically significant effect of the share of socialists in the local council. An increase in the share of socialists by 10 percentage points will increase public spending on housing by NOK 26.

Table 3.5. Housing-related spending: Estimation results

Estimates with robust/clustered (at the local government level) t-values in parentheses

	Local government housing spending		Support for establishing private housing	
	A	B	C	D
Income inequality	-7.4 (-0.86)		-2.0 (-1.35)	
Housing wealth inequality		10.3 (2.60)		6.1 (1.78)
Local government revenue (NOK 1000)	-8.2 (-1.44)	-7.1 (-1.33)	-1.4 (-0.99)	-1.0 (-0.71)
Robek	32.0 (0.81)	31.9 (0.81)	-5.9 (-0.52)	-5.4 (-0.47)
Private disposable income (NOK 1000)	0.1 (0.17)	-0.7 (-1.23)	0.5 (1.10)	0.2 (0.64)
Effective number of parties	-25.6 (-0.92)	-25.5 (-0.94)	-3.0 (-0.41)	-2.9 (-0.40)
Share of socialists in the local council	253.9 (1.83)	263.4 (1.90)	29.5 (0.63)	27.2 (0.59)
Share of children (0-5 years)	3424.1 (1.13)	3774.6 (1.26)	-759.4 (-0.70)	-719.1 (-0.68)
Share of youths (6-15 years)	3576.0 (1.05)	4002.9 (1.16)	-466.7 (-0.45)	-310.8 (-0.32)
Share of elderly (above 80 years)	-952.4 (-0.30)	-1491.2 (-0.47)	635.2 (0.53)	787.9 (0.67)
Population (10000)	185.9 (2.42)	171.8 (2.28)	109.8 (3.05)	100.7 (2.76)
Share urban	144.3 (0.55)	108.5 (0.41)	-74.9 (-0.67)	-93.3 (-0.82)
Estimation period	2010-2017	2010-2017	2010-2017	2010-2017
# of observations	3354	3344	3354	3344
R^2	0.095	0.095	0.034	0.042

Note: Local government fixed effects and county-year trends are included in all regressions but are not reported in the table.

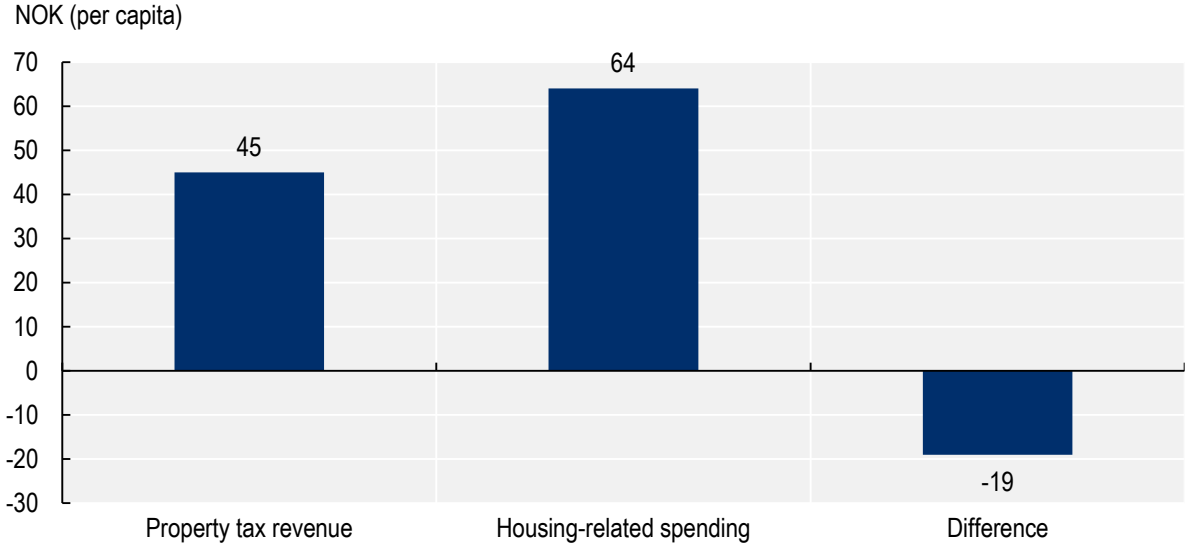
We then turn to the determinants of support for establishing own housing in columns C and D. Again, the type of inequality matters. Housing wealth inequality comes out as positive and statistically significant at the 10% level, while income inequality is not statistically significant. An increase in the Gini-coefficient of 4 increases housing support by NOK 24, which is 2% of the average. None of the other explanatory variables is statistically significant.

3.7. Policy implications

3.7.1. Property tax and housing spending

The analyses in the last two sections suggest that local governments react to increasing housing wealth inequality in two ways. First, municipalities increase the property tax, with an aim to reduce the top of the housing wealth distribution. Second, they increase local government housing spending and support for establishing private housing, thus lifting the bottom part of the housing wealth distribution. In summary, local governments seem to tackle rising inequality with policies aimed at both ends of the distribution. A relevant question is whether municipalities exercise some form of revenue recycling within housing wealth inequality. As explained in Section 3.1, local governments have very limited discretion when it comes to revenue raising. The property tax is the only tax that municipalities can decide on whether to levy as well as how much revenue to raise. Thus, there is a possibility that municipalities raise revenue from property taxation, which in turn is recycled into public housing spending. Local politicians can potentially use this argument as a justification for residential property taxation. Alternatively, housing wealth inequality may be considered as more (or less) important, such that they prioritise spending more (or less) money than they raise from residential property taxation.

Figure 3.1. Effects of increases in housing wealth inequality



Source: Authors' calculations.

We do a simple back-of-the-envelope calculation using the estimated responses. The revenue response suggests that an increase in housing wealth inequality by 4 Gini points increases the tax levied on a standard house by NOK 100. On the expenditure side, we found that municipalities increase housing-related spending by NOK 64 (40+24) when housing wealth inequality increases by 4 Gini points. The average number of persons per household in Norway is 2.2, implying that revenues per capita from the residential property tax are predicted to increase by NOK 45 when housing wealth inequality increases by 4 Gini points. These findings are summarised in Figure 3.1. This implies that the revenue response to increased housing wealth inequality is slightly smaller than the expenditure response. However, both responses are modest.

3.7.2. Some remarks on the design of the property tax

Two expert committees, one on local public finance (NOU, 2022[22]) and the other on taxation (NOU, 2022[23]), delivered reports to the Norwegian central government in 2022. Both reports discussed the property tax among other issues. The local public finance committee considered the residential property tax to be a good tax base for local governments, highlighting its low mobility, stability over the business cycle, and that it works as a benefit tax. In addition, the committee emphasised that it is important that local governments have the opportunity to take distributional effects into account through the basic deduction. Moreover, the committee suggested that local governments should have more discretion in taxing property and proposed that the recent reduction in the maximum tax rates from 0.7% to 0.4% should be reversed. The committee did not propose to include the residential property tax in the tax equalisation scheme. Since this is the same as today, it implies that the residential property tax will still not affect grants from the central government. However, there are large differences in property tax revenues from businesses and other natural resource revenues like revenues from the sale of concession power and revenues related to sea farming. The committee proposed a modest equalisation of these revenues, implying that higher revenues from some business property taxation will lead to cutbacks in grants from the central government.

As pointed out by the OECD (2022[24]) among others, housing in Norway is more favourably taxed than other capital objects. There is no taxation of user value, the valuation of the primary residence in the wealth tax is only 25% of the assessed market value, rental income is exempted from taxation if the owner lives in the house and less than half of the residence is rented out, there is no tax on the financial gain from selling a home if the owner lived there for more than a year, and interest expenses can be fully deducted. On the other hand, most house buyers must pay a document fee to the central government when a residence is purchased.

The tax committee proposed to increase the tax on housing by increasing the valuation of all residences to 100% of the market value in the wealth taxation, to (re)introduce[7] the taxation of user value, that all rental income should be taxed, and to make it more difficult to avoid the taxation of financial gains.[8] Should these measures be taken, a full deduction of interest expenses can be continued and the document fee can be abolished. Taxation of housing will then be in line with the taxation of other capital objects.

The tax committee argued that the residential property tax is well suited for local taxation because of low tax base mobility and may also contribute to better correspondence between citizens' preferences and local government service provision. The committee also proposed that local governments should no longer have the opportunity to assess properties themselves, but rather should use the same values for housing wealth as the Tax Administration uses for the wealth tax. A final proposal was that local governments should not be allowed to have a basic deduction in the residential property tax.

It is reassuring that both committees agreed that property tax is a good local tax and that the reasoning of the two committees is similar. The main point where the two committees disagree is whether local governments should have the discretion to take into account distributional aspects. The local public finance committee emphasised that it is a favourable characteristic of the property tax that local governments have the discretion to decide the size of the basic deduction. In our analyses, neither income nor housing wealth inequality are statistically significant determinants of the basic deduction. On the other hand, distributional concerns may be taken into account through the share of elderly in the population.

We support the suggestion by the tax committee on the valuation method. It is preferable that the assessed property values are updated yearly, which would be the case if the local governments were forced to use the same valuation as for wealth taxation. Yearly updating is also an advantage for local government budgeting, as it would translate into a more stable revenue development. A concern, however, is whether voters are willing to pay property tax to the local government when the general taxation of housing increases.

3.7.3. Local responsibility for housing allowances?

Both the central government and local governments have responsibilities for housing expenditure. The central government is responsible for housing allowances, while there is a local government responsibility that people have a home and provide financial support for establishing private housing. Since many of the same people receive social assistance, which is a local government responsibility, local governments could also be responsible for housing allowances. In addition to corresponding to the theory that local governments are better at matching local preferences, it also allows for more flexibility and more integrated measures when it comes to policies aimed at supporting low-income households with weak connections to the labour market.

3.8. Concluding remarks

In this chapter, we revisit the subject of the relationship between inequality and local government taxation and housing-related spending. This is motivated by rising inequality seen both globally and within Norway. We study two types of inequality, namely income and housing wealth inequality. Both have increased over time. We investigate whether Norwegian local governments respond to the increase in inequality by enacting redistributive policies. A novelty is that we separate the two types of inequality to investigate whether they have different effects on taxation and public spending.

Local governments in Norway have limited discretion when it comes to raising revenue. The only tax they can choose whether to levy, and to which extent, is the property tax. On the other hand, they have wide freedom in how they prioritise and allocate resources between service sectors. We investigate whether the increase in income or housing wealth inequality leads to an increase in the property tax level, the basic deduction of the property tax or an increase in public housing spending.

Our findings suggest that income inequality has no impact on the level of the property tax, the basic deduction in the property tax, nor housing-related spending. On the other hand, housing wealth inequality affects all policy outcomes except the basic deduction. Comparing the responses to housing wealth inequality, we find that property tax revenues increase slightly less than housing-related spending. Moreover, there is an ongoing public debate about property taxation and taxation in general. As in other Scandinavian countries, Norway is a country with a strong preference for an equal distribution of income and wealth, and distributional issues are likely to remain important topics in the future.

The positive effect of housing wealth inequality on the property tax level is explained by the observation that increased inequality implies a larger share of high valued properties in the total tax base. For a given total revenue target, this increases the average tax payment. The effect comes through the distribution of the tax base, not changes in the tax rate or basic deduction which determine the design of the property tax. Thus our findings imply that growing inequality in housing wealth makes the average tax burden higher, even if the overall design of the property tax system remains unchanged.

References

Aaberge, R., A. Atkinson and J. Modalsli (2020), "Estimating long-run income inequality from mixed tabular data: Empirical evidence from Norway, 1875–2017", *Journal of Public Economics*, Vol. 187, p. 104196, https://doi.org/10.1016/j.jpubeco.2020.104196. [12]

Alesina, A., R. Baqir and W. Easterly (2000), "Redistributive Public Employment", *Journal of Urban Economics*, Vol. 48/2, pp. 219-241, https://doi.org/10.1006/juec.1999.2164. [6]

Bénabou, R. (2000), "Unequal Societies: Income Distribution and the Social Contract", *American Economic Review*, Vol. 90/1, pp. 96-129, https://doi.org/10.1257/aer.90.1.96. [5]

Borge, L. (2005), "Strong politicians, small deficits: evidence from Norwegian local governments", *European Journal of Political Economy*, Vol. 21/2, pp. 325-344, https://doi.org/10.1016/j.ejpoleco.2004.06.005. [19]

Borge, L., J. Brueckner and J. Rattsø (2014), "Partial fiscal decentralization and demand responsiveness of the local public sector: Theory and evidence from Norway", *Journal of Urban Economics*, Vol. 80, pp. 153-163, https://doi.org/10.1016/j.jue.2014.01.003. [16]

Borge, L. and O. Nyhus (2012), *Distributional Implications of Municipal Property Tax. Manuscript*, Department of Economics, Norwegian University of Science and Technology. [11]

Borge, L. and J. Rattsø (2004), "Income distribution and tax structure: Empirical test of the Meltzer–Richard hypothesis", *European Economic Review*, Vol. 48/4, pp. 805-826, https://doi.org/10.1016/j.euroecorev.2003.09.003. [7]

Borge, L. and J. Rattsø (1995), "Demographic shift, relative costs and the allocation of local public consumption in Norway", *Regional Science and Urban Economics*, Vol. 25/6, pp. 705-726, https://doi.org/10.1016/0166-0462(95)02088-8. [15]

Boustan, L. et al. (2013), "The Effect of Rising Income Inequality on Taxation and Public Expenditures: Evidence from U.S. Municipalities and School Districts, 1970–2000", *The Review of Economics and Statistics*, Vol. 95/4, pp. 1291-1302, https://doi.org/10.1162/rest_a_00332. [9]

Corcoran, S. and W. Evans (2010), *Income Inequality, the Median Voter, and the Support for Public Education*, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w16097. [8]

Epple, D. and R. Romano (1996), "Ends against the middle: Determining public service provision when there are private alternatives", *Journal of Public Economics*, Vol. 62/3, pp. 297-325, https://doi.org/10.1016/0047-2727(95)01540-x. [4]

Fabre, B. (2018), *The Impact of Local Income Inequality on Public Goods and Taxation: Evidence from French Municipalities*, https://shs.hal.science/halshs-01721825. [10]

Fiva, J. and J. Rattsø (2007), "Local choice of property taxation: evidence from Norway", *Public Choice*, Vol. 132/3-4, pp. 457-470, https://doi.org/10.1007/s11127-007-9171-z. [20]

Hopland, A. (2013), "Central government control and fiscal adjustment: Norwegian evidence", *Econ. of Governance*, Vol. 14/2, pp. 185-203, https://doi.org/10.1007/s10101-013-0124-3. [17]

Inman, R. (1979), "The Fiscal Performance of Local Governments: An interpretative review", *Current Issues in Urban Economics*. [13]

Kalseth, J. and J. Rattsø (1998), "Political Control of Administrative Spending: The Case of Local Governments in Norway", in *Fiscal Federalism and State–local Finance*, Edward Elgar Publishing, https://doi.org/10.4337/9781035303700.00019. [18]

Laakso, M. and R. Taagepera (1979), ""Effective" Number of Parties", *Comparative Political Studies*, Vol. 12/1, pp. 3-27, https://doi.org/10.1177/001041407901200101. [21]

Meltzer, A. and S. Richard (1981), "A Rational Theory of the Size of Government", *Journal of Political Economy*, Vol. 89/5, pp. 914-927, https://doi.org/10.1086/261013. [3]

NOU (2022), *A Unified Tax System (Et helhetlig skattesystem)*, Ministry of Finance. [23]

NOU (2022), *The Grants System for the Municipalities (Inntektssystemet for kommunene)*, Ministry of Local Government and Regional Development. [22]

OECD (2022), *Housing Taxation in OECD Countries*, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/03dfe007-en. [24]

Piketty, T. (2017), *Capital in the Twenty-First Century*, Harvard University Press, https://doi.org/10.4159/9780674982918. [1]

Reschovsky, A. (2023), *Do Property Taxes in the United States Contribute to Housing Inequities?*, This volume. [25]

Roberts, K. (1977), "Voting over income tax schedules", *Journal of Public Economics*, Vol. 8/3, pp. 329-340, https://doi.org/10.1016/0047-2727(77)90005-6. [2]

Rubinfeld, D. (1987), "The economics of the local public sector", in *Handbook of Public Econ.*, (Vol. 2, pp. 571-645), Elsevier, https://doi.org/10.1016/s1573-4420(87)80006-x. [14]

Notes

[1] The terms local government and municipality are used interchangeably.

[2] A single local government decided in 2021 to have a wealth tax rate of 0.2, which is below the maximum of 0.7%. This caused a large public debate about local tax financing in Norway. However, 2021 is outside our sample period.

[3] See Reschovsky (2023[25]) in this volume. He uses the term fixed dollar exemption instead of basic deduction.

[4] At the time of writing one Euro equaled NOK 11.36.

[5] It should be noted that wealth taxation differs from property taxation in two important ways. First, the wealth tax also includes financial wealth, and second, debt is deducted.

[6] Local governments without property tax do not need to assess their properties.

[7] The taxation of user value was abolished in 2005.

[8] The tax committee proposed to link the tax exemption to the fraction of the last 5 years the person (or household) was living in the residence.

4 The Korean national property tax: History, controversies and future directions

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Korea's National Property Tax (NPT), characterised by its redistributive nature, is unique in the OECD. Originating from a history of progressive property taxation in the 1970s, the NPT was introduced in 2005 to refine the progressive local property tax system, by absorbing its upper brackets at a higher level of government. While aiming explicitly at redistribution, it has been controversial. This paper argues that given Korea's weak capital gains tax on housing, a progressive property tax, like the NPT, is sensible, a position echoed by recent OECD studies. However, challenges arise due to its use for housing price stabilisation and its limited role as a wealth tax. Maintaining the NPT at a moderate level is recommended.

4.1. Introduction

In the majority of OECD countries, recurrent taxes on immovable property are typically levied by local governments. As discussed in Bird (1993[1]), IMF (2009[2]), and OECD (2022[3]), these taxes have several desirable characteristics of local taxes: immobility of the tax base, visibility (accountability), stability, buoyancy and adherence to the principle of benefit taxation. As a result, they have become a major revenue source for local governments. Yet, as discussed in OECD (2022[3]), there is generally significant scope to enhance the design and efficacy of these taxes. First of all, taxes on immovable property are among the most economically efficient forms of taxation (OECD, 2022, pp. 79-80[3]). This implies that significant efficiency gains can be achieved through improvements in their design. Furthermore, progressive property tax rates can improve the equity of recurrent taxes on immovable property. In this context, OECD (2022, pp. 87-88[3]) emphasises that effective redistribution is best achieved at higher levels of government to ensure equitable treatment of residents regardless of their residence.

Against this backdrop, Korea's property tax system is an interesting case because both the central and local governments collect property taxes—a practice unique among OECD countries. The nation has maintained the tradition of progressive property taxation since the introduction of a highly progressive local property tax in 1973, establishing it as a norm for nearly half a century. This approach has been driven by a prolonged and significant appreciation in land and housing values. Given that the wealth disparity in Korea predominantly stems from differences in these values, progressive property taxation has long been supported by the public.

Despite its longstanding presence, progressive property taxation in Korea is by no means a well-established tax system. In particular, it is vulnerable to volatility stemming from shifts in politics. Although always a topic of contention, debates concerning the merits and drawbacks of the progressive property tax intensified with the introduction of the highly progressive national property tax, known as CRET, in 2005. This chapter delves into the historical evolution of progressive property taxation in Korea and offers a critical reassessment of the pros and cons of CRET as discussed in the existing literature.

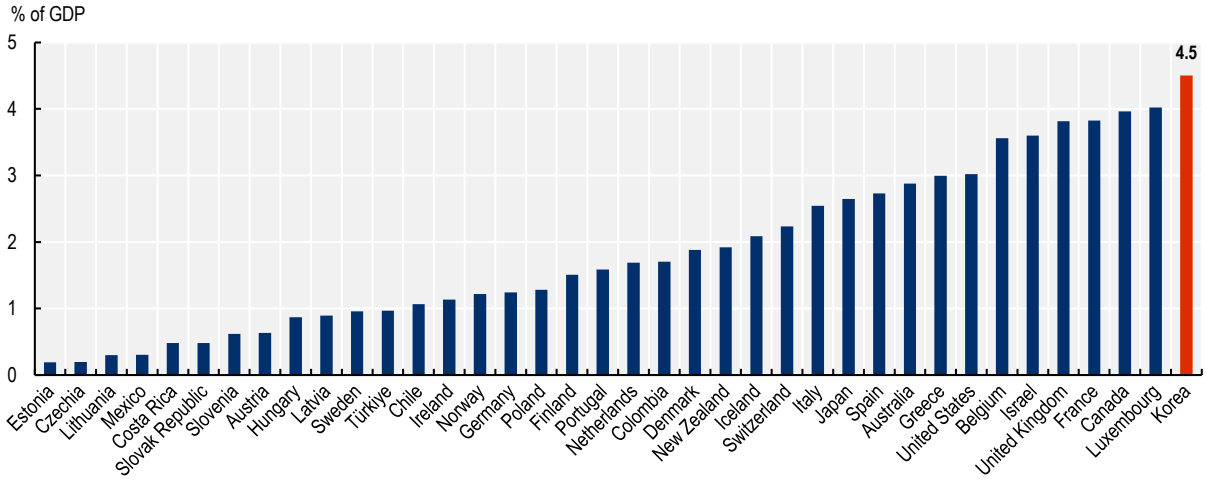
4.2. Property tax characteristics in OECD countries

4.2.1. Taxes on property

In OECD countries, revenues from all types of property taxes—including recurrent taxes on immovable property, net wealth taxes, estate taxes, inheritance and gift taxes, as well as taxes on financial and capital transactions—average 1.9% of GDP. This percentage varies among countries, ranging from above 4% in some to below 0.5% in others (Figure 4.1). Countries with high levels of property tax revenues include the United Kingdom, France, Canada, Luxembourg and Korea, with Korea collecting property taxes amounting to 4.5% of its GDP. Conversely, countries like Estonia, the Czech Republic, Lithuania, Mexico and Costa Rica collect revenues from property taxes that are below 0.5% of GDP.

The revenue from recurrent taxes on immovable property ranges from more than 2.5% of GDP in the United Kingdom, the United States, and Canada to less than 0.5% in Luxembourg, Estonia, Türkiye, the Czech Republic, and Switzerland (Figure 4.2). In Korea, this revenue item constitutes around 1.2% of GDP, indicating that the country's revenue from property transaction taxes (taxes on financial and capital transactions) is significantly higher than that from recurrent taxes on immovable property.

Figure 4.1. Revenue from property taxes in OECD countries, 2021

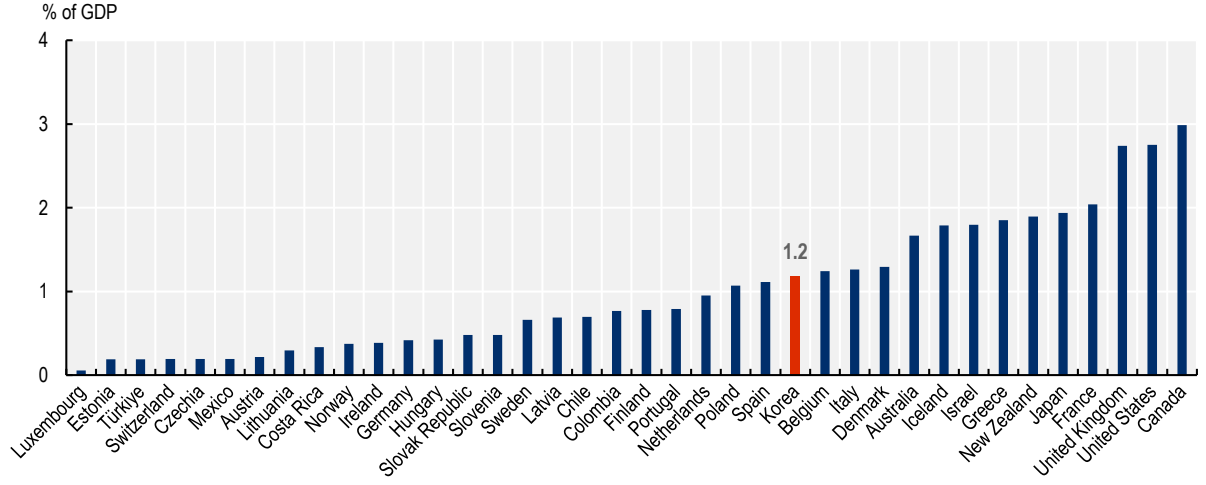


Source: OECD Revenue Statistics (https://stats.oecd.org/).

4.2.2. Recurrent taxes on property

Recurrent taxes on immovable property are typically levied by local governments. However, in several OECD countries—including Korea, the United Kingdom, Greece, France, Sweden, Italy, the Netherlands, and Ireland—the central government imposes a national property tax (Figure 4.3). Among these countries, Korea is unique as it is the only OECD country where the central government collects a redistributive property tax.[1] In countries such as Italy, Ireland, and Estonia, the central government sets the rates for local property taxes—Municipal Real Estate Tax (IMU),[2] Local Property Tax,[3] and Land Tax,[4] respectively—and then allocates the revenue from these taxes to local governments. According to the OECD Revenue Statistics (OECD, 2022, pp. 345-346[4]), these taxes are classified as central government taxes since their rates are determined by the central government.[5]

Figure 4.2. Revenue from immovable property taxes in OECD countries, 2021



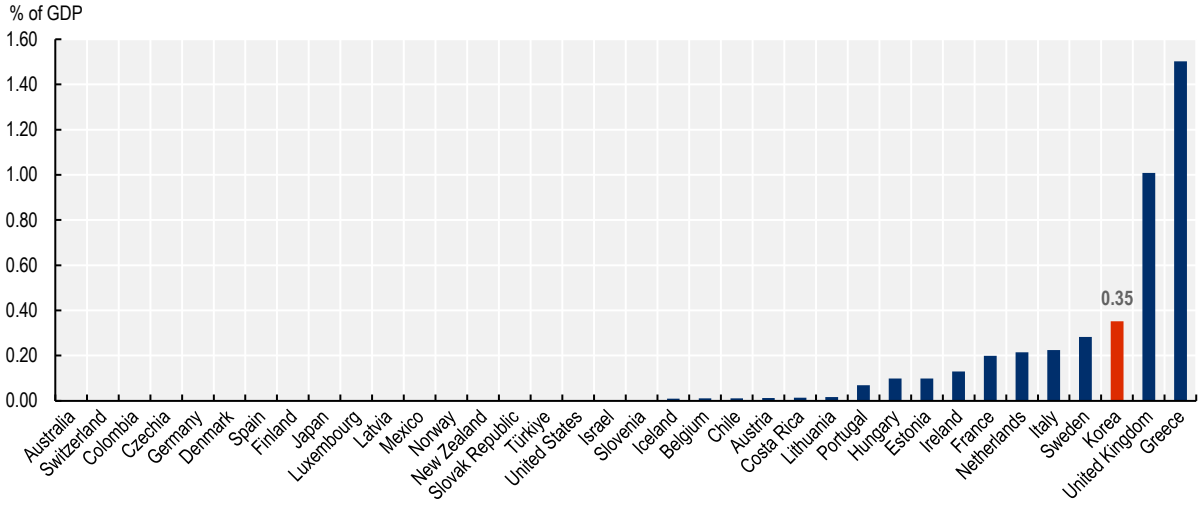
Source: OECD Revenue Statistics (https://stats.oecd.org/).

Similarly, in the Netherlands, where local tax revenue as a share of total tax revenue is very low at around 5%, local taxes are governed by respective laws,[6] resulting in a portion of local property tax revenue being reported as central government revenue. In Sweden, property tax on real estate was historically levied at both the local and state level. However, following the tax reform of 1991, the property tax became exclusively a national tax. The state real estate tax on owner-occupied houses and apartment buildings was abolished in 2008. Currently, the real estate tax is applied to commercial premises and industrial properties, with tax rates of 1.0% and 0.5%, respectively.[7] Figure 4.3 shows that the size of property tax revenue collected by the central government in the United Kingdom is relatively high. However, the UK's figure in Figure 4.3 represents the central government's revenue from business rates on shops, offices, pubs, etc., not property tax on residential properties. In the case of France, the number in Figure 4.3 shows the central government's revenue from the residence tax (*tax d'habitation*), which is being phased out through 2023.

Contrary to these countries where the central government determines local property tax rates which are flat, the central government in Greece adopted a progressive property tax structure. Greece's property tax, known as ENFIA, consists of a standard component (main ENFIA) and an additional component with progressive tax rates (applied on property values over EUR 400 000).[8] As discussed in Andriopoulou et al. (2020[5]), the role of the property tax became more prominent after the Greek government debt crisis. It should be noted, however, that the size of Greece's national property tax revenue shown in Figure 4.3, which is the highest among the OECD countries, represents the combined revenue from both the main ENFIA and the surcharge ENFIA. Andriopoulou et al. (2020[5]) argue that the burden of ENFIA is regressive when measured as a share of disposable income, implying that the progressive structure of property taxes—including the surcharge ENFIA—is not effectively redistributive in Greece.

In sum, national property taxes in most OECD countries are fundamentally similar to local property taxes, as they typically levy a flat tax rate on property values, and any progressive tax rate structures that exist are not particularly effective. However, the property tax system in Korea, and in particular the national property tax known as the Comprehensive Real Estate Tax (CRET), is notably different. Historically, during the 1970s, Korea's local property tax—which has been, and continues to be, controlled by the central government—was made highly progressive. This shift was due to the perception of relatively expensive owner-occupied housing as a luxury good. However, this led to strong tax resistance, as even minor increases in the tax base resulted in significant increases in the tax burden. By the mid-2000s, it was widely recognized that a highly progressive local property tax was both counterproductive and burdensome for local governments to manage. Consequently, in 2005, the property tax system in Korea was restructured into two components: a mildly progressive local property tax and a highly progressive national property tax, known as the CRET.

Figure 4.3. Revenue from national property taxes in OECD countries, 2021



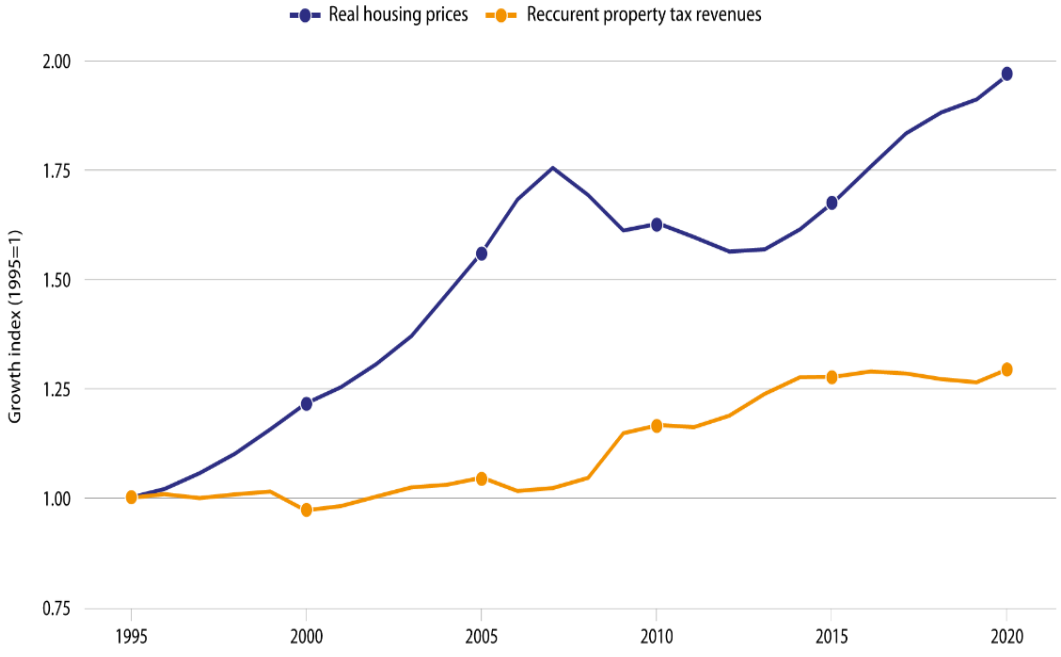
Source: OECD Revenue Statistics (https://stats.oecd.org/).

4.2.3. Trends in the growth of housing prices and property tax revenues

The average growth in real house prices has considerably outpaced the average growth in real property tax revenues in OECD countries. As seen in Figure 4.4, the average housing price in 15 OECD countries nearly doubled in real terms between 1995 and 2020. On the other hand, revenue from taxes on immovable property increased by only about 25% in real terms during the same period in these countries.

Figure 4.4. Growth trend of real housing prices and property tax revenue

Mean growth in real housing prices and revenues from recurrent taxes on immovable property in 15 OECD countries

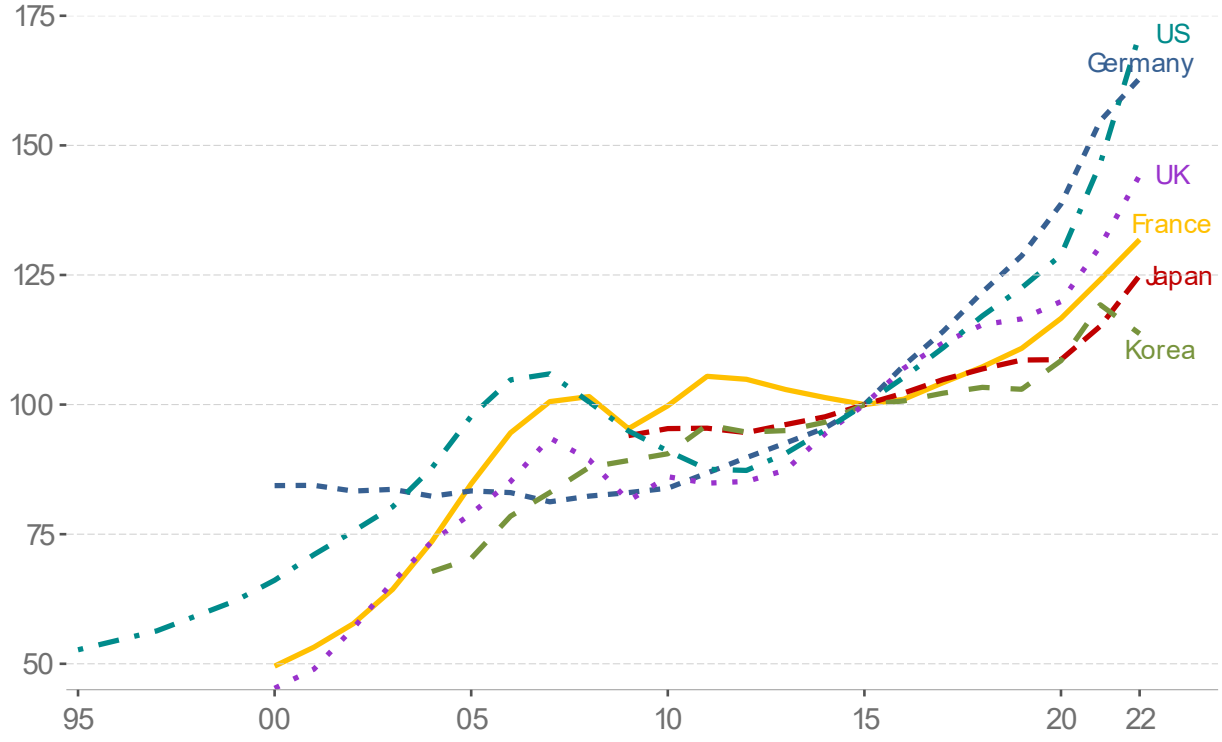


Source: OECD (2022[3]).

To examine the trend of housing prices in OECD countries in more detail, Figure 4.5 presents the housing price indexes of six selected countries (the United States, the United Kingdom, France, Germany, Japan, and Korea). The figure shows that housing prices more than doubled in all countries except Japan, and rose particularly steeply during the COVID-19 period. Between 2000 and 2020, housing prices increased by factors of 2.35, 2.64, 1.64, and 1.95 in France, the United Kingdom, Germany, and the United States, respectively. In the case of Korea, housing prices increased by a factor of 1.60 between 2004 and 2020. Japan was the exception, experiencing only modest increases in housing prices.

It is worth noting that housing prices are highly sensitive to interest rates, as discussed by Dieckelmann et al. (2023[6]) and Duca and Murphy (2021[7]), among others. During the COVID-19 period (2020-2022), central banks in OECD countries implemented expansionary monetary policies to avoid an economic recession, resulting in historically low interest rates worldwide. Consequently, housing prices experienced a sharp increase between 2020 and 2022 in these countries, as observed in Figure 4.5.

Figure 4.5. Housing price developments in 6 OECD countries



Source: OECD National and Regional House Price Indices (https://stats.oecd.org/).

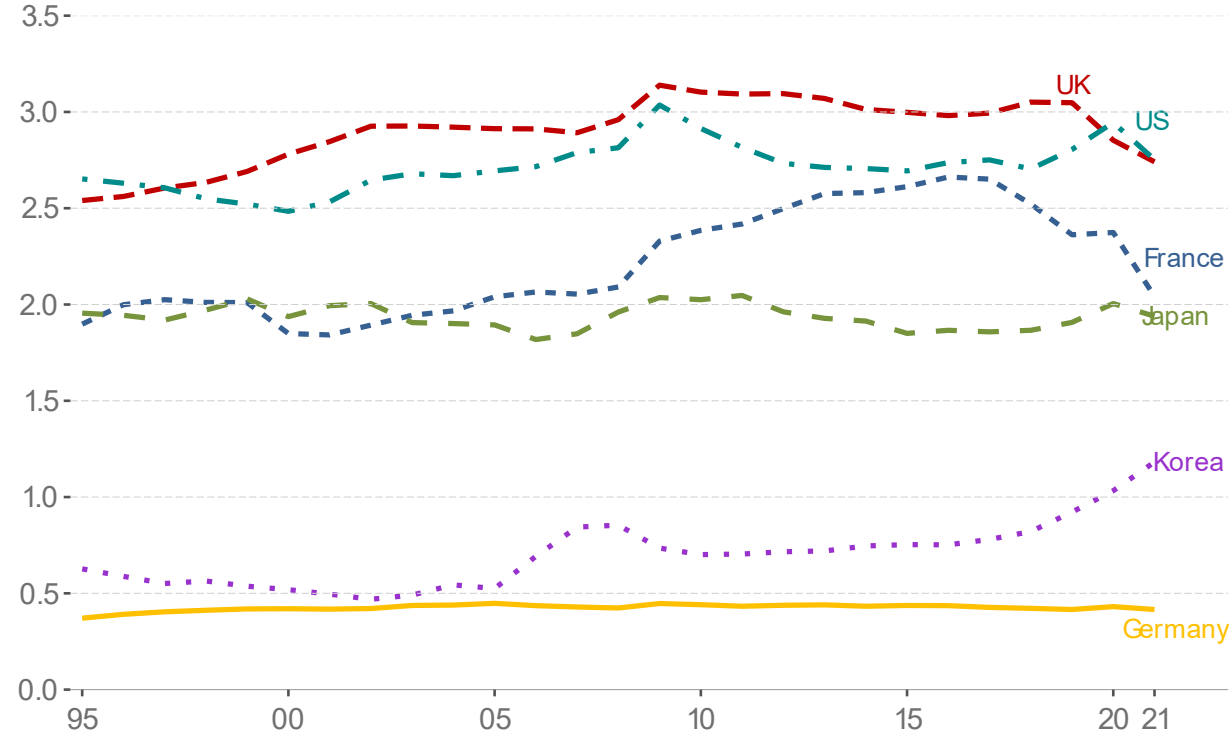
In contrast to the rapidly rising housing prices, property tax revenue as a share of GDP has remained relatively stable in all six countries over the past two decades (Figure 4.6). Property tax revenues in the United States and the United Kingdom have consistently ranged between 2.5% and 3.1% of GDP from 1995 to 2021, with a noticeable decline in the past two years. In France, property tax revenues hovered around 2% of GDP between 1995 and 2010, then increased to a peak of 2.7% in 2016 before rapidly declining back to 2% in 2021. Germany and Japan have maintained remarkably stable property tax revenues at around 0.4% and 2% of GDP, respectively, over the past two decades. In contrast, property tax revenues in Korea have shown a slightly increasing trend, noticeably after the introduction of CRET in 2005 and the efforts of the government before 2022 to boost CRET revenue. This has led to an approximate 0.2 percentage point increase in property tax revenues as a share of GDP over the past four years. However, the new government elected in May 2022 has pledged to reduce the CRET to the 2017 level. Consequently, Korea's property tax revenue, currently slightly above 1% of GDP, is expected to decrease to less than 1% in the coming years. Overall, property tax revenues in OECD countries, including the six countries examined above, have remained relatively stable, contrasting with the long-term trend of rapidly increasing housing prices.

4.3. Historical development of redistributive property taxation in Korea

4.3.1. Introduction of progressive property taxes in 1973

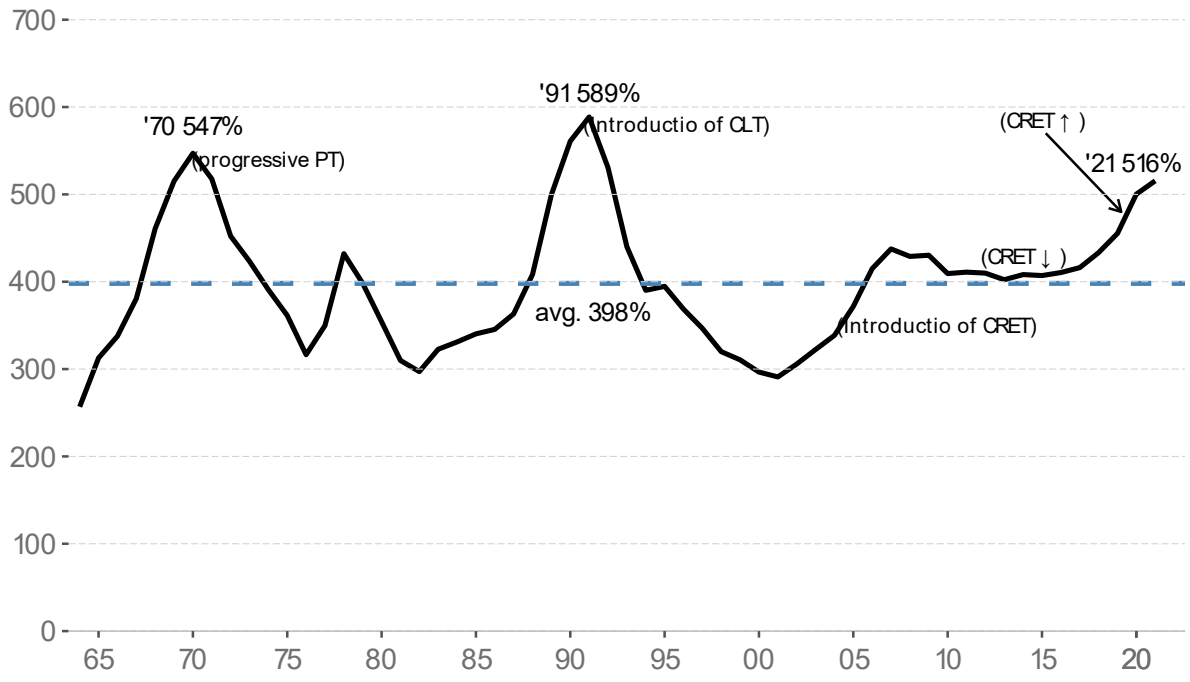
Property taxes on immovable properties (land and structures) were first introduced in Korea in 1962, with a flat tax rate of 0.2% applied to assessed land values. The tax on structures was initially a unit tax based on valuation indices, but an ad valorem rate of 0.3% was applied to the assessed value of structures starting in 1966. The 1960s marked the onset of rapid economic growth in Korea, which was accompanied by a significant increase in property values. Notably, the rate of property value appreciation outpaced the growth rate of the South Korean economy during this period. As shown in Figure 4.7, the share of land value relative to GDP surged from 256% in 1964 to 547% in 1970. The rapid increase in property values during the 1960s generated political demand for measures to curb land and housing speculation. Consequently, progressive tax brackets were introduced for property taxation of housing in 1973, as illustrated in Table 4.1. In the initial year of progressive property taxation, four progressive tax brackets (0.3%, 0.4%, 0.5%, and 0.6%) were applied to structures. Once the progressivity of property taxes was established, it was significantly strengthened. In 1975, the starting point of tax bases for structures was reduced and tax brackets were sub-divided, making the degree of progressivity steeper. Simultaneously, three significantly higher rates of 1%, 3%, and 5% were added. The tax rate on land also changed from a flat rate of 0.2% to highly progressive rates with five tax brackets (0.3%, 0.5%, 1%, 3%, and 5%). Following this, whenever the land price appreciation outpaced the growth rate of the economy (GDP), there was political demand for increased progressivity to curb land and housing speculation.

Figure 4.6. The trend of property tax revenues as a share of GDP in 6 countries



Source: OECD Revenue Statistics (https://stats.oecd.org/).

Figure 4.7. Land value in Korea as a per cent of GDP



Note: Land value before 1995 is based on Cho, et al. (2015[8]).
Source: Bank of Korea (GDP and National Balance Sheet after 1995).

Table 4.1. Property tax rates in 1973 and 1975

Structure					Land		
	1973	1973	1975		-1975	1975	
Assessed value (KRWM)	Rates (%)		Assessed value (KRWM)	Rates (%)	Rates	Assessed area (3.3㎡)	Rates (%)
0-20	0.3	0.3	0-5	0.3	0.2	0-100	0.3
20-30		0.4	5-10	0.5		100-200	0.5
30-50		0.5	10-20	1.0		200-300	1.0
50-		0.6	20-30	3.0		300-500	3.0
			30-	5.0		500-	5.0

Note: The basic unit of floor space used in Korea is 3.3 square meters, which is called 'pyeong'
Source: Korean Local Tax Law, versions of 1973 and 1975.

4.3.2. Introduction of the Comprehensive Land Tax (CLT) in 1990

After a significant economic slump in the early 1980s, the Korean economy began to experience strong economic growth in the latter half of the decade, which was again accompanied by a rapid increase in land prices. To curb land and housing speculation, an additional property tax bracket of 7% was added in 1987. However, as illustrated in Figure 4.7, the increase in land value was only beginning in 1987. The ratio of land value to GDP reached its peak in 1991, surging to 589%.

In response to the historically strong land speculation in the late 1980s, a highly progressive land tax was introduced in 1990, which consisted of nine tax brackets (0.2%, 0.3%, 0.5%, 0.7%, 1.0%, 1.5%, 2%, 3%, 5%).[9] At first glance, the progressivity of this nine-bracket system might not appear significantly stronger than its predecessor, given that it dropped the highest previous rate of 7% and added a new lowest rate of 0.2%. However, the land tax reform of 1990 changed the tax base from the value of land in a single local government to the combined value of land across all local governments owned by a single person. Under the previous land tax system, individuals who owned multiple parcels of land in different local governments paid land taxes in each jurisdiction, usually at relatively low rates. Under the new land tax system, the tax base for such individuals became the combined value of all land they owned. This subjected them to higher land tax brackets and, given the highly progressive land tax rates, resulted in a significant tax burden for those who owned a large amount of land across multiple jurisdictions. The new land tax was thus called the Comprehensive Land Tax (CLT). Although the CLT was based on the combined value of land across all local governments, it continued to be classified as a local tax. Therefore, CLT was collected by the central government in the first stage, and then its revenue was allocated to the relevant local governments based on an allocation formula.

4.3.3. Introduction of the Comprehensive Real Estate Tax (CRET) in 2005

The third land value surge occurred in the first half of the 2000s. As depicted in Figure 4.7, the magnitude of the land value increase during this third wave was less significant compared to the previous two waves. However, two aspects of taxes on land and structures became controversial during this wave. First, the assessed value of properties was substantially lower than their market value. According to Kim (2004, p. 6[9]), despite highly progressive tax rates—0.2% to 7% for the land tax and 0.3% to 5% for the tax on structures—the average effective tax rate of CLT (tax revenue/total land value) was only 0.16%, and the corresponding rate (tax revenue/total value of structures) for the tax on structures was 0.09% in 2004 (Table 4.2). Second, the practice of assessing land and structures separately led to unrealistically low

figures, especially for high-rise apartments, which comprised about 58% of housing in the Seoul Metropolitan region in 2005.[10] This was due to the relatively small land area associated with individual units in high-rise buildings, which meant that the land value of apartment buildings was not fully subject to taxation. Furthermore, the assessed value of structures in older apartments in well-developed areas such as the Seoul metropolitan area was very low due to the high depreciation rates applied in the assessment process, despite significantly higher housing prices in these areas compared to other regions. Given that nearly half of Korea's population resides in the Seoul region, the substantial discrepancy between assessed housing value and market value in the Seoul metropolitan area became a politically contentious issue. In response to the political demand for a more equitable property tax system, the progressive government introduced a newly designed national property tax named the Comprehensive Real Estate Tax (CRET) in 2005.

Table 4.2. Effective tax rates on land and structures in 2004

Total			Persons			Corporations		
Tax base Land	Tax revenue	Effective rate	Tax base Land	Tax revenue	Effective Rate	Tax base Land	Tax revenue	Effective rate
1,059	16,511	0.16%	835	8,906	0.11%	224	7,605	0.34%
Total			Persons			Corporations		
Tax base Structures	Tax revenue	Effective rate	Tax base Structures	Tax revenue	Effective rate	Tax base Structures	Tax revenue	Effective rate
994	8,619	0.09%	744	6,985	0.09%	250	1,634	0.07%

Source: Kim (2004[9]).

The creation of a redistributive national property tax (CRET), which remains a unique case among OECD countries, warrants further discussion. One of the justifications for introducing a national property tax is outlined by Kim (2004[9]). First, he argues that the existing property tax system in 2004 was already highly progressive, with nine progressive tax brackets for land and five for structures. Such a highly progressive property tax system was rare in the OECD, where most countries employed a single flat property tax rate. In other words, the property tax system in Korea had been uniquely progressive since the early 1970s, making it politically and practically difficult to abruptly abolish this highly progressive system. On the other hand, under the principles of fiscal federalism (see, e.g., Musgrave (1959[10])), the central government should bear the responsibility for redistribution, and thus it was considered desirable for the central government to levy a property tax with highly progressive brackets. Therefore, according to Kim (2004[9]), the creation of CRET would allow local governments to implement milder progressive property tax rates, aligning the tax with the benefit principle of local taxation. Additionally, it could be expected that local property tax rates would converge toward a flat rate over time as the central government takes on the role of implementing a redistributive property tax.

Second, the highly progressive nature of local property taxes posed a significant obstacle to increasing property tax revenue. Taxpayers were likely to strongly resist a substantial increase in the tax burden if tax base revaluation were pursued under highly progressive tax rates. As a result, local governments were often reluctant to exercise fiscal sovereignty by effectively mobilising revenue from property taxes. This was seen as a major obstacle to the development of local autonomy, especially since property taxes were considered the most important and suitable source of revenue for local governments compared to other taxes such as VAT and corporate income tax.

Third, though the progressive property tax system had a long history, making abrupt abolition difficult, there were considerations regarding the feasibility of introducing a flat-rate property tax system. However, transitioning from a highly progressive system to a single-rate system poses challenges due to the potential for excessive progressivity or regressivity. A pragmatic approach to address this issue was selecting a moderate tax rate within the existing brackets for land and structures, striking a balance between extremely low and high rates. For instance, a 1% rate could be a suitable candidate for both the land tax and the tax on structures (Table 4.3). However, as noted by Kim (2004[9]), approximately 75% of land taxpayers fell into the first tax bracket with a 0.2% rate in 2004. Approximately 17% of land taxpayers were in the second bracket (0.3% rate), while the remaining 8% were in the third bracket (0.5% rate) or higher (ranging from 0.7% to 5%). This suggested that even with a flat tax rate of 0.3%, about 75% of taxpayers would face a 50% increase in their tax burden under the new system. Consequently, the only viable option to prevent widespread tax resistance while adopting a flat-rate land tax would be to use a 0.2% rate. This, however, would essentially abolish the progressive land tax system that had been in place for nearly four decades. Such an option would likely face strong political opposition, particularly from the majority (75%) of taxpayers who, as a low-income group, supported the progressive land tax system. The same line of reasoning can explain why there was no realistically viable option for a single-rate tax on structures (Table 4.4).

Table 4.3. Distribution of taxpayers and revenue of CLT in 2004

Tax brackets (KRWM)	Tax rates	Persons		Tax base		Tax revenue		Effective rate (%)
		Number	Share (%)	(KRWB)	Share (%)	(KRW100M)	Share (%)	
-20	0.2	8,569,271	79.43	58,800	33.01	1,180	15.59	0.07
20-50	0.3	1,611,343	14.94	49,700	27.9	1,166	15.41	0.08
50-100	0.5	436,249	4.04	29,300	16.45	942	12.45	0.12
100-300	0.7	150,035	1.39	22,800	12.8	1,119	14.79	0.18
300-500	1.0	13,243	0.12	4,960	2.78	335	4.42	0.24
500-1,000	1.5	5,743	0.05	3,840	2.16	363	4.8	0.34
1,000-3,000	2.0	1,972	0.02	3,090	1.73	446	5.89	0.52
3,000-5,000	3.0	297	0	1,150	0.65	229	3.03	0.72
5,000-	5.0	333	0	4,510	2.53	1,787	23.62	1.44

Source: Kim (2004[9]).

Table 4.4. Distribution of taxpayers and revenue of tax on structures in 2004

Tax brackets (KRW10,000)	Tax rates	Share of taxpayers	Share of tax bases	Share of tax revenue
B ≤ 1,200	0.3	84.2	33.7	22.8
1,200 < B≤ 1,600	0.5	9.00	15.3	11.0
1,600 < B≤ 2,200	1.0	4.00	25.2	24.6
2,200 < B≤ 3,000	3.0	1.98	7.4	11.0
3,000 < B≤ 4,000	5.0	0.55	7.0	12.0
4,000 < B	7.0	0.06	11.3	18.6

Source: Kim (2004[9]).

Given that 75% of land taxpayers fell into the first bracket of the land tax and 92% into the first two brackets, one might expect that a substantial portion of land tax revenue would come from these taxpayers. However, as Table 4.3 shows, only about 25% of the total land tax was paid by this group. Therefore, abolishing the progressive land tax would have not only faced strong political resistance but also resulted in a significant loss of tax revenue.

Regarding the tax on structures (Table 4.4), 84% of taxable structures fell into the first tax bracket with a rate of 0.3%, while 9% fell into the second tax bracket with a rate of 0.5%. This means that 93% of taxpayers for structures were in the first two brackets. However, this group accounted for only around 34% of the total revenue from the tax on structures. Similar to the land tax, abolishing the progressive tax on structures would have entailed a considerable loss of tax revenue.

4.3.4. Controversies and evolution of CRET since 2005

The main theoretical reasons for the establishment of CRET, as discussed in Kim (2004[9]), are summarised as follows. First, the separation of highly progressive property taxes into a local property tax and a national property tax allows the central government to assume the role of redistribution. Concurrently, local governments can exercise their fiscal autonomy through moderately progressive local property tax rates. Second, the establishment of a national property tax enables the central government to manage a redistributive property tax from an optimal taxation perspective,[11] which seeks to balance the equity and efficiency of the redistributive property tax. In addition, given that local governments now have moderately progressive property tax rates, these rates may converge to a flat rate over time. However, in practice, the actual operation of CRET has been significantly influenced by political considerations and certain ambiguities in the wording of the Law on CRET. Article 1 of the law postulates that CRET has three objectives: (i) equity of taxation; (ii) property price stabilisation; and (iii) equitable development of local fiscal systems.

On the surface, the objectives of CRET may seem reasonable, albeit ambitious. In reality, however, the first objective, equity of taxation, is interpreted in practice to imply that CRET functions as a wealth tax, placing a 'heavy tax burden on the owners of highly expensive housing'. However, 'heavy' and 'highly expensive' are not clearly defined in the Law on CRET, as it is not explicitly intended to serve as a wealth tax in the traditional sense. Notably, the tax base of CRET is the gross housing value, which includes mortgage debt, thereby deviating from the standard definition of a wealth tax.[12]

The second objective, property price stabilisation, is more contentious. There is an extensive literature supporting the positive effect of a property tax on housing price stabilisation. For instance, the IMF (Poghosyan, 2016[11]) and the Irish Central Bank (2022[12]) present findings that support this assertion. Additionally, a report by the European Systemic Risk Board (2020[13]) corroborates these findings. This evidence suggests that CRET, as a form of property tax, could potentially stabilise housing prices. However, given CRET's narrow scope (targeting 1.8% of total homeowners in 2012, and 6.2% in 2021 when CRET reached its peak), and its emphasis on taxing the owners of multiple houses (single homeowners accounted for only 27% of CRET revenue from housing in 2021), the impact on macroeconomic housing price stabilisation is likely negligible. The extent to which CRET affects housing price stabilisation merits further discussion and will be addressed in the next section.

The third objective, equitable development of local fiscal systems, entails that CRET revenue, primarily collected in the Seoul Metropolitan region, is redistributed to local governments outside this area. This aspect of CRET is notable, as it serves as a redistribution mechanism not just among individuals, but also across local governments. It is worth noting that in Korea, the total resource pool for intergovernmental equalisation transfers, of which nearly 90% is allocated to local governments outside the Seoul Metropolitan region, is fixed at 19.24% of national tax revenue. This makes the utilisation of CRET revenue for intergovernmental redistribution not a new concept in Korea. However, the allocation of 100% of CRET

revenue for this purpose implies that the third objective is being pursued actively. This objective has been met with relatively fewer controversies and criticisms compared to the other two objectives.

Given these controversies, CRET revenue as a share of GDP has fluctuated significantly depending on the political leanings of the government in power. Between 2003 and 2008 (first period), and again between 2017 and 2022 (second period), progressive governments were in power. During these periods, CRET revenue increased to nearly 0.3% of GDP in the first period and to approximately 0.4% in the second period. Conversely, during the tenure of the conservative government between 2008 and 2016, CRET revenue remained around 0.1% of GDP. The conservative government established in 2022 pledged to reduce CRET revenue back to the 2017 level.

Separately, it is important to consider the economic context. Periods of housing booms since 2000 coincided with the tenure of progressive governments, as illustrated in Figure 4.7. This suggests that the increase in CRET revenue in the late 2000s and late 2010s was influenced more by housing booms rather than by political decisions alone. Considering that the rapid and significant increase in the property tax burden, particularly through CRET, during the late 2010s is reported to have contributed to the defeat of the progressive political party in the last presidential election, and given that strong housing booms are less likely to occur due to the ageing population and low fertility rate in Korea, the peak in CRET revenue in 2021 seems unlikely to be surpassed in the foreseeable future.

4.4. Discussions of the criticisms of the Comprehensive Real Estate Tax

In the previous section, the rationale for creating a national redistributive property tax (CRET) was explored based on historical and practical reasons as presented by Kim (2004[9]), among others. However, since its inception, CRET has been the subject of debates, with arguments both for and against it. As the future improvement of CRET hinges on reconciling these divergent perspectives, the opposing views on CRET are carefully discussed below. According to (OECD, 2008, pp. 80-82[14]), which summarises many criticisms of CRET, criticisms of CRET can be divided into five categories: whether CRET contributes to (i) promoting economic growth; (ii) ensuring adequate revenue; (iii) contributing to housing price stabilisation; (iv) addressing income inequality; and (v) improving the local tax system.

4.4.1. Promotion of economic growth

Regarding the promotion of economic growth, (OECD, 2008[14]) views the reform of property taxation (including both recurrent and transaction taxes) as an opportunity to encourage the efficient use of land. It particularly emphasises that enhancing annual property taxation on immobile properties reduces the burden of more distortionary taxes, such as transaction taxes, which tend to decrease property transactions and, consequently, the efficient use of land by increasing the cost of property transactions. As supporting evidence, (OECD, 2008, p. 80[14]) cites the low level of property transactions during the late 2000s as possible evidence of the negative effect of the capital gains tax increase in 2006-07. Additionally, it is worth noting that revenue from the property transaction tax relative to GDP is the highest in Korea among OECD countries (Figure 4.1). The stark contrast between the large amount of property taxes related to transactions (property transaction tax and capital gains tax) and the moderate amount of recurrent property tax revenue has led to a longstanding policy slogan in Korea calling for a "lower burden of transaction taxes and higher revenue from annual property taxes".

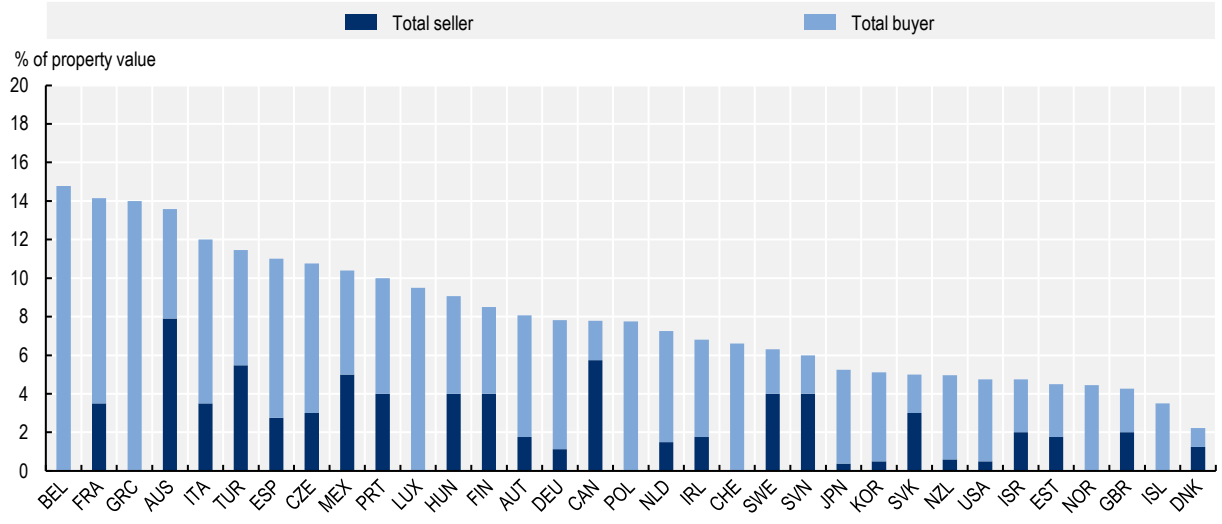
The argument for a "lower burden of transaction taxes and higher revenue from annual property taxes" has a sound theoretical basis, as the former can reduce transactions inefficiently, while the latter does not incur any distortionary effect, particularly in the case of land taxes, given that land supply is essentially fixed. However, from a practical standpoint, it is important to note that transaction taxes typically encounter a significantly lower degree of tax resistance compared to annual property taxes. This is because

transaction taxes capitalise on the property purchasers' ability to pay—as the tax burden is proportional to the amount spent on properties—whereas annual property taxes are levied irrespective of taxpayers' income flow. Unsurprisingly, politicians and bureaucrats in Korea, both at the central and local levels, tend to favour transaction taxes over annual property taxes as a revenue source.

Given that revenue from property transaction taxes is the highest in Korea among OECD countries, it can be presumed that the burden of property transactions is also the highest in Korea, potentially leading to inefficiently low levels of property transactions. However, it should be noted that the extent to which transaction taxes induce distortionary effects on property use hinges on the elasticity of property transactions with respect to transaction taxes, not the absolute size of the revenue from transaction taxes.

In this regard, the size of property transaction costs in OECD countries as a percentage of property value shown in Figure 4.8 provides important information. As discussed in OECD (2011[15]), these transaction costs include notary fees, registration fees, real estate agent fees, transfer taxes (stamp duties and acquisition taxes, etc.), and legal fees paid by both buyers and sellers. Contrary to expectations, Figure 4.8 reveals that property transaction costs in Korea, which stand at around 5% of property value, are relatively low compared with other OECD countries. In 10 OECD countries including Belgium, France, Greece, Australia, Italy, and Spain, transaction costs exceed 10% of the property value. Moreover, transaction costs in Finland, Austria, Germany, Canada, the Netherlands, Sweden, and Japan are all higher than those in Korea.

Figure 4.8. Housing transaction costs for buyer and seller (2009)



Source: OECD (2011[15]).

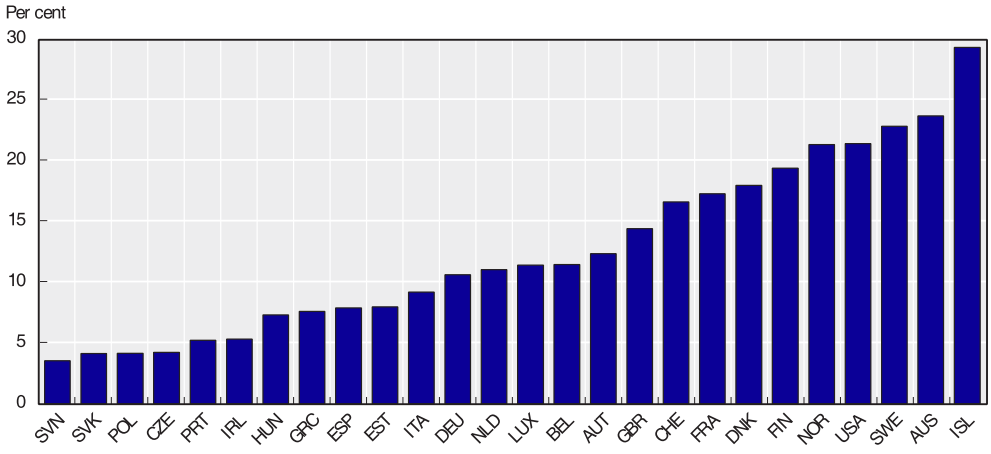
Another important metric related to property transactions is residential mobility, defined as the percentage of households that have changed residence within the last two years (housing mobility index). Figure 4.9 shows that among 25 OECD countries, Israel has the highest residential mobility at approximately 30%.[13] The index is between 20% and 25% in Austria, Sweden, the United States, and Norway. In countries such as Finland, Denmark, France, the United Kingdom, and Germany, the index ranges from 10% to 20%, while in countries like Italy and Spain, where household mobility is very low, the indices are below 10%. Although the mobility index for Korea is not included in Figure 4.9, it is available from the Korea Housing Survey published by the Ministry of Construction and Transport. Notably, as shown in Table 4.5, Korea's housing mobility index has consistently exceeded 35% over the past two decades, which is the highest in the OECD.

As Figure 4.1 illustrates, in conjunction with Figure 4.8 and Figure 4.9 and Table 4.5, property transactions and the revenue from property transaction taxes in Korea have several distinctive features. First, as demonstrated in Figure 4.8, the cost of property transactions, as a percentage of property value in Korea, is relatively low when compared to many OECD countries. Second, the frequency of property transactions in Korea is among the highest among OECD countries. Third, the interplay of these two factors results in Korea having the highest revenue from property transaction taxes as a percentage of GDP. Applying a moderate level of taxation to a high volume of property transactions generates significant revenue. Consequently, if there are any distortionary effects from property transaction taxes in Korea, they appear to be relatively mild.

Given this context, the argument for a "lower burden of transaction taxes and higher revenue from annual property taxes," as discussed by the OECD (2008[14]), does not directly counter the case for strengthening the annual property tax in Korea because the data suggests that the distortionary effects of transaction taxes are relatively mild. Although this argument is often cited in opposition to CRET due to the lack of corresponding reductions in the burden of property transaction taxes, the fact that the distortionary effect of property transaction taxes is mild suggests that it is not a strong point against enhancing the annual property tax system in Korea.

Figure 4.9. Residential mobility in OECD countries

Percentage of households that changed residence within the last 2 years



Source: Caldera Sánchez and Andrews (2011[16]).

Table 4.5. Residential mobility in Korea

Percentage of households that changed residence within the last 2 years

Area	2006	2010	2014	2016	2017	2018	2019	2020	2021
Whole country	37.5	35.2	36.6	36.9	35.9	36.4	36.4	37.2	37.2
Seoul metropolitan area	44.4	40.1	40.3	40.9	40	40.6	40.3	41.9	41
Major cities	34.5	33.9	35.1	37.1	35.2	35.5	35.5	36.1	37.5
Provinces	29.4	28.8	32	30.8	30.3	30.6	30.9	30.5	31

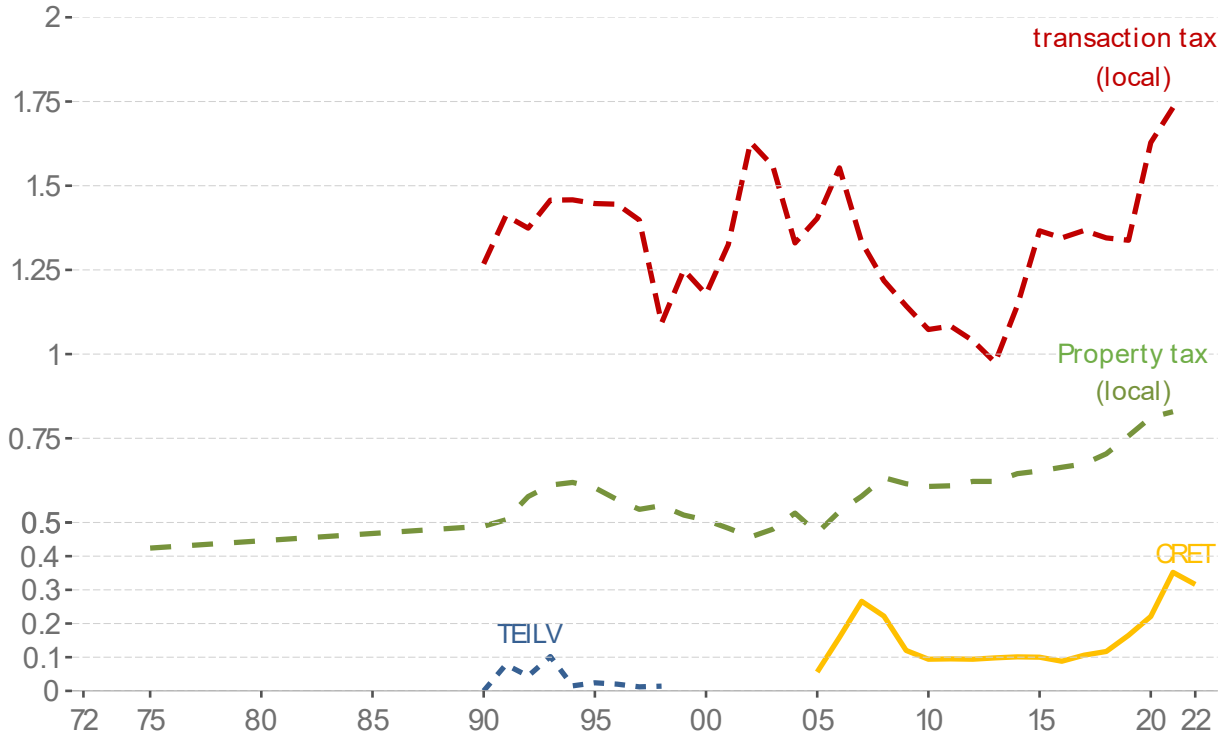
Source: Ministry of Land, Infrastructure and Transport, 2021 Housing Survey.

4.4.2. Adequacy of property tax revenue

The second argument that the OECD (2008[14]) presents against CRET is its focus on imposing a significant tax burden on a small group of taxpayers. This approach yields a relatively small amount of revenue as a share of GDP (around 0.2~0.3%, as illustrated in Figure 4.10). The OECD contends that a higher effective rate could be achieved by progressively increasing the overall holding tax, with the following argument: "as with the highly progressive rate structure of local property taxes in the past, the CRET makes it difficult to raise the average tax on holding property from its relatively low level... The introduction of the CRET in 2005 continues to limit the scope for local authorities to raise the local property tax."

While the OECD's criticism regarding CRET's narrow target and steep progressivity is valid, the claim that CRET limits the capacity of local authorities to increase local property tax overlooks a key feature of CRET: the division of the formerly highly progressive property taxes into a local property tax with moderate progressivity and a national property tax (CRET) with high progressivity. As Kim (2004[9]) points out, the theoretical intention behind CRET was to assign the central government the role of progressive taxation, allowing local governments the fiscal autonomy to expand their own property taxes by implementing a moderately progressive, though not flat, local property tax. While the trend of local property tax revenue alone does not directly support the argument put forward by Kim (2004[9]), Figure 4.10 shows that the revenue from local property tax as a share of GDP, which had hovered at around 0.5% for more than two decades, steadily increased to 0.83% in 2021. This trend suggests the property tax revenue-raising effect of moderating local property tax progressivity in 2005. Contrary to the OECD's criticism, the introduction of the CRET in 2005 did expand the scope for local authorities to increase their local property tax revenue.

Figure 4.10. Long-term trends in property tax revenues in Korea as a per cent of GDP



Source: OECD Revenue Statistics (https://stats.oecd.org/).

4.4.3. Housing price stabilisation

The third argument against CRET, as presented in OECD (2008[14]), is that CRET was primarily aimed at controlling short-term fluctuations in housing prices, whereas property taxes should ideally be based on long-term efficiency considerations and government revenue needs. The OECD contends that "given that housing prices are influenced by numerous factors, including macroeconomic conditions and regulations, utilizing tax policy to affect house prices in the short term is likely to be ineffective and leads to a sub-optimal tax policy." This criticism of CRET has proven highly pertinent, especially in recent times. The previous government aggressively employed CRET to curb housing price increases, largely propelled by extensive quantitative easing that began in 2009 and intensified during the COVID-19 pandemic. Additionally, CRET was perceived as a tool for tapping into significant, albeit unrealised, housing capital gains during this period. Speculative housing purchases, a common occurrence during housing booms in Korea, further spurred this approach, leading to demands for more progressive land and housing taxes since the 1970s. However, it is important to note that at the macroeconomic level, the increase in housing prices in Korea over the past two decades has been relatively subdued compared to other OECD countries. As illustrated in Figure 4.5, the housing price index since 2015 (including the COVID-19 period) was lower in Korea compared with the United States, the United Kingdom, Germany, and Japan. In fact, over the past two decades, Korea's index was the lowest among these countries, except for Japan.

Given the relatively mild housing price appreciation in Korea during the past two decades, it is puzzling why the former progressive government supported a further strengthening of the progressivity of CRET, despite controversies regarding its role in stabilising housing prices. The answer to this question can be found in more detailed information on housing price trends. Figure 4.10 illustrates the rates of apartment price increases in four regions—namely, the whole country, Seoul, the Seoul Metropolitan area, and areas outside the Seoul Metropolitan area—between 2006 and 2022. The rates of housing price increases starkly contrast with those in Figure 4.5, which shows a mere 13% increase in housing prices between 2017 and 2021. Unlike the trends for all types of residences shown in Figure 4.5, apartment prices—which comprise over 60% of housing and are the most popular type of residence in Korea—skyrocketed in the past five years. The peak of apartment price increase in Seoul between 2017 and 2022 was around 180%. For other areas such as the Seoul Metropolitan area, the whole country, and areas outside the Seoul Metropolitan area, the peak rates were approximately 170%, 140%, and 120%, respectively. Considering that housing prices in Seoul nearly doubled in just five years, it is unsurprising that the former progressive government adopted policies that employed a range of measures to curb housing price appreciation.

To bolster CRET during the recent housing boom, the tax base was expanded to encompass more households, particularly in the Seoul region, who became subject to CRET due to sharp increases in housing prices. Additionally, the assessed values of properties were adjusted to better reflect the surging market values, thereby widening the tax base. However, this adjustment in assessed values relative to market prices contributed to a marked increase in the tax burden for both CRET and local property taxes, sparking significant tax resistance in the Seoul metropolitan area. Considering that 50% of the country’s population resides in the Seoul region, the mounting tax burden from steeply progressive property taxes unsurprisingly became a major political issue during the 2022 presidential election. The government elected in 2022 has pledged to bring the CRET tax burden down to the level of 2017. Although it remains uncertain whether CRET revenue will drop to 0.1% of GDP (the proportion in 2017), the recent downward trend in property values in Korea indicates that 2021 might have been the peak year of CRET revenue for the foreseeable future.

Regarding the objective of housing price stabilisation through CRET, it is essential to distinguish between the macroeconomic housing price stabilisation and the taxation of capital gains accruing to expensive apartments in the Seoul Metropolitan area, which is CRET’s primary target. Furthermore, CRET's design inherently focuses not just on expensive houses, but also on the number of houses owned by individuals. Table 4.6 presents the revenue from CRET on housing in 2021, categorised by the number of houses

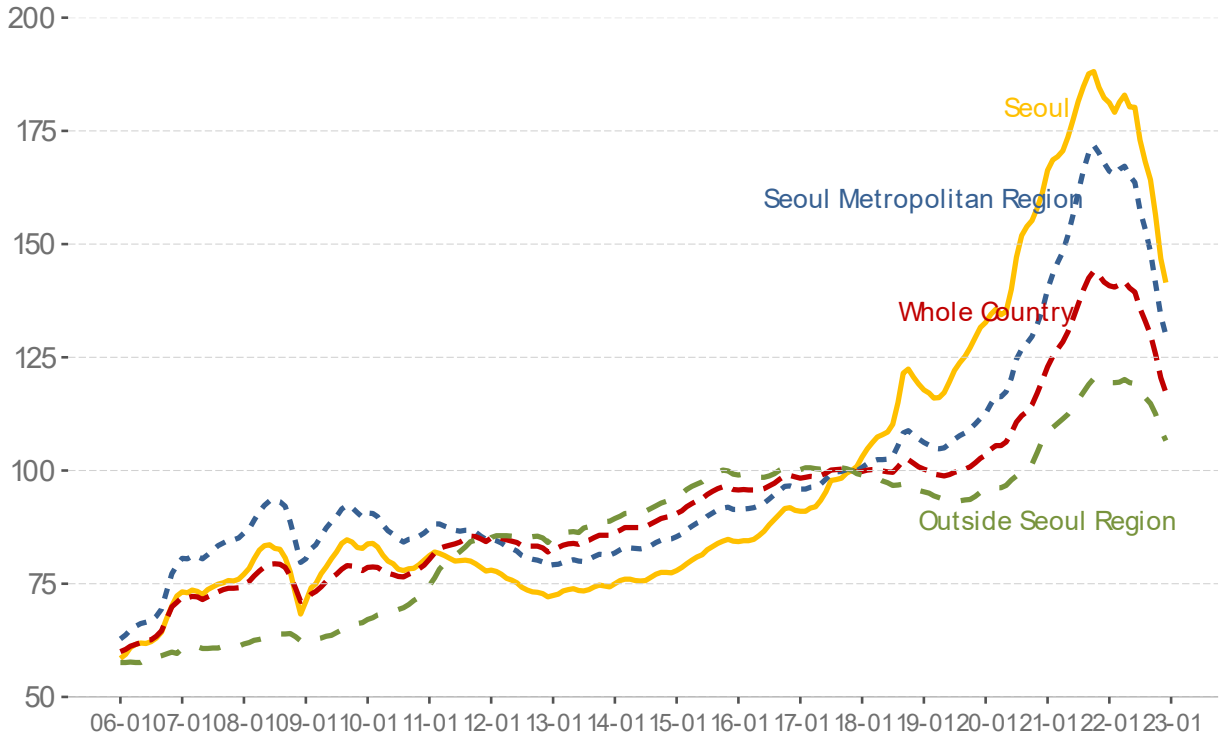
owned by taxpayers. Of the 931 384 taxpayers subject to CRET on housing, approximately 46% owned a single house. However, this group contributed only 26.6% of the total revenue from CRET on housing, indicating that around 73% of CRET on housing was paid by owners of multiple homes. This suggests that a key motivation for strengthening CRET during the housing boom was to impose a heavier tax burden on multiple homeowners, thereby encouraging them to sell properties and retain only a single home. This strategy seemingly increases the supply of houses. However, it also inadvertently increases the demand for more expensive homes as, from a CRET tax burden perspective, it is more favourable to own a one-million-dollar house than two half-million-dollar houses. Additionally, in many OECD countries, the main residence is exempt from capital gains tax (OECD, 2022, p. 137[17]). While Korea does have a cap on capital gains tax exemption for the main residence, the incentive to own an expensive primary home remains significant, similar to other OECD countries. In conclusion, CRET's narrow targeting and its role in increasing demand for expensive primary residences limit its effectiveness in curbing the housing price boom (Figure 4.11).

Table 4.6. Revenue from CRET on housing, categorised by number of houses (2021)

Number of houses	Number of taxpayers	Share of taxpayers (%)	Tax base (KRWM)	Amount of CRET (KRWM)	Share of CRET (%)
Total	931 484	100	364 850 372	5 610 142	100
1	426 686	45.8	160 181 400	1 490 118	26.6
2	288 106	30.9	106 241 909	1 753 361	31.3
3	70 697	7.6	26 800 746	513 565	9.2
4	36 848	4.0	14 013 682	277 964	5.0
5	23 236	2.5	8 938 907	179 415	3.2
6-10	47 471	5.1	20 037 590	415 590	7.4
11-	38 440	4.1	28 636 139	980 129	17.5

Source: National Tax Service, Statistical Yearbook of National Tax, 2022.

Figure 4.11. Evolution of apartment price indices in four major areas



Source: Korean Statistical Information Services (KOSIS, https://kosis.kr/). Korea Real Estate Board.

4.4.4. Redistributive role of property taxation

The fourth argument against CRET presented in OECD (2008[14]) contends that housing property taxes, as local government revenue sources, should adhere to the benefit principle. This principle posits that local taxes ought to reflect the use of local public services rather than the taxpayer's ability to pay. With respect to CRET, OECD (2008[14]) asserts that "relying on real estate taxes for redistribution is inappropriate as it does not include other forms of wealth. While housing ownership in Korea does increase with income, the relationship between household income and housing wealth is not strong, thus reducing the effectiveness of the property tax in reducing income inequality."

The first part of the OECD's argument concerning the benefit principle of local taxes does not directly pertain to CRET, as CRET is a central government tax. Nonetheless, questioning whether CRET contributes to reducing income inequality is a pertinent issue. First and foremost, the magnitude of CRET revenue, which hovers around 0.2~0.3% of GDP, is almost negligible compared to the personal income tax. The latter is a major fiscal instrument for redistribution and constitutes a significantly larger portion of approximately 6% of GDP. Furthermore, in contrast to a wealth tax that encompasses various types of financial assets, CRET does not adequately embody the principle of horizontal equity.

However, this line of argument overlooks the long history of redistributive property taxation in Korea, as emphasised throughout this chapter. In essence, the criticism concerning the redistributive nature of CRET could equally be levelled at all progressive property taxes that have been in place since the 1970s, and as such, may not be seen as a unique criticism of CRET. For instance, the Comprehensive Land Tax (CLT) introduced in 1990 was met with similar debates and contentions before it was replaced by CRET in 2005. However, it is important to highlight that there is a clear legal distinction between CLT and CRET. The Local Tax Law indicated that the purpose of CLT was to ensure that the tax burden on land was proportional to the extent of land ownership and aligned with progressive tax brackets (i.e., higher tax rates for larger

land holdings). On the other hand, the Law on CRET explicitly states that one of its objectives is to enhance the equity of the tax burden. Therefore, the debate regarding whether CRET is a more effective tool than a comprehensive wealth tax, and whether there is a strong correlation between household income and housing wealth, represents a valid and important consideration.

In this regard, it is worth noting that a recent study on housing taxation by the OECD (2022[17]) supports the redistributive role of housing taxation. In particular, OECD (2022, p. 87[17]) explains the desirability of redistributive housing taxation as follows: "progressive property tax rates apply in a minority of OECD countries and may enhance vertical equity, as taxpayers with higher-value properties face proportionately higher tax liabilities. The effectiveness of progressive tax rates in increasing the overall progressivity of the tax system will depend on the distribution of housing along the income and wealth distributions; it will be enhanced in countries where housing wealth is concentrated at the top." OECD (2022[17]) further notes that "an alternative to progressive property tax rates on individual properties consists in levying progressive taxes on taxpayers' total net housing wealth (e.g., Korea and France both levy national-level progressive taxes on overall real estate wealth above a certain threshold)."

Moreover, according to OECD (2022[17]), housing wealth represents approximately 75% of total household wealth on average in OECD countries. Furthermore, the report highlights that in Korea, it takes an average income earner more than 16 years to buy a 100m2 house, second only to New Zealand at 18 years. Given Korea's lengthy history of progressive property taxation and the high ratio of housing prices to income, CRET can be seen as a second-best solution to addressing housing wealth inequality.

However, an important caveat is that housing wealth should ideally be measured in terms of net value, which is the gross housing value minus the housing mortgage. Since CRET is calculated based on gross housing value, it has clear limitations if the objective is to strengthen it as a wealth tax.

4.4.5. Role of property taxation in the context of fiscal decentralisation

The fifth argument against CRET, presented in OECD (2008[14]), contends that CRET limits the role of local property taxes, which have many desirable characteristics as a local tax, such as visibility and accountability, by making both central and local governments co-occupy property tax bases. OECD (2008[14]) further notes that "in most OECD countries, property tax is a purely local tax, reflecting its advantages as a source of finance for local governments. However, the use of a national property tax in Korea limits the scope for using local property taxes and increasing the autonomy of local governments."

As has been repeatedly emphasised, this argument overlooks the fact that highly progressive local property taxes have been prevalent in Korea since the 1970s, a unique feature among OECD countries. The highly progressive nature of local property taxes meant that local governments did not have any incentive to exercise their taxing power on properties even before 2005. Consequently, the introduction of CRET in 2005 did not curtail any existing local fiscal autonomy, as local governments were not exercising this autonomy. On the contrary, the proportion of local property tax revenue to GDP has steadily risen from 0.5% in 2005 to 0.83% in 2021. Importantly, this increase did not result from local governments exerting their taxing power - a power which is, in practice, unused for any local tax items in Korea.[14] Instead, it reflected the steady growth of local property tax bases due to the rising market value of properties. However, as depicted in Figure 4.7, the ratio of land value to GDP significantly increased during the late 1960s, early 1970s, late 1980s, early 2000s, and late 2010s. Meanwhile, as demonstrated in Figure 4.10, the local property tax revenue in relation to GDP experienced a noticeable surge only in the late 2010s. Thus, it is argued in this chapter that the separation of formerly highly progressive local property taxes into a moderately progressive local property tax and a highly progressive national property tax (CRET) helped alleviate political resistance from local residents facing increasing assessed property values. In other words, the steady increase in local property tax revenue since 2005 is the result of a gradual tax burden increase that was made possible by the separation of a highly progressive property tax system before 2005 into a mildly progressive local property tax and CRET.

4.5. Conclusion and future directions

In understanding the Comprehensive Real Estate Tax (CRET) in Korea, which serves a redistributive role, it is crucial to acknowledge the long-standing history of progressive property taxation in Korea, spanning more than five decades. However, critiques of CRET, such as that by OECD (2008[14]) and others, fail to adequately address this history. In essence, many of the criticisms levied against CRET by OECD (2008[14]) and others could also have been applied when the highly progressive property tax system was introduced in 1973, or upon the introduction of the Comprehensive Land Tax (CLT) in 1990. Notably, the introduction of CLT in 1990 was even more radical than that of CRET in 2005, as CLT marked the first implementation of a nationwide land tax applying highly progressive tax rates to the aggregate land value across all local governments. Therefore, from a theoretical standpoint, what distinguished CRET, established in 2005, was not its progressivity but rather the fact that the central government assumed the responsibility for managing a progressive property tax, in contrast to its passive role in relation to CLT.

Thus, the pros and cons of CRET can be viewed from the perspective of second-best versus first-best arguments. If one believes that the introduction of a single-rate property tax in Korea is feasible in the short term, as was implied by the discussions in OECD (2008[14]), a national property tax may not be desirable or necessary. However, if the long history of progressive property taxation in Korea is considered a constraint, an important theoretical question arises: Should a progressive property tax be the responsibility of local governments (as was the case with CLT) or the central government (as is the case with CRET)? As discussed by OECD (2022[17]), a national redistributive property tax is generally more desirable than a local property tax for reasons articulated by, among others, Musgrave (1959[10]).

It should also be considered whether a highly progressive property tax system should be maintained in the long run with the objective of functioning as a form of wealth tax, as is currently the case with CRET. There are compelling reasons why redistributive property taxes are popular in Korea, where housing wealth constitutes about 75% of total household wealth, and the housing price relative to income is among the highest in the OECD. However, CRET is levied on gross property value, which includes housing mortgages, not on net property value. The net value of properties subject to CRET can still be overall very high with relatively few exceptions, but a transition from gross value to net value would involve a significant administrative burden. In addition, CRET has a clear limitation in its attempt to capture unrealised housing capital gains during housing booms since such unrealised housing capital gains might disappear when a housing boom ends, as recently experienced in many countries including Korea. Thus, the volatility of housing wealth clearly implies the inherent limitations of CRET when aiming to function as a wealth tax.

Considering its pros and cons, there are several reasons why CRET should be maintained at a moderate level. First, there is a clear limit to the redistributive effect of CRET; even if its tax revenue exceeds its peak level from 2021 (0.38% of GDP), it is still far below the size of the personal income tax, which is the primary fiscal tool for redistribution. Second, as suggested by OECD (2008) and Kim (2004[9]), if the tax burden of CRET is gradually reduced over time, local governments would progressively find room to boost revenue from local property taxes, as demonstrated in Figure 4.10. In other words, as long as the burden of CRET is maintained at a moderate level of 0.2%-0.3% of GDP, and the size of local property tax revenue continues to increase, the primary purpose of creating CRET in 2005, which is to mitigate the progressivity of local property tax, is achieved.

References

Andriopoulou, E. et al. (2020), "The distributional impact of recurrent immovable property taxation in Greece", *Public Sector Economics*, Vol. 44/4, pp. 505-528. [5]

Bird, R. (1993), "Threading the fiscal labyrinth: Some issues in fiscal decentralization", *National Tax Journal*, Vol. 46/2, pp. 207-227. [1]

Caldera Sánchez, A. and D. Andrews (2011), "Residential Mobility and Public Policy in OECD Countries", *OECD Journal: Economic Studies*, https://doi.org/10.1787/eco_studies-2011-5kg0vswqt240. [16]

Cho, Taehyung, et al. (2015), "Estimation of Long-Term Time Series of Land Values in Korea", *BOKDP No. 2015-06*, Bank of Korea. [8]

Dieckelmann, D. et al. (2023), "House prices and ultra-low interest rates: exploring the non-linear nexus", *Working Paper Series*, No. 2789, European Central Bank. [6]

Duca, J. and A. Murphy (2021), "Why House Prices Surged as the COVID-19 Pandemic Took Hold", Federal Reserve Bank of Dallas, December 28, https://www.dallasfed.org/research/economics/2021/1228. [7]

European Systemic Risk Board (2020), *A Review of Macroprudential Policy in the EU in 2019*. [13]

Georgopoulos, K. (2022), *The new Law 4916/2022*. [20]

IMF (2009), "Macro Policy Lessons for a Sound Design of Fiscal Decentralization", *Policy Papers*, No. 2009-050. [2]

Jonckheereere, D. et al. (2019), "Open versus Closed Competence to Tax: A Comparative Legal Study of Municipal Taxes in Belgium and the Netherlands", *Intertax*, Vol. 47/5, pp. 468-489. [18]

Kim, J. (2004), *Property Tax Reform Agenda*, Korea Institute of Public Finance [Public Hearing Document]. [9]

Musgrave, R. (1959), *The theory of public finance: a study in public economy*, McGraw-Hill, New York. [10]

O'Brien, D. et al. (2022), *Recurrent property taxes and house price risks. Irish Central Bank*. [12]

OECD (2022), *Housing Taxation in OECD Countries*, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/03dfe007-en. [17]

OECD (2022), *Housing Taxation in OECD Countries - Highlights*, Figure 9. p. 14. [3]

OECD (2022), *Revenue Statistics 2022: The Impact of COVID-19 on OECD Tax Revenues*, OECD Publishing, Paris, https://doi.org/10.1787/8a691b03-en. [4]

OECD (2021), "Tax Autonomy Indicators: Explanatory Annex", *OECD Fiscal Decentralisation Database*, OECD, Paris, https://www.oecd.org/tax/federalism/fiscal-decentralisation-database/explanatory-annex-tax-autonomy-indicators.pdf. [21]

OECD (2011), "Housing and the Economy: Policies for Renovation", in *Economic Policy Reforms 2011: Going for Growth*, OECD Publishing, Paris, https://doi.org/10.1787/growth-2011-46-en. [15]

OECD (2008), *OECD Economic Surveys: Korea 2008*, OECD Publishing, Paris, https://doi.org/10.1787/eco_surveys-kor-2008-en. [14]

Poghosyan, T. (2016), "Can Property Taxes Reduce House Price Volatility? Evidence from U.S. Regions"*, IMF Working Paper*, No. WP/16/216, IMF. [11]

Scheuer, F. and J. Slemrod (2021), "Taxing Our Wealth", *Journal of Economic Perspectives*, Vol. 35/1, pp. 207-230, https://doi.org/10.1257/jep.35.1.207. [22]

Stenkula, M. (2015), "Taxation of Real Estate in Sweden (1862–2013)", in Henrekson, M. (ed.), *Swedish Taxation*, Palgrave Macmillan, New York. [19]

Notes

[1] The property tax rates in Greece have a progressive structure. However, as discussed in Andriopoulou et al. (2020[5]), the property tax burden, when measured as a share of disposable income, exhibits a regressive pattern.

[2] The ordinary rate set by law for properties other than the main house is 0.76% and municipalities can increase or decrease it up to 0.3 percentage points (see OECD, (2021, p. 17[21])).

[3] The Local Property Tax in Ireland is governed by the Finance (Local Property Tax) Act 2012 and the Finance (Local Property Tax) (Amendment) Act 2021, as stated in the Irish Statute Book. As most local taxes are governed by laws in Ireland, the share of local tax revenue in the total tax revenue in Ireland was 1.3% in 2021.

[4] The land tax in Estonia is imposed under the Land Tax Act, as stated on the Estonian Tax and Customs Board homepage. Similarly to Ireland, local tax revenue occupies only 0.9% of total tax revenue.

[5] The definition of local tax is explained in the appendix section of (2022[3]). In the appendix section A.12, the attribution criteria are stated as follows: "A tax is attributed to the government unit that a) exercises the authority to impose the tax and b) has final discretion to set and vary the rate of the tax." When two levels of government independently determine the rates of a tax, § 106 of the OECD criteria of attribution states that "the tax revenues are attributed to each government according to its respective share of the proceeds."

[6] See de Jonckheereere et al. (2019[18]).

[7] See Stenkula (2015[19]) for detailed historical developments of the property tax system in Sweden.

[8] For more detail, see Kyriakides Georgopoulos (2022[20]) and Andriopoulou et al. (2020[5]).

[9] Another type of stringent tax on landholding, known as the Tax on Excessively Increased Land Value (TEILV), was introduced in 1990. The TEILV was levied by the central government on parcels of land that were left unused, typically held for speculative purposes. However, this tax was controversial and was ultimately abolished in 1998.

[10] It has grown to 66% in 2021 (Statistic Korea, Population and Housing Census).

[11] This view is in line with a recent OECD publication: OECD (2022, p. 15[3]) identifies a number of options for governments to reforming housing taxes, based on an assessment of their efficiency, equity, and revenue effects. One of the suggested options is "to consider capping the capital gains tax exemption on the sale of main residences to ensure that the highest-value gains are taxed, which would enhance progressivity and mitigate upward pressure on house prices, while still exempting capital gains on the main residence for most households."

[12] Scheuer and Slemrod (2021, p. 209[22]) define a wealth tax as follows: "In principle, the base of a wealth tax is net worth—the value of assets minus debts".

[13] Residential mobility is defined as percent of households that changed residence within the last two years.

[14] This is because the nationwide standard tax rates for all local taxes are first determined by Parliament, which then leaves room for local governments to exercise additional taxing power, usually within a range of 50% above or below the standard tax rates. Given that the objective of raising local tax revenues is already achieved by the act of Parliament, local governments have historically not exercised their authority to impose additional tax burdens on residents.

5 Do property taxes in the United States contribute to housing inequities?

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This chapter aims to assess the contribution of the local property tax in the United States to housing affordability and housing equity. Although property taxes contribute to the annual costs of homeownership, to the extent that property taxes are capitalised into lower housing prices, they may make it easier for families to become homeowners. The impact of public policies on the distribution of property tax burdens is analysed by tracing the role of property tax administration and assessment procedures, tax reliefs and tax limitations on the burdens faced by low-income households. The study suggests that a high-quality property tax administration that eliminates or minimises any bias towards regressivity in property tax assessment, combined with a robust system of property tax reliefs that targets those facing high property tax burdens (relative to their incomes) will help reduce property taxes for households facing high housing cost burdens.

The opinions expressed and arguments employed herein are those of the author and do not necessarily reflect the official views of the OECD, its Member countries, or the KIPF. The author is Professor Emeritus of Public Affairs and Applied Economics, University of Wisconsin-Madison, United States. He thanks the workshop participants, Sean Dougherty, Peter Hoeller, Stephen Malpezzi, Semida Munteanu, Sarah Perret and Joan Youngman for advice and for comments on an earlier draft.

5.1. Introduction

As in most countries, housing inequities in the United States take many forms. Homeownership varies dramatically by race and ethnicity. In the third quarter of 2022, the homeownership rate for White households was 74.6%, for Black households, 46.3%, and for Hispanic households, 48.7% (U.S. Census Bureau, 2022[1]). For many homeowners and renters in the United States. the most salient issue is the cost of housing. Over time the difficulty of finding affordable housing has risen (HUD USER, 2017[2]). The problem is particularly severe for households with low income and for many racial and ethnic minorities.

This paper will consider whether the property tax, a primary source of local government finance in the United States, exacerbates housing affordability. The next section provides an overview of housing affordability in the United States and in other OECD countries. Section 3 addresses the relationship between the property tax and housing affordability, Section 4 discusses the role of property taxation in financing local governments in the United States and Section 5 focuses on the burden of the property tax on homeowners. The next four sections analyse the impact of administration of the property tax, property tax reliefs, property tax limitations imposed by state governments, as well as income tax policies on housing equity and affordability. The final section summarizes the findings and suggests several policy recommendations.

5.2. Housing affordability

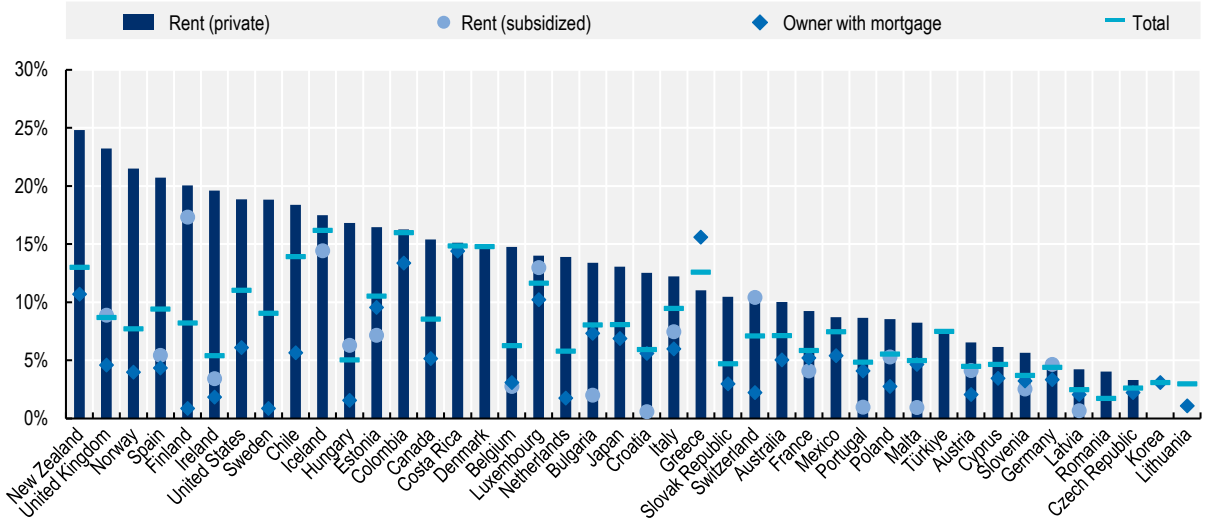
As emphasised by Malpezzi (2017[3]), housing affordability is difficult to define and measure. Most measures of affordability consider monthly or annual housing costs relative to household income. This ratio is generally referred to as a housing cost burden. Setting a threshold for housing affordability is somewhat arbitrary and the thresholds have changed over time. In the United States, the federal Department of Housing and Urban Development (HUD) considers housing to be unaffordable, if the cost burden is over 30%. If housing costs are greater than 50% of income, HUD classifies a household as facing a severe cost burden. The housing affordability measure used by the OECD is the Housing Cost Overburden Rate. It calculates the percentage of households with mortgage payments or rental payments that exceed 40% of their income. These calculations are done separately for households in different income quintiles.

In measuring cost burdens, decisions must be made about what costs to include. While the OECD's measure includes mortgage or rental payments, the *American Housing Survey* conducted by the U.S. Census Bureau, includes in its measure of homeowners' monthly total housing costs spending on mortgages, property taxes, homeowner association or condominium fees, utility payments, property insurance and routine maintenance. For renters, in addition to rent, housing costs include utilities and property insurance. Income measures also differ. Disposable (after-taxes and transfers) income is used in the housing cost burden calculations made for many OECD countries. Housing burden calculations made by the U.S. Census Bureau are based on self-reported (before tax) household income. As pointed out by Malpezzi (2017[3]) and Gabriel and Painter (2020[4]), standard measures of housing affordability may understate the economic and social costs associated with the access to housing. In order to avoid homelessness, households may be forced to make housing decisions that are detrimental to themselves and more broadly to society. To find an affordable housing unit, households may have to choose locations with low-quality public schools, close to environmentally toxic sites, or at great distance from their jobs. These personal trade-offs not only affect individuals and their families but are likely to create negative externalities for their communities and their country.

Figure 5.1 reports data from the OECD's *Affordable Housing Database* (OECD, 2022[5]). It displays the OECD's Housing Cost Overburden Rate for 42 countries. The US rate for renters is the seventh highest. At 6.1%, the US overburden rate for homeowners with mortgages is above the average rate of 5.1%. When the OECD calculates the housing cost overburden rate for households in the lowest quintile of the income distributions, not only are all burdens much higher, but of the countries included in Figure 5.1, only Colombia, Costa Rica and Chile have higher total (owners and renters) overburden rates.

Figure 5.1. Housing cost overburden rate for homeowners and tenants

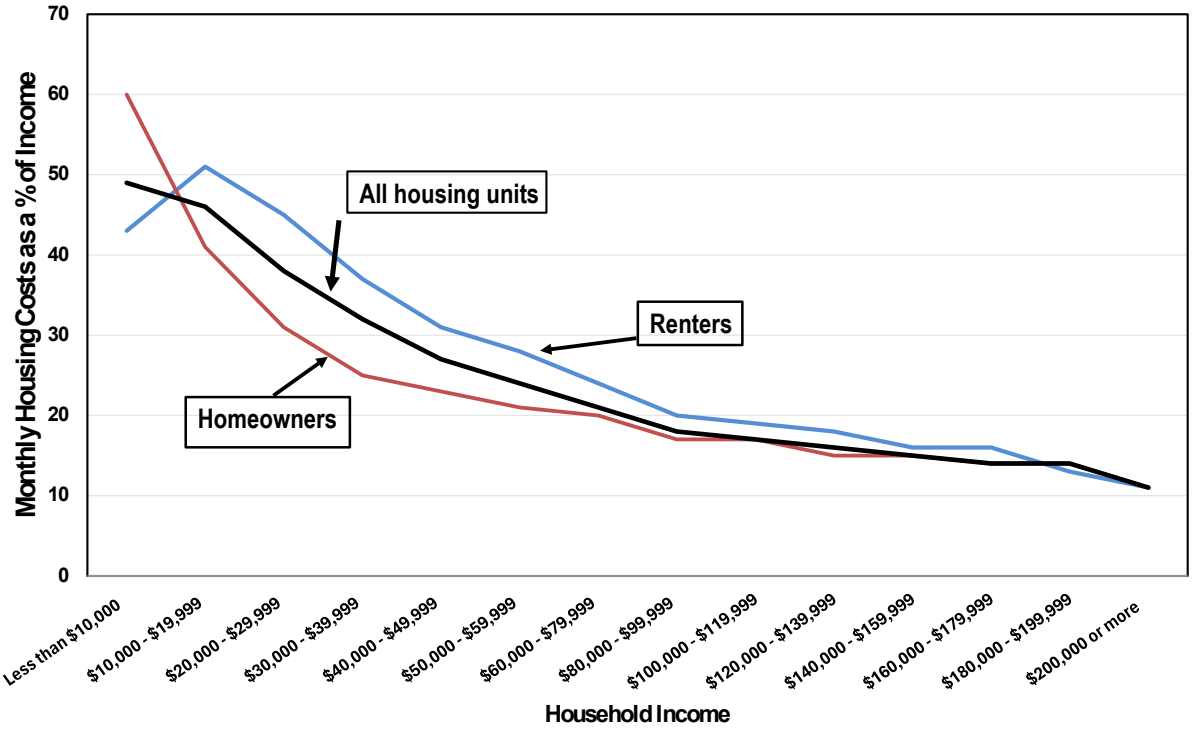
% of population spending more than 40% of disposable income on mortgages or rent by tenure, 2020 or latest year



Note: In Chile, Colombia, Mexico, Korea and the United States gross income instead of disposable income is used due to data limitations. No data available on subsidised rent in Australia, Canada, Chile, Mexico and the United States. In the Netherlands, Denmark, New Zealand and Sweden tenants at subsidised rate are included in the private market rent category due to data limitations. No data on mortgage repayments available for Denmark, Iceland and Türkiye. Results are only shown if a category is composed of at least 100 observations.
Source: OECD (2022[5]).

The *Annual Housing Survey* conducted every other year by the US Census Bureau and the Department of Housing and Urban Development collects data on a broader measure of housing costs than just mortgage and rent payments. The survey addresses housing cost affordability by calculating monthly housing costs as a percentage of household income for all owner and renter households. Using data from this survey, Figure 5.2 displays the median housing cost burden by household income class separately for homeowners, renters and for all households. The data show clearly that median housing cost burdens are highest for low-income households. Except for households with income below $10 000, median housing cost burdens for renters are higher than cost burdens for homeowners with similar incomes.

Figure 5.2. Median monthly housing costs as a percentage of income by tenure, 2021



Note: Excludes households with no cash rent, with housing costs greater than income, and with zero or negative income.
Source: U.S. Census Bureau (2022[6]).

The magnitude of the housing affordability problem depends in part on the housing cost burden threshold one uses to define housing affordability. As in Figure 5.2, the data in Table 5.1 use the *American Housing Survey's* comprehensive measure of monthly housing costs that includes property taxes (for homeowners), property insurance and all utilities. The table displays the percentage of owner and renter households that face housing cost burdens above two different thresholds: 30%, referred to as moderate housing cost burdens, and 50%, referred to as severe burdens.

The data in Table 5.1 show that over a third of homeowners and half of renters with incomes below $50 000 face moderate housing cost burdens. Over 10% of these households face severe housing cost burdens. Even though over two-thirds of households are homeowners, because housing affordability is a greater problem for renters, more renters than homeowners face high housing cost burdens.

Table 5.1. Housing affordability in the United States by household income and housing tenure, 2021

Percentage of homeowners and renters facing moderate and severe housing cost burdens

Household Income	Number of Homeowners	Per cent with Housing Costs as a % of Income above		Number of Renters	Per cent with Housing Costs as a % of Income above	
		30%	50%		30%	50%
Less than $10,000	761 000	95.3%	65.7%	1 187 000	76.5%	42.8%
$10,000 to $19,999	3 890 000	71.9%	37.5%	4 085 000	81.0%	51.7%
$20,000 to $29,999	5 248 000	52.5%	22.4%	4 628 000	82.7%	40.7%
$30,000 to $39,999	5 361 000	40.1%	14.4%	4 616 000	72.5%	23.1%
$40,000 to $49,999	5 631 000	34.5%	10.6%	4 230 000	55.5%	12.5%
$50,000 to $59,999	5 232 000	28.2%	6.5%	3 392 000	45.3%	6.8%
$60,000 to $79,999	10 290 000	22.6%	4.4%	5 462 000	29.7%	4.0%
$80,000 to $99,999	8 460 000	15.8%	2.0%	3 305 000	17.1%	1.8%
$100,000 to $119,999	7 464 000	11.9%	1.3%	2 039 000	10.9%	0.0%
$120,000 to $139,999	5 559 000	7.2%	0.0%	1 378 000	2.4%	0.0%
$140,000 to $159,999	4 613 000	6.8%	0.0%	816 000	0.0%	0.0%
$160,000 to $179,999	3 003 000	4.1%	0.0%	471 000	0.0%	0.0%
$180,000 to $199,999	2 161 000	2.7%	0.0%	363 000	0.0%	0.0%
$200,000 or more	8 895 000	1.2%	0.0%	1 317 000	0.0%	0.0%
Total	77 077 000	23.0%	7.5%	37 715 000	47.5%	17.7%

Note: A moderate housing cost burden is defined as monthly housing costs that are over 30% of household income. A severe housing cost burden exists when monthly housing costs are more than 50% of household income.
Source: U.S. Census Bureau (2022[6]).

5.3. The property tax and housing affordability

Property tax payments are an integral part of the costs of homeownership. By raising the annual cost of homeownership, the property tax can contribute to or exacerbate problems of housing affordability. However, the link between property taxation and the cost of homeownership is complex and not without controversy.

With the exception of some mobile homes, the purchase of a housing unit is inexorably linked to a specific location. Every location has a set of attributes. These include amenities such as access to parks, good schools, shopping, nodes of employment, and possible dis-amenities such as the condition of neighbouring houses, high crime rates and air pollution. It is widely accepted that locational attributes are capitalised into property values, either increasing housing values (amenities) or decreasing housing values (dis-amenities). Among the attributes of any location are a set of goods and services provided by local governments and a set of taxes and fees used to finance these local government public services. In the United States, the property tax is the primary local source of local government revenues.

Starting with Wallace Oates (1969[7]), there is a large empirical literature directed at measuring the capitalisation of both local government public services and local property taxes. This literature generally finds that property taxes are either partially or completely capitalised into lower property values, while public services are generally capitalised into higher property values. The net impact varies across studies and across locations reflecting differences in the demand and supply elasticity of housing and differences (often unmeasurable) in the quality of local public services.[1]

While in some locations, the positive capitalisation of local public services may completely offset the negative capitalisation effect of property taxes, in other locations the negative capitalisation of taxes may exceed any positive capitalisation of public services. This is especially likely to occur where local governments provide low-quality public services.[2] As pointed out by Slack and Tassonyi (2022[8]), while high taxes will increase annual housing costs, the net negative capitalisation of local public services and taxation will lower housing prices and hence increase affordability.

Additional complications arise in tracing the link between property taxation and housing affordability for residential tenants. Depending on the elasticity of supply and demand for rental housing, as much as 100% of property tax liabilities could be shifted from landowners to tenants in the form of higher rents. England (2016[9]) provides a comprehensive review of the theoretical and empirical literature on the incidence of property taxes on rental housing. The results of the relatively small empirical literature are mixed, with several studies finding substantial shifting to tenants. In a paper that addresses many of the empirical shortcomings of previous research, Carroll and Yinger (1994[10]) finds that landlords in the Boston metropolitan area are able to shift only about 15% of property tax increases to their tenants. Recent research by Schwegman and Yinger (2020[11]) found that only 16% of property tax increases in three large cities in New York State were shifted to tenants. Bauer et al. (2020[12]) in a study of rent shifting in German municipalities found considerable tax shifting to tenants in urban communities, but no tax shifting in rural communities.

Given the high rent-income ratios faced by many tenants, especially those with low income, property taxation will probably exacerbate housing affordability as long as there is some shifting of property taxes to rents. However, given the lack of comprehensive data on tax shifting, quantifying the impact of property taxation on renter housing burdens is not possible.

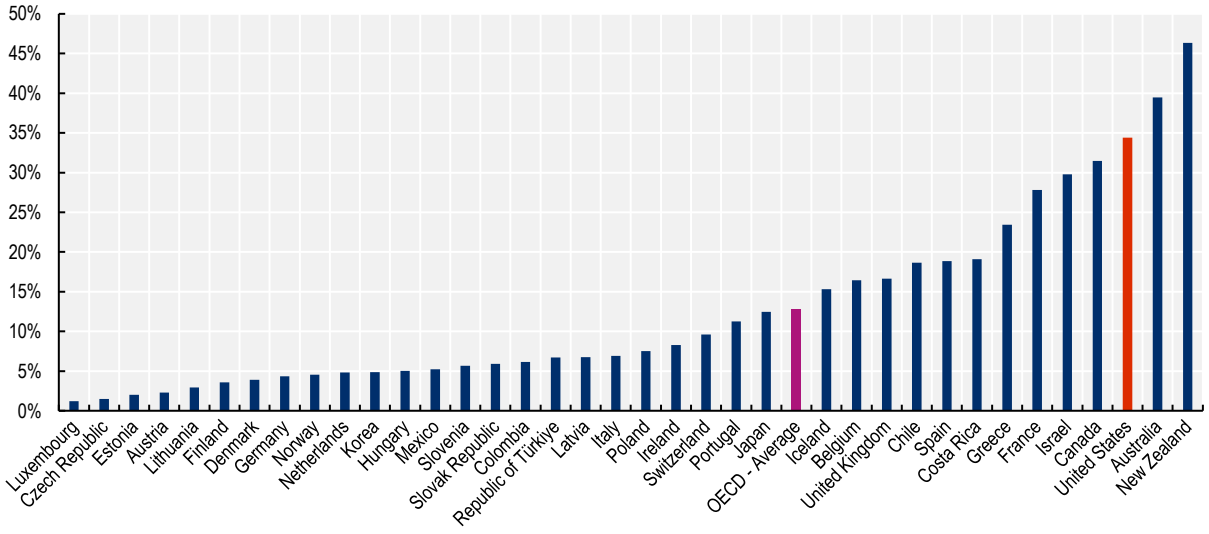
The focus of the rest of the paper will be on the impacts of the property tax on housing affordability for homeowners.[3] To the extent that the property tax increases the monthly housing costs associated with homeownership, property taxes, especially those levied on individuals with relatively low incomes, may influence housing tenure choices by making it more difficult for individuals to become first-time homeowners.[4]

5.4. The role of the property tax in funding local governments in the United States

In the United States, the property tax levied by local governments plays a much more important role in the financing of local public services than in most OECD countries. In 2020, the property tax accounted for nearly half of the own-source revenue of local governments and 34.4% of their total revenue (OECD/UCLG, 2022[13]). As illustrated in Figure 5.3, this percentage was nearly three times the average property tax share among 37 OECD countries. Only in Australia and New Zealand did property taxes account for a larger share of local government revenue.

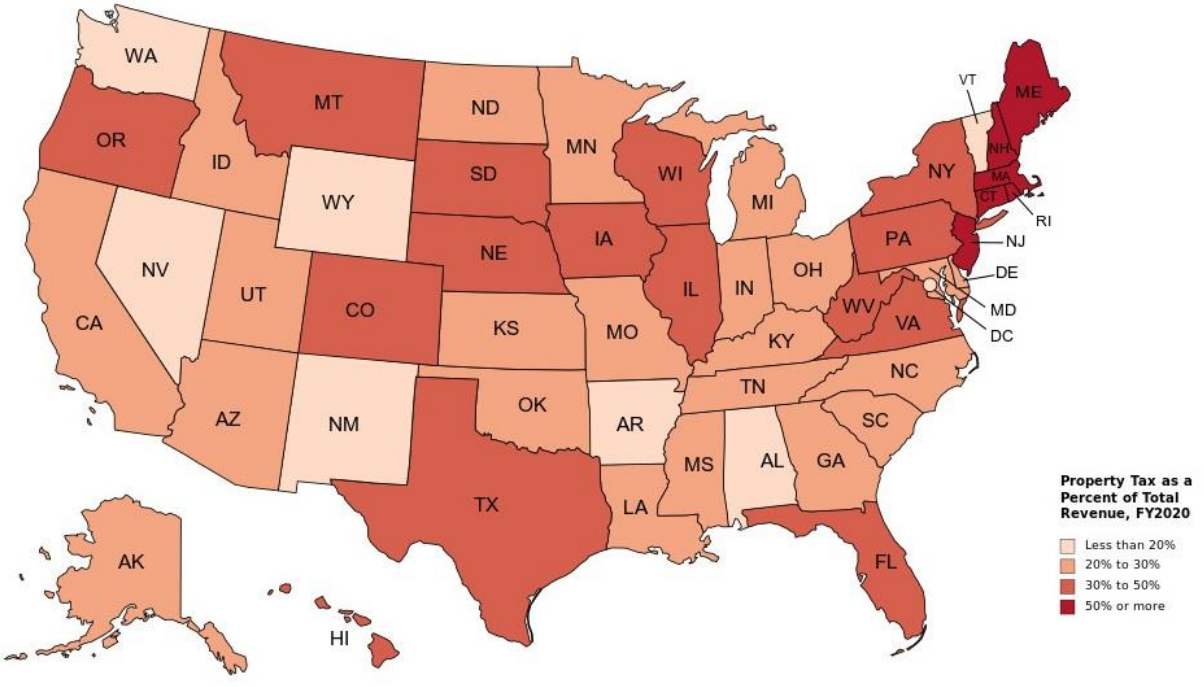
The role of the property tax varies substantially across states, with the property tax as a share of own-source revenue ranging from 19.7% in Alabama to 88.4% in Connecticut (U.S. Census Bureau, 2022[14]). As the share of local governments' total revenue from intergovernmental transfers (especially from state governments) also varies substantially across states, the importance of the property tax in the total revenue of local governments ranges from 11.8% in Arkansas to 61.5% in New Hampshire. Figure 5.4 shows that the heaviest reliance on property taxation is found in the New England states and in New Jersey.

Figure 5.3. Local government property tax revenue as a percentage of local government revenue in OECD countries, 2020



Note: Sweden is not included.
Source: OECD/UCLG (2022[13]).

Figure 5.4. Property tax revenue as a percentage of total local government revenue by state, FY2020



Source: U.S. Census Bureau (2022[14]).

Table 5.2 provides an overview of the role of the property tax in local government finance in the United States. There are four types of local governments. Municipal governments are contained within larger counties. In some parts of the country, especially in the South, county governments provide a broad range of public services including education, while in New England, counties have very few functions. Independent school districts have their own governing bodies, which impose and collect property taxes. Some states rely in whole or part on dependent school districts, which are part of county or municipal governments and rely on revenues from their parent governments. Special districts are governments created for a specific purpose such as fire protection, hospitals, water and sewage, public transportation, including airports and parks and recreation.

The data in Table 5.2 show that of the over $500 billion in local government property tax revenue collected in 2017, the largest share went to independent school districts. School districts rely on property taxes for over 80% of their own-source revenue and after accounting for intergovernmental transfers, for 37% of their total revenues. While property taxes are a relatively minor source of revenue for special districts, which rely heavily on user fees, property taxes contribute 43% of the revenue of county governments.

In general, local governments have considerable autonomy in setting property tax rates. However, state governments often play an important role in authorising and financing property tax relief measures, in restricting or limiting changes in the assessed values of property and in property tax levies (OECD, 2022[15]). Although the determination of the value of properties subject to taxation is almost always a local government function, state government regulations and legislation generally define the parameters of property tax assessment systems and in some states, state governments play an active role in maintaining assessment quality. As a result, there are large variations in property tax systems across states. This implies that the relationship between housing affordability and the property tax differs by state.

Table 5.2. The financing of local government by type of government, 2017

Millions of US dollars

Type of Government	Counties	Municipal (incl. Townships)	Independent School Districts	Special Districts	All Local Governments
Number of governments	3 031	35 748	12 754	38 542	90 074
General revenue	$420 590	$562 916	$573 699	$193 128	$1 750 334
Per cent of general revenue from transfers	33.8%	23.4%	55.2%	34.0%	37.5%
General revenue from own sources	$278 586	$431 402	$256 992	$127 387	$1 094 367
Property tax revenue	$119 452	$155 440	$212 074	$21 770	$508 736
Share of total property tax revenue	23.5%	30.6%	41.7%	4.3%	100.0%
Share of own-source revenue	42.9%	36.0%	82.5%	17.1%	46.5%
Share of general revenue	28.4%	27.6%	37.0%	11.3%	29.1%

Source: U.S. Census Bureau (U.S. Census Bureau, 2022[16]).

5.5. Property tax burdens on homeowners

For homeowners, real estate taxes constitute about one-fifth (19.1%) of total monthly housing costs.[5] Although slightly higher for income under $30 000, the property tax share of total housing costs varies very little over the entire income distribution. Housing costs are dominated by monthly mortgage payments. Thus, households without mortgages generally have much lower monthly housing costs and property taxes tend to be a larger share of total monthly costs. There is also substantial geographic variation in not only

housing costs but in housing costs as a percentage of income. For example, in New York City, where housing prices are high, median total monthly housing costs for owner-occupied housing are $1 837 and equal to 22% of median household income (compared to a national average of 16%). In New York, median real estate taxes comprise 25.6% of median housing costs. By comparison, in Memphis, Tennessee, median housing costs are only $926, which is equal to 17% of median income, and property taxes make up only 15.1% of total housing costs (U.S. Census Bureau, 2022a).

Although policymakers generally consider the local property tax to be regressive, economists' view on the incidence of the property tax is hardly settled. Two well-known experts on the property tax recently concluded: "Despite a series of books and papers stretching over a period of nearly 50 years, there is nothing approaching a consensus on this issue" (Oates and Fischel, 2016[17]).

Some scholars argue that the property tax is a benefits tax with property taxes being payments for the receipt of local public services, and hence questions of property tax incidence are largely irrelevant. Alternatively, the so-called capital view takes a general equilibrium approach and assumes that housing capital is mobile, and that in response to an increase in property taxes, it will move into non-housing uses, thereby reducing the rate of return on all capital. As the ownership of capital is concentrated at the top end of the income distribution, the property tax under the capital view is likely to be progressive.

In discussing property tax incidence, economists often abstract from a number of important institutional features of the tax such as different property tax assessment practices in different jurisdictions, the variation in tax rates across jurisdictions, the impact of a wide set of state government tax relief measures, and state government-imposed limitations on rates, assessments and tax levies.

In considering the incidence of the property tax levied on homeowners, proponents of the capital view generally recognise that differences from the national average tax rate create excise tax effects which are borne by the owners of individual properties. In addition, for the majority of homeowners, their total net worth consists primarily of their home equity, suggesting that homeowners bear most of the burden of the property tax levied on their homes.

Calculating property tax burdens on homeowners requires that one compares their property tax liability to their ability to pay. The empirical issue is how best to measure a family's ability to pay. As both income and consumption vary over most people's lives, the correct way to assess incidence of a tax is from a lifetime perspective. The basis for this argument, which has its origins in Friedman's permanent income theory of consumption (Friedman, 1957[18]) and the companion life-cycle model of saving (Ando and Modigliani, 1963[19]), is that if most people with low incomes are only temporarily poor, and if housing consumption decisions tend to be made on the basis of lifetime income, then calculating tax burdens based on data from a single year will yield tax burdens for low-income people that are substantially higher than burdens calculated on the basis of lifetime or permanent income. As a result, tax incidence calculations are biased towards regressivity.

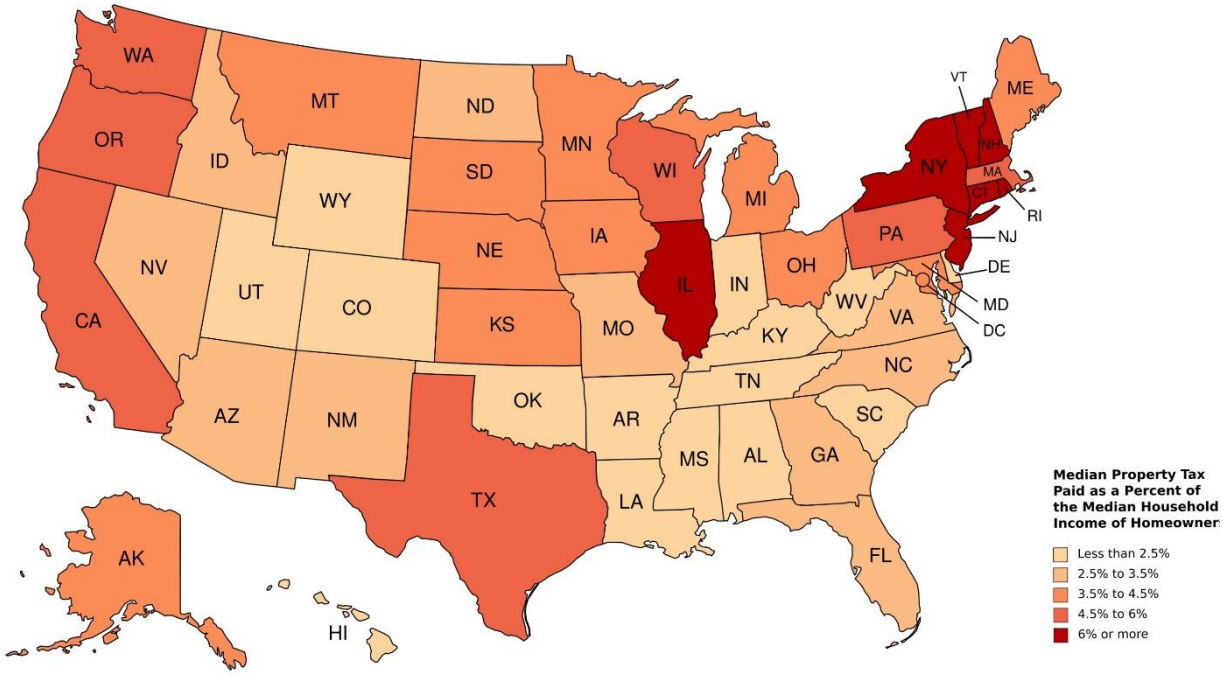
Although this "annual income bias" in the calculation of tax burdens has long been recognised (Poterba, 1989[20]), the absence of large-scale longitudinal datasets that include data both on household income and property tax payments, means that most property tax burden calculations are made using data for a single year. One exception is Boldt, Caruth and Reschovsky (2010[21]) who used eight years of income and property tax data from Wisconsin state income tax returns to calculate average property tax burdens. By using average household income over an eight-year period, they argue that they have eliminated most of the impact of transitory income. Their income measure includes income from both taxable and non-taxable sources and an estimate of the imputed rent from homeownership. As expected, the property tax is regressive when tax burdens are calculated using a single year of data. The property tax remains regressive when 8-year average burdens are calculated, but the regressive pattern is reduced.[6]

Given data limitations, the property tax burden calculations presented in this paper are all based on annual property tax and income data. These data show that the property tax levied on homeowners is regressive,

with the highest burdens falling on homeowners with low annual income. Based on 2019 U.S. Census Bureau data, nearly two-thirds of homeowners face annual property tax burdens of less than 4% of their income (Langley and Youngman, 2021[22]). However, 14% of homeowners face burdens of between 4% and 6% and 21% burdens above 6%. Most homeowners facing the highest property tax burdens have relatively low incomes.

Property tax burdens measured as the median property tax paid by homeowners divided by the median household income of homeowners, vary substantially by state. Figure 5.5 shows the regional concentration of both low tax burden and high tax burden states. Low tax burden states are concentrated in the South and Central portion of the country, while with the exception of Illinois, high tax burden states are found in the Northeast. Median burdens are also high in the Pacific coast states as well as in Texas, a state without a state income tax.

Figure 5.5. Homeowner property tax burdens by state



Source: U.S. Census Bureau (2022[6]).

5.6. Property tax administration

Local governments in the United States use a market value-based system of property taxation. This means that the value of properties for tax purposes (generally known as the assessed value) is regularly updated to reflect changes in the market value of properties. Although sometimes subject to limitations and restrictions imposed by state governments, local governments have considerable freedom to determine the size and the composition of their budgets. Based on estimates of how much revenue they are likely to receive from federal and state government transfers and from user fees, licenses and other non-property tax sources, local government officials calculate the amount of money they need to raise from the property tax in order to fund their spending priorities.

Using the latest assessed values of their property tax base, local officials determine the property tax rate necessary to raise their desired property tax levy.[7] As shown in equation 1, the property tax paid by

household j in city i (T_{ij}) equals the tax rate in i (t_i) on the assessed value of j's property (A_{ij}).[8] The property tax revenue in i is the sum over j of all T_{ij}s.

$$(1)\ T_{ij} = t_i\, A_{ij}$$

To compare tax rates across communities, it is necessary to calculate an effective tax rate (t^e_{ij}). It is defined as the tax paid by a property owner relative to its true market value. As shown in equation 2, the effective tax rate is calculated by multiplying the nominal tax rate by an assessment ratio, which is defined as the average ratio in city i of the assessed value to sales price of recently-sold properties (M_{ij}). From equation 1, we know that the nominal tax rate is defined as the ratio of taxes paid relative to assessed value.

$$(2)\ t^e_{ij} = \frac{T_{ij}}{A_{ij}} \times \frac{A_i}{M_i}$$

Especially in urban areas, where problems of housing affordability tend to be most severe, property tax assessed values for residential properties are usually based on various automated valuation models (AVMs). These models use statistical techniques, such as hedonic regressions, based on data from recent arms-length housing sales, to produce estimates of market values for housing units that have not been sold.

In a well administered property tax system, there will be very little variation in assessment ratios across properties.[9] In fact, the quality of property tax assessments varies substantially across states. A major reason why assessment ratios differ across properties is infrequent reassessments. According to a recent survey of assessment cycles, 10 states require annual reassessments of property, 14 states require reassessments every 2 to 4 years, 15 states every 5 or more years, while 10 states have no fixed reassessment schedules (Dornfest et al., 2019[23]). The frequency of assessment is important because changes over time in property values vary within jurisdictions, especially in cities. If properties are not reassessed frequently, those properties whose market values grow at below-average rates will face higher assessment ratios than properties whose market values grow at above-average rates. To the extent that the market prices of more expensive houses tend to grow at a faster rate than the market value of less expensive houses, overtime, without reassessment, the average assessment ratios for low-valued houses will exceed the average assessment ratio for high-valued houses. The result, as can be seen in equation 2, is that although all houses face the same nominal tax rate, the effective rate of property taxation on low-value houses will be higher than the effective rate on high value houses.

There is a relatively small literature that has investigated the extent to which higher-priced properties tend to have lower assessment ratios than lower-priced properties. Most of these studies have found a regressive pattern of assessments.[10] While older studies focused on assessments within a single jurisdiction, several recent studies use administrative records of the assessed values and sale prices of millions of housing units throughout the country. Christopher Berry (2021[24]) used a national sample of 26 million housing sales occurring between 2007 and 2020. He calculated sales ratios for each transaction by dividing the assessed value of each property on January 1st of the sales year by the sales price. He then used regression analysis to determine whether the sales ratios declined as sales prices increased. His results show a substantial amount of assessment regressivity with on average sales ratios within any given jurisdiction being twice as high in the bottom sales price decile than in the top decile.[11]

Using the same national data as Berry but a somewhat different methodological approach, Amornsiripanitch (2022[25]) provides further evidence that inexpensive houses are over-assessed relative to expensive houses. Although some of the measured assessment regressivity is attributable to measurement error in sale prices, he argues that 60% of the remaining regressivity can be explained by a flawed methodology used by assessors and 40% by infrequent reassessments. In a recent paper, Avenancio-León and Howard (2022[26]) find that after controlling for assessment regressivity, Black and Hispanic households face assessment ratios that are substantially higher than assessment ratios on

homes of white households. They attribute these racial gaps to the fact that assessments fail to capture many within and across neighbourhood characteristics that are reflected in market values.

Even if there were no biases in the assessment process, some states require different assessment ratios for different types of property. In some states commercial and industrial property is subject to a higher assessment ratio than residential property. In Connecticut and several other states, residential apartment buildings, generally defined as having four or more apartments, are assessed at a higher fraction of market value than single-family homes (Lincoln Institute of Land Policy/George Washington Institute of Public Policy, 2022[27]). As a result, a higher effective tax rate is applied to rental apartment buildings than to single family housing, regardless of whether it is owner-occupied or rented. In Massachusetts, where all types of property are assessed at 100% of market value, local governments are given the option of applying higher tax rates to commercial-industrial property than to residential property. The application of different assessment ratios or tax rates to different types of property is referred to as classification.

The rules that define property tax assessment and administrative procedures, and the quality of the assessment process vary tremendously across states. The evidence to date suggests that even in states with high-quality property tax assessments, low-value properties may be assessed at a higher proportion of their true market value than high-value properties. The result is that the owners of relatively low-value properties may face higher effective tax rates than owners of properties with higher market value. To the extent that household income is correlated with the value of owner-occupied housing, the administration of the property tax may result in higher housing costs for low-income households. Although the impacts of property tax administration on problems of housing affordability are difficult to quantify, it is likely that in some states, property tax administration adversely affects the ability of low and moderate-income households to become homeowners.

5.7. Property tax relief

The property tax system in every state includes a set of policies designed to reduce property taxes on selected taxpayers. In many cases property tax relief measures are designed to reduce property tax regressivity by targeting relief to individuals facing high property tax burdens. If properly designed these relief measures have the potential to reduce housing-related costs for taxpayers struggling to afford housing. In this section, I describe the most commonly used types of property tax relief. Their effectiveness in reducing property tax regressivity depends on how each policy is designed, which taxpayers are eligible to receive property tax relief, and whether the funding of property tax relief comes from the state government or from individual local governments. Information in this section of the paper comes primarily from detailed descriptions of homeowner property tax relief measures in all 50 states and the District of Columbia compiled by the Lincoln Institute of Land Policy and George Washington Institute of Public Policy (2019[28]).

5.7.1. Property tax exemptions and credits

The most common property tax relief measure is a fixed dollar exemption, often referred to as a homestead exemption because eligibility is almost always restricted to homeowners on their primary residence. This type of property tax relief exempts a fixed dollar amount of homeowners' assessed value from property taxation. With a state-funded homestead exemption, a taxpayers' property tax liability is determined by equation 3, where E is the legislatively-determined exemption amount.

$$(3)\quad T_{ij} = t_i\,(A_{ij} - E)$$

As E is the same for all eligible homeowners, the exemption will result in a larger percentage reduction in property taxes for homeowners with low-valued homes as compared to homeowners with more valuable homes. This progressive pattern reduces the regressivity of homeowner property tax burdens. The tax

savings from a fixed dollar exemption depend both on the size of the exemption and the local government tax rate. In some states, exemptions apply to all local government property tax payments, while some other states apply exemptions only to property taxes levied by independent school districts.

Although used less frequently, a few states provide homeowners with a percentage exemption, which as shown in equation 4, exempts from taxation a fixed percentage (γ) of each homeowner's assessed value. Percentage exemptions provide a larger dollar exemption to owners of more valuable houses and thus have no impact on regressivity.[12]

$$(4)\quad T_{ij} = t_i\,(A_{ij} - \gamma A_{ij})$$

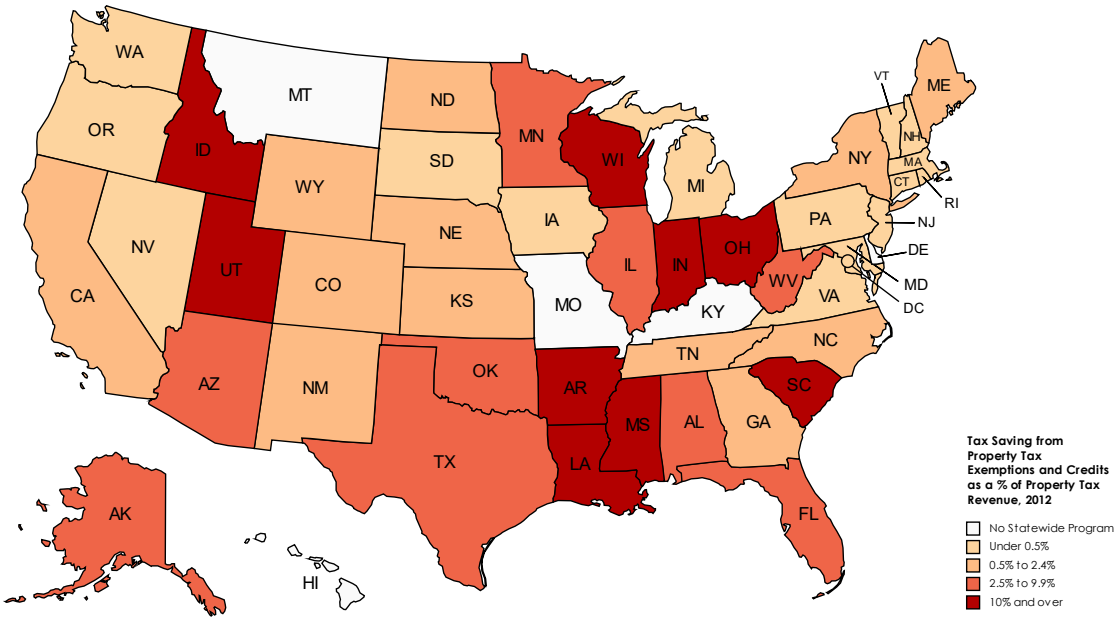
Using the Lincoln Institute of Land Policy's *Significant Features of the Property Tax* database, Adam Langley (2015[29]) determined that 25 states and the District of Columbia offer property tax exemptions or credits to all homeowners, with 11 of these states providing higher benefits for "seniors". In nearly all states, seniors are defined as homeowners age 65 or older.[13] In seven states homeowner property tax exemptions and credits are only available for seniors.[14] In the remaining 18 states, homeowners are not eligible for property tax relief from exemptions or credits.[15]

In a number of states, local governments are reimbursed by their state government for the reduced property tax revenue associated with the issuance of exemptions and credits. In some states, the financing of property tax relief is shared by the state and local governments, while in other states, the entire cost of the exemptions and credits is borne by local governments. Local government self-funding implies a shifting of tax burdens from those eligible for property tax relief to those taxpayers who are not eligible. In most cases, this implies higher taxes on commercial-industrial property and on most multi-unit residential property. To the extent that taxes are shifted to tenants, local government funding of homeowner property tax relief results in tax burden shifting from homeowners to tenants.

It is important to emphasize that the generosity of tax relief programmes varies tremendously across states. For example, among states with fixed dollar exemptions, the exempted property values range from $4 850 in Iowa to $75 000 in Louisiana. Using detailed information from the *Significant Features of the Property Tax* database on characteristics of state property tax relief programmes, Adam Langley (2015[29]) estimated the property tax savings from each tax relief programme operating in each state in 2012. His estimates were made by combining details of property tax relief programmes with data on individual household characteristics from the U.S. Census Bureau's *American Community Survey* (ACS). This survey of over 6.5 million households includes data on household characteristics such as age, income, marital status, disabilities, veteran status, home value and property tax payments, which are required to determine eligibility for and benefits from various property tax relief programmes.

Langley's results demonstrate the wide variation of the impact of property tax relief policies across states. Among the 25 states and the District of Columbia that provide a property tax exemption or credit to all homeowners on their principal residence, the tax saving of the median homeowner was less than 10% in 11 states and over 40% in five states.[16] Figure 5.6 illustrates for each state the total tax saving from all property tax exemptions or credits programmes as a percentage of property tax revenue in that state. In only eight states, total tax relief exceeds 10% of property tax revenue. For the nation as a whole, total tax savings from tax reliefs equal 3.6% of tax revenue. Given that in most states the exemption levels are not indexed for inflation, it is likely that since 2012 the tax savings from property tax relief measures have declined as a percentage of property tax revenues.

Figure 5.6. Total tax savings from property tax exemptions and credits as a percentage of total property tax revenue by State, 2012



Source: Langley (2015[29]).

5.7.2. Property tax circuit breakers

Unemployed individuals or those unable to work because of a medical crisis and elderly taxpayers with low income but houses that have greatly appreciated in value over time may face economic hardship due to high property tax burdens. Starting in the 1960s a few states developed policies designed to target property tax relief to taxpayers whose property taxes are particularly high relative to their income. Drawing on the analogy to an overcharged electrical circuit, some states developed circuit breakers, which are tax credits designed to partially offset high property tax burdens. In most states, the credits are issued as refundable state income tax credits or as property tax credits mailed directly to taxpayers.

As illustrated in equation 5, a circuit breaker credit to taxpayer j can be defined as a share, α, of the taxpayer's property tax liability, T_{ij}, in excess of a threshold percentage, β, of the taxpayer's income, Y_j.

$$(5)\quad CB_{ij} = \alpha(T_{ij} - \beta Y_j) \text{ if } T_{ij} > \beta Y_j \text{ and zero otherwise.}$$

In a state that defined α equal to one and β equal to 5%, the circuit breaker credit would effectively place a 5% ceiling on the property tax burden. It would also mean that as long as the taxpayer's income remained unchanged, the taxpayer would be completely shielded from any future property tax increases. Facing a tax-price of zero, recipients of circuit breakers in community i may support higher spending, effectively shifting the financing of that spending to other taxpayers.

To discourage excess spending and to reduce the costs of circuit breaker programmes most states give α a value of less than one, thereby requiring that taxpayers pay a portion of their property tax bill that is in excess of the threshold percentage of their income.[17] Furthermore, every state with a circuit breaker restricts eligibility by setting a maximum income for eligibility. These income ceilings range from $10 000

in Oregon to $113 150 (for a married couple) in Minnesota. In addition, many circuit breaker programmes specify a maximum circuit breaker payment. Langley and Youngman (2021[22]) report that in 2018 of the 26 states with circuit breaker programmes, the largest number set their maximum benefit between $1 000 and $1 500.

In about half the states with circuit breaker programmes, renters are also eligible. As tenants do not directly pay property taxes, state legislatures must determine a percentage of individuals' gross rent constituting property taxes and apply this percentage to all rent payments. In 2018, these legislatively-determined percentages ranged from 6% in New Mexico to 25% in Massachusetts and Wisconsin. Although every state which provides circuit breakers to tenants uses a single rent constituting property tax percentage for all eligible tenants, empirical estimates of this percentage indicate large intra-state variations. Allen et al. (2007[30]) estimated that 22% of rent in Milwaukee constituted property taxes, while that percentage was only 13 per cent in Madison, the state's second largest city. A statewide study conducted by the Minnesota Department of Revenue (2018[31]) determined that the rent constituting property taxes percentage was 16.1% in Minneapolis, 15.5% in St. Paul but only 12.9% in the rest of the state.

In principle, circuit breakers are a powerful tool for reducing property tax payment for those taxpayers facing the highest property tax burdens. As most taxpayers facing the highest burden also have low incomes, circuit breakers can reduce the regressivity of the property tax and increase housing affordability for low-income households. In practice, circuit breakers fail to live up to their potential. Only half the states have circuit breaker programmes, and among those states, circuit breakers are restricted to elderly taxpayers in 14 states (Lincoln Institute of Land Policy/George Washington Institute of Public Policy, 2019[28]).

A few states have robust circuit breaker programmes. For example, in New Jersey all non-elderly homeowners with incomes below $75 000 and elderly homeowners with income below $150 000 are eligible for circuit breakers. Maximum benefits are relatively high, with the maximum for elderly homeowners set at $10 000. New Jersey, however, is not typical. Because many states have low-income ceilings, relatively few taxpayers facing high property tax burdens are eligible for circuit breakers, and among those who are eligible, programme parameters, including low ceilings on benefits, limit the effectiveness of circuit breakers in reducing high property tax burdens.

The state of Wisconsin provides an example of a weak circuit breaker programme (officially called the Homestead Tax Credit). Credits are equal to 80% of the difference between a taxpayer's property tax and 8.75% of the taxpayer's income above $8 060 (Spika, 2021[32]). All residents over the age of 18 are eligible. For tenants, property tax payments are assumed to be 25% of rent.[18] Circuit breaker credits are limited in a couple ways. First, using a broad definition of income, households' annual income may not exceed $24 680. Second, the maximum property tax that can be used in calculating the credit is $1 460. This implies that the largest possible credit, payable to households with incomes below $8 060, is $1 168 (80% of $1,460).

Because these maximum income and benefit programme parameters have remained unchanged since 2010, it is not surprising that the number of circuit breaker claimants fell by 47% between 2010 and 2019. In 2019, only 5.4% of Wisconsin households benefited from the state's circuit breaker, with the average credit equal to $493.[19]

Another reason for the limited effectiveness of circuit breakers in reducing high property tax burdens among low-income households is the administrative complexity involved in applying for circuit breaker credits. To receive a credit, taxpayers must understand complex instructions and complete lengthy forms that require that they provide a substantial amount of information. Although detailed data are not available, it is likely that some eligible households who are most in need of property tax relief are not receiving circuit breaker credits because they are unaware of the programme or because of the administrative complexities involved in applying for the credits.

5.8. Property tax limitations

Nearly every state places limits on property taxation. Although these limits are usually enacted as a means of providing property tax relief, they are generally not targeted to individuals, but rather constrain the fiscal behaviour of local governments. Based on information from the Lincoln Institute's *Significant Features of the Property Tax* database, Langley and Youngman (2021[22]) determined that 37 states imposed property tax levy limits on their local governments, 36 states imposed rate limits, and 18 states imposed assessment limits.[20] Although in some states these limits have been embedded in state constitutions, most limits are imposed by statutes, either enacted by state legislatures or by voter-approved referenda.

The primary objective of property tax levy and rate limits is to reduce local government property tax revenues. Unless local governments can shift to alternative sources of revenue, these limits will have the effect of reducing local government spending. Supporters of these tax limitations frequently argue that reducing spending will force local governments to reduce waste and hence, tax limitations will have no adverse impact on public services. However, research has quite consistently shown that property tax limits placed on school districts, which rely heavily on local revenue from the property tax, have resulted in both reduced spending per pupil and reduced academic performance by students (Downes and Figlio, 2015[33]).

The impact of property tax levy or rate limits on housing inequities is far from clear. To the extent that these limitations result in reductions in both property tax revenue and public spending, they are unlikely to have a significant impact on property values. In jurisdictions where property values are rising, and presumably where housing affordability may be a growing problem, property tax levy limits will mandate that local governments lower their property tax rates. Tax rate reductions have similar impacts on property owners of both low-value and high-value properties. As a result, percentage reductions in housing-related costs are likely to be similar for both low-income and high-income households.[21]

Assessment caps place a limit on annual increases in the assessed values of properties. For example, California's Proposition 13, a 1978 voter-approved ballot initiative, restricted the annual growth of assessed values to the lesser of 2% or the rate of inflation, with market-value reassessment only occurring upon the sale of the property. In New York City, the annual increase in the assessed value of most houses is limited to 6% and to no more than 20% over a five-year period.

The assessment ratio will decline for any homeowner whose house value is appreciating at a rate greater than the assessment cap. As can be seen in equation 2, this will result in a decline in their effective property tax rate relative to homeowners whose houses are appreciating at rates below the assessment cap. In California, where Proposition 13 also limited the property tax rate to 1%, the assessment cap has resulted in large horizontal inequities in effective property tax rates depending solely on homeowners' tenure in their house. The property tax bills on two identical and adjacent houses may well vary by a factor of ten or more if one homeowner has lived in their house for decades and the other has just purchased their house.

Aside from the horizontal inequities caused by assessment caps, they can have adverse, and presumably unintended, impacts on housing affordability. In states, such as California, where houses are reassessed to market value only upon sale, current owners have an incentive to remain in their house. Wasi and White (2005[34]) provide estimates of the magnitude of the "lock-in" effect created by Proposition 13. By extending the average length of housing tenure, the assessment cap reduces the supply of houses available for sale and exacerbates housing affordability. It reduces the mobility of the elderly, who have owned their homes for decades and are eager to downsize, and worsens housing affordability, especially for parents looking for larger houses for their families.

When high-value houses appreciate at faster rates than lower-value houses, as is often the case in American central cities, assessment caps are likely to increase property tax regressivity by shifting property tax burdens from the owners of high-value properties (benefiting from the assessment cap) to owners and renters of lower-valued properties unaffected by the assessment cap. This tax burden shifting occurs because to maintain public service levels, local governments must raise property tax rates in response to

the reduced size of their tax base due to the assessment caps. As a result of this tax shifting, property taxes are likely to rise for those city residents most likely to be coping with severe problems of housing affordability.[22]

5.9. The impact of income tax policies on housing costs

While property taxes have the closest direct connection to housing costs, it is important to emphasise that federal and state income tax policies also have a large impact on housing costs. As in many OECD countries, owner-occupied housing relative to rental housing is strongly favoured by income tax policies (OECD, 2022[35]). As in nearly all countries, in the United States the imputed rent on owner-occupied housing is excluded from income subject to taxation. In addition, homeowners who itemise deductions on their federal income tax returns can deduct their mortgage interest payments from their gross income.

For several reasons, the tax savings from mortgage interest deductions have always been skewed towards high income homeowners. The share of taxpayers itemising deductions (rather than taking a standard deduction) rises with income, the tax savings from any deduction is greater for those taxpayers facing higher marginal tax rates, and high-income taxpayers tend to own more expensive houses. An analysis conducted by the Congressional Research Service (Keightley, 2020[36]) found that in 2018, 63.9% of the tax savings from the mortgage interest deduction went to tax filers with income over $200 000, while only 3.4% of the benefits went to taxpayers with income less than $75 000.

The passage of the Tax Cuts and Jobs Act (TCJA) in 2017 resulted in a sharp reduction in the number of taxpayers who itemised deductions.[23] In 2017, 30.6% of taxpayers itemised their deductions. As a result of the passage of the TCJA, the percentage of itemisers fell to 11.4% in 2018 and 9.5% by 2020. Between 2017 and 2020, the number of taxpayers taking the mortgage interest deduction fell from 33.7 million to 12.3 million, a decline of 63.6% (Internal Revenue Service, 2022[37]).

Prior to the passage of TCJA, homeowners who itemised deductions were able to deduct property tax payments. The TCJA capped the total deduction of all state and local taxes at $10 000. As a result, the number of tax filers deducting property taxes fell from 39.1 million in 2017 to 13.6 million in 2020, a reduction of 65.4%. Finally, homeowners can exclude from income subject to taxation up to $250 000 ($500 000 for a married couple) in capital gains from selling their home. Subject to some limitations, this tax benefit can be taken several times.

5.10. Conclusions

Many American households, both homeowners and renters, struggle to meet their monthly housing-related expenses. In addition to mortgage or rent payments, households bear the cost of utilities, property insurance, and for homeowners, property taxes, routine maintenance, and in some cases, condominium or homeowner association fees. Based on data from the *American Housing Survey*, nearly 21 million households (27.1% of all homeowners) had an income below $50 000. Of these households, fully half reported housing costs equal to 30% of more of their incomes. For 22% of these households, housing costs exceeded 50% of their income.

A goal of this paper is to assess the contribution of the property tax to housing affordability and housing equity. The potential capitalisation of both property taxes and local public services into housing values makes it difficult to assess the impact of the property tax on housing affordability. Although property taxes contribute to the annual costs of homeownership, to the extent that property taxes are capitalised into lower housing prices, they may actually make it easier for families to become homeowners.

Housing is unique because housing consumption is always bundled with the receipt of public services. In the United States local governments provide an especially wide array of public services, including primary and secondary education. Although local property taxes play a central role in financing these services, it is important to emphasise that other potential sources of local government revenue, such as local sales or income taxes, would, by lowering disposable income or raising the costs of non-housing expenditures, worsen housing affordability.

In the United States, the property tax is primarily a local government tax with individual state governments playing an important role in mandating how the tax is administered, in authorising property tax relief measures, and in imposing various limitations on local government policies with respect to the property tax. As a result, the potential impact of the property tax on housing costs varies dramatically across states. On average, however, property taxes make up a little under one fifth of total monthly housing costs.

Housing cost burdens decline as income rises. This reflects in part that property tax burdens decline across the income distribution. The paper describes the impact of public policy on the distribution of property tax burdens by tracing the role of property tax administration and assessment procedures, tax reliefs, and tax limitations on the burdens faced by households, especially by those with relatively low income.

The contribution of the property tax to housing inequities also depends on how the property tax operates in different locations. High-quality property tax administration that eliminates or minimises any bias towards regressivity in property tax assessment, combined with a robust system of property tax reliefs that targets those facing high property tax burdens (relative to their incomes) will help reduce property taxes for households facing high housing cost burdens.

Local government services are particularly important for individuals and families with a low and moderate income, who lack the resources to obtain private sector substitutes, such as private schools for their children and gym memberships in lieu of public recreation facilities. The question of whether property taxes contribute to housing inequities focuses on two issues. First, what is the appropriate role of the property tax in funding local public services? Assuming the assignment of functions among levels of governments remains basically unchanged, then the question is whether state and federal governments should play a more important role in financing local government public services, in particular public education.

A shift to more state funding of local government services will likely improve the economic well-being of low- and moderate-income households if state government funding comes primarily from progressive income taxes. The answer is less clear in states that rely heavily on consumption taxes. Also of great importance is the way in which state funding is distributed to local governments. Funding formulas that allocate more state aid to jurisdictions with high housing cost burdens and with high property tax rates are likely to reduce the contribution of property taxes to housing costs.

References

Allen, D. et al. (2007), "The School Property Tax and Homestead Credits: Accuracy, Equity, and Contribution to Overall Fiscal Relief", *Wisconsin Department of Revenue*, Report prepared for the Wisconsin Department of Revenue, Madison, WI: Robert M. La Follette School of Public Affairs, May 4. [30]

Amornsiripanitch, N. (2022), "Why Are Residential Property Tax Rates Regressive?", *Working paper (Federal Reserve Bank of Philadelphia)*, Federal Reserve Bank of Philadelphia, https://doi.org/10.21799/frbp.wp.2022.02. [25]

Ando, A. and F. Modigliani (1963), "The 'Life Cycle' Hypothesis of Saving: Aggregate Implications and Tests", *American Economic Review*, Vol. 53, pp. 55-84. [19]

Avenancio-León, C. and T. Howard (2022), "The Assessment Gap: Racial Inequalities in Property Taxation", *The Quarterly Journal of Economics*, Vol. 137/3, pp. 1383-1434, https://doi.org/10.1093/qje/qjac009. [26]

Bauer, T. et al. (2020), "Local Property Taxation and the Rental Housing Market", RWI – Leibniz Institute for Economic Research Universtät Duisburg Essen. [12]

Berry, C. (2021), "Reassessing the Property Tax", *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.3800536. [24]

Boldt, R., B. Caruth and A. Reschovsky (2010), "An Empirical Investigation of the Incidence of the Property Tax on Owner-Occupied Housing", Paper prepared for delivery at the 103rd Annual Conference on Taxation, National Tax Association, Chicago, IL, November 18-20, 2010. [21]

Carroll, R. and J. Yinger (1994), "Is the Property Tax a Benefit Tax? The Case of Rental Housing", *National Tax Journal*, Vol. 47/2, pp. 295-316, https://doi.org/10.1086/ntj41789069. [10]

Chernick, H. and A. Reschovsky (2023), *Measuring the Fiscal Health of U.S. Cities*, IMFG Papers on Municipal Finance and Governance, No. 63, Institute on Municipal Finance & Governance, University of Toronto, https://hdl.handle.net/1807/126243. [43]

Chernick, H. and A. Reschovsky (1997), "Who Pays the Gasoline Tax?", *National Tax Journal*, Vol. 50/2, pp. 233-259, https://doi.org/10.1086/ntj41789255. [44]

Dornfest, A. et al. (2019), "State and Provincial Property Tax Policies and Administrative Practices (PTAPP): 2017 Findings and Report", *Journal of Property Tax Assessment & Administration*, Vol. 16/1, pp. 43–130. [23]

Downes, T. and D. Figlio (2015), "Tax and Expenditure Limits, School Finance and School Quality", in *Handbook of Research in Education Finance and Policy*, Second Edition, edited by Helen F. Ladd and Margaret E. Goertz, Routledge, New York, https://doi.org/10.4324/9780203961063.ch21. [33]

Dye, R. and D. McMillen (2007), "The Algebra of Tax Burden Shifts from Assessment Limitations", Lincoln Institute of Land Policy Working Paper WP07RD1, https://www.lincolninst.edu/publications/working-papers/algebra-tax-burden-shifts-assessment-limitations. [40]

England, R. (2016), "Tax Incidence and Rental Housing: A Survey and Critique of Research", *National Tax Journal*, Vol. 69/2, pp. 435-460, https://doi.org/10.17310/ntj.2016.2.07. [9]

Friedman, M. (1957), *A Theory of the Consumption Function*, National Bureau of Economic Research, Princeton University Press. [18]

Gabriel, S. and G. Painter (2020), "Why affordability matters", *Regional Science and Urban Economics*, Vol. 80, p. 103378, https://doi.org/10.1016/j.regsciurbeco.2018.07.001. [4]

HUD USER (2017), "Defining Housing Affordability", *PD&R Edge; an Online Magazine*, August 14, https://www.huduser.gov/portal/pdredge/pdr-edge-featd-article-081417.html. [2]

Internal Revenue Service (2022), "Returns with Itemized Deductions: Sources of Income, Adjustments, Itemized Deductions by Type, Exemptions, and Tax Items", *Statistics on Income*, Table 2.1, Publication 1304, November, https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-returns-complete-report-publication-1304-basic-tables-part-2. [37]

Keightley, M. (2020), "An Economic Analysis of the Mortgage Interest Deduction", Congressional Research Service Report R46429, Washington, DC, June 25, https://crsreports.congress.gov/product/pdf/R/R46429. [36]

Langley, A. (2015), "How Do States Spell Relief? A National Study of Homestead Exemptions & Property Tax Credits", *Land Lines Magazine*, Lincoln Institute of Land Policy, April 24-31, https://www.lincolninst.edu/publications/articles/how-do-states-spell-relief. [29]

Langley, A. and J. Youngman (2021), *Property Tax Relief for Homeowners*, Policy Focus Report, Lincoln Institute of Land Policy, Cambridge, MA, https://www.lincolninst.edu/publications/policy-focus-reports/property-tax-relief-homeowners. [22]

Lincoln Institute of Land Policy (2014), *Significant Features of the Property Tax*, Tax Savings from Property Tax Exemptions and Credits in 2012, https://www.lincolninst.edu/research-data/data-toolkits/significant-features-property-tax/access-property-tax-database/residential-property-tax-relief-programs. [41]

Lincoln Institute of Land Policy/George Washington Institute of Public Policy (2022), *Significant Features of the Property Tax*, Property Tax Classification, 2020, https://www.lincolninst.edu/research-data/data-toolkits/significant-features-property-tax/access-property-tax-database/property-tax-classification. [27]

Lincoln Institute of Land Policy/George Washington Institute of Public Policy (2019), *Significant Features of the Property Tax*, Residential Property Tax Relief Programs: Summary Tables on Exemptions and Credits and on Circuit Breakers in 2018, https://www.lincolninst.edu/research-data/data-toolkits/significant-features-property-tax/access-property-tax-database/residential-property-tax-relief-programs. [28]

Malpezzi, S. (2017), "Is the American Dream Affordable? A First Look at Housing 'Affordability", in *New Jersey and the United States*, Rutgers Center for Real Estate, https://realestate.business.rutgers.edu/news/american-dream-affordable. [3]

McMillen, D. and R. Singh (2022), "Measures of Vertical Inequality in Assessments", Lincoln Institute of Land Policy, https://www.lincolninst.edu/publications/working-papers/measures-vertical-inequality-in-assessments. [39]

Minnesota Department of Revenue (2018), "Estimate of the Percentage of Rent that Constitutes Property Taxes in Minnesota: Based on Rent and Property Taxes Paid in 2016", Report to the Legislature, March 1, https://www.revenue.state.mn.us/sites/default/files/2018-12/Rent%20Constituting%20Property%20Taxes%202018%20%28Feb%2027%29.pdf. [31]

Oates, W. (1969), "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis", *Journal of Political Economy*, Vol. 77/6, pp. 957-971, https://doi.org/10.1086/259584. [7]

Oates, W. and W. Fischel (2016), "Are local property taxes regressive, progressive, or what?", *National Tax Journal*, Vol. 69/2, pp. 415-433, https://doi.org/10.1086/ntj44014529. [17]

OECD (2022), "Figure HC1.2.3, Panel B: Housing Costs Over Income", *OECD Affordable Housing Database*, https://www.oecd.org/housing/data/affordable-housing-database/housing-conditions.htm. [5]

OECD (2022), *Housing Taxation in OECD Countries*, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/03dfe007-en. [35]

OECD (2022), "Twenty years of tax autonomy across levels of government: Measurement and applications", in *Fiscal Federalism 2022: Making Decentralisation Work*, OECD Publishing, Paris, https://doi.org/10.1787/599c856a-en. [15]

OECD/UCLG (2022), *The OECD/UCLG World Observatory on Subnational Government Finance and Investment*, Database, https://www.sng-wofi.org. [13]

Poterba, J. (1989), "Lifetime Incidence and the Distributional Burden of Excise Taxes", *American Economic Review*, Vol. 79/2, pp. 325-330. [20]

Rakow, R. (2022), "Comparative Measures of Property Tax Equity in Suffolk County, Massachusetts", Lincoln Institute of Land Policy Working Paper WP22RR1, August, https://www.lincolninst.edu/publications/working-papers/comparative-measures-property-tax-equity-in-suffolk-county-massachusetts. [42]

Schwegman, D. and J. Yinger (2020), "The Shifting of the Property Tax on Urban Renters: Evidence from New York State's Homestead Tax Option", *Center for Economic Studies*, Working Papers 20-43, Center for Economic Studies, U.S. Census Bureau, https://www.census.gov/library/working-papers/2020/adrm/CES-WP-20-43.html. [11]

Slack, E. and A. Tassonyi (2022), "Unaffordable Housing: Is Property Tax the Villain?", *Perspectives on Tax Law & Policy*, Vol. 3/3, pp. 13-15. [8]

Spika, D. (2021), "Homestead Tax Credit", *Informational Paper*, No. 13, Wisconsin Legislative Fiscal Bureau, https://docs.legis.wisconsin.gov/misc/lfb/informational_papers/january_2021/0013_homestead_tax_credit_informational_paper_13.pdf. [32]

U.S. Census Bureau (2022), "2017 State & Local Government Finance Historical Datasets and Tables", 2017 Census of Governments Finance. Table 2: Local Government Finances by Type of Government and State: 2017, revised June 2022, https://www.census.gov/data/datasets/2017/econ/local/public-use-datasets.html. [16]

U.S. Census Bureau (2022), "2021 5-Year American Community Survey, Median Real Estate Taxes Paid (Table B25103) and Median Household Income and Median Monthly Housing Costs (Table S2503)". [45]

U.S. Census Bureau (2022), *American Housing Survey*, Table: 2021 National-Housing Costs - All Occupied Housing Units, Owners, and Renters, https://www.census.gov/programs-surveys/ahs/data/interactive/ahstablecreator.html?s_areas=00000&s_year=2021&s_tablename=TABLE10&s_bygroup1=7&s_bygroup2=1&s_filtergroup1=1&s_filtergroup2=1. [6]

U.S. Census Bureau (2022), *Annual Surveys of State and Local Government Finances, 2020*, Table 1. State and Local Government Finance by Level of Government and by State: 2020, https://www.census.gov/data/datasets/2020/econ/local/public-use-datasets.html. [14]

U.S. Census Bureau (2022), *Current Population Survey*, Table 16, Homeownership Rates by Race and Ethnicity, https://www.census.gov/housing/hvs/data/histtabs.html. [1]

Wasi, N. and M. White (2005), "Property Tax Limitations and Mobility: Lock-in Effect of California's Proposition 13", *Brookings-Wharton Papers on Urban Affairs*, Vol. 2005/1, pp. 59-97, https://doi.org/10.1353/urb.2006.0013. [34]

Wigger, C. (2022), "Persistence and Variation in the Capitalization of Neighborhood Schools in Housing Markets", Unpublished paper, Elon University. [38]

Notes

[1] In a recent paper using a boundary discontinuity research design, Wigger (2022[38]) provides evidence, consistent with previous research, that public school quality, measured by academic test results, is capitalised into higher housing prices.

[2] Low-quality public services may result from government inefficiencies or because of the weak fiscal health of local governments. See Chernick and Reschovsky (2023[43]) for estimates of the fiscal health of 148 large American central cities.

[3] While many states take no account of the possible burden of the property tax on tenants, I will discuss tax policies in several states that provide property tax relief to tenants.

[4] In its 2022 report, the National Association of Realtors (2022) reported that first-time homeowners made up the smallest share of home purchases in the 41 years they have been tracking this information.

[5] This percentage is calculated as the median monthly real estate tax as a share of the median monthly total housing costs. Data are from the 2021 American Housing Survey.

[6] In a study of the incidence of the gasoline tax, Chernick and Reschovsky (1997[44]) address the annual income bias inherent in the calculation of consumption taxes by using average incomes over a period of 11-years as a proxy for lifetime income. They find that while regressivity is reduced, the incidence of the gas tax remains regressive.

[7] Property tax rates are usually defined in *mills*. A mill is one-tenth of one per cent.

[8] Some states allow a "classified" property tax system, where different types of property within a jurisdiction can be taxed at different tax rates. In most classified systems, commercial and industrial property is taxed at higher rates than residential property.

[9] In most states, the standard for good assessment practice is based on an assessment ratio equal to one. However, in some jurisdictions assessed values are set equal to a fraction of market values. For example, in Chicago assessed values are defined as 10 per cent of market value and in Detroit at 50 per cent of market value. In these jurisdictions, higher nominal tax rates compensate for fractional assessments.

[10] McMillen and Singh (2022[39]) explain why several frequently used measures of the vertical incidence of assessments are biased towards regressivity. To address this issue, they propose three approaches, each of which focuses on the entire distribution of assessments rather than using a single measure to characterizes the entire assessment process.

[11] Rakow (2022[42]) re-examines Berry's assessment regressivity results for Suffolk County, Massachusetts. Using data from the Massachusetts Department of Revenue, he finds evidence of the regressivity of assessment ratios, but to a lesser extent than Berry. Berry's Suffolk County analysis also calculates effective tax rates by property value decile and reports that effective tax rates are regressive over the bottom few deciles. Rakow's calculation of effective tax rates, which includes the impact of generous homestead exemptions, finds that the pattern of effective tax rates is progressive across market value deciles.

[12] In Ohio, homeowners are eligible for a percentage credit on their property tax bills. Like a percentage exemption, the credit has no impact on the progressivity of the property tax. Homeowners in Illinois and Wisconsin can receive a state income tax credit on a fixed percentage (5 per cent in Illinois and 12 per cent in Wisconsin) of the property taxes they pay on their principal residence. The maximum credit in both states is fixed at $300 and the credit is non-refundable. As a result, low-income homeowners are unlikely to benefit, or fully benefit, from the credit.

[13] In some states, only seniors with income below a threshold level are eligible for property tax exemptions.

[14] Many states also provide property tax relief to specific categories of homeowners such as disabled veterans.

[15] Three of the states without state-wide property tax relief programmes do however provide local governments with the option of operating their own property tax exemption or credit programmes. No state government funds are used to finance these local option property tax relief programmes.

[16] Langley's detailed estimates of tax savings from property tax relief measures can be found at Lincoln Institute of Land Policy (Lincoln Institute of Land Policy, 2014[41]).

[17] Some states use a "sliding scale" with the value of α declining as taxpayer income rises. Circuit breaker formulas in other states include multiple income thresholds with the value of β higher for higher income households.

[18] Rent constituting property taxes are equal to 20% of rent when utilities (heat and electricity) are included in the rent.

[19] According to data from the 2021 5-Year American Community Survey, the median homeowner in Wisconsin paid $3 690 in annual property taxes (U.S. Census Bureau, 2022[45]).

[20] A local government's property tax levy is the amount of property tax revenue it intends to raise. Actual property tax revenue may be smaller than the tax levy if the jurisdiction is unable to collect the entire levy.

[21] If local government services provide larger benefits to low-income households, property tax limits that lead to cuts in public spending may have a larger negative impact on those households.

[22] Dye and McMillen (Dye and McMillen, 2007[40]) develop a model that identifies the conditions under which an assessment limit will result in property tax increases even for property owners whose assessed values grow at rates above the assessment limits.

[23] By nearly doubling the standard deduction and capping the amount of state and local taxes that could be deducted, many taxpayers no longer benefited from itemising their deductions.

6 Why we need a green land value tax and how to design it

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A model green land value tax (LVT) can resolve conflicts among meeting climate goals, equity and housing affordability, while reducing inter-generational injustice. Land prices, reflected in house prices relative to incomes, are near all-time records, pricing the young out of home-ownership and affordable rents. The OECD confirms that annual property taxes linked to recent market values can improve macroeconomic stability and also boost long-run growth. The green LVT – effectively a split-rate property tax – would consist of a charge on the land plus a charge on the building minus a discount depending on its energy usage. Regular revaluations discourage speculation and avoid cliff-edge changes. To protect cash-poor but land-rich households, everyone would have the right to defer the tax. To avoid complex interest charges, the tax authority would register a proportionate claim at the land registry equal to the unpaid tax for each year deferred, settled upon the property's transfer or sale.

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6.1. Introduction

At COP27, UN Secretary General Antonio Guterres said: “Greenhouse gas emissions keep growing, global temperatures keep rising and our planet is fast approaching tipping points that will make climate chaos irreversible”. According to the UNEP (2020[1]), “When adding emissions from the building construction industry on top of operational emissions, the sector accounted for 38 per cent of total global energy-related CO_2 emissions.” Around 28 per cent comes from the operation of buildings mainly in the form of heating, providing hot water and air conditioning, and 10 per cent from new construction. In Europe, according to the European Commission, the percentages are even higher. As buildings have long lives, allowing their initial energy inefficiency to persist is a major obstacle to moderating the climate crisis. The reform of annual property taxes to incorporate discounts for energy-efficient buildings, together with subsidies and stronger building regulation, should be high on the agenda of every government. Conventional property taxes based the market value of buildings provide a considerable disincentive to green investing, which raise the value of buildings, for example, in the form of retrofitting better insulation or installing rooftop solar panels. Green discounts are therefore an important corrective. In principle, discounts related to the *carbon-efficiency* of buildings would be preferable to discounts purely based on energy efficiency. However, with fossil fuel sources of energy used in buildings still so dominant, the two are strongly related. Moreover, as a practical matter, the use of Energy Performance Certificates is widespread and EPCs, which sometimes include information relevant for checking the carbon footprint of buildings as well as their energy efficiency, offer the only currently available tag for offering green discounts.

As OECD (2021[2]) demonstrates, complex links tie housing and environmental quality. Environmentally related transport policies and infrastructure decisions affect housing. Links include land-use policies and regulation, taxes and subsidies to reduce the carbon footprint of construction and improve the energy efficiency of the existing building stock. The report points out that: “In 2018, 2/3 of countries still lacked mandatory building energy codes. High-performance buildings, such as near-zero energy buildings, still make up less than 5% of new construction”.

Alternative energy technologies are already cheaper than fossil fuels in many applications and will become cheaper across almost all applications. If we accelerate the transition, they will become cheaper faster, resulting in a virtuous cycle whereby the net zero agenda boosts living standards rather than being seen as a cost (Way et al., 2022[3]; Sharpe, 2023[4]). More generally, new regulations, taxes and subsidies should speed the adoption of new technologies, bringing down costs in the medium term. But in the short run, they potentially increase affordability problems, social exclusion and inequality. The green LVT would represent a significant change from current property tax systems in most countries, but serves as an ideal model for achieving multiple policy goals. While appealing in concept, the feasibility of implementation for many countries not already using land value taxes would need to be tested.

The OECD’s Building Back Better report (2021[2]) and its reports on property taxation (OECD, 2021[5]; OECD, 2022[6]) make a strong efficiency case for shifting away from transactions taxes on property, which impede labour mobility and consumer choice, to recurrent annual taxes. After the massive fiscal interventions due to the global pandemic and Russia’s large-scale war against Ukraine, most governments’ fiscal capacity has deteriorated. Broadening the tax base has become a high priority. As these crises have had the most extreme impact on those with the lowest resources, those with the broadest shoulders should carry most of the burden of extending the tax base. Moreover, as the poorest households tend to have the highest expenditure shares for domestic energy, regulation and carbon taxes should not disproportionately disadvantage these households, see the OECD Building Back Better report, volume 2 (2023[7]). This is why discounts for energy-efficient homes, which could give an advantage to the more affluent, need to be embedded in a progressive property tax structure. And home insulation for lower-income households needs to be supported by a subsidy.

Green discounts can be applied to any recurrent property tax. The next section of the paper expands on the urgency to implement green property taxes, to pursue multiple objectives of good tax design and to implement green discounts.

A key objection to recurrent property taxes, usually most vociferously made by the wealthiest property owners, is that cash-poor households in expensive properties can face hardship. This is easily addressed by permitting deferral of payment until the property is sold or transferred. The following section discusses the issue and why the take-up of deferral is often low. A simple design proposal for deferral is put forward that addresses the causes of low take-up.

Several countries have a mix of conventional property taxes and taxes based on land value, including split-rate taxes, though many have only the former. The subsequent section discusses the pros and cons of land value taxation, including issues of valuation, data issues around estimates of land in national balance sheets, and political feasibility. The final sections conclude and address issues of the transition from existing property tax regimes to green split-rate regimes in which buildings and land are taxed at different rates.

6.2. Criteria for property tax design

6.2.1. The urgent need to act

Climate scientists fear catastrophic tipping points in the global climate – see Lenton et al. (2019[8]) and IPCC (2021[9]; 2022[10]; 2023[11]). The global climate accelerator describes the phenomenon whereby an accumulation of greenhouse gases, by raising global temperatures, in turn, leads to the release of more carbon and even higher temperatures, ultimately making much of the planet uninhabitable. We face a climate crisis, as the world is dangerously close to the tipping points at which irreversible changes would occur. The United Nations' (2023[11]) IPCC AR6 report notes that previous reports understated the risks faced by humanity: "For any given future warming level, many climate-related risks are higher than assessed in AR5, and projected long-term impacts are up to multiple times higher than currently observed (*high confidence*). Risks and projected adverse impacts and related losses and damages from climate change escalate with every increment of global warming (*very high confidence*). Climatic and non-climatic risks will increasingly interact, creating compound and cascading risks that are more complex and difficult to manage (*high confidence*)". The global climate accelerator, and the financial accelerator (for instance, that operated in the Global Financial Crisis or GFC), are both characterised by highly non-linear feedback loops (Aron and Muellbauer, 2022[12]). In the GFC, falling real estate prices were amplified in the financial system and by its interaction with the real economy, leading to further price collapses. Thus, the tipping points and cascades in the climate literature have parallels in financial crises like the GFC or the Great Depression, manifested in falling stock markets and bankruptcies of homebuilders, the foreclosures of many homes, and failures of banks and other financial institutions.

The building sector is a large part of the problem in addressing climate change and reaching the global net zero target by 2050. Policy needs to be comprehensive, encompassing green building regulations, subsidies for insulation, subsidies for carbon storage, the promotion of green mortgages and the greening of finance more generally (see the Network for Greening the Financial System (2019[13]) or NGFS), and green taxation such as a carbon tax, emissions trading and green property taxes.

6.2.2. Criteria for property tax design

I consider ten criteria for property tax design: raising revenue; incentivising the green transition; reducing climate risk for the financial system; improving equity; stabilising the economy and the financial system; improving efficiency in resource allocation and promoting growth; simplicity and the cost of administration;

reducing housing supply constraints; balancing localism – subsidiarity and democratic accountability – and national objectives; achieving public acceptability and easing the transition from the previous system.

Raising revenue

After the massive fiscal interventions due to the global pandemic and Russia's war on Ukraine, most governments' fiscal capacity has deteriorated.[1] Broadening the tax base has become a high priority. Given the difficulty of avoiding the tax, the low cost of collection and the potential amount of revenue raised, recurrent property taxes have substantial advantages. Most countries have land registries or cadastres of titles and debt collateralised on property. As OECD (2021[2]) argues: "Many countries are underutilising recurrent property taxes and have substantial scope for increasing these levies".

Incentivising the green transition

Green discounts should be linked to the property's Energy Performance Certificate providing an incentive for all owners including landlords to improve the energy performance of their homes. Note that the EPC does not include only the EPC rating which places a building in a particular energy efficiency class but a good deal of additional information.[2] Green discounts would also generate a systematic incentive for owners to acquire an EPC and to ensure that the home's EPC was up to date and accurate. Even by itself, this encourages households to improve energy efficiency and reduce carbon emissions. It would also encourage mortgage lenders' engagement with owners to improve energy efficiency. OECD (2023[7]) argues that even where there is carbon pricing, additional measures are needed. In particular, landlords have weak incentives to engage in electrification and insulation if the savings accrue to tenants and cannot be recouped in higher rents. As such green investments may even result in higher property taxes, green discounts have a special role to play in strengthening green incentives for landlords.

Green discounts would also sharpen incentives for green mortgage pricing – lower interest rates or more favourable lending criteria for homes with better EPCs. There are good reasons why lenders would have such incentives: two risks worrying lenders are cash-flow problems of households with mortgages and collateral value falling below the mortgage value. The lower tax liability of a green property reduces the running costs of a building over its life-time, supporting household cash-flows. It also reduces the risk of cash-flow stress induced by higher energy prices. Furthermore, a green property, with lower tax obligations, faces a lower risk of a future price collapse – a transition risk – that will also protect the collateral value.

EPCs are influenced by the quality of home insulation, lighting and heating systems, external surface area and draft-excluding design features. As BPIE (2014[14]) notes, there has been significant evolution in the design and implementation of EPCs, with some country differences. EPCs often include information on the carbon footprint of a building in addition to the classification of a building into a particular energy efficiency class. In principle, green discounts could take into account not only the energy efficiency rating but also whether the heating system uses green hydrogen, green electricity or a fossil fuel. In the case of Great Britain, the rating system is already based on CO_2 emissions, rather than purely on energy efficiency. As the availability of green energy increases, green discounts should evolve to include not just energy efficiency but the carbon footprint of the energy used. Linking tax discounts to EPCs would also incentivise builders to prioritise qualities that respond to the resulting shift in demand towards greener building characteristics. As OECD (2021, p. 65[5]) points out, several countries including Brazil,[3] have begun to introduce rebates in their property tax systems that promote the use of green technologies including renewable energy installations and use, and /or energy efficiency.

While reducing life-time carbon emissions from the use of buildings, making building design and retrofitting the key, there could be another green aspect through carbon capture and storage. Only infrequently mentioned is the use of "mass" timber as a superb carbon store (UN Emissions Gap Report (2019[15]) and

Committee on Climate Change (2019[16])). In principle, discounts on property taxes could incentivise the use of timber in construction as well as operate via the energy efficiency rating.

Green incentives reduce financial instability risk from climate change

The real estate sector provides an important channel for the transmission of climate change to financial instability. The two major types of risks linked with climate change are transition risk and physical risk. Amplification of these risks concerning the real estate sector can occur via the financial accelerator (Duca, Muellbauer and Murphy, 2021[17]).[4]

Transition risks have direct effects on the real estate sector and banks. Carbon taxes, regulation and higher insurance premia will affect some real estate values. Early risk reduction via green incentives and early phasing in of valuation effects, rather than late and large disruption reduces risks of financial instability.

The reduction in physical climate risk from green incentives reduces risks of macroeconomic disruption and falling real estate values from rising sea levels, increased flooding and wildfires, storms, heat extremes or drought, making particular places ultimately uninhabitable. As insurance companies would be subject to sharply higher insurance claims, lower physical climate risks lower the threat to their financial stability.

The distributional aspect of green policies

Green policies could, in the short run, weigh most heavily on the poor, worsening housing affordability and fuel poverty. Public acceptance of green policies requires that the distributional issues are at the front and centre of policy design. Thus, higher short-run costs due to green taxes and tougher building regulations need to be compensated by targeted subsidies and progressive green taxes and finance. While OECD (2021[2]) under-emphasises the potential for green property taxation, the tax report OECD (2021[5]) highlights the issue, with recent examples of such policies. A green property tax could potentially resolve the conflict between affordability/equity and meeting climate goals. A similar argument is made in Leodolter, Princen and Rutkowski (2022[18]) for the European Commission. Chancel (2022[19]) has examined inequality in global carbon emissions. For example, in the United States, households in the top 10 per cent of incomes emit around 7 times as much carbon as households in the bottom half of the distribution. In China, the ratio is around 14 times. Chancel (2020[20]) also suggests a progressive wealth tax with a top-up for pollution to help pay for global efforts towards carbon reduction.

The inequality issue is currently particularly relevant since central bank policies and the pandemic have driven land and house prices up to high levels. Although higher house prices in many countries tend to reduce the Gini measure of wealth inequality (OECD, 2021[2]; Dossche, Slacalek and Wolswijk, 2021[21]), the gap has widened between owners and non-owners and between older and younger generations. Inequality has also increased within younger cohorts and between desirable locations and left-behind places.

Property taxes can easily be made more progressive – e.g., imposing a surcharge on the most expensive properties and/or giving a tax allowance on the first *x* euros of each property's value. To make the tax a little less onerous in high-priced regions, the tax allowance could be linked to regional house prices.

Market-value-based property taxes promote financial, macroeconomic and regional stability

Regarding financial and macroeconomic stability, annual property taxes linked to recent market values combined with macroprudential limits on household leverage reduce the incentive for property speculation based on expectations of high rates of return which tend to be based on recent property appreciation, as explained in Duca, Muellbauer and Murphy (2021[17]). Less volatile real estate prices, reduce the risk of over-valuations and price collapses.

Regarding regional stability, taxation linked to recent market values dampens drivers of higher regional inequality. The mechanism is the following: the rise in land prices and related tax obligations in growth hotspots should deter migration to hotspots (and further growth). But without market value-linked taxation, the stabilising role of rising local tax rates will be absent. Then potential migrants to hotspots will tend to keep coming, anticipating further capital gains; and residents sitting on large capital gains will tend to postpone moving to cheaper locations to cash in those gains. (see Cameron and Muellbauer (1998[22]) and Cameron, Muellbauer and Murphy (2006[23])) for evidence on UK regional migration).

Annual property taxes based on recent market values dampen such speculation, which otherwise prolongs the swings in widening regional inequality. There is also a carbon-saving benefit coming from less pressure for extra construction in the hotspots and improving housing stock utilisation in less prosperous locations.

Promoting efficiency and economic growth

Well-designed market-value-based property taxes, avoiding single-person and second-home discounts, improve the efficient use of the existing stock, e.g., encouraging downsizing by retired households. Even without an explicit green design of the tax, this is good for the environment as new construction is carbon intensive. Wealthy foreign owners often leave properties empty for large parts of the year, reducing availability for locals. Similar issues prevail in areas attractive to holiday makers, where locals are increasingly priced out. Higher tax rates on second homes and for international investors, e.g., a surcharge on owners who are not domestic tax payers or pensioners, would discourage foreign speculation and improve the utilisation of the housing stock.

Recurrent property taxes are hard to shift, unlike transaction taxes. Hence, lowering transaction taxes and increasing recurrent property taxes should result in large efficiency gains. Lower transaction taxes increase the flexibility of labour and housing markets and ease adaption to shifts in the economic environment (OECD, 2021[2]). For example, relocating to 20-minute neighbourhoods to reduce commuting times and increase localism is good for the environment (The Planner, 2021[24]). Relocation because of increased flood risk is made easier by lowering transaction taxes.

The evidence has mounted that credit-fuelled real estate booms have crowded out more productive investment, with negative consequences for sustainable growth, as well as increasing crisis risk. Müller and Verner (2021[25]) find crowding out of more productive investment in real estate booms with negative consequences for sustainable growth. They study the sectoral allocation of credit in 116 countries since 1940 and show that credit to non-tradable sectors, including construction and real estate, is associated with a boom-bust pattern in output, similar to household credit booms. Such lending booms also predict elevated financial crisis risk and productivity slowdowns.

More evidence for a negative relationship between rising real estate values and productivity comes from a study of US firms by Doerr (2020[26]). He finds that rising real estate values relax collateral constraints for companies that own real estate and allow them to expand production. Consequently, an increase in real estate prices reallocates capital and labour towards firms that have previously tended to focus on their real estate portfolios at the expense of other factors of production where gains in productivity are likely to be greater. This will tend to have negative consequences for aggregate productivity. Another study by Chakraborty, Goldstein and MacKinlay (2018[27]) shows that for US data, bank lending for housing crowds out commercial lending, lowering investment by firms borrowing from these banks, especially small credit-constrained firms. Basco et al. (2022[28]) find a similar result for Spain and document the negative impact on TFP in the manufacturing sector.

For China, Hau and Ouyang (2018[29]) show that real estate price rises caused by a restrictive land supply reduce bank credit to small firms, increase their borrowing costs, diminish their investment rate and compromise their output and productivity growth. For European countries, Grjebine, Hericourt and Tripier (2022[30]) argue, via a sectoral allocation mechanism that “there is a group of countries where real estate shocks generate TFP losses, including countries where real estate booms started early and were

substantial, such as Ireland, the United Kingdom, France, and Spain….. On the other hand, there is another group of countries for which our mechanism generates TFP gains – including Germany, Austria, and Italy, where real estate prices grew later or at a slower pace."

The bottom line is that current market value-linked property taxes would have moderated all these negative implications and improved sustainable economic growth.

Simplicity and cost of administration

Taxes that are easy to understand and administer help compliance, reduce collection costs and lower tax avoidance. As all properties are (or should be) registered at the land registry, legal avoidance of property taxes is very hard. Information from past sales records makes mass valuation methods quite cheap. Satellite data and access to recent transaction data on internet sites have enhanced transparency.

Incentivise supply

Housing supply restrictions, resulting from planning systems, zoning regulations and costs of providing new infrastructure, are a major problem in many countries, e.g. the United Kingdom (Hilber and Vermeulen, 2014[31]; Muellbauer, 2018[32]). Increases in property values from local infrastructure investment, taxed by a current market-value-based recurrent property tax can help fund such investment and reduce this source of supply blockage.

The balance between localism and national objectives

Much depends on the government structure in particular countries, e.g., the degree of federalism, and how proceeds of taxation are spent and by which agency. Principles of democratic control, subsidiarity, decentralisation and the use of local knowledge suggest that local government should control a substantial part of local spending and hence the revenue base.

One issue is national versus local tax rate setting. Purely locally determined tax rates can exacerbate vicious circles wherein declining locations with rising needs raise tax rates, driving out economic activity and reducing the tax base further. A balance needs to be struck between widening locational inequality and local democratic control. Some redistribution across local jurisdictions is needed. This suggests sharing of property tax revenue or a split system with one tax under local control, plus another at the national government level.

Public acceptability and transition

Tax reforms generate winners and losers. Tax reforms that benefit and are supported by a majority of the public are more likely to succeed. However, opposition often comes from powerful elites, especially from entrenched land-owning interests, 'know-nothing' climate change deniers – long financed by the fossil fuel industry, from a myopic, individualistic ideology that denies externalities and the very concept of 'Society', and from monopolistic media that promulgate disinformation. Most citizens and indeed elected public officials do not understand 'General Equilibrium' – the idea that there are many inter-relations, spill-overs, feedbacks and unintended consequences. Losers tend to shout louder than winners, especially for redistribution with widely spread small gains and concentrated large losses. Any change creates uncertainty which generates resistance. Hence there is a need for phased transitions.

But the biggest single issue for public acceptability of property taxes is the potential discrepancy between cash-flows and property values.[5] We turn to this next.

6.3. Designing property tax deferral

Since recurrent market value-linked property taxes take no account of the cash income of households, deferral is a key element for public acceptance. To protect cash-poor but property-rich households some jurisdictions, such as Canada, Denmark, Ireland and some US states, offer tax deferral (OECD, 2021[5]). OECD (2022, p. 87[6]) says: "There is a strong case for addressing liquidity issues through tax deferrals to reduce the potential for hardship and the need for less efficient and equitable forms of relief (such as broad exemptions or delaying property revaluations)."

In the United States, 24 states operate deferral options for retirees. Munnell, Hou and Walters (2022[33]) describe eligibility criteria typically depending on age (usually 65+), residence, income (typically under USD 20 000), and sometimes property values and with debt ceilings of typically 50% of value. The typical interest rate in 2019 was around 6%. In 9 states, the state finances the deferral programme to guarantee tax revenue for municipalities.

Take-up is remarkably low and this seems to be the case in other countries too. Munnell, Hou and Walters (2022[33]) suggest eligibility restrictions, ignorance, complexity and concern about high interest rates as possible reasons. They propose a simpler state-wide system for which all 65+ households would be eligible. This would eliminate onerous eligibility tests for that age group. The interest rate would be given by the state's borrowing cost plus a buffer to cover administrative costs and defaults. But interest rate risk and downside house price risk for the deferring households are still likely to discourage participation.

In Muellbauer (2018[32]), I proposed a simpler system in which every household, or at least those headed by a person of retirement age, would have the right to defer the tax. The tax authority registers a proportionate interest at the Land Registry equal to the unpaid tax for each year deferred, to be settled when the property is sold or transferred. It is important for revenue flows that the liability to the tax authority is settled at that point and that properties encumbered with a tax liability are not allowed to be sold before that liability is settled. A small discount for cash payments would help stabilise annual revenue flows and roughly offset what otherwise could be seen as a subsidy to the deferrers.

My 'proportion of equity' deferral proposal is easy for tax payers to understand. Ticking a box on the property tax form requesting deferral without having to be means tested, undergo complex form-filling and complex interest rate calculations is a big advantage. As we know from research on the financial sophistication of consumers, many do not understand compound interest. In contrast, the fraction of a home which is owned is a simple concept. For example, with a 1% tax, after ten years of deferral, the property owner would retain 90% of the then-current value of the registered property title. By comparison with deferral taking the form of paying cumulative interest on unpaid tax bills, the household is protected against the risk of higher interest rates over the deferral period, and lower property values at the point where the next transaction takes place and the debt needs to be settled. That could leave the net equity position in a poor state. On the other hand, if interest rates turned out to be lower than expected and house prices higher, the household would be worse off under equity-based deferral.

For the tax authority considering deferral with cumulative interest payments versus equity-based deferral, the relevant question is how the expected profile of real interest rates compares with that of real house price appreciation. In most OECD countries since 2000, annual real house price appreciation has exceeded the real return on 10-year government bonds. In the G7, the exceptions are Japan and Italy. From 1997 to 2022, Germany joins the exceptions as the average real bond yield slightly exceeded the average real house price appreciation. Since 2010, Italy is the only exception in the G7 (Table 6.1). Of course, with a reformed current market-value-based property tax, real house price rises would have been more moderate and history is not necessarily a reliable guide to the future.

Municipalities need stable revenue streams. It is possible that at the beginning of the introduction of an equity-based deferral scheme – if many households choose deferral – revenues will drop temporarily. Revenues will pick up and steady later as transactions or settlements of estates of the deceased occur.

Offering a small discount to those choosing cash payment should help stabilise revenue streams. Moreover, national or state governments that can take the long view and borrow cheaply, especially in recessions, should underwrite deferral schemes to stabilise local revenue streams.

Table 6.1. Comparing annual average real returns on 10-year government bonds and house prices

	USA	Canada	UK	France	Germany	Italy	Japan
Real bond return (annual percentage)							
1997-2022	1.59	1.79	1.64	1.72	1.26	2.07	1.20
2000-2022	1.21	1.47	1.27	1.32	0.87	1.85	1.14
2010-2022	0.31	0.26	-0.11	0.24	-0.72	1.57	0.25
Real housing return (annual percentage)							
1997-2022	2.64	4.51	4.34	3.26	1.16	0.29	-0.66
2000-2022	2.58	5.11	3.79	3.36	1.52	0.44	-0.44
2010-2022	3.35	5.20	2.39	1.32	3.87	-2.19	1.85

Note: Real bond return is defined as the yield minus 100 x 4-quarter change in log consumer expenditure deflator. Real housing return is defined as 100 x 4-quarter change in log real house price index.
Source: OECD Analytical House Price database, OECD Key Short-term Indicators.

This equity-based deferral mechanism has useful stabilisation properties for the economy. In periods when house prices are expected to increase, the incentive to pay cash increases, a counter-cyclical property in terms of private sector spending. In periods when house prices are in retreat, households have a greater incentive to defer, which improves their cash flow and is also usefully counter-cyclical. Indeed, this deferral mechanism shares some of the features of home equity insurance recommended by Shiller and Weiss (1999[34]). Shiller and Weiss bemoan the virtual non-existence of insurance contracts to protect households from major falls in the value of their homes. Knowing that their tax liability would fall if house prices fell removes a major source of stress for deferring households.

6.4. Land value taxes versus property taxes

OECD (2021[2]) argues: “Relying less on housing transaction taxes and more on annual taxes on immovable property while shifting the base of these taxes from the value of structures to current land prices would bring multiple benefits. The move away from transaction levies towards recurring taxes would lower obstacles to mobility, facilitating labour market adjustment and boosting economic growth. Shifting the basis from the value of structures to current land prices would encourage construction in valuable developable areas, helping to address supply-demand mismatches. Many countries are underutilising recurrent property taxes and have substantial scope for increasing these levies.”

Land value taxation has a long history. McLean (2005[35]) and Kumhof et al. (2021[36]) trace the history of LVT back to the French Physiocrats, followed by Tom Paine (1797[37]), Ricardo (1817[38]) and ‘Single Tax’ Henry George (1879[39]). In the United Kingdom, Lloyd George tried to introduce LVT in 1909 and again in 1914 (with the support of Winston Churchill). He failed partly because of the land-owner lobby, and partly because the Land Registry was still not ready by 1914, and post-WW1, the political landscape shifted. While debates over land value taxation never disappeared, in recent years there has been quite a resurgence in interest. This is probably the result of a better understanding of the important role land plays in the economy, practical experience with land value and split-rate[6] taxes and greatly improved spatial data and data processing (Kumhof et al., 2021[36]).

6.4.1. The efficiency of taxing the asset value of land and green discounts

Economists have long regarded LVT as the most efficient type of tax. OECD (2022, p. 117[6]) says: "As the supply of land is highly inelastic, taxes on the unimproved value of land are economically efficient and therefore contrast with taxes on improvements (i.e., buildings), which may affect investment". The 2011 Mirrlees Review (Mirrlees et al., 2011[40]), commissioned by the Institute for Fiscal Studies (IFS) to examine sensible reforms of the UK tax system, argued that business rates should be replaced by a land value tax.[7] However, the Mirrlees Review also argues that homes, and not just the land on which they sit, should be taxed as the services that homes provide are a form of consumption, and taxing consumption is part of an efficient tax system. This contradicts, therefore, the Georgist 'single tax' principle and provides a prima facie case for a split-rate tax. Kumhof et al. (2021[36]) review the literature on the efficiency of LVT, while Bonnet et al. (2021[41]) expound on the efficiency of LVT in several general equilibrium settings, including where second-best issues are important.

Taxes on the asset value of land, capture more precisely than property taxes increases in value stemming from infrastructure investment, improvements in the quality of local schools or human health implications of the environment, and thus help fund such investment.

Land value taxation helps land value capture (LVC) – where gains in land values from shifts in planning or zoning permission and public investment – accrue partly to the general public and not just to the land-owner (OECD (2022[42])). LVC schemes or infrastructure levies are typically leaky. For example, 'hope value' often affects the prices of land currently zoned for low-value uses such as agriculture. This means that gains in value that result from a decision to rezone to more advantageous uses tend to be underestimated. Much of the planning gain then accrues to previous owners or to investors who have taken options on the land (see further discussion below). These are arguments for the case that a split-rate tax should have a higher rate on the land component than on the building.

To shift LVT in a green direction requires taking into account the carbon emissions of buildings on a plot of land – hence a type of split-rate property tax. This implies a two-part tax: one tax on the site value, plus a tax on the building with green discounts. The building tax would be proportionate to the value of the structure and the green discount would depend on the EPC. As noted above, Energy Performance Certificates often include a great deal of qualitative information relevant for evaluating a building's carbon footprint as well as placing it into an energy efficiency class rating.[8] The design of property tax discounts could take both types of information into account. Thus, owners in a well-insulated high-rise apartment block would pay relatively low taxes, particularly if the main energy sources were sustainable. The proportions of a plot devoted to a garden or a building would affect the tax paid.[9] For public acceptability, this is potentially important as labelling this version of LVT as a 'garden tax' would then be avoided.

Such a split-rate tax with green discounts captures the best of both worlds: it shifts behaviour in favour of saving the planet, without taxing increases in the value of retrofitted buildings. Note that a straight property tax would actually penalise such green investment that raised the value of the property. It can be argued that even stronger incentive effects could come from property tax discounts, not on the EPC rating of a building, but on improvements that come from investing, for example, in home insulation and heat pumps. However, using progressive subsidies, as already used in a number of countries, for the cost of such investment is likely to be more effective in incentivising such green investment, especially for cash-constrained low-income households.

Applying the tax to empty land zoned for high-value uses encourages development and discourages land hoarding for speculative purposes. The split-rate system would work well as a business tax with land tax rates similar to residential land but different tax rates, typically lower or zero, on business property located on the land. Replacing conventional business property taxes with this split-rate tax would go a long way to meeting the recommendations of the Mirrlees Review.

A surcharge on owners who are not domestic taxpayers or pensioners would discourage foreign speculation. As noted earlier, regular revaluations are necessary to discourage land speculation and to avoid cliff-edge changes. A three-year average of annual valuations would smooth cash flows. As noted earlier, to make the tax a little less onerous in high-priced regions, a tax allowance could be linked to regional land prices. And such a radical tax reform would need to be phased in over several years.

6.4.2. Distributional issues around the green split-rate tax

For greater progressivity and to avoid capturing low-value land, a tax allowance for the first x euros of the *per sq. m land price* should be given. Note that such allowances on land *parcels* suffer from tax escape through sub-division and therefore should be avoided.

The land element in the split-rate green tax is more progressive than the structures element: land ownership in most developed[10] countries is far more unequally distributed than housing wealth or indeed income. In England, for example, according to Shrubsole (2020[43]) over half of the land by area is owned by around 25 000 owners and owner-occupiers of residential dwellings own only about 5 per cent.[11] The distribution of land by market value in England will be less concentrated than the distribution by area, though still much more unequal than the income distribution. There is some literature that addresses the question of whether a tax on land values is more or less progressive than a tax on total property values. England and Zhao (2005[44]) examine the split-rate property tax in Dover, a small town in New Hampshire, finding that a shift to a pure land value tax would be regressive. Bowman and Bell (2008[45]) replicate the methodology for the larger city of Roanoke, Virginia, finding the opposite result. They confirm the progressive nature of a shift to LVT in two other cities in Virginia. Plummer (2010[46]) finds that in the third most populous county in Texas, a shift to a pure LVT would be progressive.

Barbosa and Skipka (2019[47]) analyse more comprehensive data than previous studies, but confined to owner-occupiers. For Germany, they find that land ownership is more concentrated than property ownership, but land values are slightly less correlated with cash income than overall property values. They find that among owner-occupiers a shift from a property tax to a pure LVT would create somewhat more losers than winners in the lower income quintiles. However, as over half of German households are renters, the opposite conclusion almost certainly holds for households in general. Renters tend to have lower average incomes and are more likely to live in apartments with a lower share of land than the average for owner-occupied homes. Assuming landlords pass on property tax to the tenants, a shift to LVT is likely to benefit most renters.[12] Moreover, Barbosa and Skipka do not consider the age of households and it seems likely that retired homeowners with low cash incomes tend to live in homes with above median land value shares. The deferral scheme explained in the previous section would therefore be likely to modify their conclusion even for owner-occupiers, by breaking the link between the tax burden and current income.

It is important to realise that the above studies of the distributional effects of different types of property taxes are based on a concept of cash income. For welfare measurement, imputed rent from owner-occupation needs to be included in income, as is recognised in the national accounts concept of household disposable income. By breaking the link between the property tax paid and cash income through an easy option deferral mechanism, it becomes realistic to examine the distributional implications of property taxes in terms of household disposable income. And these are transformative: no longer is the cash-poor widow owning a home in an expensive location, ‘poor’ in terms of household disposable income, but she is very well off compared to a tenant with the same cash income but paying rent.

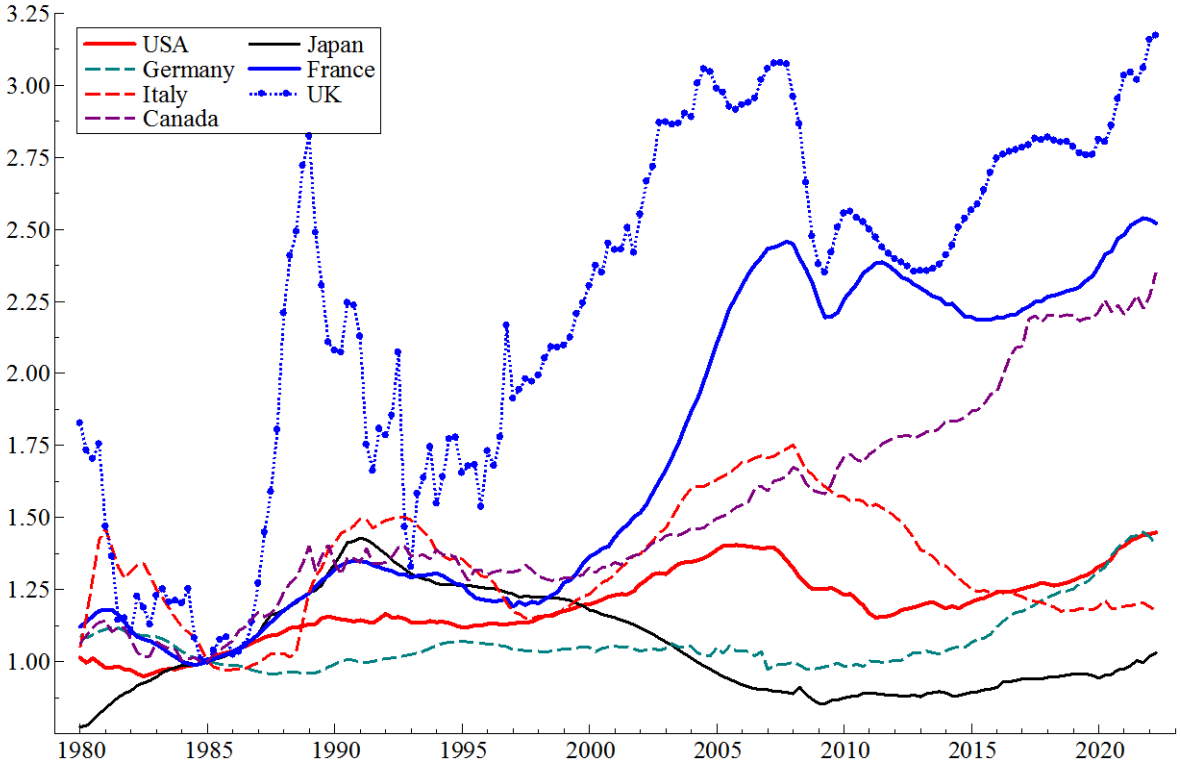
A proportional property tax, and especially one with higher rates on land, is necessarily progressive for household disposable income and can be made even more progressive through tax allowances as noted above. The extra progressive element in the land value component would tend to offset the burden on lower-income households in poor-quality housing from carbon taxes, tighter building regulations or costs of insulation, hence making green policies more acceptable.

Several OECD countries offer tax incentives for energy-efficient retrofitting of homes through the income tax; however, take-up has been disproportionately stronger for higher-income households (2022, p. 114[6]). As land ownership is far more unequally distributed than income or the structure component of property values, the green split-rate tax would automatically offset the green discount that potentially benefits more affluent households, by the highly progressive LVT element. However, home-insulation subsidies for the poorest households will still be necessary.

6.4.3. Stability issues and the share of land in tangible fixed assets

The split-rate tax incorporating LVT is better for financial and macroeconomic stability than conventional property taxes. House prices combine bundles of land and structures. As house prices are far more cyclical and volatile than construction price indices, this must be because land prices are even more volatile. Since 1985Q1, the ratios of national house price indices to construction cost indices have risen in all G7 countries except Japan, where the ratio boomed before 1985 (Figure 6.1). This implies that housing land prices have risen more than construction costs, and by far more in the United Kingdom, France and Canada. This also implies that since 1985, the share of land in the total value of residential property has risen everywhere except in Japan.[13] The OECD has invested considerable effort in improving the quality and international comparability of estimates of the land component in balance sheets, especially for households. OECD/Eurostat (2015[48]) describes four valuation methodologies for the national balance sheets.

Figure 6.1. Price indices for housing relative to construction costs



Note: Historical data for earlier years for the deflators from Oxfordeconomics.com were linked to OECD national accounts data. Base 1985Q1.
Source: OECD for house price indices and deflators for fixed residential investment.

The ‘direct method’ estimates land values on a price-times-quantity basis, where the total land value is the sum over all plots of the land prices per hectare for each plot multiplied by the area in hectares of the plot. The method begs the question of the origin of the price per hectare data, which may not be easily found especially where buildings occupy plots and vacant plots are rarely traded.

The ‘residual method’ subtracts the estimate of the construction value – typically the net capital stock – from the current market value of combined land and buildings. This is the most commonly used method, though Kumhof et al. (2021[36]) express reservations as the depreciation rates used for structures can be hard to assess. They can be so small as to sometimes result in negative values for the land on which the structures sit. For example, a physically sound but economically obsolete building can depress the overall property value. Its depreciated valuation based on its original cost indexed to construction cost indices will then exaggerate its share of the overall property value, depressing the estimate of the land share.

The ‘land to structure ratio method’ assumes knowledge of the ratios of land value to structure at a disaggregated level. It then applies these ratios to the value of combined land and structure bundles. The idea here is that these ratios could be obtained by estimating ratios for a representative sample of types and locations of structures and scaling up these estimates to the whole population of structures.

Finally, the ‘hedonic method’ can take a variety of forms. For example, suppose there is a sample of observations that includes some vacant plots and (typically many more) observations on bundles of land and buildings. Using detailed building characteristics such as the footprint of the building, the number of rooms, the type of building, its age and location, and the footprint of the plot on which the building stands, a regression of market values is used to separate the value of the building from the value of the underlying land.

Checking land value share estimates with an alternative approach

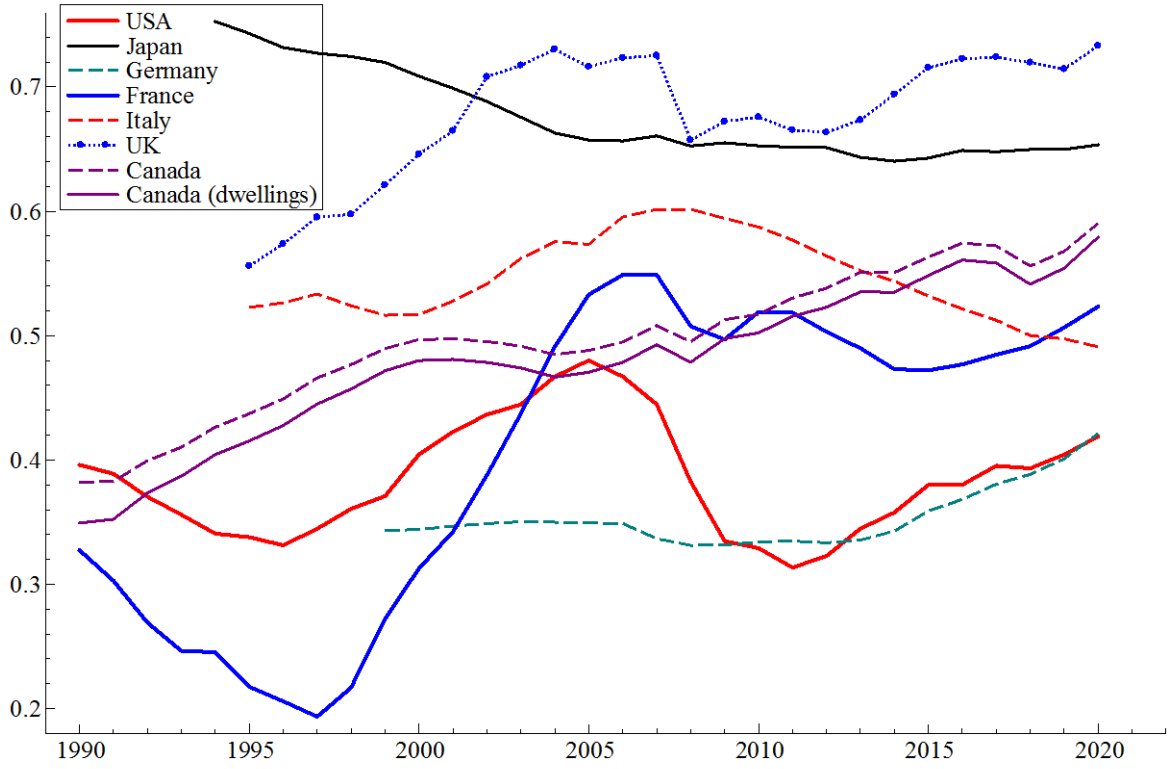
For households, residential property dominates the category of tangible fixed assets. Therefore, the ratio for the household sector of land to tangible fixed assets is a good estimate of the land share in residential property owned by households. Figure 6.2 shows these data[14] for the G7 economies up to 2020. For the United Kingdom, Canada and Germany, land shares are at historic highs, and in France and the United States, not far from previous records.

Because the value of a home is a combination of the value of the structure and of the land it occupies, an alternative approach to tracking the evolution of the share of land is as follows. Let s denote the share of land in a base year. An index of house prices HP can then be defined by s $\times LP + (1-s) \times CP$, where LP is a housing land price index and CP is the construction price index, with these indices referenced to be 1 in the base year. The share of land in the value of a typical home is then

$$S = s \times LP = HP - (1-s) \times CP \quad (1)$$

If there is no substitution between land and structure as a result of relative price movements, equation 1 can be used to trace the evolution of the land share away from the base year. Since substitution takes time and stocks adjust only slowly, equation 1 should be a good approximation to the evolution of the land share. Taking the base year of 2005, let us use the OECD estimate of the land share in that year to construct these alternative estimates of the evolution of land shares. By comparing the two estimates one can learn something about the nature of the land valuation exercises carried out in the different countries. According to OECD/Eurostat (2015[48]), in a 2011 comparison, the United States, United Kingdom, France and Italy were using the residual method for valuing the land share in balance sheets of tangible assets. Canada was using the land-to-structure ratio method. Germany was using a direct method, assembling granular data on land parcels, by type, in combination with purchase values of building land from the national statistical office. Japan was using a similar direct method in combination with publicly assessed land values.

Figure 6.2. The shares of land in tangible fixed assets on household balance sheets



Source: OECD, Balance sheets for non-financial assets owned by households and non-profit institutions serving households.

Figure 6.3 plots these comparisons with the OECD land share estimates. Except for the United States, the United Kingdom and the partial exception of France, the profiles of the OECD national balance sheet estimates of the land share are generally flatter and less volatile than the profiles of the fixed weight index method. The graphs for Italy, Germany, Japan and Canada show lower volatility and a smaller increase over time for the national balance sheet estimates of the land share compared to the fixed-weight method based on OECD house price and construction cost indices. This is confirmed by regressions of the balance sheet estimates on current and lagged fixed-weight estimates (Table 6.2). For all four countries the long-run coefficients on the fixed-weight estimate range between 0.42 and 0.57, and are significantly below 1. Moreover, for Italy and Japan and to a degree Germany, the national balance sheet estimates lag behind the fixed-weight estimates.

What might explain the differences between national balance sheet and fixed-weight estimates?

There are several possible explanations for the differences highlighted in Figure 6.3 and Table 6.2. The first point to note is that we know that year-to-year changes in land prices are far more volatile than those for values of structures. A case study for Finland (OECD/Eurostat, 2015, pp. 85-87[48]) compares the residual-based approach with more direct estimates based on granular data on the land covered by each building and official estimates of local land value per sq. m. It also shows a smoother pattern for the latter than for the residual-based approach. A simple explanation, which has parallels for Germany and Japan, is that available estimates of land prices lag or fail to fully capture true movements in underlying market prices of land. In the case of Italy which, unlike Germany and Japan, uses the residual method, it is possible that the mix of sources of local real estate price information, which includes administrative and tax office

Figure 6.3. Households' shares of land in tangible fixed assets compared with fixed-weight estimates of shares in residential property

Note: Shares for households and non-profit institutions serving households (NPISH), from national balance sheets refer to the share of land in tangible fixed assets. Fixed-weight estimates of land value shares are derived as shown above, based on price indices in equation 1, with the fixed weight calibrated to the land share from national balance sheets at the end of 2005.
Source: OECD, Balance sheets for non-financial assets owned by households and non-profit institutions serving households, author's calculations. See Figure 6.1 for sources of the price indices.

Table 6.2. Regressing household land value shares on fixed-weight estimates of the shares

	USA	Canada	UK	France	Germany	Italy	Japan
Variable							
C	-0.178	0.299	0.0398	0.110	0.185	0.293	0.304
t-statistic	*-2.85*	*13.1*	*0.633*	*5.89*	*21.9*	*30.6*	*8.03*
Fixed-weight share (t)	1.35	0.423	0.952	1.15	0.238		
t-statistic	*9.21*	*10.1*	*10.5*	*8.52*	*3.70*		
Fixed-weight share (t-1)				-0.425	0.222	0.524	0.568
t-statistic				*-3.75*	*2.84*	*27.1*	*9.42*
Std. error of regression	0.0220	0.0139	0.0112	0.0121	0.0044	0.0059	0.0079
Adjusted R-squared	0.807	0.835	0.845	0.962	0.967	0.973	0.814
Durbin-Watson	0.585	0.476	0.397	0.426	0.948	1.27	0.515

Note: Land value shares for households and NPISHs are taken from national balance sheets, see notes to Figure 6.2 and Figure 6.3. For fixed weight estimates of land value shares, see note to Figure 6.3. Insignificant coefficients have been set to zero.
Sources: see Figures 6.1-6.3.

information, understates or lags behind more timely national house price indices. For these countries, one can argue that the national balance sheet estimates are implausibly smooth and not cyclical enough.

The fixed-weight estimates shown in Figure 6.3 may, however, overstate volatility and cyclicality in some cases. The house price indices used are derived from the OECD analytical data base and are generally transactions-weighted indices. Transactions-weighted indices could exaggerate the average rise in prices: more frequently traded houses may have appreciated more or may be disproportionately located in large cities where price rises have outpaced those in the rest of the country. UK evidence for this comes from ONS (2018[49]) and Mason and Pryce (2011[50]). According to ONS (2018[49]), from 2009 to 2015, the transactions-weighted index in the UK increased significantly more than a stock-weighted index. However, this cannot explain the difference between the two UK valuation measures shown in Figure 6.3, suggesting that the ONS balance sheet estimates were based on transactions-weighted house price indices rather than stock-weighted indices. Indeed, the UK house price index used by the ONS tracks quite closely the index from the OECD database.

For the United States, Pennington-Cross (2005[51]) found little evidence for long-run differences between stock-weighted and transactions-weighted indices. However, more recently, Contat and Larson (2022[52]) show that in the United States, differences between the two indices vary greatly over time. Since 2005, transactions-weighted indices appear to have underestimated the decline in house prices compared to stock-weighted indices. This could explain some of the divergences between the fixed-weight estimate of the land share based on OECD (transactions-weighted) house price indices compared to the national balance sheet estimates, assuming that in the United States, the latter relied more on stock-weighted indices.[15]

An important question is whether trends in substitution can explain part of the deviations for other countries between the national balance sheet and fixed weight index estimates. The higher relative price of housing land may have resulted in some substitution towards structures and away from land in the cases of France and Germany. Had fixed weights from years before the rise in house prices been used for those two countries, the fixed-weight index method would, in recent years, be showing substantially higher land value shares than the balance sheet estimates. This is consistent with substitution towards investment in buildings, and conserving land after the relative price of land rose. For the United Kingdom, this mechanism seems to have been absent: from 1996, the fixed-weight method gives a remarkably close match to the ONS estimates, with no tendency for the relative increase in land prices from 1996 to 2006 to show itself in a tendency for the fixed-weight estimates to outpace the ONS estimates. It is important to recognise that

the tendency for substitution in response to relative prices may be absent in highly speculative markets: investment demand and search for yield in low-interest rate environments by wealthy investors may have offset a substitution tendency among those mainly interested in housing as shelter. This could explain the apparent absence of a substitution effect revealed by the close tracking of the fixed-weight estimate for the United Kingdom with the ONS balance sheet estimate. Since speculative fever would surely have died down after the GFC, there could well have been some re-emergence of a substitution effect that could account for some of the small relative increase in the ONS estimate of the land value share relative to the fixed-weight estimate after 2009.

Another possibility may result from a regional bias in the OECD (transaction-weighted) house price indices which, in some countries, may be over-representing large cities, where house prices outpace and rise ahead of prices in the rest of the country, a particularly strong pattern in the last 20 years.[16] This highlights the obvious point that the land share in tangible fixed assets from national balance sheets skates over a great deal of heterogeneity within countries, with far higher land shares in large and dynamic cities than in small ones or non-touristic rural locations.

None of these explanations looks particularly plausible for Canada, where from 1990 to 2002, the national balance sheet estimates strongly contradict the profile from the fixed-weight method. The problem likely lies in the estimates of housing wealth.[17]

The evidence that among these seven economies, the United Kingdom is the most extreme in the relative valuation of land, deserves further comment. Above we surveyed international evidence that credit-fuelled real estate booms, to which the United Kingdom has been particularly prone, crowd out more productive investment, with negative consequences for sustainable growth, as well as increasing crisis risk. In Muellbauer and Soskice (2022[53]), we argue that a mix of policies originating with the Thatcher governments of the 1980s are fundamental to the many problems the United Kingdom faces. The policy mix includes the preservation of exorbitant property rights for land-owners, loose financial regulation, the selling off of the social housing stock without replacement, a highly regressive property tax – both regionally and individually (Muellbauer, 2005[54]; 2018[32]; Fairer Share, 2021[55]), relatively high transaction taxes, restrictive and cumbersome planning regulations, and poor incentives for local governments to permit building. We argue that lacklustre economic performance, the severe damage to the economy from the crises that followed the late 1980s and mid-2000s credit-fuelled house price booms, the United Kingdom's relatively poor infrastructure and low national saving and investment rates, high levels of individual, regional and inter-generational inequality, and the fact that the United Kingdom has the longest commuting times and the worst insulated homes in Western Europe can all be linked to this policy mix.

Many countries lack longer series even for the housing wealth component of household balance sheets let alone estimates of the value of the land component. Given the importance of the need to better understand the role of land markets in the economy and how this differs across countries, this is an area where more work needs to be done by statistical agencies.

6.4.4. Valuation issues for the land value tax

Valuation methods that are fairly satisfactory for aggregate balance sheets are not necessarily adequate for the taxation of individual properties.[18] Difficulties in the measurement of land values are often seen as an explanation for why land value taxes are not more widespread.[19] In principle, LVT should apply to the best-use unimproved land value as distinct from the value of the building on the land. A system of land use regulation based on zoning likely will generate clear land values for land zoned for particular uses. In contrast, a discretionary planning system as used in the United Kingdom, will more often, as Cheshire and Hilber (2021[56]) argue, create ambiguities for the unimproved land values of vacant plots since 'hope value' (of obtaining future planning permission) will affect prices of vacant plots. However, if hope values can be estimated, for example from recent sales or land options[20] this could be more of a benefit of LVT rather than a problem. If the hope value on a piece of vacant land is incorporated in the valuation, LVT

spurs efforts to obtain development rights and improves land value capture for the public interest by reducing speculative hope values.

There are many more transactions of 'house plus land' bundles than of vacant plots. Property values are thus more transparent than underlying land values. One measure of land value is property value minus the replacement cost of a similar structure. If LVT were based on such a residual measure, there could be a misreporting incentive for building insurance-based measures of rebuilding costs in high land-value locations. The replacement cost could also overestimate the value of the structure where deterioration through age has occurred and hence underestimate the land value.[21]

Hedonic mass-valuation measures can be applied to granular multi-year house price data to extract land values (Diewert, de Haan and Hendriks, 2011[57]; 2015[58]). Taking account of the age of the structure and any other indicators of the condition of the building is an important part of such exercises. Construction price indices are largely national and not location-specific. Controlling for their movements improves the identification of local land prices by sorting movements in building values from land values. The hedonic regression then can look like this:

$$(Property\ value)_t = A_t \times (land\ plot\ area) + CP_t \times (1-D)^{age\ of\ structure} \times F(structure\ floor\ space\ and\ other\ characteristics) \quad (2)$$

where CP_t, the construction price index measures movements in the price of constructing a square meter of structure, D is the annual geometric depreciation rate and the age of the structure is in years. The per unit area land price A_t and the depreciation rate D are the parameters to be estimated, along with the parameters of structure floor space and other characteristics. This model therefore allows a decomposition of the property value into land and structure components. The hedonic model for condominium unit sales in high buildings is a little more complicated and was implemented by Diewert and Shimizu (2016[59]).

It can be argued that such estimates of land values should be at least as good as relying on hedonic mass-valuation methods to obtain property values since land value gradients are likely to be relatively smooth and continuous. Consider, for example, a suburban street of houses with heterogeneous characteristics. There could be small differences in per square meter land values between each side, e.g., because sun facing, or at each end, e.g., because of exposure to traffic, but land parcels otherwise should have near-identical per square meter values along the entire street. The continuity of implied land price gradients is an advantage, effectively averaging information to reduce house-specific measurement errors.[22]

The case of agricultural land needs further comment as much of the discussion around valuation issues for LVT has focused on urban settings. Farming tends to be very land-intensive, especially in more marginal hill farms where livestock graze freely with little labour and capital input. In most countries, major exemptions for agriculture apply to recurrent land taxes or property taxes dominated by land values. The value of farming land depends considerably on the efforts of the farmer to ditch, fence, fertilise and generally maintain quality, making the 'unimproved value' an elusive concept. This weakens somewhat the efficiency argument for pure land value taxation of farmland. However, given these exemptions and other tax privileges, e.g., for estate duty, that apply to agricultural and forest land in a number of countries, in the low interest rate environment of the last decades, there have been large portfolio flows, including from international investors searching for yield, into these assets, driving up their prices (Savills, 2020[60]). It can be argued that this has increased barriers to entry into farming and has contributed to the exit of family farms. It has also increased the riskiness of farming for those without large capital behind them. Moreover, as towns and cities have expanded, the rise in prices of nearby agricultural land has contributed to the housing affordability problem. While use-based exemptions for national parks and areas of outstanding natural beauty make sense, it is better for general principles to govern tax criteria. On distributional grounds and for limiting costs of tax collection, it makes sense for agricultural land to be included in broad-based property tax regimes, but for tax allowances to apply. For example, the first EUR 10 000 per hectare of value could be tax-exempt. In France, for example, this would exempt the great

majority of farmland. In countries such as the United Kingdom, Germany, Denmark and Ireland, where average farmland prices are higher, tax allowances would need to be set at higher levels.

Cheshire and Hilber (2021[56]) compare LVT and property taxes on various criteria, raising land valuation difficulties as a particular disadvantage of LVT, though LVT wins on efficiency and stabilisation. However, the conclusion that the distributional implications are similar is not plausible as land is much more unequally distributed (see above). They argue that LVT loses on revenue raising, simplicity, public acceptability and ease of transition. However, a green split-rate property tax with an LVT element does better than a pure LVT on revenue raising, public acceptability and ease of transition. Moreover, errors in valuing land (and the relative contribution of buildings) matter less than in a pure LVT. A split-rate property tax is more complex. But there is some experience with split-rate taxes from Hawaii, Pennsylvania and Finland (OECD, 2021[5]; OECD, 2022[6]) and (Hughes et al., 2018[61]). Some countries, such as Denmark, have a conventional property tax alongside a land value tax. Once land valuations become transparent and built into the system, people will adapt. In Germany, the separate valuation of the land and building component has long been a feature of property valuation. Barbosa and Skipka (2019[47]) provide an explanation of the system, the valuation methods and illustrative findings. The 'Bodenrichtwert' – the standard land value – of the locality continues to play an important role in the current revaluation and tax reform exercise in explaining the composition of the property tax.[23] Enhancing public understanding in this way should improve local accountability and more accurate estimates of land price gradients should help local government decision-making, e.g., in planning and infrastructure decision-making.

6.5. Elements of a transition

The evolution from existing property tax systems to a green split-rate system in which land and buildings are subject to separate tax rates needs to be handled with care and phased in gradually. Step 1 should be to invest in the cadastral registration system, which is not complete in all countries. Vacant and agricultural land are sometimes not covered by the prevailing property tax systems, whether for households or for businesses. Fairly complete registration is needed for the extension of the tax base, an important part of the desirable reform, but subject to tax allowances for land with lower per hectare value, and exemptions for public land such as nature reserves. Step 2 should be to invest, where necessary, in robust systems and trained staff for generating energy performance certificates (EPCs). Some countries would do well to reconsider the harmonisation of local, regional and national tax regimes and the funding structure of local government. Basic rules and valuations should be set at the national level. There should be limits on local tax-setting powers to prevent excessive tax competition between local and regional governments. A balance needs to be struck between encouragement of local and regional autonomy and national criteria for efficient resource allocation, macroeconomic objectives and preventing excessive locational inequality.

Since, in many countries, valuations for the prevailing property tax are out of date (OECD, 2022[6]), updating valuations to current market values needs to be step 3, run concurrently with steps 1 and 2. Given the new valuations, tax rates for residential property and businesses would need to be adjusted in any case in step 4. Bringing in the simple equity-based deferral system for residential property, with small discounts for cash payers (explained above), is highly desirable at this stage as it prevents revaluation shocks to the cash-flow of those with limited ability to pay. Even with incomplete coverage of EPCs across housing, green discounts for homes with favourable EPC ratings should also be introduced at this point. Both simple deferral and the green discount are crucial elements in gaining public acceptability for property tax reform. As public alarm about the climate crisis mounts, especially among younger generations, the rationale for the green discount will be more and more widely appreciated. Initially, a no-strings deferral should be offered to the over-65 age group. Later, given experience with take-up and administration, there can be consideration of rolling out the offer of deferral to all owners of residential property. Throughout, a programme of education and consultation to build public acceptance and achieve a degree of cross-party consensus would be highly advisable.

Even with a deferral for older households and the green discount, it makes sense to phase in the valuations used to implement step 4. For example, in the first year, the effective property value for taxation could be based on one-third of the new value and two-thirds of the old. In the second year, the effective value could be two-thirds of the new and one-third of the old, with the transition completed in the third year. Extensions to longer transitions are obvious.

In step 3, the focus needs to be on an early update of overall property values. As Fernandez Milan, Kapfer and Creutzig (2016[62]) show in some detail, prevailing property valuation methods in most countries need improving, especially as regards land valuation. They suggest that the integration of GIS information and automated mass valuation systems is the way forward,[24] an area where Denmark appears to be the current leader in practical application. Step 5 should implement improvements in valuation systems with a view, for each property, to split the overall value into land and building components. Finally, in step 6, tax rates for the two components can gradually be separated, with tax rates on land values adjusted upwards relative to tax rates on buildings.

One important question is at what stage to incorporate the extension of the tax base to include vacant and agricultural land. This is mainly a question for the business tax regime. Since expanding the tax base is such an important current issue, with widespread concerns about the fiscal capacity of states after the massive increase in government spending both after the GFC and during the Covid pandemic, early extensions are advisable. As ever, phasing in these changes is advisable to prevent excessive sudden shocks to cash-flows and asset prices.

6.6. Conclusions

The paper has explained the urgency to implement green property taxes given the climate emergency. It considered how to implement green discounts in the context of the multiple objectives of good tax design. These include, as well as incentivising the green transition and reducing climate risk for the financial system, raising tax revenue, improving equity, stabilising the economy and the financial system, improving efficiency in resource allocation and promoting growth, simplicity and the cost of administration, reducing housing supply constraints, balancing localism – subsidiarity and democratic accountability – and national objectives, achieving public acceptability and easing the transition from the previous system.

Economists have often argued that there is a trade-off between growth and an equitable distribution, so that policies that favour the latter, damage economic growth and the efficiency of resource allocation. However, well-designed recurrent property taxes do the opposite: they enhance growth and efficiency *and* equity. Lowering transaction taxes and increasing recurrent property taxes improves the utilisation of the existing stock, increases the flexibility of labour and housing markets and eases adaption to shifts in the economic environment. Moreover, the evidence has mounted that credit-fuelled real estate booms have crowded out more productive investment, with negative consequences for sustainable growth, as well as increasing crisis risk. Furthermore, with appropriate green discounts, green property taxes can enhance sustainable growth and address the climate crisis. Green discounts are important because without them, green investments that increase property values raise taxes where these are linked to recent property values, thus discouraging this kind of investment. Green property tax discounts also sharpen incentives for green mortgage pricing in the form of lower interest rates or more favourable lending criteria for homes with better EPCs. These are reasons for maintaining such discounts even if carbon pricing or emissions trading are introduced. The proposed green LVT and deferral mechanisms, while conceptually appealing for achieving equity, efficiency and environmental goals, would entail feasibility challenges in implementation for many countries compared to current property tax regimes. Shifting to this new system would require overcoming hurdles related to public acceptability (see Section 6.2), valuation and data availability (see Section 6.4.4), and the complexity of administering a tax split between land and buildings, requiring careful consideration of the transition from existing tax regimes (see Section 6.5).

A key objection to recurrent property taxes, usually most vociferously made by the wealthiest property owners, is that cash-poor households in expensive properties can face hardship. This is most easily addressed by permitting deferral of payment until the property is sold or transferred. The chapter discussed the issue, why the take-up of deferral is often low and explained a simple equity-based design proposal for deferral that addresses the causes of low take-up.

Several countries have a mix of conventional property taxes and taxes based on land values, including split-rate taxes, though many have only the former. As explained previously, land value taxes have long been seen as the most efficient form of taxation, though the optimal tax literature also argues for consumption taxes. Split-rate property taxes with different tax rates on buildings – a kind of consumption tax- and on land are therefore desirable. Some of the literature on the distributional effects of split-rate property taxes argues that higher tax rates on the land component may not be equitable if the land shares of property values are relatively high for cash-poor households. However, the proposed deferral scheme breaks the link with cash income, making an income concept including imputed rent more relevant. Then the case for arguing that split-rate property taxes lower income inequality becomes overwhelming.

The importance of accurate national balance sheet data was emphasised by uncovering a major error in Canada's data on housing wealth which may well have misled monetary policy by distorting the link between housing wealth and aggregate consumption. National household balance sheet data suggests that in three G7 countries, more than half of the value of housing wealth is accounted for by land – over 70 percent in the case of the UK – and in none is the share less than 40 percent. The share of land has risen strongly in all G7 countries but for Italy and Japan, implying an increase in the relative price of land. As house values are a combination of volatile and cyclical land values and far more stable building values, given by construction costs, this highlights the risks to the stability of the financial system and the wider economy of land prices. Land value taxation therefore is especially useful for promoting economic stability and better targeted than standard property taxation. Advances in data management and statistical methods for mass valuation address concerns over the complexity of separating land and building values for tax and the current roll-out in Germany is evidence for the practicality of valuation methods.

Major tax reforms and property revaluations that generate a large number of winners and losers need to be phased in gradually. The chapter addressed issues of the transition from existing property tax regimes to green split-rate regimes in which buildings and land are taxed at different rates. The proposed deferral scheme greatly reduces the risk of cash-flow distress that could be suffered by losers and is therefore an important part of a reform package.

To summarise the overall conclusions of the chapter, in line with OECD (2021[2]), "Relying less on housing transaction taxes and more on annual taxes on immovable property while shifting the base of these taxes from the value of structures to current land prices would bring multiple benefits". The need for such a shift has never been greater, given widespread fiscal pressure. The Coronavirus pandemic has generated huge structural changes in employment patterns and in housing preferences, many long-lasting. Major structural changes in the economy associated with efforts to reach net zero emissions can be expected. These add to the need to reduce the costs of adjustment by lowering transaction taxes. Especially in English-speaking and Scandinavian countries, there had been large pre-pandemic rises in house prices relative to income, pricing many younger citizens out of home-ownership, especially with tougher down-payment requirements that followed the GFC. Easy monetary policies during the pandemic have fuelled further large wealth gains for property owners relative to the rest and further undermined long-run productivity growth. Stiglitz (2015[63]) has analysed the contribution of the structure of the financial system and of low interest rates to widening wealth and income inequality. He argues that a tax on land values or the returns from land would reduce inequality and increase real labour income.

Moreover, the world is facing a climate crisis and urgent action is needed to reduce carbon emissions of which buildings account for a large fraction. Lower-income households often live in poorly insulated homes and tend to spend a large fraction of their budgets on energy and housing. This means that they can be

more negatively affected in the short run by carbon taxes and tougher building regulations and benefit less from green tax rebates or discounts. The negative distributional effects of dealing with the climate crisis need to be offset by combining green discounts with a more progressive property tax. The green split-rate tax, proposed here, with its property and land value components, as well as a simple deferral mechanism, fits the bill.

The comparison of threats to the climate and financial stability in Aron and Muellbauer (2022[12]) has particular resonance just now: after the post-pandemic rise in inflation and the shocks of Russia's war on Ukraine, the sudden rise in nominal interest rates after over a decade of low rates has brought a near-global house price boom to a sudden halt. Particularly in countries where floating rate or short-term fixed mortgages are prominent, fears of bankruptcies and foreclosures have returned. It is likely that in many countries, policymakers will have regrets that their property taxes were not better designed to stabilise house prices and mortgage debt. In most OECD countries, real house prices have recently been falling and may have further to fall. In the not-too-distant future, an opportune moment will arrive to bring in long delayed revaluations for property tax with smaller changes in relative valuations compared with those at real estate price peaks. With appropriate phasing of tax changes and simple, widely-offered tax deferral, the move to regimes of regular revaluation, ideally with split-rate taxes and green discounts, should then be politically feasible.

References

Aron, J. and J. Muellbauer (2022), "The Global Climate Accelerator and the Financial Accelerator: Clarifying the Commonalities, and Implications from Putin's War", *CEPR: VoxEU*, https://cepr.org/voxeu/columns/global-climate-accelerator-and-financial-accelerator-clarifying-commonalities-and. [12]

Barbosa, R. and S. Skipka (2019), "Tax Housing or Land: Distributional Effects of Property Taxation in Germany"*, CESifo Working Paper Series*, No. 8039, https://ideas.repec.org/p/ces/ceswps/_8039.html. [47]

Basco, S., D. Lopez-Rodriguez and E. Moral-Benito (2022), "House Prices and Misallocation: The Impact of the Collateral Channel on Productivity"*, Banco de Espana Working Paper*, No. 2135, summarised in SUERF Policy Brief 284, https://www.suerf.org/suerf-policy-brief/41287/house-prices-and-misallocation-the-impact-of-the-collateral-channel-on-productivity. [28]

Bonnet, O. et al. (2021), "Land is back, it should be taxed, it can be taxed", *European Economic Review*, Vol. 134, p. 103696, https://doi.org/10.1016/j.euroecorev.2021.103696. [41]

Bourassa, S. (2009), "The Political Economy of Land Value Taxation", in Dye, R. and R. England (eds.), *Land Value Taxation: Theory, Evidence, and Practice*, pp. 195-209, Lincoln Institute of Land Policy, Cambridge, MA. [68]

Bowman, J. and M. Bell (2008), "Distributional Consequences of Converting the Property Tax to a Land Value Tax: Replication and Extension of England and Zhao", *National Tax Journal*, Vol. 61/4.1, pp. 593-607, https://doi.org/10.17310/ntj.2008.4.02. [45]

Buildings Performance Institute Europe (2014), *Energy Performance Certificates across the EU: A Mapping of national Approaches*, https://bpie.eu/wp-content/uploads/2015/10/Energy-Performance-Certificates-EPC-across-the-EU.-A-mapping-of-national-approaches-2014.pdf. [14]

Cameron, G. and J. Muellbauer (1998), "The Housing Market and Regional Commuting and Migration Choices", *Scottish Journal of Political Economy*, Vol. 45/4, pp. 420-446, https://doi.org/10.1111/1467-9485.00106. [22]

Cameron, G., J. Muellbauer and A. Murphy (2006), "Housing Market Dynamics and Regional Migration in Britain", *CEPR Discussion Papers*, No. 5832, https://cepr.org/publications/dp5832. [23]

Chakraborty, I., I. Goldstein and A. MacKinlay (2018), "Housing Price Booms and Crowding-Out Effects in Bank Lending", *The Review of Financial Studies*, Vol. 31/7, pp. 2806-2853, https://doi.org/10.1093/rfs/hhy033. [27]

Chancel, L. (2022), "Global carbon inequality over 1990–2019", *Nature Sustainability*, Vol. 5/11, pp. 931-938, https://doi.org/10.1038/s41893-022-00955-z. [19]

Chancel, L. (2020), *Unsustainable Inequalities: Social Justice and the Environment*, Harvard University Press, Cambridge, https://www.hup.harvard.edu/catalog.php?isbn=9780674984653. [20]

Cheshire, P. and C. Hilber (2021), *Home Truths: Options for reforming residential property taxes in England*, Bright Blue Campaign, http://www.brightblue.org.uk/wp-content/uploads/2021/05/BB_Property-Taxes-Report-May-2021_prf06b.pdf. [56]

Committee on Climate Change (2019), "UK Housing: Fit for the Future?", https://www.theccc.org.uk/publication/uk-housing-fit-for-the-future/. [16]

Contat, J. and W. Larson (2022), *A Flexible Method of House Price Index Construction using Repeat-Sales Aggregates*, Federal Housing Finance Agency, https://www.fhfa.gov/PolicyProgramsResearch/Research/PaperDocuments/wp2101.pdf. [52]

Diewert, W., J. de Haan and R. Hendriks (2011), "The Decomposition of a House Price Index into Land and Structures Components: A Hedonic Regression Approach", *The Valuation Journal*, Vol. 6, pp. 58-106, https://ideas.repec.org/a/vaj/journl/v6y2011i1p58-105. [57]

Diewert, W., J. Haan and R. Hendriks (2015), "Hedonic Regressions and the Decomposition of a House Price Index into Land and Structure Components", *Econometric Reviews*, Vol. 34/1-2, pp. 106-126, https://doi.org/10.1080/07474938.2014.944791. [58]

Diewert, W. and C. Shimizu (2021), "Residential Property Price Indexes: Spatial Coordinates Versus Neighbourhood Dummy Variables", Paper prepared for the 36th IARIW Virtual General Conference, https://iariw.org/wp-content/uploads/2021/08/Diewert_Shimizu_Paper.pdf. [70]

Diewert, W. and C. Shimizu (2016), "Hedonic regression models for Tokyo condominium sales", *Regional Science and Urban Economics*, Vol. 60, pp. 300-315, https://doi.org/10.1016/j.regsciurbeco.2016.08.002. [59]

Doerr, S. (2020), "Housing booms, reallocation and productivity", *BIS Working Paper*, No. 904, Bank for International Settlements, https://www.bis.org/publ/work904.pdf. [26]

Dossche, M., J. Slacalek and G. Wolswijk (2021), "Monetary policy and inequality", *Economic Bulletin Articles*, No. 2, European Central Bank. [21]

Duca, J., J. Muellbauer and A. Murphy (2021), "What Drives House Price Cycles? International Experience and Policy Issues", *Journal of Economic Literature*, Vol. 59/3, pp. 773-864, https://doi.org/10.1257/jel.20201325. [17]

England, R. and M. Zhao (2005), "Assessing the Distributive Impact of a Revenue—Neutral Shift from a Uniform Property Tax to a Two-Rate Property Tax with a Uniform Credit", *National Tax Journal*, Vol. 58/2, pp. 247-260, https://doi.org/10.17310/ntj.2005.2.05. [44]

Fairer Share (2021), *Fairer Share Manifesto*, https://fairershare.org.uk/wp-content/uploads/2021/10/Fairer-Share_Manifesto.pdf. [55]

Fernandez Milan, B., D. Kapfer and F. Creutzig (2016), "A systematic framework of location value taxes reveals dismal policy design in most European countries", *Land Use Policy*, Vol. 51, pp. 335-349, https://doi.org/10.1016/j.landusepol.2015.11.022. [62]

George, H. (1879), *Progress and Poverty*, Everyman Edition, J.M. Dent., London. [39]

Grjebine, T., J. Hericourt and F. Tripier (2022), "Real estate booms are behind Europe's productivity divergence", *CEPR: VoxEU*, https://cepr.org/voxeu/columns/real-estate-booms-are-behind-europes-productivity-divergence. [30]

Harrison, F. (1983), *The Power in the Land: an Inquiry into Unemployment, the Profits Crisis and Land Speculation*, Shepheard-Walwyn, London. [71]

Hau, H. and D. Ouyang (2018), "Capital Scarcity and Industrial Decline: Evidence from 172 Real Estate Booms in China", *Swiss Finance Institute Research Paper Series*, No. 18-38, Swiss Finance Institute, https://ideas.repec.org/p/chf/rpseri/rp1838.html. [29]

Hilber, C. and W. Vermeulen (2014), "The Impact of Supply Constraints on House Prices in England", *The Economic Journal*, Vol. 126/591, pp. 358-405, https://doi.org/10.1111/ecoj.12213. [31]

Hughes, C. et al. (2018), *Investigation of Potential Land Value Tax Policy Options for Scotland*, Final Report for the Scottish Land Commission, https://www.landcommission.gov.scot/downloads/5dd6984da0491_Land-Value-Tax-Policy-Options-for-Scotland-Final-Report-23-7-18.pdf. [61]

IPCC (2023), "Synthesis Report of the IPCC Sixth Assessment Report (AR6): Summary for Policymakers", Intergovernmental Panel on Climate Change, United Nations, https://report.ipcc.ch/ar6syr/pdf/IPCC_AR6_SYR_SPM.pdf. [11]

IPCC (2022), "Climate change: A threat to human wellbeing and health of the planet", Intergovernmental Panel on Climate Change, United Nations, https://www.ipcc.ch/2022/02/28/pr-wgii-ar6/. [10]

IPCC (2021), "Crushing climate impacts to hit sooner than feared", *AR6 Climate Change 2021: The Physical Science Basis*, Intergovernmental Panel on Climate Change, United Nations. [9]

Kalkuhl, M. et al. (2018), "Can land taxes foster sustainable development? An assessment of fiscal, distributional and implementation issues", *Land Use Policy*, Vol. 78, pp. 338-352, https://doi.org/10.1016/j.landusepol.2018.07.008. [69]

Kumhof, M. et al. (2021), "Post-Corona Balanced-Budget Super-Stimulus: The Case for Shifting Taxes onto Land", *CEPR Discussion Paper*, No. 16652, https://ideas.repec.org/p/cpr/ceprdp/16652.html. [36]

Lenton, T. et al. (2019), "Climate tipping points — too risky to bet against", *Nature*, Vol. 575/7784, pp. 592-595, https://doi.org/10.1038/d41586-019-03595-0. [8]

Leodolter, A., S. Princen and A. Rutkowski (2022), "Immovable Property Taxation for Sustainable and Inclusive Growth", *Economy and Finance Working Paper*, No. 156, European Commission, https://economy-finance.ec.europa.eu/publications/immovable-property-taxation-sustainable-and-inclusive-growth_en. [18]

Mason, P. and G. Pryce (2011), "Controlling for Transactions Bias in Regional House Price Indices", *Housing Studies*, Vol. 26/5, pp. 639-660, https://doi.org/10.1080/02673037.2011.581908. [50]

McLean, I. (2005), "The politics of land tax - then and now", in Maxwell, D. and A. Vigor (eds.), *Time for Land Value Tax*, Institute for Public Policy Research, https://www.ippr.org/publications/time-for-land-value-tax. [35]

Mirrlees, J. et al. (2011), "The Taxation of Land and Property", in *Tax by Design*, Oxford University Press, Oxford, https://ifs.org.uk/mirrlees-review. [40]

Muellbauer, J. (2019), "A Tale of Two Cities: Is Overvaluation a Capital Issue?", in Nijskens, R. et al. (eds.), *Hot Property*, Chapter 5, pp. 51-62, Springer International Publishing, Cham, https://doi.org/10.1007/978-3-030-11674-3_5. [67]

Muellbauer, J. (2018), "Housing, debt and the economy: A tale of two countries", *National Institute Economic Review*, Vol. 245, pp. R20-R33, https://doi.org/10.1177/002795011824500112. [32]

Muellbauer, J. (2005), "Property Taxation and the Economy after the Barker Review", *The Economic Journal*, Vol. 115/502, pp. C99-C117, https://doi.org/10.1111/j.0013-0133.2005.00982.x. [54]

Muellbauer, J. and D. Soskice (2022), "The Thatcher Legacy: lessons for the Future of the UK Economy", *The Navigating Economic Change Essays*, Resolution Foundation, https://economy2030.resolutionfoundation.org/reports/the-thatcher-legacy/. [53]

Müller, K. and E. Verner (2021), "Credit Allocation and Macroeconomic Fluctuations", *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.3781981. [25]

Munnell, A., W. Hou and A. Walters (2022), "Property Tax Deferral", in Mitchell, O. (ed.), *New Models for Managing Longevity Risk: Public-Private Partnerships*, Oxford University Press, Oxford, UK, https://doi.org/10.1093/oso/9780192859808.003.0012. [33]

Network for Greening the Financial System (2019), "First comprehensive report: A call for action climate change as a source of financial risk", NGFS/Banque de France, https://www.academia.edu/44423779/Network_for_Greening_the_Financial_System_First_comprehensive_report_A_call_for_action_Climate_change_as_a_source_of_financial_risk. [13]

OECD (2023), *Brick by Brick (Volume 2): Better Housing Policies in the Post-COVID-19 Era*, OECD Publishing, Paris, https://doi.org/10.1787/e91cb19d-en. [7]

OECD (2022), *Housing Taxation in OECD Countries*, OECD Tax Policy Studies, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/03dfe007-en. [6]

OECD (2021), *Brick by Brick: Building Better Housing Policies*, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en. [2]

OECD (2021), *Making Property Tax Reform Happen in China: A Review of Property Tax Design and Reform Experiences in OECD Countries*, OECD Fiscal Federalism Studies, OECD Publishing, Paris, https://doi.org/10.1787/bd0fbae3-en. [5]

OECD/Eurostat (2015), *Eurostat-OECD Compilation guide on land estimations*, Eurostat, Luxembourg, https://doi.org/10.1787/9789264235175-en. [48]

OECD/Lincoln Institute of Land Policy, PKU-Lincoln Institute Center (2022), *Global Compendium of Land Value Capture Policies*, OECD Regional Development Studies, OECD Publishing, Paris, https://doi.org/10.1787/4f9559ee-en. [42]

ONS (2018), "Stock-weighted House Price Index, England and Wales: 1995 to 2015 preliminary estimates", Office for National Statistics, UK, https://www.ons.gov.uk/economy/inflationandpriceindices/articles/stockweightedhousepriceindexenglandandwales/preliminaryestimates1995to2015. [49]

Paine, T. (1797), "Agrarian Justice", in Philp, M. (ed.), *The Political Writings of Thomas Paine*, Oxford University Press, Oxford, https://oxfordworldsclassics.com/display/10.1093/owc/9780199538003.001.0001/isbn-9780199538003-book-part-21;jsessionid=AB537F09BE9A4A8A4345DE64396D7BD5. [37]

Pennington-Cross, A. (2005), "Aggregation bias and the repeat sales price index", *BIS Paper*, No. 21, https://www.bis.org/publ/bppdf/bispap21y.pdf. [51]

Plummer, E. (2010), "Evidence on the Distributional Effects of a Land Value Tax on Residential Households", *National Tax Journal*, Vol. 63/1, pp. 63-92, https://doi.org/10.17310/ntj.2010.1.03. [46]

Prestwood, D. (2020), "How energy efficiency data can help reduce our carbon footprint", Office of National Statistics, https://blog.ons.gov.uk/2020/09/23/how-energy-efficiency-data-can-help-reduce-our-carbon-footprint/. [66]

Ricardo, D. (1817), *On the Principles of Political Economy and Taxation*, https://www.econlib.org/library/Ricardo/ricP.html. [38]

Savills (2020), *Global Farmland Index*, Savills Research, https://pdf.euro.savills.co.uk/uk/rural---other/spotlight-global-farmland-index---sep-2020.pdf. [60]

Sharpe, S. (2023), *Five Times Faster: Rethinking the Science, Economics and Diplomacy of Climate Change*, Cambridge University Press, Cambridge, https://fivetimesfaster.org/. [4]

Shiller, R. and A. Weiss (1999), "Home Equity Insurance", *The Journal of Real Estate Finance and Economics*, Vol. 19/1, pp. 21-47, https://doi.org/10.1023/a:1007779229387. [34]

Shrubsole, G. (2020), *Who Owns England?*, Harper-Collins, https://harpercollins.co.uk/products/who-owns-england-how-we-lost-our-land-and-how-to-take-it-back-guy-shrubsole?variant=32600538906702. [43]

Slack, E. and R. Bird (2014), "The Political Economy of Property Tax Reform", *OECD Working Papers on Fiscal Federalism*, No. 18, OECD Publishing, Paris, https://doi.org/10.1787/5jz5pzvzv6r7-en. [65]

Stiglitz, J. (2015), "New Theoretical Perspectives on the Distribution of Income and Wealth among Individuals: Part IV: Land and Credit", *NBER Working Paper*, No. 21192, https://doi.org/10.3386/w21192. [63]

Stueckmann (2022), "Planned Time Schedule for the Implementation and Effects of the Land Tax Reform from 2022", https://www.stueckmann.de/en/property-tax-law/effects-of-the-land-tax-reform-from-2022/. [64]

The Planner (2021), "20/20 Visions: How 20-Minute Neighbourhoods Can Support the Drive to Net-Zero", https://www.theplanner.co.uk/2021/11/10/2020-visions-how-20-minute-neighbourhoods-can-support-drive-net-zero. [24]

UNEP (2020), *Building sector emissions hit record high, but low-carbon pandemic recovery can help transform sector – UN report*, https://www.unep.org/news-and-stories/press-release/building-sector-emissions-hit-record-high-low-carbon-pandemic. [1]

United Nations Environmental Programme (2019), *Emissions Gap Report 2019*, https://www.unep.org/interactive/emissions-gap-report/2019/. [15]

Way, R. et al. (2022), "Empirically grounded technology forecasts and the energy transition", *Joule*, Vol. 6/9, pp. 1-26, https://doi.org/10.1016/j.joule.2022.08.009. [3]

Notes

[1] Bailing out the banking system in the global financial crisis and loss of tax revenue in the recession that followed have also been wide-spread factors in reducing fiscal capacity.

[2] BPIE (2014[14]) explains that 'EPCs may include additional information, such as the actual impact of heating and cooling on the energy needs of the building, on its primary consumption and the carbon dioxide emissions'. Quite apart from placing a building into a particular energy efficiency class, EPCs include 'recommendations for the cost-effective or cost-optimal improvement of the energy performance of a building'. Also see Prestwood (2020[66]) on how EPC data can help reduce carbon emissions. In England and Wales, certificates provide an estimate of annual tonnes of CO_2 emissions and state that "Properties get a rating from A (best) to G (worst) on how much carbon dioxide (CO_2) they produce each year." In a number of other countries, the ratings are based on energy efficiency as measured by annual consumption of kilowatt-hour per square metre.

[3] In the city of Salvador, the fourth largest in Brazil, property tax discounts of up to 10 percent are offered based on the ability of buildings to reduce CO_2 emissions through the use of sustainable technologies, based on a checklist of 70 characteristics.

[4] Harrison (1983[71]) is an early dissection of speculative boom-bust house price and credit cycles, issues to which the author returned in several later books. He sees major benefits for land value taxation in reducing these risks.

[5] Bourassa (2009[68]) suggests that this and lack of public understanding are likely to be the most important explanations for why, when LVT is such a good idea, it has not been more widely implemented. In addition to the points raised in this section, he argues that the additional complexity of separate valuations of land and buildings is a drawback and the additional volatility of land prices can create strong resistance to recent market value based LVT, unless tax rates are moderated after sharp rises in values. He suggests that the rejection in Hawaii of LVT was partly because of fears of over-development in ecologically sensitive parts of the island. However, green discounts and appropriate zoning could easily address this problem. Moreover, LVT discourages urban sprawl (see Fernandez-Milan et al., 2016 and OECD (2022[6]) for references to the large literature on this). Slack and Bird (2014[65]) note the visibility of property taxes in contrast to income tax withheld at source or VAT, and concerns about the accuracy and fairness of valuations, as obstacles.

[6] OECD (2022, p. 117[6]) defines the term as follows: “Split-rate taxes are a hybrid of pure land value taxes and regular recurrent taxes on immovable property, where both the land and improvements on the land are taxed, but land is typically taxed at a higher rate.”

[7] It argued that business property is an intermediate input to production. A basic principle of efficient taxation is that intermediate inputs, as opposed to final consumption, should not be taxed. It is distortionary to skew the economy away from business property- intensive production. Moreover, in practice, business taxes often have other distortionary features such as exemptions for farming or reduced rates for empty buildings or unused land.

[8]In Great Britain, the energy classes are directly based on estimated carbon emissions.

[9] To be precise, note that the parts of a plot not occupied by a building can vary in how ‘green’ they are. A garden, adding to biodiversity with CO_2 absorbing plants, is green, while a tarred forecourt or tennis court or a swimming pool are not. The green discount should be applied to gardens.

[10] Kalkuhl et al. (2018[69]) note that in developing economies where high fractions of low income households are subsistence farmers, a land value tax is likely to be regressive. However, a tax allowance on low value land can easily correct this.

[11] In England around 17% of land is not registered at the Land Registry, mainly estates that have passed down many generations and not been transacted on the open market. Shrubsole’s estimates of ownership concentration takes this into account.

[12] In the theory part of their paper they consider some of the wider general equilibrium effects of a switch to LVT. These include a boost to residential investment, increasing housing supply and lowering rents. Depending on how the efficiency gains from the switch to LVT are shared across the population, there could be further reductions in long-term income inequality.

[13] It is possible that the higher relative price of housing land may have resulted in some substitution towards structures and away from land which would result in somewhat lower fractions attributed to land in 2020 than implied by these numbers. But investment demand and search for yield in low interest rate

environments by wealthy investors may have offset this substitution tendency among those mainly interested in housing as shelter.

[14] Strictly speaking, these data from the OECD balance sheet tables are for households and non-profit institutions serving households (NPISH).

[15] It is also worth noting that the construction cost deflator for the United States tends to be more aligned with the housing cycle than is the case in other countries. This could underestimate the fall in the relative price of land after 2006.

[16] See Muellbauer (2019[67]) for evidence that low interest rates and credit liberalisation tend to have disproportionate effects in major cities such as London and Paris, where supply constraints also tend to be more severe.

[17] Matthew Kelly of Statistics Canada raises the possibility that the housing stock count in the 1991 Census was misinterpreted. This could have led to under-estimating the 1991 benchmark and over-estimating the subsequent rise in the value of the housing stock. Because this would have seriously biased towards zero empirical estimates of the housing collateral or 'wealth' effect on consumption in Canada, this had potentially significant policy implications.

[18] Though improvements in the granular data would feed into improving the aggregate balance sheet data.

[19] See Fernandez Milan, Kapfer and Creutzig (2016[62]), for a remarkably comprehensive, yet concise, review of the literature and of valuation and tax systems in Europe. Hughes et al. (2018[61]) examine international experience of land value taxation and the feasibility of introducing LVT in Scotland.

[20] Key to this is to legislate that for land options to be legally enforceable, they need to be registered on a public database, e.g., at the Land Registry.

[21] As noted above, in the context of national balance sheets, Kumhof et al. (2021[36]) argue that this 'residual' method tends to underestimate land values.

[22] There are counter-examples, such as where the catchment area for a desirable school separates one side of the street from another, or where a wild-life reserve backs onto only one part of a street. However, given houses of similar characteristics in both locations, hedonic methods should be able to track the higher land values in the more desirable locations successfully.

[23] There are differences between states in how valuations of land and buildings are to be assessed and on the tax structure (Stueckmann, 2022[64]). In the Federal valuation model, the building value is determined by multiplying the normal production costs by the construction price index published by the Federal Statistical Office and the gross floor area less a reduction in value due to age. Normal production costs are determined on the basis of the type of building (e.g., office building, factory building of solid or skeleton construction or storage building depending on use) and the year of construction. Baden-Württemberg is proposing to tax only the land value from 2025.

[24] Diewert and Shimizu (2021[70]) integrate GIS information and the hedonic model set out in equation 2 to allow separate estimation of land and structure components of property values.

7 Housing supply responsiveness across levels of government: Novel evidence on tax and spending autonomy

Frank van Hoenselaar, Boris Cournède and Sean Dougherty, OECD

This research explores how fiscal autonomy across governmental tiers affects housing supply amidst declining housing affordability across countries. Using unique OECD indicators, the study assesses the decentralisation of housing-related spending and property tax autonomy. While local governments often possess insights into regional needs, they often encounter "NIMBYism", where current residents resist new development. The chapter also evaluates the influence of tax autonomy, particularly regarding property taxes, on housing supply. The results indicate that countries with more local control over housing spending policies exhibit lower housing supply elasticities. In contrast, for those subnational entities that control more of their property tax base, a higher elasticity is found, potentially driven by the lure of increased tax revenues from new development. This study underscores the interplay between spending decentralisation and tax incentives, suggesting that local tax benefits might counteract opposition to housing development.

This paper was presented at the 2021 meeting of the OECD Network on Fiscal Relations across Levels of Government. It was prepared by Frank van Hoenselaar, while on secondment from the Netherlands Central Bank to the Network, together with Sean Dougherty, head of the Network Secretariat and Boris Cournède, coordinator of the OECD Horizontal Housing Project. The authors would like to thank John Muellbauer, Luiz de Mello, Federica De Pace and Jaebeum Cho for providing helpful written comments.

7.1. Introduction and main findings

Rising house prices and diminishing housing affordability are an impediment to realising an inclusive housing market. Recent OECD work shows that the affordability of housing is declining in developed countries, with households spending an increasingly larger share of their income on housing (OECD, 2021[1]). These trends tend to affect many vulnerable households. Expanding the current stock of housing is key to ensuring universal access to housing and improving housing affordability. Housing supply needs to be sufficiently elastic to ensure that the economy responds to changing housing needs in a swift manner. Earlier work by the OECD (Caldera and Johansson, 2013[2]; Cavalleri, Cournède and Özsöğüt, 2019[3]) documented a wide dispersion in the price elasticity of housing supply across OECD countries. This earlier work also provides evidence that supply elasticities in OECD countries are negatively affected by land use regulation and natural barriers, as these limit the possibilities to expand supply.

This paper contributes to the policy debate by linking the price elasticity of housing supply to a new set of indicators that capture the division of housing-related expenditure responsibilities across different layers of government. These novel indicators were recently designed by the OECD Network on Fiscal Relations and constructed based on the OECD Questionnaire on Affordable & Social Housing and Phillips (2020[4]). Over recent decades, governments have implemented policy reforms that have allocated more and more responsibilities to local governments for developing, co-ordinating and implementing housing policies. The underlying idea for these reforms is that local governments have greater knowledge of local preferences and conditions. On the flipside, however, local governments can be prone to lobbying by existing residents that dislike new construction because it can decrease the value of their homes and the attractiveness of their neighbourhoods (Fischel, 2004[5]; Hilber and Robert-Nicoud, 2013[6]; Blöchliger et al., 2017[7]). This is often termed “NIMBYism” (not in my backyard-ism).

This paper thus investigates the effect of greater decentralisation of housing responsibilities in terms of spending power on the elasticity of housing supply. The paper also investigates how the tax autonomy of local governments influences the elasticity of housing supply based on another unique set of OECD indicators developed by the Network on Fiscal Relations (Dougherty, Harding and Reschovsky, 2019[8]). Tax autonomy implies that local governments can levy their own taxes and decide on rates and tax bases themselves. In relation to housing supply, autonomy over local property taxes is especially relevant: if housing construction yields additional property tax revenues to finance local public goods, it might incentivise local governments to allow more new construction. The paper therefore investigates the relationship between the property tax autonomy of local governments and housing supply.

There is limited empirical work that aims to explain differences in housing supply elasticities across countries. More work has been done in explaining supply elasticities within countries, across regions or municipalities (Saiz, 2010[9]; Hilber and Vermeulen, 2016[10]; Green, Malpezzi and Mayo, 2005[11]). These studies show that supply elasticities tend to be lower in areas with more stringent geographic or regulatory constraints to new construction. Studying the nature of housing supply at an aggregate level has some pitfalls, as the planning system and geographic constraints typically have a local character. Studying them at an aggregate level could result in aggregation bias, because more constrained areas are averaged with less constrained areas. However, recent empirical work has shown that nationally estimated housing elasticities are tightly correlated with cross-regional averages of regionally-estimated elasticities (Bétin and Ziemann, 2019[12]). Based in part on this evidence, as well as the effect of national policies on housing supply, it is worth exploring the factors behind the cross-country variation in housing supply elasticities.

The empirical strategy of this paper builds upon earlier OECD work on housing supply elasticities (Cavalleri, Cournède and Özsöğüt, 2019[3]). It extends their model by including the spending and tax autonomy indicators. The empirical results of the paper indicate the following:

- Countries where housing policy responsibilities are more decentralised – in terms of their spending power – experience lower price elasticities of housing supply. Of the sub-components of the spending power indicator, policy autonomy exerts the largest negative impact on the supply elasticity. The results appear to be partially non-linear, with the effect becoming increasingly strong with greater decentralisation.
- Countries where subnational governments have more control over their property taxes – more property tax autonomy – and which levy a larger share of property taxes, have higher elasticities of housing supply. If local governments and communities can benefit from new construction through increased property taxes, they will be more inclined to allow new development.

The next section 7.2 describes the data, model and empirical strategy, then the following section 7.3 interprets the empirical results and discusses their implications. The final section 7.4 concludes.

7.2. Empirical strategy

7.2.1. Data

This paper employs the housing policy dataset developed by Cavalleri, Cournède and Özsöğüt (2019[3]). This panel dataset consists of 25 countries and quarterly data from 1980Q1 until 2017Q4. The main variables of interest are real residential investment, real house prices, construction costs, total population and real disposable income per capita. The dataset does not cover the entire period for all countries in the sample, due to limited coverage for some variables. The dataset by Cavalleri, Cournède and Özsöğüt (2019[3]) is complemented by several measures for the decentralisation of housing policies and taxation. Box 7.1 discusses the calculation of the spending power and tax autonomy indicators.

Box 7.1. Subnational spending power and tax autonomy in the housing sector

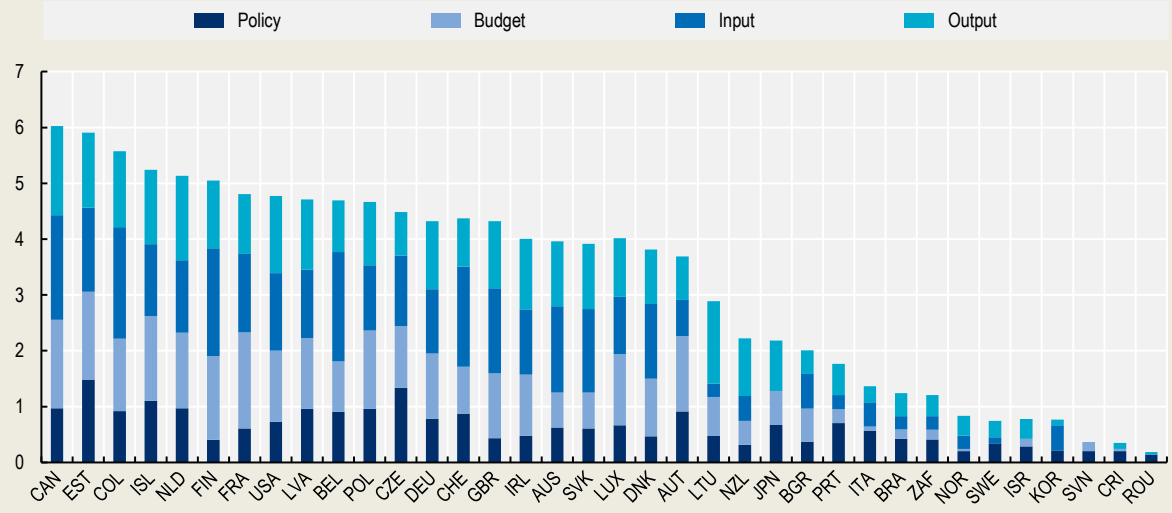
Spending power

Spending power is defined as the ability of a subnational government to control its own expenditure. The spending power indicators aim to provide more information than just the expenditure shares of subnational government by distinguishing between situations where subnational governments are merely the paying agent for the central government and where they have little independence or decision-making authority. Dougherty and Phillips (2019[13]) constructed a spending power indicator for five sectors – health, education, old age care, transportation and housing – along four dimensions:

- **Policy autonomy:** The extent to which subnational decision-makers exert control over main policy objectives and main aspects of service delivery.
- **Budget autonomy:** The extent to which subnational decision-makers exert control over the budget (e.g., is budget autonomy limited by upper-level regulation).
- **Input autonomy:** The extent to which subnational decision-makers exert control over the civil service (personnel management, salaries) and other input-side aspects (e.g., right to tender or contract out services).
- **Output and monitoring autonomy:** The extent to which subnational decision-makers exert control over standards such as quality and quantity of services delivered and devices to monitor and evaluate standards, such as benchmarking.

Among the five sectors, housing is the most decentralised. Phillips (2020[4]) uses the same concept to construct spending power indicators with a focus on affordable housing development. This indicator is based on input that OECD member countries provided via the Questionnaire on Affordable and Social Housing. The four dimensions are used to build an aggregate indicator, with 0 representing fully centralised decisions and increasing values more decentralised ones (Figure 7.1).

Figure 7.1. Composition of the spending power indicator

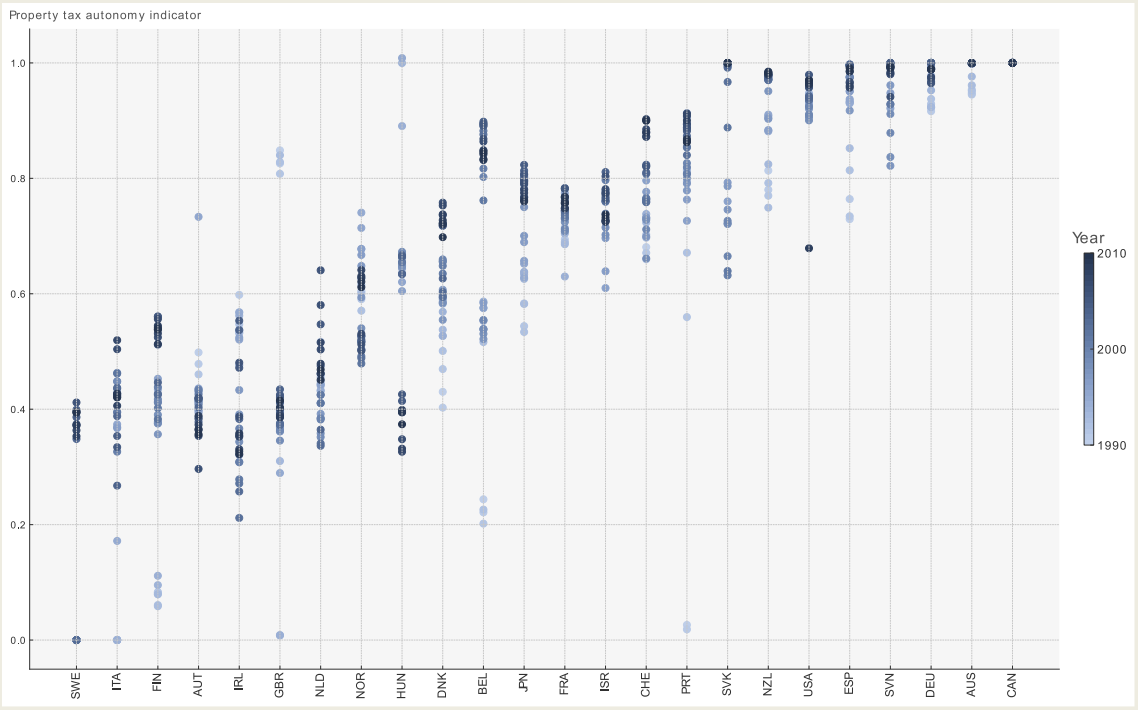


Source: Authors' calculation based on data from Phillips (2020[4]).

Property tax autonomy

Starting in 1995, the OECD began to assess the tax autonomy of state or regional and local governments in OECD member countries. A taxonomy was developed to assess the degree of tax autonomy in each country. Each tax instrument used by state or local governments in a country is assigned one of twelve possible policy-based codes to indicate the extent of tax autonomy for the instrument. The results of this exercise are summarised by calculating the share of total government revenue by level of government assigned to each tax autonomy code. Property tax autonomy is calculated as the share of property taxes in a country that are gathered by subnational governments. The indicator lies between 0 and 1. Figure 7.2 shows the distribution of the property tax autonomy variable. From the most recent vintage, the indicators are available on an annual basis, using revenue shares to construct the indicator in the years between the three-yearly survey updates (Dougherty, Harding and Reschovsky, 2019[8]). The indicators are disseminated in the OECD Fiscal Decentralisation database.

Figure 7.2. Property tax autonomy (1980 – 2018)



Source: ChatGPT rendering based on data from the OECD Fiscal Decentralisation Database and Revenue Statistics.

For the decentralisation of housing policies, this paper relies on the work by Phillips (2020[4]) regarding the spending power of subnational governments in the area of affordable housing. As this spending power indicator is only available for one year for each country, we need to implicitly assume that the assignment of spending power across governments has been relatively stable over time.[1] The paper uses data from the OECD Fiscal Decentralisation database to calculate indicators related to property tax autonomy. In contrast to the spending power indicators, the tax autonomy indicator id available for many years and hence they have a time series dimension. This allows us to estimate our model for tax autonomy with a panel feature. In all the specifications the decentralisation indicators will be de-meaned by their cross-sectional average.

7.2.2. Model

This paper builds on the earlier work by Cavalleri, Cournède and Özsöğüt (2019[3]) who employ a stock--flow model of the housing market following the work of Wheaton and DiPasquale (1994[14]) to estimate the long-run relationship between the housing stock, prices and building costs. We build on the supply side equation of that model:

$$S = I(P, X_1) + (1 - \delta)S_{t-1} \quad (1)$$

Equation 1 links the changes in the housing stock (S) to new investment (I) and changes in the value of the existing housing stock due to deprecation (δ). Housing investment (I) itself is a function of house prices (P) and building costs which are captured in vector X_1. In the emprical model we use real residential investment as a proxy for changes in the housing stock and a construction cost index to capture the costs of several construction inputs. The standard long-run model of Cavalleri, Cournède and Özsöğüt (2019[3])

is augmented by an interaction term between prices and the set of decentralisation indicators that are tested. This results in the following estimation model:

$$Ln\, I_{ct} = \beta_c^0 + \beta^1 lnP_{ct} + \beta^2 Dec_c + \beta^3 lnP_{ct} * Dec_c + \beta^4 lnCC_{ct} + h\acute{f}_t + \varepsilon_{ct} \quad (2)$$

Where I_{ct} is real residential investment, P_{ct} are real house prices and CC_{ct} are construction costs for country c in quarter t. β_1 captures the long-run price elasticity of housing supply. This coefficient should be positive as higher prices should provide an incentive for developers to invest in housing. Coefficient β_2 controls for variation in the decentralisation (Dec) variable. Coefficient β_3 captures the interaction effect of our decentralisation variable. This tells us how much higher or lower the housing supply elasticity is given a certain degree of decentralisation. Because the decentralisation variables are all de-meaned, the supply elasticity for the average level of decentralisation is equal to β_1. For β_4 the coefficient is expected to be negative, since higher construction costs discourage housing investment for a given level of house prices. This specification captures long-term effects: for more detail on the short-term adjustment to the estimated long-term equilibrium, see Cavalleri, Cournède and Özsöğüt (2019[3]), and for a discussion of estimation strategies tailored to focussing on the short term, see Duca, Muellbauer and Murphy (2021[15]).

In the estimation for spending autonomy, the decentralisation indicators only appear in the interaction term, as its separate inclusion would result in perfect multicollinearity with the country fixed effects. However, in the estimation of the model for tax autonomy the decentralisation indicator also enters the model seperately as this variable has a panel feature.

The specification of equation (2) also deals with cross-sectional dependence, which comes from exogenous common forces that affect residential investment in all the countries in the panel. To do so, the long-run investment equation is estimated in a heterogeneous panel model with a general multi-factor structure using the common correlated coefficient approach first proposed by Pesaran (2006[16]). Vector *f* therefore consists of the cross-sectional averages of all the regressors and instruments that enter the model. These control for the unobserved common factors, which can for instance be global shocks (such as technological progress, synchronisation of housing cycles, global demographic trends) that affect residential investment differently in each country.

The estimation also needs to address potential endogeneity of residential investment and construction costs. Large increases in residential investment could, for instance, inflate construction costs. To tackle this potential bias, the estimation uses the lagged values of contruction costs as instruments. Furthermore, substantantial increases in housing supply following large increases in homebuilding could have an effect on house prices. To address this issue, the estimation uses the instrumentation strategy of Cavalleri, Cournède and Özsöğüt (2019[3]), augmented with the decentralisation variables. Total population and real disposable income per capita are instruments for prices where they are feasible and strong, which corresponds to 10 countries. The first and second lag of real house prices are used for the remaining 15 countries, since for these they better meet availability and validity criteria than population and income.

The instrumentation can be written as:

$$LnP_{ct} * Dec_c = \beta_c^0 + \beta^1 Z_{ct}^1 + \beta^{2*} Dec_c + \beta^3 Z_{ct}^1 * Dec_c + \beta^4 Z_{ct}^2 + \beta^5 Z_{ct}^2 * Dec_c + h_c{}' f_t + \varepsilon_{ct} \quad (3)$$

Z^1 and Z^2 represent the instruments and $\underline{f}$ is again a vector of cross-sectional means to account for cross-sectional dependence. Annex Table 7.A.2 provides the results of the standard unit roots and cointegration tests.

7.3. Empirical findings

Table 7.1 presents the results of the estimation of equation 2 using the dataset underpinning Cavalleri, Cournède and Özsöğüt (2019[3]) augmented with the spending autonomy indicator and its sub-components described in this paper. All the estimation results use the instrumental variables approach as outlined in section 7.2 and include cross-sectional means to correct for cross-sectional dependence (test results are

shown in Annex Table 7.A.1). Column 1 of the table shows the baseline specification without an interaction term: it therefore yields the same overall supply elasticity as the pooled estimation in Cavalleri, Cournède and Özsöğüt (2019[3]). Because all variables are in logs, the coefficient on prices should be interpreted as an elasticity; hence a one per cent increase in house prices leads on average to a 0.96 per cent increase in real residential investment. The coefficient on construction costs is, however, not significant in the baseline estimation. Cavalleri, Cournède and Özsöğüt (2019[3]) show that mean group estimators or specifications with time fixed effects yield similar results with average supply elasticities close to unity.

Columns 2 to 6 show the estimations where house prices are interacted with the different components of the spending autonomy indicator (Phillips, 2020[4]). The estimation results show that the coefficients related to the interaction terms are negative and statistically significant. The autonomy measures used in columns 2-6 could be capturing the effects of land use availability and rental market regulation on housing supply elasticities as identified by Cavalleri, Cournède and Özsöğüt (2019[3]). However, the autonomy indicators are not correlated with the measures of land use governance and rental market regulation.

Since the variables are demeaned, the overall supply response can be calculated as the coefficient on real house prices plus the interaction term times the change in the policy indicator. For instance, a one-standard deviation increase in subnational government composite spending power (by 1.7 of the indicator value) is estimated to decrease the housing supply elasticity – or additional investment response – by about 40%. While this may be based on an unrealistically large policy shift, based on a full cross-country standard deviation, it nevertheless implies that large subnational spending autonomy could well make local governments much more vulnerable to lobbying from residents against new construction investment, in support of the literature on NIMBYism (Wassmer and Wahid, 2018[17]).

Table 7.1. Long-run elasticity interacted with spending power indicators

	Dependent Variable: Real residential investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Real house prices	0.956***	1.166***	1.116***	0.887***	1.153***	1.079***
	(0.105)	(0.111)	(0.126)	(0.126)	(0.121)	(0.119)
Lag of construction costs	-0.235	-0.563***	-0.489***	-0.217	-0.517***	-0.437**
	(0.147)	(0.169)	(0.178)	(0.170)	(0.175)	(0.171)
P x Spending power (Policy)		-0.367***				
		(0.046)				
P x Spending power (Budget)			-0.183***			
			(0.019)			
P x Spending power (Input)				-0.144***		
				(0.022)		
P x Spending power (Output)					-0.209***	
					(0.024)	
P x Spending power (Composite)						-0.233***
						(0.025)
Chi-squared	40502783***	15704684***	13489706***	24180855***	15778343***	16214490***
Countries	25	23	23	23	23	23
Observations	2,840	2,598	2,598	2,598	2,598	2,598
Adjusted R^2	0.843	0.849	0.847	0.842	0.835	0.846

Note: Significance levels: *** p < .01, ** p < .05, * p < .1; Standard errors (in parentheses) are robust to arbitrary common correlated disturbances (Driscoll - Kraay).

The spending autonomy indicators have a focus on decision-making concerning affordable housing. For commercial rental housing and owner-occupied housing, the distribution of responsibilities and power could in practice be different. As a robustness check, we therefore run the regression also on a smaller set of countries, for which there is also a spending power indicator available for housing more broadly. This indicator is taken from Dougherty and Philips (2019[13]), and is only available for a sub-set of countries in our panel data set. Annex Table 7.A.3 shows that the results are broadly similar to the results shown in Table 7.1. However, some dimensions of spending power do not yield significant results likely due to the smaller sample size, but may also reflect the importance of the affordable housing decision-making channel.

Recent OECD work on spending authority in the health sector (Dougherty et al., 2021[18]) has shown that its effects on economic outcomes are not always linear. We therefore test for non-linear relationships by adding a quadratic interaction term to the previous specification (see Annex Table 7.A.4). The estimation results confirm the existence of non-linearities, but the sign of the estimated coefficients vary according to the various sub-components of spending power. In the regression, which considers the policy autonomy indicator, the coefficient of the quadratic term is negative (column 2), implying that its negative impact on the supply elasticity increases as housing policy decisions are more decentralised. In the regression that considers the input and budget autonomy indicator (column 3 and 4), the quadratic terms are positive. This implies that the negative effect of more decentralisation diminishes if budget and input autonomy increases. Lastly, the quadratic term related to the composite indicator (column 6) and the output indicator (column 5) is not significant.

Table 7.2 shows the estimation results for the specification with the property tax autonomy indicator. The results in column 2 suggest that more autonomy over property taxes should lead to a more elastic housing supply as local governments gain from allowing more housing construction. Again, since the variables are demeaned, the overall supply response can be calculated as the coefficient on real house prices plus the interaction term times the change in the policy indicator. For instance, a one-standard deviation increase in subnational property tax autonomy (by 0.25 of the value) is estimated to increase the housing supply elasticity, or the additional real housing investment response, by about 35%. While the tax and spending indicators are not directly comparable, the magnitude of this tax policy effect on the elasticity is roughly in line with a one-standard deviation increase in subnational spending power.

Table 7.2. Long-run elasticity interacted with the property tax autonomy indicator

	Dependent variable: Real residential investment	
	(1)	(2)
Real house prices	0.956***	1.384***
	(0.105)	(0.135)
Lag of construction costs	-0.235	-0.723***
	(0.147)	(0.212)
P x Tax autonomy (Property taxes)		1.451***
		(0.472)
Tax autonomy (Property taxes)		-5.705***
		(1.852)
Chi-squared	40502783***	55404299***
Countries	25	24
Observations	2,840	2,653
R^2	0.851	0.828
Adjusted R^2	0.843	0.818

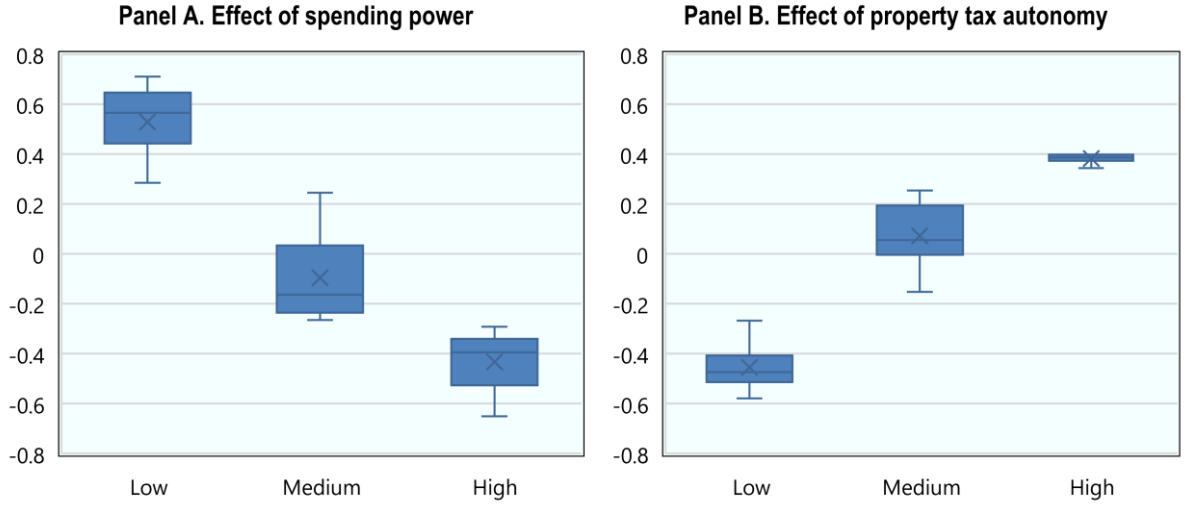
Note: Significance levels: *** p < .01, ** p < .05, * p < .1; Standard errors (in parentheses) are robust to arbitrary common correlated disturbances (Driscoll - Kraay).

7.4. Conclusion

This paper extends earlier work by Cavalleri, Cournède and Özsöğüt (2019[3]). It explores factors that could explain the large cross-country variation in housing supply elasticities. The present analysis examines the role of subnational governments in tax and spending decision-making regarding housing, by employing unique tax and spending autonomy indicators developed by the OECD Network on Fiscal Relations (Dougherty, Harding and Reschovsky, 2019[8]; Phillips, 2020[4]). The estimations suggest that countries where subnational governments have more spending authority in the area of housing, the responsiveness of the housing supply may be substantially lower (Figure 7.3, Panel A). This empirical finding supports the narrative of subnational government being more prone to the not-in-my-backyard phenomenon and lobbying by locals who oppose new development, if their influence on housing policymaking is larger. The results for housing supply are confirmed when we use an indicator that reflects policies related to affordable and housing more broadly. This is consistent with the recent debate around the possibility that democractic and equity objectives can come into conflict and influence the pace and scale of new local development (Scally and Tighe, 2015[19]).

Furthermore, this paper goes beyond the previous literature in looking at the degree of tax autonomy of state and local governments and the responsiveness of housing supply. The paper finds that a higher degree of subnational government autonomy over their tax base – in particular for property taxes, meaning they can levy a larger portion of these taxes – is associated with a significantly higher housing supply response (Figure 7.3, Panel B), which may help to overcome contrasting pressures, which could arise from unconditional spending decentralisation. This provides evidence for second generation fiscal federalism theory, which suggests that if local governments and their communities can benefit from new construction through increased property tax revenues – which may help to provide higher quality local public goods – they will be more inclined to allow new housing, helping to overcome potential community opposition.

Figure 7.3. Simulated effect of spending and property tax autonomy on housing supply elasticity



Note: Countries were divided into three equally-sized (Low/Medium/High) groups based on their spending power and property tax indicators. Then the marginal effects of the indicators on the housing supply elasticity are simulated using estimated country coefficients. The simulated effect of the spending power indicator is based on an elasticity of -0.233 for overall spending power on housing supply based on Table 7.1, while the effect of property tax autonomy is based on the 2018 indicators and an elasticity of 1.451 on housing supply elasticity based on Table 7.2.
Source: Authors' calculations, with the help of ChatGPT4.

References

Bétin, M. and V. Ziemann (2019), "How responsive are housing markets in the OECD? Regional level estimates", *OECD Economics Department Working Papers*, No. 1590, OECD Publishing, Paris, https://doi.org/10.1787/1342258c-en. [12]

Blöchliger, H. et al. (2017), "Local taxation, land use regulation, and land use: A survey of the evidence", *OECD Economics Department Working Papers*, No. 1375, OECD Publishing, Paris, https://doi.org/10.1787/52da7c6a-en. [7]

Caldera, A. and Å. Johansson (2013), "The price responsiveness of housing supply in OECD countries", *Journal of Housing Economics*, Vol. 22/3, pp. 231-249. [2]

Cavalleri, M., B. Cournède and E. Özsöğüt (2019), "How responsive are housing markets in the OECD? National level estimates", *OECD Economics Department Working Papers*, Vol. 1589, https://doi.org/10.1787/4777e29a-en. [3]

DiPasquale, D. and W. Wheaton (1994), "Housing Market Dynamics and the Future of Housing Prices", *Journal of Urban Economics*, Vol. 35/1, pp. 1-27, https://doi.org/10.1006/juec.1994.1001. [14]

Dougherty, S., M. Harding and A. Reschovsky (2019), "Twenty years of tax autonomy across levels of government: Measurement and applications", *OECD Working Papers on Fiscal Federalism*, No. 29, OECD Publishing, Paris, https://doi.org/10.1787/ca7ebc02-en. [8]

Dougherty, S. et al. (2021), "The impact of decentralisation on the performance of health care systems: a non-linear relationship", *The European Journal of Health Economics*, Vol. 23/4, pp. 705-715, https://doi.org/10.1007/s10198-021-01390-1. [18]

Dougherty, S. and L. Phillips (2019), "The spending power of sub-national decision makers across five policy sectors", *OECD Working Papers on Fiscal Federalism*, No. 25, OECD Publishing, Paris, https://doi.org/10.1787/8955021f-en. [13]

Duca, J., J. Muellbauer and A. Murphy (2021), "What Drives House Price Cycles? International Experience and Policy Issues", *Journal of Economic Literature*, Vol. 59/3, pp. 773-864, https://doi.org/10.1257/jel.20201325. [15]

Fischel, W. (2004), *The homevoter hypothesis : how home values influence local government taxation, school finance and land-use policies*, Harvard University Press. [5]

Green, R., S. Malpezzi and S. Mayo (2005), "Metropolitan-Specific Estimates of the Price Elasticity of Supply of Housing, and Their Sources", *American Economic Review*, Vol. 95/2, pp. 334-339. [11]

Hilber, C. and F. Robert-Nicoud (2013), "On the origins of land use regulations: Theory and evidence from US metro areas", *Journal of Urban Economics*, Vol. 75, pp. 29-43. [6]

Hilber, C. and W. Vermeulen (2016), "The impact of supply constraints on house prices in England", *The Economic Journal*, Vol. 126/591, pp. 358-405. [10]

OECD (2021), *Brick by Brick: Building Better Housing Policies*, OECD publishing Paris, https://doi.org/10.1787/b453b043-en. [1]

Pesaran, M. (2006), “Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure”, *Econometrica*, Vol. 74/4, pp. 967-1012. [16]

Phillips, L. (2020), “Decentralisation and Governance in the Housing Sector”, *OECD Working Papers on Fiscal Federalism*, Vol. 32. [4]

Saiz, A. (2010), “The Geographic Determinants of Housing Supply”, *Quarterly Journal of Economics*, Vol. 125/3, pp. 1253-1296. [9]

Scally, C. and J. Tighe (2015), “Democracy in Action?: NIMBY as Impediment to Equitable Affordable Housing Siting”, *Housing Studies*, Vol. 30/5, pp. 749-769, https://doi.org/10.1080/02673037.2015.1013093. [19]

Wassmer, R. and I. Wahid (2018), “Does the Likely Demographics of Affordable Housing Justify NIMBYism?”, *Housing Policy Debate*, Vol. 29/2, pp. 343-358, https://doi.org/10.1080/10511482.2018.1529694. [17]

Annex 7.A. Robustness tests

Annex Table 7.A.1. Cross sectional dependence test results

Variable	CD Statistic	Mean ρ
Residential investment	58.97***	0.28
Real house prices	68.37***	0.34
Construction costs	64.27***	0.32
Total population	164.34***	0.77
Disposable income per capita	153.94***	0.77
Δ Residential investment	16.10	0.08
Δ Real house prices	25.85	0.13
Δ Construction costs	10.87	0.06
Δ Total population	9.22	0.04
Δ Disposable income per capita	13.08	0.07

Note: The test measures the mean correlation between panel units in individual variables. The panel dimension is 25 countries and the sample for the variables is 1980Q1 to 2017Q4. The null hypothesis is CS independence. The cross-sectional dependence measure (ρ) is the mean of the pair-wise correlation between the cross-section units of the variable. Pesaran (2006[16]) CD test for cross-sectional dependence in individual variables.
Source: Cavalleri, Cournède and Özsöğüt (2019[3]).

Annex Table 7.A.2. Panel unit root tests

Pesaran panel unit root test in the presence of cross-section dependence (CIPS test statistics)

Variable	Only intercept	With intercept and trend
Residential investment	-1.74	-2.87
Real house prices	-1.31	-1.87
Construction costs	-1.98	-1.95
Total population	-2.39	-2.33
Disposable income per capita	-2.01	-2.85
Δ Residential investment	-5.58	-5.71
Δ Real house prices	-4.38	-4.98
Δ Construction costs	-5.81	-6.03
Δ Total population	-0.69	-2.15
Δ Disposable income per capita	-6.10	-6.30

Note: Panel unit root tests for each variable, conducted over 25 countries and a horizon from 1980Q1 to 2017Q4. CIPS statistics are computed as the simple average of the individual specific CADF(2) tests, where two time lags are used in each regression. The null hypothesis is homogeneous non-stationarity, i.e., that all series have a unit root. The alternative hypothesis is that some series are stationary. Critical values for the CIPS statistics are -2.3, -2.16 and -2.08 for 1%, 5% and 10% significance, respectively, for the model with intercept only; -2.77, -2.65 and -2.59 for 1%, 5% and 10% significance, respectively, for the model with intercept and time trend.
Source: Cavalleri, Cournède and Özsöğüt (2019[3]).

Annex Table 7.A.3. Long-run elasticity interacted with general spending power indicators

	Dependent variable: Real residential investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Real house prices	0.956***	0.601**	0.891**	0.893***	0.869***	0.772***
	(0.105)	(0.237)	(0.396)	(0.233)	(0.120)	(0.132)
Lag of construction costs	-0.235	-0.069	-1.896	-0.258	0.131	0.166
	(0.147)	(0.380)	(1.490)	(0.367)	(0.267)	(0.275)
P x Spending power (Policy)		0.235				
		(0.240)				
P x Spending power (Budget)			2.122			
			(1.546)			
P x Spending power (Input)				-0.199***		
				(0.067)		
P x Spending power (Output)					-0.366***	
					(0.081)	
P x Spending power (Composite)						-0.535***
						(0.145)
Chi-squared	40502783***	241861***	84656***	174200***	148294***	166870***
Countries	25	11	11	11	11	11
Observations	2,840	1,303	1,303	1,303	1,303	1,303
Adjusted R^2	0.843	0.850	0.433	0.847	0.844	0.839

Note: Significance levels: *** p < .01, ** p < .05, * p < .1; Standard errors (in parentheses) are robust to arbitrary common correlated disturbances (Driscoll - Kraay).

Annex Table 7.A.4. Long-run elasticity of housing supply interacted with quadratic spending power indicators

	Dependent variable: Real residential investment					
	(1)	(2)	(3)	(4)	(5)	(6)
Real house prices	0.956***	1.426***	0.938***	0.638***	1.226***	1.074***
	(0.105)	(0.104)	(0.134)	(0.130)	(0.115)	(0.116)
Lag of construction costs	-0.235	-0.425**	-0.481***	-0.412**	-0.530***	-0.437**
	(0.147)	(0.175)	(0.176)	(0.168)	(0.167)	(0.175)
P x Spending power (Policy)		-0.239***				
		(0.050)				
P x Spending power (Policy)^2		-0.241***				
		(0.068)				
P x Spending power (Budget)			-0.172***			
			(0.018)			
P x Spending power (Budget)^2			0.030*			
			(0.017)			
P x Spending power (Input)				-0.075***		
				(0.027)		
P x Spending power (Input)^2				0.051***		
				(0.010)		
P x Spending power (Output)					-0.204***	
					(0.025)	
P x Spending power (Output)^2					-0.017	
					(0.025)	
P x Spending power (Composite)						-0.232***
						(0.026)
P x Spending power (Composite)^2						0.002
						(0.035)
Chi-squared	40502783***	14684271***	19233289***	12784721***	14084937***	16453109***
Countries	25	23	23	23	23	23
Observations	2,840	2,598	2,598	2,598	2,598	2,598
R^2	0.851	0.858	0.857	0.852	0.841	0.855
Adjusted R^2	0.843	0.849	0.849	0.843	0.832	0.847

Note: Significance levels: *** p < .01, ** p < .05, * p < .1; Standard errors (in parentheses) are robust to arbitrary common correlated disturbances (Driscoll - Kraay).

Note

[1] As a time-varying indicator would have been welcome for further econometric analysis, we explored whether local government shares in total housing expenditure could provide useable proxy measures of local government spending power. However, it turns out that such local government spending shares do not accurately reflect subnational spending power. For instance, local government spending can be high also in configurations where local authorities have a limited say over the expenditure (Phillips, 2020[4]). Quantitatively, these measures are only weakly correlated with each other.

8 The impact of housing policy on housing inequality

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This chapter reviews existing housing inequality estimates and discusses how housing policy may affect them, focusing on recent evidence for Belgium. Housing inequality in Belgium is relatively low, but differences across subnational units are substantial. Within cities, housing inequality is higher in downtowns and lower in residential areas – patterns that are similar in Brussels, Barcelona and Boston. More evidence is needed, but research suggests that housing and income inequality are highly correlated. Housing allowances, vouchers and rental investment subsidies offer promising ways to reduce housing inequality, although the latter may exacerbate wealth inequality. A recent reduction in housing transaction fees in Flanders increased housing prices and reduced inequality, with substantial geographic heterogeneity. These results highlight the local nature of housing, as even national policies have significantly distinct impacts across space. Enhancing granularity in existing income and housing inequality estimates may assist policymakers in better designing, targeting and implementing future policies.

8.1. Introduction

Housing inequality is relevant, yet we know very little about it. Housing is crucial to understanding income and wealth inequality and, as the "door of entry to neighbourhoods," critical to studying social mobility and other inequality dynamics. However, housing inequality has been largely overlooked in the literature. Perhaps because income and wealth inequality have received most of the attention, or possibly because, until recently, computing capabilities required to process large administrative datasets (such as a cadastre) were very limited. This chapter reviews existing housing inequality estimates and discusses how different housing policy instruments may shape it, with a strong focus on recent evidence for Belgium.

The chapter starts with a review of the reasons to study housing inequality and a series of definitions of several dimensions of housing inequality (e.g., housing consumption versus housing wealth). Housing is both a consumption good and an asset. Households spend a significant fraction of their income on housing and invest most of their wealth in housing assets. Thus, housing is crucial to understand income, consumption and wealth inequality. It is also crucial to the study of social mobility, as housing's physical locations (i.e., neighbourhoods) are extremely relevant to several short and long-term outcomes (Chetty, Hendren and Katz, 2016[1]; Chetty and Hendren, 2018[2]; 2018[3]; Chyn and Katz, 2021[4]; Durlauf, 2004[5]). These reasons alone justify investigating housing inequality per se, but they also constitute strong foundations for looking at housing when the objective is to understand the roots of income or wealth inequality better.

Cadastral data is an ideal tool to study housing inequality. Their main advantages are cross-country availability and homogeneity, geolocation capabilities, coverage and the potential to perform historical analysis with cross-sectional data. The availability of this excellent resource provides yet another reason to study housing, especially when the focus of research or policy is at the sub-national level.

The chapter then reviews some of the few existing estimates of housing value inequality, focusing on Belgium. Housing inequality in Belgium is relatively low. Domènech-Arumí, Gobbi and Magerman (2022[6]) (DGM henceforth) estimate an overall level of housing (value) inequality of 0.25 (Gini index) and document substantial geographic heterogeneity, with inequality in some regions, districts and cities significantly below or above the national level. New estimates for Massachusetts (MA) also reveal significant geographic heterogeneity in that state but suggest that the overall level of housing inequality in the United States (US) may be substantially higher (Gini of 0.4 in MA). The results at the sub-national level reveal the great extent of geographic heterogeneity in (at least) the two countries and make salient that granularity in the data matters in the study of inequality.

Within cities, housing inequality appears to be higher in downtowns and lower in residential areas. The chapter then investigates within-city patterns by reviewing and reproducing existing local housing inequality estimates for Brussels and Barcelona (Domènech-Arumí, 2021[7]), as well as new estimates for Boston. The three cities show similar spatial patterns in their distribution of housing inequality across neighbourhoods, with higher inequality levels in the central parts of a city.

The correlation between housing value and income inequality is high. DGM find a correlation above 0.6 between their housing inequality estimates and available income inequality estimates for Belgium, a result that is in line with Aladangady et al. (2017[8]) and Albouy and Zabek (2016[9]) for the United States. These correlations reinforce the idea that exploring housing inequality may be helpful to understand income inequality when income data are unavailable, e.g., at low levels of aggregation.

The final section of the chapter starts reviewing a set of common housing policies and discusses their impact on housing inequality based on existing evidence. These policies are housing allowances, housing vouchers, mortgage interest deductions, rental investment subsidies, rent control and housing transaction fees (or stamp duties). Among these, housing vouchers and allowances appear to be the most promising for reducing housing consumption inequality. Rental investment subsidies may also achieve that goal, but they may exacerbate housing wealth inequality.

Finally, the chapter reviews the effects of a recent reduction in Flanders' housing registration fees on housing prices and inequality. DGM estimate that the 3 percentage point reduction in transaction fees caused house prices to increase by almost 3%, a result in line with Han et al. (2022[10]). They also find that house price increases were more prevalent at the bottom of the dwelling value distribution, thus causing the overall housing value inequality in Flanders to decrease by 0.8%. They document significant spatial heterogeneities, with inequality reductions being more prevalent in the east of the country and less in the areas close to Brussels. That geographic heterogeneity makes the local nature of housing salient, as even policies designed at the regional or federal level can have very distinct impacts at the local level.

8.2. Housing inequality

8.2.1. Why housing and housing inequality?

Income or wealth inequality cannot be fully understood without considering the role of housing. Housing expenditure account for 10 to 30% of household consumption in OECD countries (OECD, 2022[11]) – thus, it is a crucial component of consumption and income inequality – and housing is the most evenly distributed asset of the wealth distribution (Garbinti, Goupille-Lebret and Piketty, 2020[12]), and therefore a major determinant of wealth inequality.

As the “door of entry” to neighbourhoods, housing is crucial for the study of social mobility. There is overwhelming evidence pointing to the many short and long-term effects of exposure to different quality neighbourhoods, such as social mobility or lifetime earnings.[1] Therefore, given that owning or renting a home in a neighbourhood is the only way to benefit from (or be harmed by) neighbourhood effects, housing is a key to understanding current and future inequality dynamics. Housing is the link connecting the research on inequality and neighbourhoods.

8.2.2. Dimensions of housing inequality and their interpretation

Housing is a complex good. It is a consumption good, that provides shelter (housing structure) and access to local amenities (e.g., schools) and labour markets. It is also an asset and capital good, the major source of wealth throughout the income distribution (Kaas, Kocharkov and Preugschat, 2019[13]; Martínez-Toledano, 2020[14]). Finally, it is a source of income, specifically a direct source for landlords leasing housing units in the rental market and an indirect source for owner-occupiers. Consequently, different measures of housing inequality are informative of different things.

With knowledge of ownership and owner-occupancy, measures of the total housing value per owner are informative about wealth inequality. It is also reasonable to consider renters as households with zero wealth (Albouy and Zabek, 2016[9]), and homeowners (of potentially multiple properties) as households with positive wealth, with their total wealth being equal to the total value of all owned properties. Since the wealthiest households hold a higher share of their wealth in financial assets (Kuhn, Schularick and Steins, 2020[15]; Zucman, 2019[16]), that approach will understate true wealth inequality. A caveat is that, ideally, the most accurate measure of housing wealth should rely on market-value house prices, net of outstanding mortgage payments. While the former can be estimated with supplementary data (e.g., combining a transactions database with machine learning techniques), the latter is more difficult to supplement, as mortgage information is typically unavailable in cadastres. Despite its shortcomings, it is the view of the author that pursuing this measurement agenda can be fruitful for researchers and policymakers alike.

Housing value inequality is also informative about income inequality. In a world with homothetic preferences,[2] housing consumption (rents or imputed rents) would be perfectly correlated with income. Because lower-income households spend relatively more on housing than richer households, the relationship between income and housing inequality is not one-for-one. Still, recent research suggests that there is a strong link between the two – see Albouy and Zabek (2016[9]) and DGM for more elaboration.

When comparing dwellings of different values, it is useful to think of each home as representing a household. Most of the estimates reviewed in this chapter refer to this type of inequality and can therefore be interpreted as informative of household income inequality.

Finally, the inequality of housing space is informative about real income inequality. Recent work highlights that inequality may be overestimated because higher-income workers tend to live in cities with high housing costs (Diamond and Moretti, 2021[17]; Moretti, 2013[18]). Thus, net-of-housing consumption (and income) inequality may not be as stark as they seem after factoring in housing and other costs of living. In this sense, looking at housing space is informative of the extent of real housing consumption inequality at the national level. At a more local level (where amenities and land value are approximately held constant), it is also informative about income inequality.

8.2.3. Cadastral data as an ideal resource to study housing inequality

Studying housing inequality with cadastral data offers several advantages. First, cadastral data are typically very homogeneous and available in many countries. This implies a high degree of replicability across contexts. Second, the data are typically geolocated, thus implying that time-varying or arbitrary administrative boundaries are not a problem. Third, the data typically contain information on the universe of real estate, thus implying that censoring or the need for imputations is not an issue. Finally, because real estate is durable and the year of construction is typically observed, it is possible and meaningful to construct a panel dataset from a simple cross-section.[3]

A disadvantage of cadastral data is that official value assessments of properties may be outdated, as it is the case in Belgium (see below). That limitation can be overcome with supplementary data. For example, real estate transactions or listing data may be combined to impute the contemporary market value of properties. A second, related, disadvantage is that some characteristics of the properties may not be appropriately updated (e.g., energy efficiency).

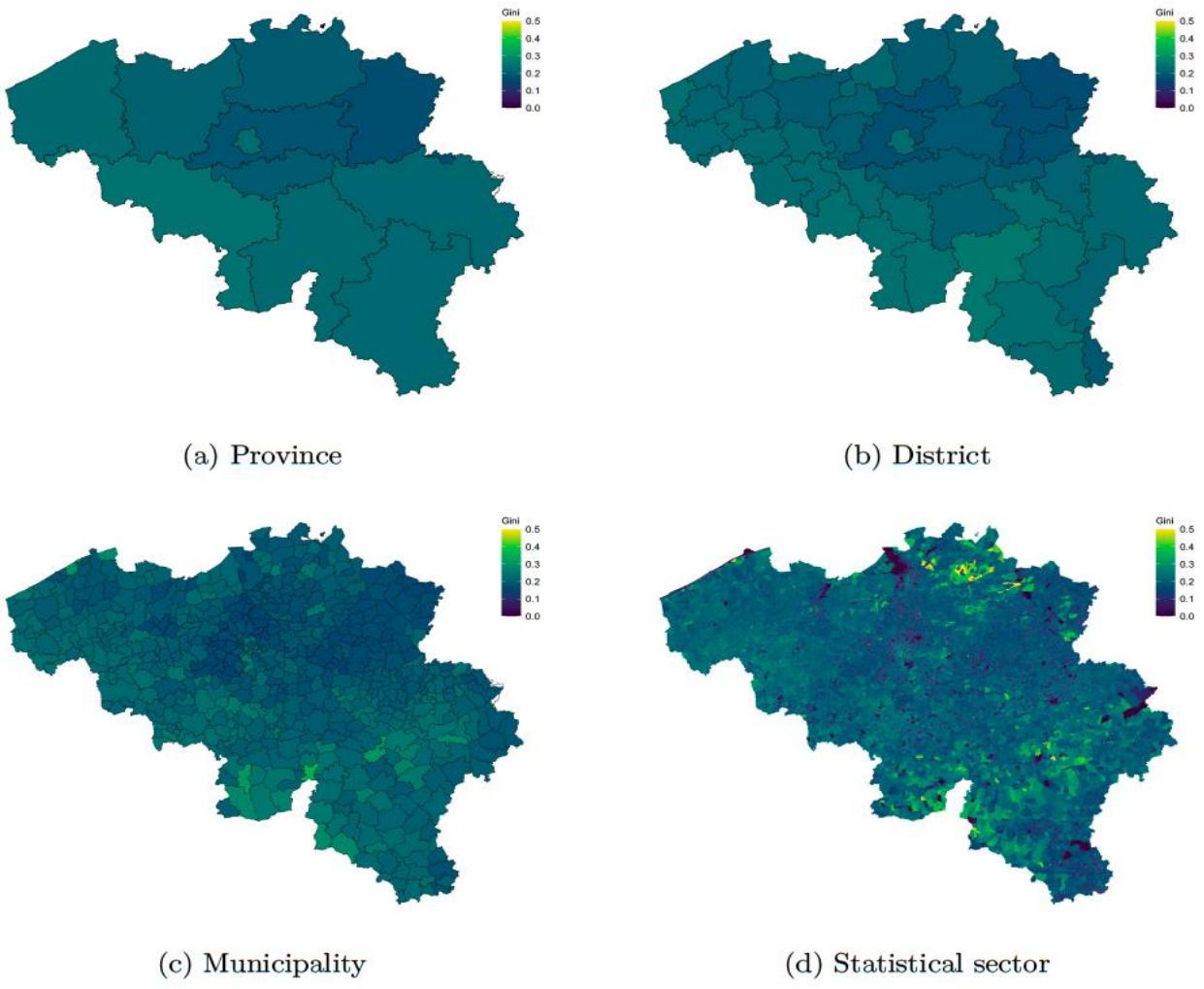
8.2.4. Housing inequality estimates in Belgium and other countries

Belgium

DGM (2022[6]) studies housing value (and space) inequality in Belgium using data from the Belgian cadastre. It should be noted upfront that the official cadastral values in Belgium date back to the 1970s and are outdated. However, DGM use the universe of Belgian real estate transactions from 2006-2022 to estimate current property values, rather than using the outdated official cadastral values. By leveraging this extensive transaction data, the housing inequality estimates presented here reflect contemporary market values and avoid the limitations of the archaic official cadastral valuations. They estimate an overall level of housing value inequality (as of 2022), as measured by the Gini index, of 0.25 – a number very close to the OECD estimate (0.26) of income inequality (OECD, 2022[19]). They take advantage of the granularity of cadastral data to further study inequality at different sub-national levels, from the region and down to the statistical sector level (the smallest administrative unit in Belgium). Figure 8.1, borrowed from DGM, offers a visualisation of their results in maps.

Inequality estimates vary substantially with the level of aggregation. At the regional level, Wallonia (in the south) is the most unequal (Gini of 0.265) and Flanders (in the north) the least unequal (Gini of 0.208). Inequality within regions is also substantial. For example, within the relatively equal region of Flanders, the *communes* (municipalities) and statistical sectors in the vicinity of Antwerp exhibit high levels of inequality. Aggregation matters and significant heterogeneities exist within country and regional borders.

Figure 8.1. Housing value inequality in Belgium

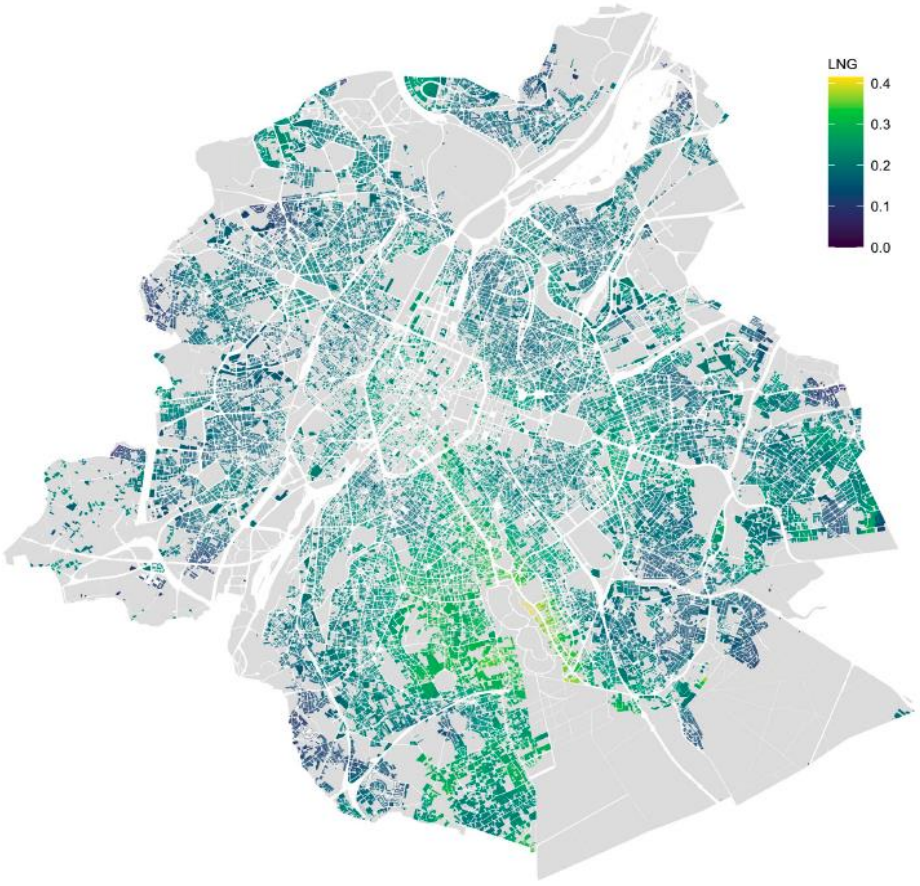


Note: Each map illustrates housing value inequality (Gini index) at a sub-national level. Darker colours describe geographic units with lower inequality. Brighter colours denote higher inequality. Overall housing value inequality in Belgium is 0.253. The values are 0.226, 0.265 and 0.208 for the regions of Brussels, Wallonia and Flanders, respectively. Estimates for 2022.
Source: Domènech-Arumí, Gobbi and Magerman (2022[6]).

Inequality within a city can also be substantial. Applying the methodology developed in Domènech-Arumí (2021[7]), the author also estimates the Local Neighbourhood Gini (LNG) – a Gini index capturing inequality in the immediate vicinity of a given building – for several cities in Belgium. Two significant advantages of the LNG are that it is independent of (arbitrarily drawn and changing) administrative boundaries and offers excellent visualisation of local inequality when plotted on a map. Figure 8.2 shows the estimates for Brussels.

Local inequality varies substantially within Brussels. Inequality is especially high in the southern neighbourhoods of the city, particularly in the areas close to Bois de la Cambre, the park in the south, some areas in the East of Ixelles, as well as central parts of the city close to Avenue Louise. Inequality is lower in the outskirts of the city. Particularly in Watermael (in the southeast) and Anderlecht (northwest). These are predominantly residential areas.

Figure 8.2. Local housing value inequality in Brussels



Note: This figure shows local housing value inequality (proxied by the LNG-500) in Brussels. Each coloured polygon is a parcel with dwellings. Darker colours describe parcels with lower local inequality. Brighter colours illustrate parcels with higher local inequality. Grey polygons denote areas without dwellings. Estimates for 2022.
Source: Domènech-Arumí, Gobbi and Magerman (2022[6]).

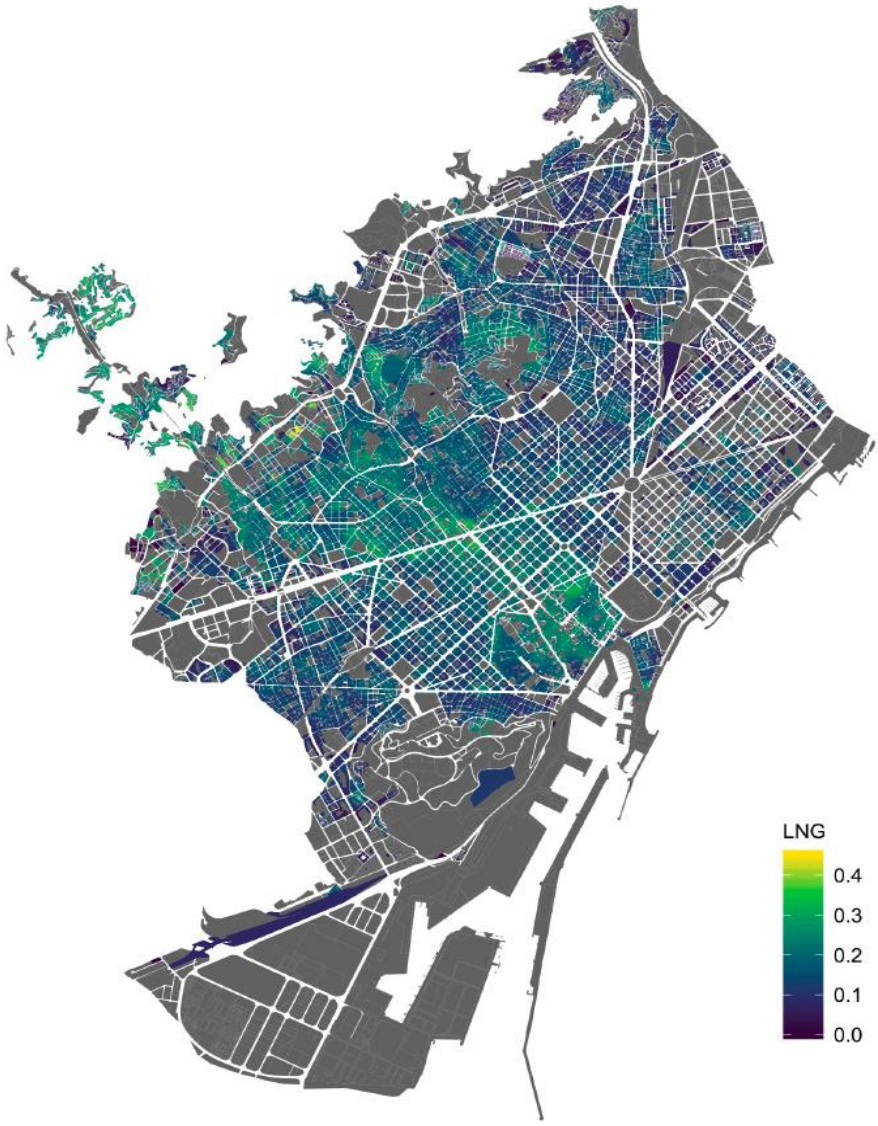
The previous figures make clear that inequality estimates vary substantially as we zoom in or out in terms of aggregation, at least in Belgium. Subsection 2.5 will discuss the possible causes, but before that, the chapter briefly reviews housing inequality estimates in other countries.

Barcelona, Boston and Massachusetts

The chapter first keeps the focus at the very local level and the original LNG estimates from Domènech-Arumí (2021[7]) for Barcelona, Spain are reproduced in Figure 8.3.

As in Brussels, local inequality varies substantially across Barcelona's neighbourhoods. Local inequality is especially high in the central parts of the city, particularly in the streets close to La Rambla and Diagonal Avenue, as well as in the neighbourhoods of Sarrià and Sant Gervasi. Local inequality is generally lower in the neighbourhoods of Sants, Sant Martí and Sant Andreu – in the southwest and east of the city. Heterogeneity in local inequality is substantial in Barcelona.

Figure 8.3. Local housing value inequality in Barcelona



Note: Local housing value inequality (proxied by the LNG-100) in Barcelona, Spain. Each coloured polygon in the map is a parcel with dwellings. Darker colours describe parcels with lower local inequality. Brighter colours illustrate parcels with higher local inequality. Grey polygons denote areas without dwellings. The overall housing value inequality (Gini index) in Barcelona is 0.295. Estimates for 2020.
Source: Domènech-Arumí (2021[7])

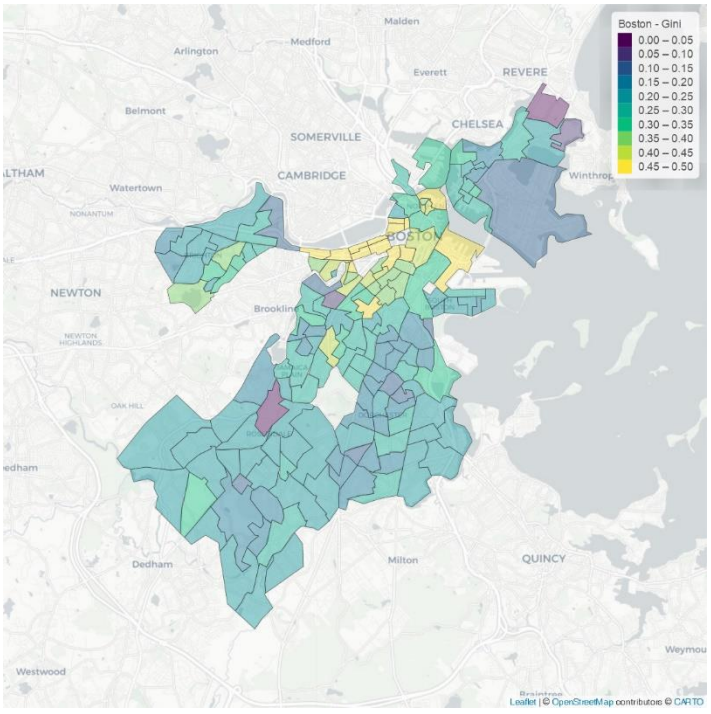
We next switch continents to look at housing inequality within Boston and Massachusetts (MA). Figure 8.4 and Figure 8.5 show housing value inequality estimates (Gini index) across Boston's census tracts and MA's municipalities, respectively.[4] Estimates are computed using the 2021 assessed value of the universe of dwellings in the state, obtained from the Massachusetts property registry (the cadastre equivalent in the United States).

As in Brussels and Barcelona, inequality heterogeneity is substantial in Boston. Similar to its European counterparts, inequality is higher in the central parts of the city (Back Bay, the South End and East Boston) and lower in the neighbourhoods farther from downtown (Dorchester, Roxbury and Jamaica Plain). In contrast with Barcelona and Brussels, overall housing inequality is substantially higher in Boston. The citywide housing value Gini index was 0.226 in Brussels, 0.295 in Barcelona, but 0.427 in Boston.

Housing inequality in Massachusetts is significantly higher than in any Belgian region or Barcelona. The overall level of inequality in the state is 0.405, as measured by the Gini index. The same pattern and ordering appears when looking at income inequality. For example, income inequality (Gini) is 0.354 in Catalonia (*Encuesta de Condiciones de Vida*, 2019) and 0.48 in Massachusetts (American Community Survey, 2019).[5]

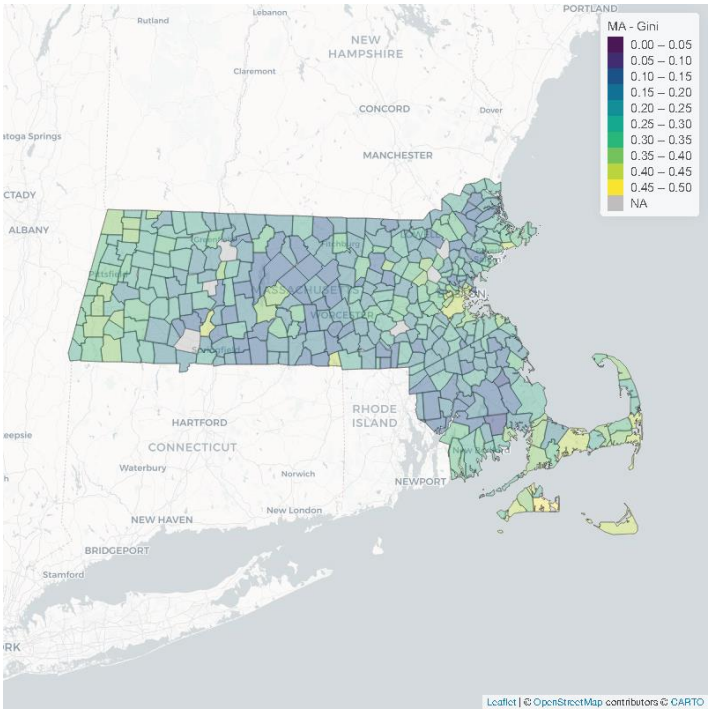
Finally, heterogeneity across MA's municipalities is also very significant. Inequality is high in the towns close to Boston, Cape Cod, or the border with New York state. Inequality is lower in the central areas of the state. In ongoing and future work, the author of this chapter will extend and analyse housing inequality in the rest of the United States.

Figure 8.4. Housing value inequality in Boston



Note: Housing value inequality (Gini index) in Boston, MA. Each polygon in the map represents a census tract. Darker colours describe tracts with lower inequality. Brighter colours denote higher inequality. Overall housing value inequality in Boston is 0.427.
Source: Own elaboration and calculations from 2021 Massachusetts property registry data.

Figure 8.5. Housing value inequality in Massachusetts



Note: Housing value inequality (Gini index) in Massachusetts. Each polygon in the map represents a town (municipality). Darker colours describe towns with lower inequality. Brighter colours denote higher inequality. Overall housing value inequality in Massachusetts is 0.405. Source: Own elaboration and calculations from 2021 Massachusetts property registry data.

Other contexts

Housing inequality is largely unexplored. Some work has taken into account the role of housing in income inequality in terms of imputed rents (Frick et al., 2010[20]; Frick and Grabka, 2003[21]; Piketty, Saez and Zucman, 2017[22]), or provided nuances to the idea that differences in the standard of living in the United States are as stark as they seem by accounting for geographic disparities in housing costs (Diamond and Moretti, 2021[17]; Moretti, 2013[18]). However, there is very little work directly quantifying cross and within-country differences in housing inequality. The closest example of such work is probably Albouy and Zabek (2016[9]), who show that housing consumption inequality in the United States closely mirrored trends in income inequality in the second half of the twentieth century. They also show that housing inequality is primarily driven by differences in the value of land. For France, it is worth mentioning the work by André and Meslin (2021[23]), who use rich data from the French cadastre to explicitly look at the role of housing in explaining wealth inequality. For China, some work has shown a positive relationship between housing consumption and socio-economic status and has documented increasing inequality since the 1990s (Huang and Jiang, 2009[24]; Logan, Bian and Bian, 1999[25]). To the best of the author's knowledge, there is no similar work that quantifies within-country housing inequality, as was done in the above sub-sections.

8.2.5. Lessons from housing inequality estimates

The housing inequality estimates for Belgium, Barcelona and Massachusetts revealed two patterns. First, within-country heterogeneity is large. At least in Belgium and Massachusetts, some regions and municipalities are more unequal than the country (or state) as a whole, whereas some others are significantly less unequal. Second, cities themselves are highly unequal and heterogeneous, but inequality tends to be higher in areas closer to downtown areas and lower in residential areas further from them. That same pattern emerged in the cities of Brussels, Barcelona and Boston.

Housing value inequality is (probably) highly correlated with income inequality. DGM (2022[6]) find a correlation between the two above 0.5 for Belgium and 0.6 for Brussels.[6] The income and housing inequality estimates from Boston and Massachusetts, as well as the work by Albouy and Zabek (2016[9]), suggest that the correlation is also high in the United States.

Fully characterising the relationship between income and housing inequality will be crucial. Thanks to the OECD, the World Inequality Lab and others, our knowledge of cross-national inequality has significantly improved in recent years (Alvaredo et al., 2020[26]; 2022[27]; Chancel et al., 2021[28]; Kuhn, Schularick and Steins, 2020[15]; OECD, 2022[19]; Piketty and Saez, 2003[29]; Solt, 2016[30]). We know that (particularly northern) Europe is the least unequal region in the world, whereas Sub-Saharan Africa and Latin America are the most unequal. We also know that inequality in North America is significantly higher than in Europe and that disparities have grown since the 1980s. Unfortunately, we know very little about the current state and dynamics of inequality within those regions and countries, largely due to data availability (e.g., survey data may not have exact location identifiers, or sample sizes may be too small to obtain accurate measurements at low aggregations). Since cadastral data are typically geolocated and contain information on the universe of real estate, it is relatively straightforward to compute inequality estimates at any desired level of aggregation. Thus, if housing and income inequality are highly correlated and addressing a research or policy question requires granularity of the data, focusing on housing may be the best way around it.

It will also be critical to study whether the spatial patterns revealed in Belgium, Barcelona and Massachusetts also appear in other contexts. As discussed in the last sub-section, housing inequality is largely unexplored, and therefore more work is needed to see whether the previous findings are truly general or specific to the Western cities analysed.

Most importantly, from a policy perspective, it is paramount to fully understand the causes and consequences of housing inequality and how policy can affect it. We already have a good idea about the causes. At the core, the underlying mechanism driving housing inequality is sorting. Households and firms choose where they live or operate, which mechanically creates inequality across regions and within cities – for example, households sort across cities and neighbourhoods based on income or skill. Moreover, the interaction between these factors in the physical space creates externalities (e.g., agglomeration economies) that may reinforce or reverse inequality dynamics (Baum-Snow and Pavan, 2013[31]; Behrens, Duranton and Robert-Nicoud, 2014[32]; Behrens and Robert-Nicoud, 2015[33]; Fogli and Guerrieri, 2019[34]; Glaeser, Resseger and Tobio, 2009[35]; Puga, 2010[36]). We do not know as much about the consequences of housing inequality, but it is well-known that segregation and consuming poor-quality or overcrowded housing are linked with several negative outcomes (Akbar et al., 2022[37]; Ananat, 2011[38]; Billings, Deming and Rockoff, 2013[39]; Currie and Yelowitz, 2000[40]; Cutler and Glaeser, 1997[41]; Goux and Maurin, 2005[42]; Shertzer and Walsh, 2019[43]). Policy interventions may affect housing inequality and its dynamics in different ways. The last section of this chapter provides a short overview of several widely used housing policies and studies the effects of a recent reform in Belgium.[7]

8.3. Housing policy and housing inequality

8.3.1. Housing policy and inequality: an overview

Housing allowances

Housing allowances are transfers to low-income households (typically tenants) to assist them in affording housing expenses. Commonly, they are progressive, means-tested, and not conditional on residing in some pre-determined area (in contrast to housing vouchers).

Some studies estimate that housing allowances reduce post-tax as well as transfer income inequality (Bozio et al., 2015[44]; 2018[45]). However, their impact is not as large as it could be as landlords capture a fraction of the subsidy in the form of higher rents (Fack, 2006[46]; Gibbons and Manning, 2006[47]; Susin, 2002[48]). The exact impact of this policy (and all policies discussed in this section) critically depends on the elasticities of housing supply and demand (Eerola et al., 2022[49]; Eriksen and Ross, 2015[50]).

Housing vouchers

Housing vouchers are similar to housing allowances, but they are conditional on leasing or purchasing affordable housing in specific (good) neighbourhoods. The Moving to Opportunity program implemented in 1994 in the United States is probably the most prominent and well-studied example of this policy.

Research suggests that vouchers reduce rent burdens, overcrowding and homelessness, while also being effective in keeping or moving disadvantaged households to good neighbourhoods, thereby allowing these households to benefit from all the advantages associated with living in better neighbourhoods. Vouchers also reduce housing consumption inequality (Chetty, Hendren and Katz, 2016[1]; Chyn, 2018[51]; Katz, Kling and Liebman, 2001[52]; Ludwig et al., 2013[53]). Scalability and programme take-up are areas with room for improvement (Ellen, 2020[54]).

Mortgage interest deductions

Mortgage interest deductions (MID) allow households to deduct mortgage payments from their taxes. MID policies are common in many OECD countries, and one of their stated goals is to increase homeownership.

MID policies are regressive as they target homeowners – individuals in the middle and upper parts of the income and wealth distribution (Poterba and Sinai, 2008[55]). Moreover, research suggests MID policies tend to increase home prices without significantly affecting homeownership rates (Damen and Goeyvaerts, 2021[56]; Gruber, Jensen and Kleven, 2021[57]; Hilber and Turner, 2014[58]). With little effect on homeownership, MID policies increase post-transfer income and wealth inequalities.

Rental investment subsidies

Rental investment subsidies are tax deductions for landlords purchasing or investing in new housing to be rented on the market as affordable units for low and middle-income tenants. The most prominent example of such a policy is the Low-Income Housing Tax Credit (LIHTC) in the United States.

Evidence from the United States suggests that the LIHTC effectively keeps lower-income households in better neighbourhoods (Diamond and McQuade, 2019[59]), thereby reducing housing consumption inequality. However, because these policies are transfers to homeowners, housing wealth inequality may increase.

Rent control

Rent control is a policy that aims to make rental units affordable to keep low and middle-income renters in good neighbourhoods. This policy has many versions: from absolute price ceilings affecting all dwellings in a city or a neighbourhood to restrictions on the growth rate of rents that vary with local or dwelling characteristics (e.g., their age).

The effects of rent control depend on the characteristics of the policy, but most evidence finds predominantly negative impacts on several dimensions. For example, tenants become less mobile, and owners become less likely to provide units in the regulated rental market – and when they do, they tend to invest less in dwelling maintenance (Diamond, McQuade and Qian, 2019[60]; Diamond and McQuade, 2019[59]; Glaeser and Luttmer, 2003[61]; Sims, 2007[62]). Rent control policies allow a few households to significantly increase housing consumption (as they remain in good or gentrifying neighbourhoods). However, rents in the unregulated market increase, thus harming most renters, benefiting landlords, and increasing inequality (Diamond, McQuade and Qian, 2019[60]).

Housing transaction fees (or stamp duties)

Housing transaction fees are levies on the parties transferring real estate. Unlike the previous policies, which regulated or subsidised housing consumption, housing transaction fees' primary purpose is typically tax revenue collection. They exist in many OECD countries.

Research suggests that transaction taxes are highly distortionary, affecting house prices, sales volumes, and therefore, homeownership rates (Besley, Meads and Surico, 2014[63]; Best and Kleven, 2017[64]; Han, Ngai and Sheedy, 2022[10]). Since homeowners have relatively higher incomes and wealth, these policies can reduce post-tax and transfer income inequality. However, as they may discourage some households from becoming homeowners, they can exacerbate housing wealth inequality. This paper's following and last sub-section discusses the effects of a recent housing transaction fee reform in Flanders.

8.3.2. Case study: the Flemish 2022 reduction in registration fees

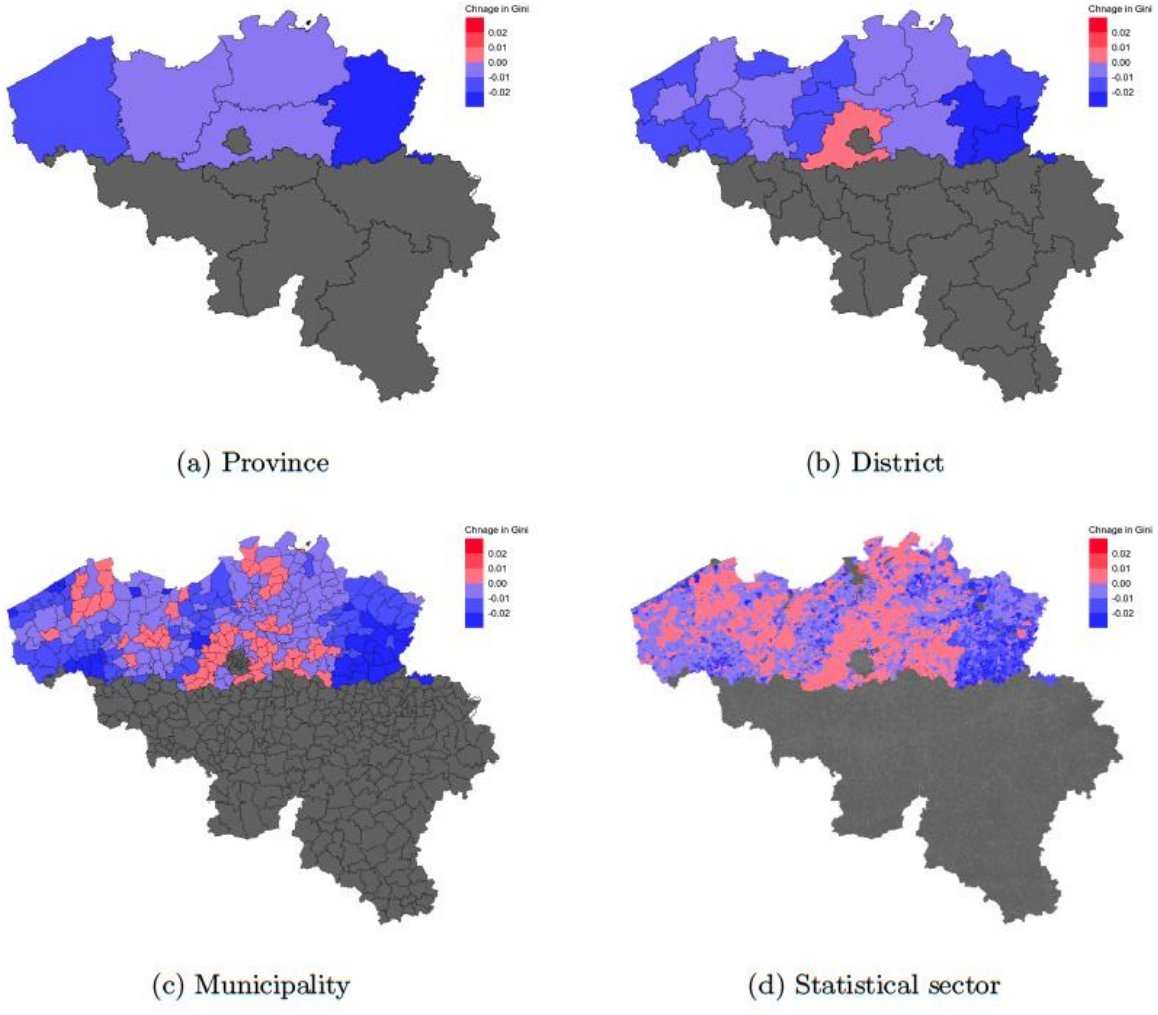
DGM (2022[6]) study the effects of a 3 percentage point reduction in home registration fees in the Belgian region of Flanders. On January 1, 2022, the reform was introduced in Flanders but not in the regions of Brussels and Wallonia. Using a differences-in-differences framework, they find that the 3 percentage point reduction in registration fees caused an increase in house prices of almost 3%. This result is in line with findings from similar policies in other contexts (Besley, Meads and Surico, 2014[63]; Best and Kleven, 2017[64]; Han, Ngai and Sheedy, 2022[10]).

The reform compressed the dwelling value distribution. The paper finds that the increase in home prices was more pronounced at the bottom of the dwelling value distribution, with homes at the bottom decile appreciating as much as 7%. Homes above the median value only experienced a negligible change in prices. The authors estimate that the compression in the dwelling value distribution decreased housing inequality in Flanders by 0.8%.

The geographic heterogeneity effects of the policy (a dimension not often studied in the literature) were substantial. Given the uneven distribution of dwellings of different values in Flanders and the rest of Belgium, the reform affected housing value inequality differently across geographies. Figure 8.6 illustrates the estimated changes in inequality across varying sub-national levels. Inequality decreased more in the east and west of Flanders. At the province level, the authors estimate the reform reduced housing inequality by more than 2% in Limbourg and between 1 and 2% in West Flanders. The image is more nuanced when going below the province level. At the district level, the same spatial patterns persist at the country's borders, but the maps reveal a slight increase in inequality (less than 1%) in the district (*arrondissement*) of Halle-Vilvoorde – the district immediately adjacent to Brussels. At the municipality or

statistical sector level, the number of administrative units with small increases in housing inequality is much larger. It is worth noting, however, that most of these "increases" in inequality are negligible and not statistically different from zero (particularly at the statistical sector level).

Figure 8.6. Estimated change in housing value inequality caused by the Flemish reform



Note: Each map illustrates the predicted change in housing value inequality after the reduction in registration fees introduced in the Flanders region in 2022. Blue polygons are administrative units with reductions in housing value inequality. Red polygons denote administrative units with increases in housing value inequality. The overall estimated change in housing value inequality is -0.14% for Belgium and -0.8% for Flanders.
Source: Domènech-Arumí, Gobbi and Magerman (2022[6]).

The authors discuss two implications of their results. First, the likely winners of the policy were low-value homeowners – who saw the value of their real estate (and therefore wealth) increase thanks to the reform. Second, and this is just speculation, the reform might have reduced wealth inequality if a fraction of liquidity-constrained wishing-to-be homeowners acquired a property thanks to the reduction in transaction fees (part of a home down payment).

A shortcoming of the study is that the authors cannot make factual statements about housing wealth inequality. In that regard, they can only speculate. They were unable to access ownership information in the cadastral data. Without such information, their analysis was limited to discussions on housing value and space inequality, thus providing only a partial picture of two dimensions of housing inequality.

Nevertheless, their analysis illustrates well the important extent of local heterogeneities induced by a regional housing policy and makes the local nature of housing salient. For policymakers, it provides valuable insights about the spatial scope of policies they might not have previously considered, and it opens the door for the consideration of compensatory mechanisms following the identification of (local) winners and losers from the policy.

8.4. Conclusions

The chapter reviewed some of the existing housing inequality estimates, with a strong emphasis on recent evidence for Belgium. Housing inequality in Belgium is relatively low (e.g., compared to estimates from the United States), but heterogeneity across subnational entities is substantial. Within cities, housing inequality tends to be larger in downtowns and lower in residential areas, a pattern that emerged in Brussels, Barcelona and Boston. More cross and within-country evidence are required, but housing and income inequality appear to be highly correlated.

The chapter also reviewed some of the most common housing policies and discussed their impact on housing inequality. Housing allowances, housing vouchers and rental investment subsidies are among the most promising avenues to reduce housing (consumption) inequality, although the latter may also exacerbate housing wealth inequality. Finally, a recent reduction in housing registration fees in Flanders increased housing prices in that region and reduced housing value inequality. The impact of the policy was highly heterogeneous across sub-national units, thus highlighting how all housing policies involve a strong local component. Therefore, enhancing the granularity of housing and income inequality estimates may assist governments in improving their policies' design, targeting and implementation.

Finally, as the OECD's (2021[65]) *Brick-by-Brick* report argues, and the Belgian case study makes clear, regularly updating cadastral values is important for fairness, avoiding distortions and keeping track of housing inequality.

References

Akbar, P. et al. (2022), "Racial Segregation in Housing Markets and the Erosion of Black Wealth", *The Review of Economics and Statistics*, pp. 1-45, https://doi.org/10.1162/rest_a_01276. [37]

Aladangady, A., D. Albouy and M. Zabek (2017), "Housing inequality", *NBER Working Paper Series*, No. 21916 (Revised), https://dornsife.usc.edu/assets/sites/1003/docs/D._Albouy_Paper.pdf. [8]

Albouy, D. and M. Zabek (2016), *Housing Inequality*, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w21916. [9]

Alvaredo, F. et al. (2020), *Distributional National Accounts Guidelines, Methods and Concepts Used in the World Inequality Database*, https://hal.archives-ouvertes.fr/hal-03307274. [26]

Alvaredo, F. et al. (2022), *World Inequality Database*, https://wid.world/. [27]

Ananat, E. (2011), "The Wrong Side(s) of the Tracks: The Causal Effects of Racial Segregation on Urban Poverty and Inequality", *American Economic Journal: Applied Economics*, Vol. 3/2, pp. 34-66, https://doi.org/10.1257/app.3.2.34. [38]

André, M. and Meslin (2021), "Et pour quelques appartements de plus: Étude de la propriété immobilière des ménages et du profil redistributif de la taxe foncière", Document de Travail, Insee, https://www.bnsp.insee.fr/ark:/12148/bc6p07c0xkt.pdf. [23]

Baum-Snow, N. and R. Pavan (2013), "Inequality and City Size", *The Review of Economics and Statistics*, Vol. 95/5, pp. 1535-1548, https://doi.org/10.1162/rest_a_00328. [31]

Behrens, K., G. Duranton and F. Robert-Nicoud (2014), "Productive Cities: Sorting, Selection, and Agglomeration", *Journal of Political Economy*, Vol. 122/3, pp. 507-553, https://doi.org/10.1086/675534. [32]

Behrens, K. and F. Robert-Nicoud (2015), "Agglomeration Theory with Heterogeneous Agents", in *Handbook of Regional and Urban Economics*, Elsevier, https://doi.org/10.1016/b978-0-444-59517-1.00004-0. [33]

Besley, T., N. Meads and P. Surico (2014), "The incidence of transaction taxes: Evidence from a stamp duty holiday", *Journal of Public Economics*, Vol. 119, pp. 61-70, https://doi.org/10.1016/j.jpubeco.2014.07.005. [63]

Best, M. and H. Kleven (2017), "Housing Market Responses to Transaction Taxes: Evidence From Notches and Stimulus in the U.K.", *The Review of Economic Studies*, Vol. 85/1, pp. 157-193, https://doi.org/10.1093/restud/rdx032. [64]

Billings, S., D. Deming and J. Rockoff (2013), "School Segregation, Educational Attainment, and Crime: Evidence from the End of Busing in Charlotte-Mecklenburg", *The Quarterly Journal of Economics*, Vol. 129/1, pp. 435-476, https://doi.org/10.1093/qje/qjt026. [39]

Bozio, A. et al. (2018), "Inequality and redistribution in France", *1990-2018: evidence from post-tax distributional national accounts (dina). WID. World Working Paper*, No. 10, http://www.ecineq.org/ecineq_paris19/papers_EcineqPSE/paper_58.pdf. [45]

Bozio, A. et al. (2015), "Reforming French housing benefits: why not merging benefits?", *Notes IPP*, No. 18, https://shs.hal.science/halshs-02539844/. [44]

Chancel, L. et al. (2021), *World inequality report 2022*. [28]

Chapelle, G., G. Domènech-Arumí and P. Gobbi (2023), "Housing, Neighborhoods and Inequality", *CEPR Discussion Papers*, No. DP17969, https://cepr.org/publications/dp17969. [67]

Chetty, R. and N. Hendren (2018), "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects*", *The Quarterly Journal of Economics*, Vol. 133/3, pp. 1107-1162, https://doi.org/10.1093/qje/qjy007. [2]

Chetty, R. and N. Hendren (2018), "The Impacts of Neighborhoods on Intergenerational Mobility II: County-Level Estimates*", *The Quarterly Journal of Economics*, Vol. 133/3, pp. 1163-1228, https://doi.org/10.1093/qje/qjy006. [3]

Chetty, R., N. Hendren and L. Katz (2016), "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment", *American Economic Review*, Vol. 106/4, pp. 855-902, https://doi.org/10.1257/aer.20150572. [1]

Chyn, E. (2018), "Moved to Opportunity: The Long-Run Effects of Public Housing Demolition on Children", *American Economic Review*, Vol. 108/10, pp. 3028-3056, https://doi.org/10.1257/aer.20161352. [51]

Chyn, E. and L. Katz (2021), "Neighborhoods Matter: Assessing the Evidence for Place Effects", *Journal of Economic Perspectives*, Vol. 35/4, pp. 197-222, https://doi.org/10.1257/jep.35.4.197. [4]

Currie, J. and A. Yelowitz (2000), "Are public housing projects good for kids?", *Journal of Public Economics*, Vol. 75/1, pp. 99-124, https://doi.org/10.1016/s0047-2727(99)00065-1. [40]

Cutler, D. and E. Glaeser (1997), "Are Ghettos Good or Bad?", *The Quarterly Journal of Economics*, Vol. 112/3, pp. 827-872, https://doi.org/10.1162/003355397555361. [41]

Damen, S. and G. Goeyvaerts (2021), "Housing market responses to the mortgage interest deduction", *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.3854883. [56]

Diamond, R. and T. McQuade (2019), "Who Wants Affordable Housing in Their Backyard? An Equilibrium Analysis of Low-Income Property Development", *Journal of Political Economy*, Vol. 127/3, pp. 1063-1117, https://doi.org/10.1086/701354. [59]

Diamond, R., T. McQuade and F. Qian (2019), "The Effects of Rent Control Expansion on Tenants, Landlords, and Inequality: Evidence from San Francisco", *American Economic Review*, Vol. 109/9, pp. 3365-3394, https://doi.org/10.1257/aer.20181289. [60]

Diamond, R. and E. Moretti (2021), *Where is Standard of Living the Highest? Local Prices and the Geography of Consumption*, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w29533. [17]

Domènech-Arumí, G. (2021), "Neighborhoods, Perceived Inequality, and Preferences for Redistribution: Evidence from Barcelona", *SSRN Electronic Journal*, https://doi.org/10.2139/ssrn.3863594. [7]

Domènech-Arumí, G., P. Gobbi and G. Magerman (2022), "Housing inequality and how fiscal policy shapes it: Evidence from Belgian real estate", *National Bank of Belgium Working Paper*, No. 423, https://ideas.repec.org/p/nbb/reswpp/202210-423.html. [6]

Durlauf, S. (2004), "Neighborhood effects", in *Handbook of Regional and Urban Economics, Cities and Geography*, Elsevier, https://doi.org/10.1016/s1574-0080(04)80007-5. [5]

Eerola, E. et al. (2022), *The Incidence of Housing Allowances: Quasi-Experimental Evidence*, https://www.doria.fi/handle/10024/185961. [49]

Ellen, I. (2020), "What do we know about housing choice vouchers?", *Regional Science and Urban Economics*, Vol. 80, p. 103380, https://doi.org/10.1016/j.regsciurbeco.2018.07.003. [54]

Eriksen, M. and A. Ross (2015), "Housing Vouchers and the Price of Rental Housing", *American Economic Journal: Economic Policy*, Vol. 7/3, pp. 154-176, https://doi.org/10.1257/pol.20130064. [50]

Fack, G. (2006), "Are housing benefit an effective way to redistribute income? Evidence from a natural experiment in France", *Labour Economics*, Vol. 13/6, pp. 747-771, https://doi.org/10.1016/j.labeco.2006.01.001. [46]

Fogli, A. and V. Guerrieri (2019), "The end of the American dream? Inequality and segregation in US cities", Becker Friedman Institute for Economics at the University of Chicago, https://bfi.uchicago.edu/insight/research-summary/the-end-of-the-american-dream-inequality-and-segregation-in-us-cities/. [34]

Frick, J. and M. Grabka (2003), "Imputed Rent and Income Inequality: A Decomposition Analysis for Great Britain, West Germany and the U.S.", *Review of Income and Wealth*, Vol. 49/4, pp. 513-537, https://doi.org/10.1111/j.0034-6586.2003.00102.x. [21]

Frick, J. et al. (2010), "Distributional effects of imputed rents in five European countries", *Journal of Housing Economics*, Vol. 19/3, pp. 167-179, https://doi.org/10.1016/j.jhe.2010.06.002. [20]

Garbinti, B., J. Goupille-Lebret and T. Piketty (2020), "Accounting for Wealth-Inequality Dynamics: Methods, Estimates, and Simulations for France", *Journal of the European Economic Association*, Vol. 19/1, pp. 620-663, https://doi.org/10.1093/jeea/jvaa025. [12]

Gibbons, S. and A. Manning (2006), "The incidence of UK housing benefit: Evidence from the 1990s reforms", *Journal of Public Economics*, Vol. 90/4-5, pp. 799-822, https://doi.org/10.1016/j.jpubeco.2005.01.002. [47]

Glaeser, E. and E. Luttmer (2003), "The Misallocation of Housing Under Rent Control", *American Economic Review*, Vol. 93/4, pp. 1027-1046, https://doi.org/10.1257/000282803769206188. [61]

Glaeser, E., M. Resseger and K. Tobio (2009), "INEQUALITY IN CITIES", *Journal of Regional Science*, Vol. 49/4, pp. 617-646, https://doi.org/10.1111/j.1467-9787.2009.00627.x. [35]

Goux, D. and E. Maurin (2005), "The effect of overcrowded housing on children's performance at school", *Journal of Public Economics*, Vol. 89/5-6, pp. 797-819, https://doi.org/10.1016/j.jpubeco.2004.06.005. [42]

Gruber, J., A. Jensen and H. Kleven (2021), "Do People Respond to the Mortgage Interest Deduction? Quasi-Experimental Evidence from Denmark", *American Economic Journal: Economic Policy*, Vol. 13/2, pp. 273-303, https://doi.org/10.1257/pol.20170366. [57]

Han, L., L. Ngai and K. Sheedy (2022), "To Own or to Rent? The Effects of Transaction Taxes on Housing Markets", *Entre for Economic Policy Research*, https://personal.lse.ac.uk/ngai/HanNgaiSheedy.pdf. [10]

Hilber, C. and T. Turner (2014), "The Mortgage Interest Deduction and its Impact on Homeownership Decisions", *Review of Economics and Statistics*, Vol. 96/4, pp. 618-637, https://doi.org/10.1162/rest_a_00427. [58]

Huang, Y. and L. Jiang (2009), "Housing Inequality in Transitional Beijing", *International Journal of Urban and Regional Research*, Vol. 33/4, pp. 936-956, https://doi.org/10.1111/j.1468-2427.2009.00890.x. [24]

Kaas, Kocharkov and Preugschat (2019), "Wealth Inequality and Homeownership in Europe", *Annals of Economics and Statistics* 136, p. 27, https://doi.org/10.15609/annaeconstat2009.136.0027. [13]

Katz, L., J. Kling and J. Liebman (2001), "Moving to Opportunity in Boston: Early Results of a Randomized Mobility Experiment", *The Quarterly Journal of Economics*, Vol. 116/2, pp. 607-654, https://doi.org/10.1162/00335530151144113. [52]

Kuhn, M., M. Schularick and U. Steins (2020), "Income and wealth inequality in America, 1949-2016", *Journal of Political Economy*, Vol. 128/9, pp. 3469-3519. [15]

Logan, J., Y. Bian and F. Bian (1999), "Housing inequality in urban China in the 1990s", *International Journal of Urban and Regional Research*, Vol. 23/1, pp. 7-25, https://doi.org/10.1111/1468-2427.00176. [25]

Ludwig, J. et al. (2013), "Long-Term Neighborhood Effects on Low-Income Families: Evidence from Moving to Opportunity", *American Economic Review*, Vol. 103/3, pp. 226-231, https://doi.org/10.1257/aer.103.3.226. [53]

Martínez-Toledano, C. (2020), "House price cycles, wealth inequality and portfolio reshuffling", *WID. World Working Paper*, No. 2,8. [14]

Moretti, E. (2013), "Real Wage Inequality", *American Economic Journal: Applied Economics*, Vol. 5/1, pp. 65-103, https://doi.org/10.1257/app.5.1.65. [18]

OECD (2022), *OECD Affordable Housing Database*, https://www.oecd.org/housing/data/affordable-housing-database. [11]

OECD (2022), *OECD Income Inequality Database*, https://data.oecd.org/inequality/income-inequality.htm. [19]

OECD (2021), *Brick by Brick: Building Better Housing Policies*, OECD Publishing, Paris, https://doi.org/10.1787/b453b043-en. [65]

Piketty, T. and E. Saez (2003), "Income Inequality in the United States, 1913-1998", *The Quarterly Journal of Economics*, Vol. 118/1, pp. 1-41, https://doi.org/10.1162/00335530360535135. [29]

Piketty, T., E. Saez and G. Zucman (2017), "Distributional National Accounts: Methods and Estimates for the United States", *The Quarterly Journal of Economics*, Vol. 133/2, pp. 553-609, https://doi.org/10.1093/qje/qjx043. [22]

Poterba, J. and T. Sinai (2008), "Tax Expenditures for Owner-Occupied Housing: Deductions for Property Taxes and Mortgage Interest and the Exclusion of Imputed Rental Income", *American Economic Review*, Vol. 98/2, pp. 84-89, https://doi.org/10.1257/aer.98.2.84. [55]

Puga, D. (2010), "The Magnitude and Causes of Agglomeration Economies", *Journal of Regional Science*, Vol. 50/1, pp. 203-219, https://doi.org/10.1111/j.1467-9787.2009.00657.x. [36]

Sharkey, P. and J. Faber (2014), "Where, When, Why, and For Whom Do Residential Contexts Matter? Moving Away from the Dichotomous Understanding of Neighborhood Effects", *Annual Review of Sociology*, Vol. 40/1, pp. 559-579, https://doi.org/10.1146/annurev-soc-071913-043350. [66]

Shertzer, A. and R. Walsh (2019), "Racial Sorting and the Emergence of Segregation in American Cities", *The Review of Economics and Statistics*, Vol. 101/3, pp. 415-427, https://doi.org/10.1162/rest_a_00786. [43]

Sims, D. (2007), "Out of control: What can we learn from the end of Massachusetts rent control?", *Journal of Urban Economics*, Vol. 61/1, pp. 129-151, https://doi.org/10.1016/j.jue.2006.06.004. [62]

Solt, F. (2016), "The Standardized World Income Inequality Database", *Social Science Quarterly*, Vol. 97/5, pp. 1267-1281, https://doi.org/10.1111/ssqu.12295. [30]

Susin, S. (2002), "Rent vouchers and the price of low-income housing", *Journal of Public Economics*, Vol. 83/1, pp. 109-152, https://doi.org/10.1016/s0047-2727(01)00081-0. [48]

Zucman, G. (2019), "Global Wealth Inequality", *Annual Review of Economics*, Vol. 11/1, pp. 109-138, https://doi.org/10.1146/annurev-economics-080218-025852. [16]

Notes

[1] See Sharkey and Faber (2014[66]) or Chyn and Katz (2021[4]) for recent reviews.

[2] Households have homothetic preferences if they consume the same basket of goods in the same proportion, independently of their income.

[3] With some caveats. Namely, demolitions and property modifications (e.g., parcel partitions) might be an issue, especially when intending to extrapolate to long time horizons.

[4] A census tract in Boston contains roughly 4 000 people and is one of the smallest administrative units in the United States Census.

[5] According to EU-SILC data, the income Gini index for the Brussels Capital Region was 0.345 in 2022, substantially higher than Flanders (0.226) and Wallonia (0.242).

[6] They compare the Income Inter-quantile Range (IQR) at the statistical sector level (the only measure of income inequality at that level of aggregation) with the housing value IQR.

[7] See Chapelle et al. (2023[67]) for a more thorough description of these policies and their incidence on homeowners and renters.

9 Balancing act: How a national initiative to address regional imbalances amplified local housing inequality

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This chapter investigates the interplay between a national policy initiative and local housing inequality by examining Korea's Innovative City development project. While the national policy intended to address housing inequality at a broad level, the development project may have unintentionally contributed to local housing inequality by creating a gap between newly constructed housing units and existing neighbourhoods. The study illustrates the importance of considering both national and local perspectives to achieve balanced housing outcomes, focusing on housing price inequality. Results show that Innovative Cities have intensified housing price inequality within their host municipalities. Closer inspection shows this rise is specifically in the villages where Innovative Cities are located, while nearby areas see stagnant or declining prices. The findings strongly indicate that the national development plan inadvertently amplified local inequalities, highlighting the necessity of a comprehensive approach that integrates both national and local perspectives.

The opinions expressed and arguments employed herein are those of the author and do not necessarily reflect the official views of the OECD, its Member countries, or the KIPF.

9.1. Introduction

Housing inequality is a persistent issue that requires a comprehensive understanding at both the national and local levels. This chapter explores the interplay between national policy and local housing inequality through the lens of a community development policy in Korea, called the Innovative City development project. The project aims to reduce housing and quality of living differences across regions, which has been considered a central socioeconomic problem in Korea for decades. Figure 9.1 illustrates how population growth in Korea has been concentrated in the Seoul Capital Area since the Korean War. While the national policy intends to reduce regional imbalance at the national level, it may lead to unintended consequences for local housing inequality as the development project introduces a gap between the newly constructed housing units and the existing neighbourhoods. By analysing this interplay, this study aims to shed light on the importance of pursuing both national and local objectives to achieve balanced housing outcomes.

From a national perspective, the development of planned communities across several provinces serves as a strategic approach to reduce housing and quality of living gaps at the national level. National policymakers use data on regional disparities, economic indicators and demographic factors to identify areas in need of intervention. The goal is to promote equitable access to affordable housing, amenities and infrastructure across regions. By investing in community development, the national policy aims to create a more balanced housing landscape, foster socioeconomic development of underdeveloped regions and improve overall living standards.

At the local level, the implementation of the planned community development policy can have varying effects on housing inequality. While the national policy aims to reduce disparities, there is a need to carefully consider the potential implications for local communities. The establishment of new developments may lead to increased housing inequality within specific neighbourhoods. Factors such as rising property values, gentrification and segregation can contribute to local housing disparities.

While various factors contribute to housing inequality, including affordable housing provision, neighbourhood segregation and access to amenities, this research focuses on housing price inequality. This deliberate choice is motivated by several reasons. First, housing price inequality serves as a comprehensive measure that encapsulates the overall level of inequality within a given area. By analysing housing prices, we can gain valuable insights into differences in wealth distribution among local residents. Second, by concentrating on housing price inequality, we establish a unified framework for analysis. Examining multiple factors simultaneously can lead to complex and intricate analyses, often lacking a cohesive framework. By focusing on housing prices, we provide a consistent and standardised measure that enables us to compare and evaluate the extent of inequality across different regions and time periods. Lastly, housing price inequality carries significant implications for individuals and communities. It affects affordability, geographical segregation and social mobility. As such, understanding the dynamics of housing price inequality can inform policymakers and stakeholders about the broader implications of housing challenges and guide the formulation of effective interventions to address these issues.

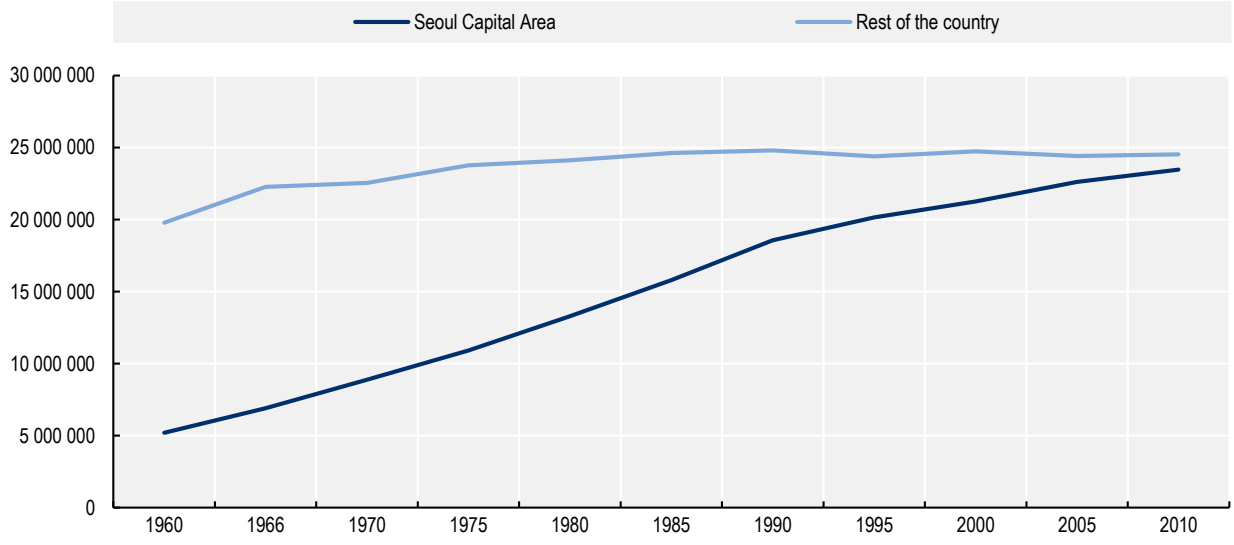
By examining the impact of the community development project on local housing price inequality, this study aims to contribute to the existing literature on housing inequality and provides valuable insights into the interplay between national policies and local housing dynamics. Understanding the effects of such projects on housing price inequality can inform policy decisions and facilitate the development of targeted interventions aimed at promoting more equitable housing outcomes at both the national and local level.

The empirical analysis in this chapter leverages administrative housing price data within a difference-in-difference framework, contrasting housing price inequalities in municipalities hosting Innovative City projects with the rest of the municipalities before and after the establishment of housing units in the new urban centres. The findings reveal a rise in the housing price Gini index within municipalities undertaking innovative city projects, while geographically distant municipalities remain unaffected. Further investigation

at the village level elucidates this municipal housing inequality shift. Through an event-study analysis, we find that the surge in housing prices within villages hosting innovative city housing units, alongside the concurrent decrease in housing prices within neighbouring villages, contributes to the increase in housing inequality at the municipal level. These results indicate that the national balanced development initiative generated housing disparities at the local level.

The subsequent sections of this chapter are structured as follows: the next section offers an overview of the Korean Innovative City development project. Following this, the chapter explains the research methodology, encompassing data selection and regression specifications and then presents the empirical findings. The final section concludes the chapter with a summary of the results, along with a discussion on relevant policy measures.

Figure 9.1. Population growth has been concentrated in the Seoul Capital Area



Source: Seoul Institute (2013[1]), *Geographical Atlas of Seoul*, https://www.si.re.kr/node/53240

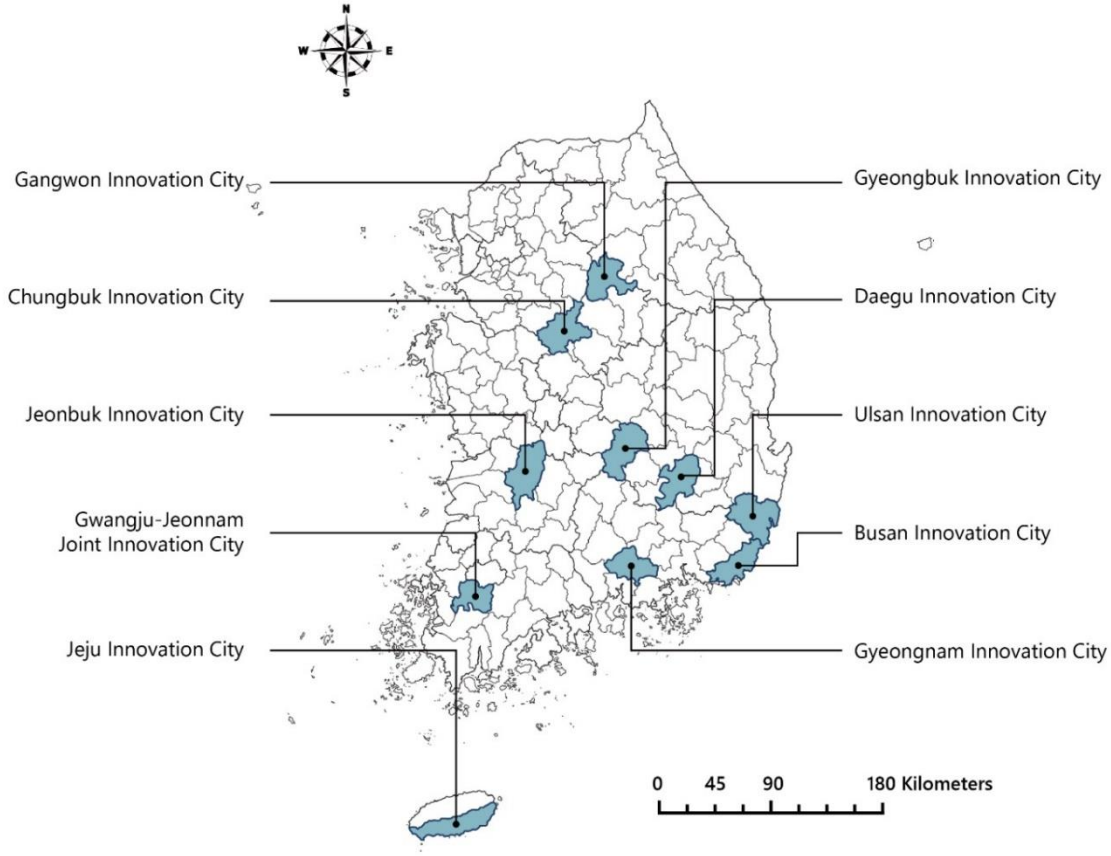
9.2. Korean Innovative City development

The Innovative City development project is a response to the large underlying regional imbalances within the country. Korea has been facing a significant population imbalance, with over 50% of its population concentrated in the Seoul Capital Area. This disproportionate distribution of people across regions gives rise to a range of challenges, such as unequal infrastructure development, limited employment opportunities and unequal access to public services outside the Seoul Capital Area. In light of these disparities, the government has implemented a range of policies to promote a more balanced and inclusive development approach.

The Innovative City development project stands out as a prominent initiative in this endeavour. It aims to establish regional growth centres by strategically relocating public institutions and subsequently creating residential and business areas in regions outside Seoul. The primary objective is to create self-sustaining communities equipped with adequate housing, industries and amenities. By doing so, the government aims to attract businesses and residents to these areas, fostering local economic growth and addressing regional disparities. By promoting economic diversification and providing quality housing, the project aims to create a more equitable distribution of resources and opportunities across the Korean regions.

The Innovative City development project started in June 2003, operating within the framework of the "Government's Policy for Local Relocation of Public Institutions for Balanced National Development." The selection process for the 10 innovative cities was finalised in 2005 and the building of housing units in these cities commenced in 2013. By 2019, a total of 134 public institutions, employing 48 000 individuals, had successfully relocated to these newly-established cities. As of 2022, approximately 90 000 housing units had been provided, accommodating a population exceeding 230 000 residents. The budget for the development of innovative cities surpassed USD 7.7 billion by the end of 2015 (KoChangsu & LeeHwanoong, 2020). Notably, the distribution of the 10 Innovative Cities is fairly balanced throughout the country, except for the Seoul Capital Area (Figure 9.2).

Figure 9.2. Locations of the municipalities with Innovative Cities



Source: Ahn et al. (2021[2]), *Impact of Innovation City Projects on National Balanced Development in Korea: Identifying Regional Network and Centrality*, International Journal of Geo-Information, 10(3):169, https://doi.org/10.3390/ijgi10030169

Table 9.1 presents an overview of the distinct phases in the development of the Innovative City project. Phase 1, spanning from 2007 to 2014, marks the initial stage of the project and involves the relocation of public institutions and associated companies. This phase lays the foundation for the subsequent phases by establishing the necessary infrastructure and administrative backbone. Phase 2 focuses on attracting private industries and research institutes, including universities, to participate in the development project. By involving diverse stakeholders, this phase aims to foster collaboration and knowledge exchange to further enhance the innovative ecosystem within the cities. Finally, Phase 3 represents the spread of innovation throughout the cities, characterised by the continuous growth and expansion of innovative industries, businesses and research activities. This phase embodies the ultimate objective of the Innovative City project, which is to create dynamic and sustainable centres of innovation and economic development.

Table 9.1. Innovative City development plan

Development phase	Years	Specifics
Phase 1: Relocating public institutions	2007~2014	Approximately 2 500 to 4 000 employees related to the relocation of public institutions and affiliated companies, with an induced population of 15 000 to 25 000 people.
Phase 2: Industries and research facilities	2015~2020	Approximately 4 000 to 8 000 employees in private companies, universities and research institutes, with an induced population of 25 000 to 50 000 people.
Phase 3: Spread of innovation	2021~2030	The number of jobs and induced population resulting from the spread of innovation clusters varies depending on the region and scale.

Source: Ministry of Land, Infrastructure and Transport (2022[3]), Introduction to Innovative City, http://innocity.molit.go.kr/content.do?key=2208172074710

The development project, which involves the simultaneous development of ten small to medium-sized cities, has led to a diverse range of studies investigating the impact on housing prices and land values. Researchers such as Min & Shin (2021[4]) found that housing prices in Innovative City locations were notably higher compared with non-Innovative City locations at the municipality level. Similar findings were observed by Lee (2015[5]), who analysed housing price trends in Innovative City areas. Various studies have also examined the fluctuations of land values in Innovative City locations.[1] While previous studies have primarily focused on the impact of Innovative Cities on housing prices and land values within their immediate locations, this study takes a broader perspective by investigating whether the influence of Innovative Cities extends beyond their boundaries and affects housing price developments in surrounding areas. By exploring this aspect, the study aims to gain insights into the potential implications of the Innovative City project on inequality.

9.3. Methods and data

The yearly housing price data from 2008 to 2019 come from the official housing prices provided by the Korean government for tax purposes. These housing price estimates encompass every housing unit across the country, enabling a comprehensive analysis of housing inequality at any geographical level. While the prices are not actual market prices but estimated values, they are credible estimates updated every year that both the government and the taxpayers rely on for property taxation. I combine the housing price data with the distance between the geographic centre of each village and the nearest Innovative City housing unit computed via GIS. This allows for an examination of the spatial relationship between housing prices and the proximity to Innovative City development projects.

To identify the causal effect of the Innovative City development on local inequality at the municipality level, a two-way fixed effects model is employed. This model controls for municipality fixed effects and year fixed effects, allowing for an analysis of the causal relationship between Innovative City construction and changes in local housing price inequality in a difference-in-difference framework. The analysis focuses on comparing treated municipalities, where Innovative Cities are constructed, with control municipalities that are distant from the newly constructed cities. Considering the potential spill-over effect of the construction on neighbouring municipalities, the effect of development is assessed based on the distance of each municipality to the closest Innovative City. The regression specification for this model is as follows:

$$Gini_{it} = \sum_{d\in\{0,10,40\}} \beta^{d} Distance_{i}^{d} \times Post_{it} + \gamma \mathrm{Post}_{it} + \lambda_i + \mu_t + \varepsilon_{it} \quad (1)$$

where $Gini_{it}$ is municipality i's Gini index in year t; $Distance_i^0$ indicates whether there is an Innovative City in municipality i; $Distance_i^{10}$ and $Distance_i^{40}$ indicate whether the distance between municipality i's

housing-weighted centre and the closest Innovative City housing unit from it is between 0~10km and 10~40km, respectively; $Post_{it}$ indicates whether the first housing units of the Innovative City closest from municipality i has been supplied in year t; λ_i, μ_t are municipality and year fixed effects, while ε_{it} is the robust standard error. The coefficients of interest are β^0, β^{10} and β^{40}. Coefficient β^0 estimates the treatment effect of the Innovative City development project on the inequality level of the municipality where the new city is located, while β^{10} and β^{40} measure the spill-over effects.

Table 9.2 presents the distribution of municipalities based on their proximity to the nearest Innovative City. The grouping of municipalities into three distance categories allows for a comprehensive analysis with sufficient comparison groups for each Innovative City.

Table 9.2. Number of municipalities by distance to the closest Innovative City

Closest Innovative City	Treated	0km < Distance < 10km	10km < Distance < 40km	Distance. > 40km
Gangwon	1	1	4	36
Gyeongnam	1	1	8	8
Gyeongbuk	1	1	5	3
Daegu	1	2	11	8
Busan	1	10	9	2
Ulsan	1	3	4	3
Jeonnam	1	1	12	12
Jeonbuk	2	3	8	13
Jeju	1	1	1	-
Chungbuk	2	2	12	66
Total	**12**	**25**	**74**	**151**

Note: "Distance" indicates the distance from the centre of the municipality to the closest Innovative City housing unit. "Treated" indicates that an Innovative City is located in the municipality.

After identifying the impact of Innovative City development on housing price inequality at the municipality level, a more granular event study analysis is conducted to examine housing price changes at the village level. This approach aims to understand how housing prices have changed within municipalities around the time of construction, contributing to the overall change in municipal housing price inequality. The analysis focuses on the heterogenous impact of city development on housing prices at the village level by considering the proximity of each village to the Innovative City. This allows us to understand how the development of Innovative Cities has influenced housing prices in nearby villages compared to those further away, resulting in changes in overall inequality. The corresponding regression specification is as follows:

$$log(Housing\ Price)_{it} = \sum_{d\in\{-7,-6,\ldots,6\}/-1} \beta^d \delta_{it}^d \times Treated_i + \lambda_i + \mu_t + \varepsilon_{it} \quad (2)$$

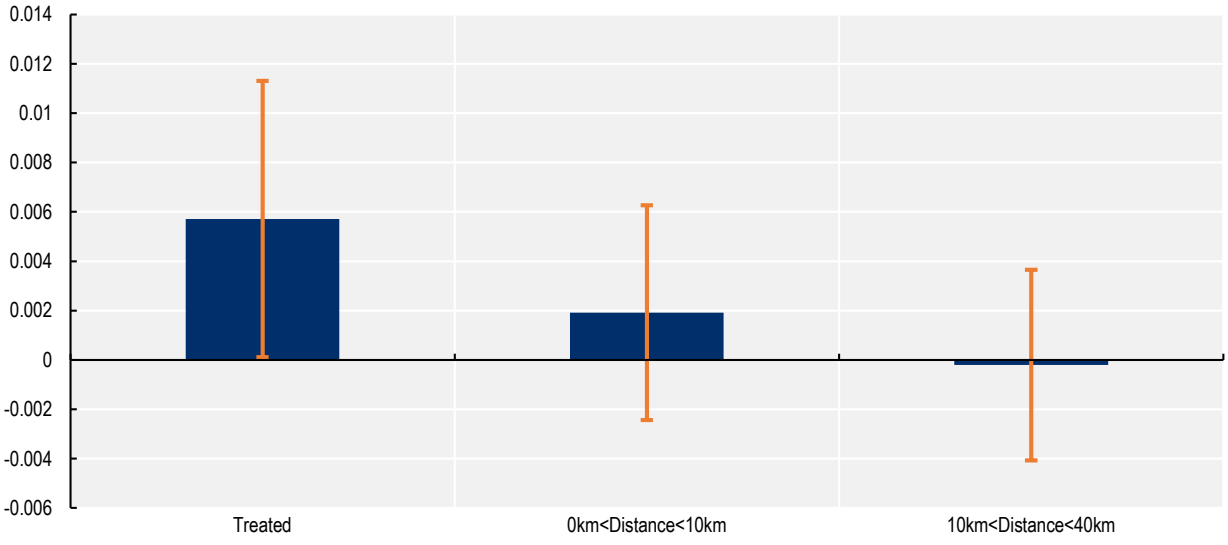
where $log(Housing\ Price)_{it}$ is the log of village i's average housing price in year t; δ_{it}^d is the event time dummy; the year before the construction of the nearest Innovative City is normalised to zero; $Treated_i$ indicates whether municipality i is within the given distance from the nearest Innovative City; the control group comprises the villages that are more than 10km away from the nearest Innovative City housing unit; λ_i, μ_t are municipality and year fixed effects, while ε_{it} is the standard error clustered at municipality level. This event study analysis is conducted separately for different distance levels between villages and Innovative cities: villages where Innovative Cities are located, villages between 0~1km, 1~3km and 3~5km.

9.4. Results

The analysis of housing price inequality reveals interesting findings regarding the impact of Innovative City development on municipalities. Figure 9.3 shows the regression coefficients and confidence intervals based on regression specification (1). When comparing municipalities where Innovative Cities are located to a comparison group located farther than 40km from the Innovative Cities, there is statistically significant evidence of an increase in the housing price Gini index. Specifically, municipalities hosting Innovative Cities experienced an increase in the housing price Gini index by 0.006 after the introduction of housing units within the Innovative City development. The median of the standard deviation of the yearly Gini index from 2008 to 2019 at each municipality is 0.011. Hence, the size of the effect of Innovative Cities on municipal housing inequality is half of the size of the standard deviation of the municipality level ten-year variation. The findings suggest that the presence of Innovative Cities has contributed to a notable increase in housing price inequality in these municipalities.

Regarding the spill-over effect, the analysis considers municipalities located at varying distances from the Innovative Cities. For municipalities situated between 0 and 10km from the Innovative Cities, there is a slight increase in the housing price Gini index by 0.002. However, this estimate is statistically insignificant, suggesting that the spill-over effect of Innovative City development on directly neighbouring municipalities is not robust. Municipalities located between 10 and 40km from the Innovative Cities did not experience an impact of Innovative City development on housing price inequality. This finding suggests that the influence of Innovative City development on housing price inequality is limited to municipalities within close proximity to the Innovative Cities, rather than affecting a wider range of municipalities located at greater distances.

Figure 9.3. Impact of Innovative City development on local housing price inequality at the municipality level



Note: Each bar corresponds to the difference-in-difference estimator of the treatment effect of the Innovative City development on the local Gini index at the municipality level by the distance from the centre of the municipality to the closest Innovative City housing unit. "Treated" indicates that an Innovative City exists in the municipality. The control group comprises the municipalities that are more than 40km away from an Innovative City. The line for each bar spans the 95% confidence interval of the corresponding coefficient.
Sources: Ministry of Land, Infrastructure and Transport (2022[6]), National Spatial Data Infrastructure Portal (database), http://data.nsdi.go.kr/dataset/12645 and http://data.nsdi.go.kr/dataset/20200305ds00001

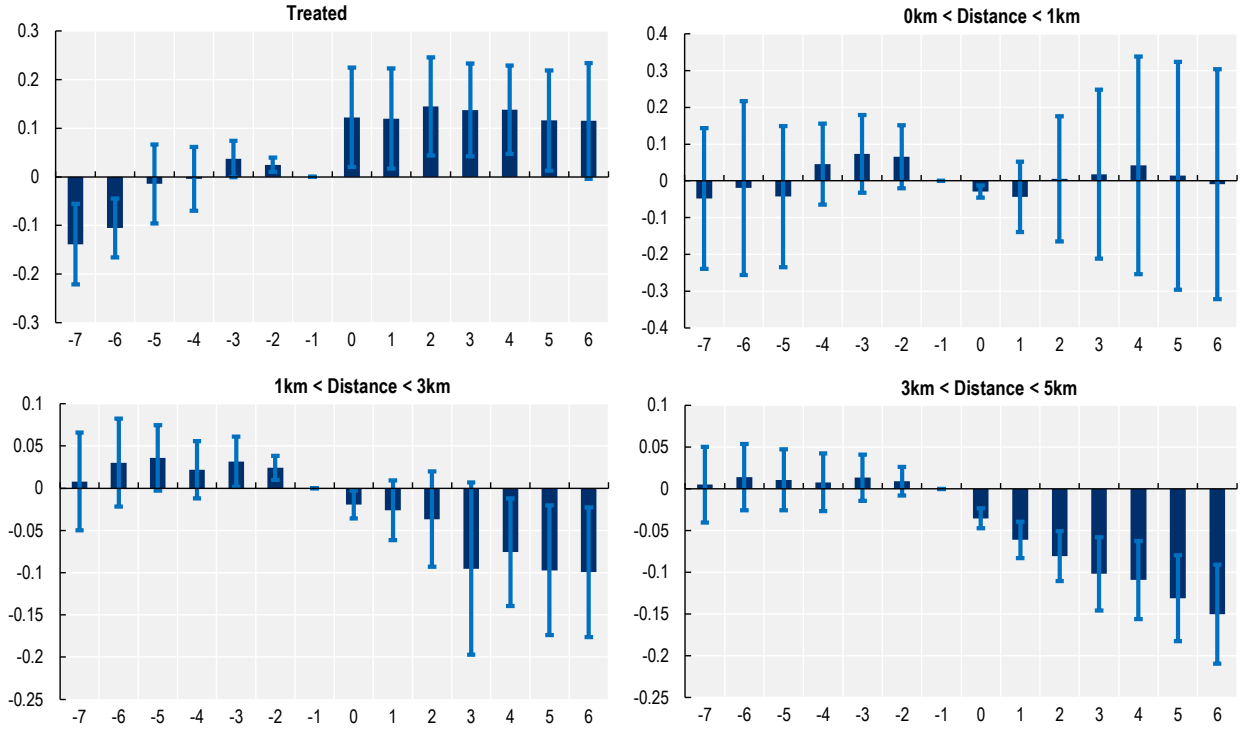
Figure 9.4 presents the regression results at the village level based on specification (2), analysing the housing price dynamics within municipalities where Innovative Cities are located. The top-left panel displays the results for villages where the Innovative Cities are located, while the other panels illustrate the housing price changes in neighbouring villages.

The findings reveal interesting patterns. Firstly, in the village where the Innovative City is located, an immediate increase in housing prices of approximately 10 per cent is observed. This suggests that the presence of the Innovative City has led to a surge in housing prices within these villages. The estimates persist over the subsequent years, suggesting that the effect of Innovative City projects is not a temporary shock on housing prices.

The neighbouring villages show a different trend. The regression results indicate that these villages did not experience a similar increase in housing prices as observed in the villages where the Innovative Cities are situated. Instead, there is some evidence suggesting a decrease in housing prices in the neighbouring villages after the development of the Innovative City when compared with villages sufficiently distant from the new housing units. This finding implies that the newly developed Innovative Cities may have absorbed some housing demand from surrounding areas, leading to a decrease in housing prices in those villages.

Overall, the changes in housing prices within and around the Innovative Cities contribute to an increase in housing price inequality at the municipality level. This increase is driven by the rise in prices within the villages where the Innovative Cities are located, while the neighbouring villages experience a decline or no significant change in housing prices. These findings demonstrate how a national policy designed to address spatial inequality unintentionally resulted in a rise in local inequality concerning housing prices.

Figure 9.4. Impact of Innovative City development on local housing price at the village level



Note: Each bar corresponds to the difference-in-difference estimator of the treatment effect of the Innovative City development on local housing price at the village level by the distance from the centre of the village to the closest Innovative City housing unit. "Treated" indicates that at least one Innovative City housing is within the village. The control group comprises the villages that are up to 5km away from the nearest Innovative City housing unit. The line for each bar spans the 95% confidence interval of the corresponding coefficient.
Sources: Ministry of Land, Infrastructure and Transport (2022[6]), National Spatial Data Infrastructure Portal (database), http://data.nsdi.go.kr/dataset/12645 and http://data.nsdi.go.kr/dataset/20200305ds00001

9.5. Conclusion

The analysis of the impact of Innovative City development on housing price inequality reveals important insights into the unintended consequences of national policies aimed at reducing regional imbalances. The results demonstrate that municipalities hosting Innovative Cities experienced a significant increase in housing price inequality compared to distant control municipalities. This highlights the local effects of Innovative City development on housing price dynamics.

Moreover, the village-level analysis within Innovative City areas reveals that housing price dynamics contributed to the observed increase in inequality, while neighbouring villages did not experience similar changes. These findings highlight the need to consider the local dynamics and spill-over effects when implementing national development projects. Policymakers should carefully evaluate the potential implications of such policies on local inequality and consider targeted interventions to mitigate unintended consequences.

To address the local housing price inequality problem while still achieving balanced growth initiatives, a potential policy approach from a national perspective involves promoting the availability of high-quality housing options across a wider geographic region. This could be achieved through the construction of new housing units and infrastructure improvements to enhance living standards. Collaboration between national and local authorities is crucial in co-ordinating these efforts effectively.

In addition to addressing housing price inequality, it is essential to examine other factors contributing to housing inequalities, such as neighbourhood segregation, affordability and access to amenities. In-depth research and engagement with local stakeholders can help identify specific challenges and tailor interventions accordingly. Strategies may include implementing affordable housing quotas, rent control measures, community land trusts, or measures to preserve the existing affordable housing stock.

Bridging the gap between national policy and local housing inequality requires an ongoing dialogue and knowledge exchange. Collaboration between national policymakers, researchers and local stakeholders is key to understanding and mitigating the potential negative effects of community development projects. National policymakers can provide guidance, support and resources to address housing disparities within the new developments, while local communities contribute valuable insights to inform research and policymaking.

Ultimately, this research enhances our understanding of the complex relationship between national balanced development initiatives and local inequality. It underscores the importance of carefully considering the local context and implementing targeted interventions to achieve more equitable outcomes in housing. By adopting a holistic approach and fostering collaboration between national and local stakeholders, policymakers can work towards reducing housing disparities from both the local and national perspectives.

References

Ahn, J., D. Seo and Y. Kwon (2021), "Impact of Innovation City Projects on National Balanced Development in South Korea: Identifying Regional Network and Centrality", *International Journal of Geo-Information*, Vol. 10/3, https://doi.org/10.3390/ijgi10030169. [2]

Kang, H. and M. Jun (2010), "Empirical study on land price increase through the increase of expectation value in the development process of Administration city, Innovation cities and Enterprise cities", *Journal of the Korean Regional Development Association*, Vol. 22/1, pp. 53-66, http://uci.or.kr/G704-000688.2010.22.1.007. [7]

Kim, M. and E. Kim (2018), "Influence of Innovation Cities Development on Officially Announced Land Price", *Journal of the Korean Urban Geographical Society*, Vol. 21/3, pp. 93-107, https://doi.org/10.21189/JKUGS.21.3.7. [8]

Lee, J. (2015), *혁신도시 부동산 시장 10년*, pp. 69-82, https://www.reb.or.kr/reb/common/nttFileDownload.do?fileKey=9174eaa181bba0a2c12f4a9cf4f3708f (accessed on 27 June 2023). [5]

Lee, Y. and C. Kim (2020), "A Study on the Performance Evaluation and Validation of Innovation City Development", *Journal of The Korean Regional Development Association*, Vol. 32/1, https://www.kci.go.kr/kciportal/ci/sereArticleSearch/ciSereArtiView.kci?sereArticleSearchBean.artiId=ART002574452. [9]

Min, H. and S. Shin (2021), "The Evaluation of the Impact of Innovative City Development Policy - Focusing on Local Real Estate Prices -", *Journal of the Residential Environment Institute of Korea*, Vol. 19/3, pp. 165-183, https://doi.org/10.22313/reik.2021.19.3.165. [4]

Ministry of Land, Infrastructure and Transport (2022), *Introduction to Innovative City*, http://innocity.molit.go.kr/eng/content.do?key=2209054164788 (accessed on 22 June 2022). [3]

Ministry of Land, Infrastructure and Transport (2022), *Multi-unit Housing Prices*, http://data.nsdi.go.kr/dataset/12645 (accessed on 28 March 2022). [6]

Seoul Institute (2013), *Geographical Atlas of Seoul 2013*, Seoul Institute, https://www.si.re.kr/node/53240 (accessed on 27 August 2023). [1]

Note

[1] For example, Lee & Kim (2020[9]), Kim & Kim (2018[8]), Kang & Jung (2010[7]). The studies confirm the rise in land values associated with the development.

10 The laws of attraction: Economic drivers of inter-regional mobility in selected OECD countries

Orsetta Causa, Michael Abendschein, Maria-Chiara Cavalleri and Nhung Luu, OECD

The capacity of workers to move between regions in response to local economic shocks is one key dimension of labour market dynamism, which could contribute to the recovery from the pandemic and support necessary transformations underpinning the green transition. This chapter presents new empirical evidence on how policies shape the responsiveness of inter-regional migration to regional economic conditions, with a particular focus on housing markets, social policies and business regulations. The results suggest that inter-regional migrants move in search of higher income and better employment opportunities, but are discouraged by high housing costs. There is, however, large heterogeneity across countries in terms of what factors matter the most and in terms of the magnitude of the migration response. The chapter highlights the need for supplementing structural with place-based policies to help prospective movers as well as stayers.

All of the authors are currently or formerly with the OECD Economics Department. This chapter is based on Causa, Abendschein and Cavelleri (2021[1]) and Cavelleri, Luu and Causa (2021[2]).

10.1. Introduction and main findings

Inter-regional migration[1] can spur economic growth, in particular by enhancing labour market dynamism and as such the efficient allocation of workers within a country. It can also enhance social mobility, in particular by allowing people from disadvantaged areas to move to areas, where they can find better opportunities. Inter-regional mobility is not always desirable: it can accentuate regional inequalities and depopulate areas that are left behind and that sometimes suffer from the closure of essential public services. In addition, inter-regional mobility, which is usually directed towards metropolitan areas (OECD, 2020[3]) can create congestion and hence contribute to environmental and health damages. There is no ideal level of inter-regional mobility and the extent to which policies should encourage people to move from one area to another will depend on country-specificities and social preferences. While inter-regional mobility is not an end in itself, policy settings should not create obstacle for individuals to move to places where they find better opportunities to fulfil their potential.

This chapter sheds light on inter-regional mobility and the role of policies. The underlying rationale for studying this topic is that the capacity of workers to move across regions in response to local economic shocks and conditions is one key dimension of labour market dynamism and also of resilience. The available literature in this area has so far been country-specific, with a large number of studies documenting a decline in labour and geographic mobility in the United States, and a more limited number of studies on European countries.[2] The comparative perspective adopted in this chapter provides new evidence on the role of policies in shaping inter-regional migration flows. Two main stylised facts stand out:

- OECD countries exhibit stark differences in inter-regional migration rates, with more than 4% of the population changing region each year in Hungary and Korea, around 3% changing state in the United States and less than 1% in Poland and Italy.
- Trends in inter-regional migration also differ across countries. Since the early 2000s, inter-regional migration has declined in around half the OECD countries for which data are available, including North American and Asian countries as well as Spain, while it has increased in a number of Continental and Central European countries, including Austria, Germany and Hungary.

Inter-regional migration responds to local housing and economic conditions:

On average across OECD countries, regional GDP per capita is the strongest driver of regional migration inflows: an increase in regional income by 10% triggers a 5% increase in regional inflows. House prices at the regional level are the second most important driver. An increase in regional house price growth by 10% triggers a decline in regional inflows of around 2%. Unemployment at the regional level is also a significant economic driver of migration: an increase in regional unemployment by 10% triggers a decline in regional inflows by around 1.3%.

Policy settings are found to influence the responsiveness of inter-regional migration to local economic conditions:

Housing-related policies

- Where housing supply is more flexible, inter-regional migration is more responsive to local economic conditions. Reducing policy-driven barriers in this area, for example by reforming the governance of land-use and planning policies, may facilitate moving towards better economic opportunities by reducing house price differences across regions.
- Stricter rental regulations, both rent control and greater security of tenure, are associated with lower responsiveness of inter-regional migration to local labour market conditions. Striking the right balance between tenants' and landlords' interests, providing an adequate security of tenure and encouraging the supply of rental housing for all socio-economic groups is a difficult policy challenge.

- Housing-related social transfers, both in-kind in the form of social housing and cash in the form of housing allowances, are associated with a lower responsiveness of inter-regional migration to regional economic conditions. This suggests that social housing may create "lock-in effects" whereby social tenants are reluctant to pursue better economic opportunities as they may lose access to social housing.

Labour market and social protection policies

- Excessive job protection of regular contracts is associated with a lower responsiveness of inter-regional migration to regional economic conditions and may reduce regional labour mobility.
- Higher levels of public spending on active labour market policies are associated with a lower responsiveness of inter-regional migration. Participation in active labour market programmes can create "lock-in" effects, for instance by reducing time for job search, especially outside the region of residence.
- The effect of unemployment benefits varies across the unemployment spell: at the early stage of unemployment more generous benefits are associated with a lower responsiveness to regional GDP while at later stages with higher responsiveness.
- Wider union coverage and centralisation of collective wage bargaining are associated with a lower responsiveness of inter-regional migration to regional economic conditions. Similar findings apply to higher minimum cost of labour and minimum wages. Such policies tend to narrow the wage dispersion, hence reducing incentives to move to another region with higher wages.

Regulatory policies

- Policy barriers to business dynamism, such as barriers to entrepreneurship and administrative burdens, are found to reduce the pass-through from regional economic conditions to inter-regional migration.
- Stringent regulations and occupational licensing for workers in professional and personal services are found to significantly reduce the responsiveness of inter-regional mobility to local economic conditions.

This chapter shows that structural policy settings at the country level have a significant effect on the responsiveness of inter-regional mobility to local economic conditions. Yet the extent to which policies should influence inter-regional mobility and the nature of appropriate interventions will vary depending on countries' economic and social context. The responsiveness of internal migration to local economic factors varies across countries in terms of what factors matter the most and in terms of the magnitude of the response. This implies that policy requirements in this area will depend on country-specificities, challenges and social preferences. At the current juncture, there may be a case for helping both prospective movers and stayers: this can be achieved by supplementing structural policies with place-based policies, which seek to foster skills, economic and labour market dynamism at the local level, enhance the provision of public services where they are lacking, and that provide transport and digital infrastructure that allows connecting less developed to more developed areas.

10.2. Stylised facts

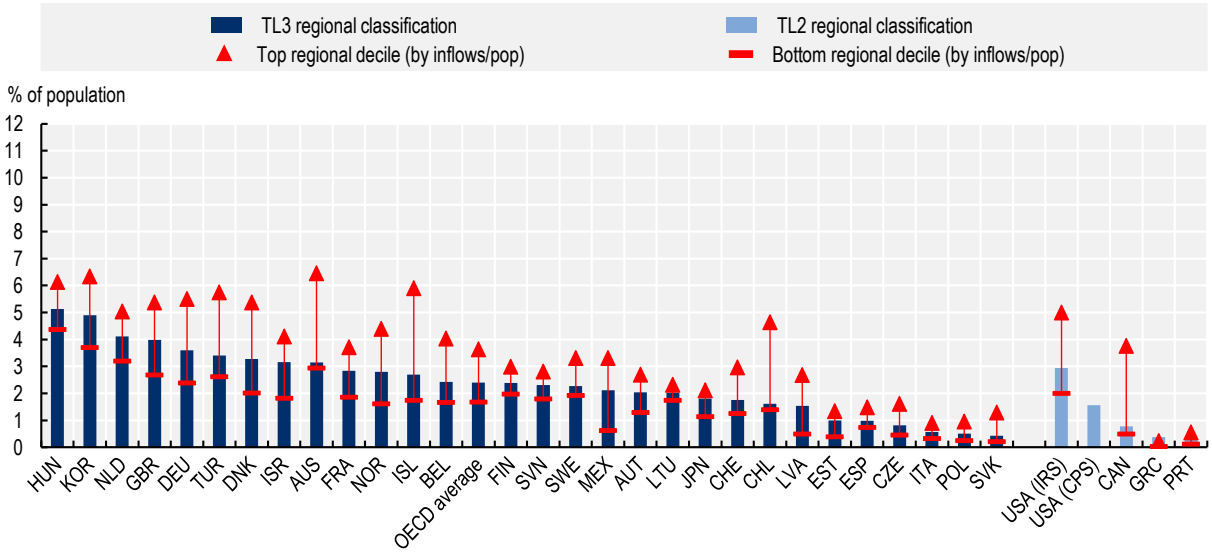
The comparative analysis of inter-regional migration rates across OECD countries delivers the following main stylised facts (Figure 10.1):

- OECD countries exhibit stark differences in country-level inter-regional migration rates, as conventionally measured by the proportion of the population within each national economy that changes the region of residence over one year. The migration rate ranges from more than 4% in Hungary and Korea to less than 1% in the Slovak Republic, Poland and Italy.

- OECD countries also exhibit a wide dispersion of migration flows across regions, as measured by the differences between top and bottom decile regions ranked by inflow rates: for example, inter-regional migration is relatively equally distributed across regions in Korea and Hungary while less so in Mexico, Chile and Australia.

Figure 10.1. Inter-regional migration in OECD countries

National rate, average over the last five available years

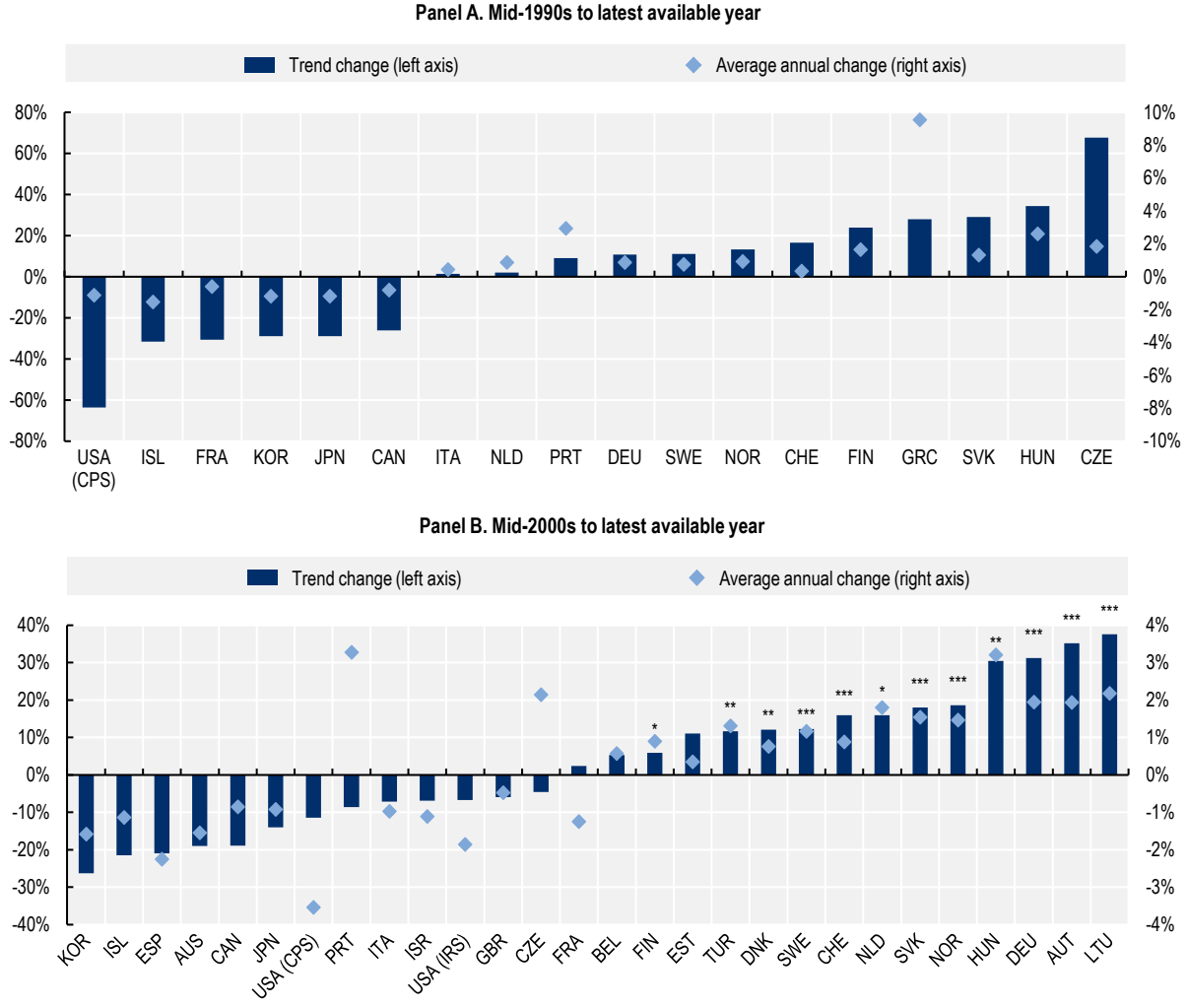


Note: Internal regional migration rates are defined as the number of migrants coming in the region from another region in the same country divided by regional population one year before. Average of years 2012-2017 or closest period i.e. AUS (2012-16), BEL (2012-15), DEU (2012-16), DNK (2012-16), FRA (2013-15), GBR (2012-15), ISL (2012-16), ISR (2012-16), ITA (2012-15), LTU (2012-15), MEX (2015), TUR (2012-15), USA (IRS) (2013-14,2016), USA (CPS) (2012-2017). The OECD regional classification scheme is applied. TL2 regions indicate large regions, TL3 small ones.
Source: US data from CPS/IRS; GRC and PRT from EULFS; the remaining countries from OECD Regional database.

OECD countries have experienced very different developments in inter-regional migration over the last decades (Figure 10.2):

- Less than half of the countries for which data are available since the mid-90s have experienced a trend decline in migration including the United States,[3] Iceland, Korea and Japan. By contrast, some countries, in particular in Eastern Europe, have experienced a strong increase in inter-regional migration.
- Since the mid-2000s, inter-regional migration has been on a downward trend in Spain and Australia, while it has been on an upward trend, rising by more than 30% between 2005 and 2017, in Lithuania, Austria and Germany.

Figure 10.2. Developments in inter-regional migration across OECD countries



Note: Internal regional migration rates are defined as the number of migrants coming in the region from another region in the same country divided by regional population one year before. Trend change is computed as the percentage change between the migration rate in the first year and the predicted migration rate in the last year. The predicted value is computed as the sum of the initial migration rate and the product of the number of years between the first and the last observation times the slope coefficient of a regression from the migration rate on a linear time trend. ***, **, * refer to the statistical significance of the estimated slope coefficient at the 1%, 5% and 10%, respectively.

The national average is calculated as the sum across regions of new residents from another region divided by the sum across regions of regional population one year before. For Panel A, the data refers to 1995-2017 with the following exceptions: DEU (1995-2015), FRA (1995-2002, 2006-2017), ISL (1995-2016), ITA (1995-2015), PRT (1999-2017), SVK (1997-2017) and SWE (1998-2017). For Panel B, the data refers to 2005-2017 with the following exceptions: AUS (2005-2016), BEL (2005-2015), DNK (2006-2016), EST (2005-2016), FRA (2006-2017), ISL (2005-2016), ISR (2010-2016), ITA (2005-2015), ESP (2008-2017), TUR (2008-2015), GBR (2005-2015), USA (IRS) (2013-2014 and 2016).

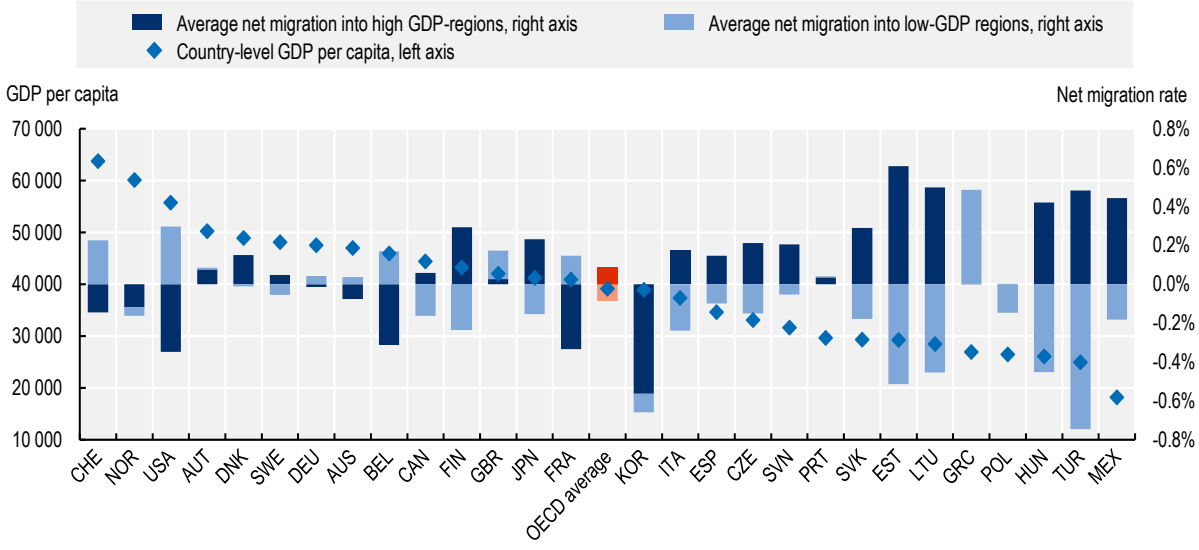
TL2 regional classification for AUS, BEL, CAN, FRA, GRC, ITA, PRT and USA; TL3 for the other countries. Countries with structural breaks in the time series are excluded (GRC, POL, SVN).

Source: US data from CPS/IRS; FRA and PRT from EU LFS; the remaining countries from OECD Regional database.

The stark differences in levels and trends of inter-regional migration across advanced countries is likely to reflect a variety of non-economic factors that influence people's choices and opportunities to move, embedded in history, culture and geography. This notwithstanding, economic theory and empirical evidence have modelled and identified the economic drivers of migration (Molloy, Smith and Wozniak, 2011[4]; Greenwood, 1997[5]; Treyz et al., 1993[6]): people move towards places that offer them better opportunities, in particular in terms of jobs, incomes and amenities, as well as lower living costs, in particular in terms of housing affordability. In theory, inter-regional migration should thus respond to differences in regional economic performance, and this in turn can raise welfare: at the micro-level as individuals move to better opportunities, and at the macro-level as labour market matching and labour market dynamism improve and regional imbalances decline. Moving from theory to practice, inter-regional migration does not seem to systematically respond to inter-regional differences[4] in economic performance (Figure 10.3 and Figure 10.4):

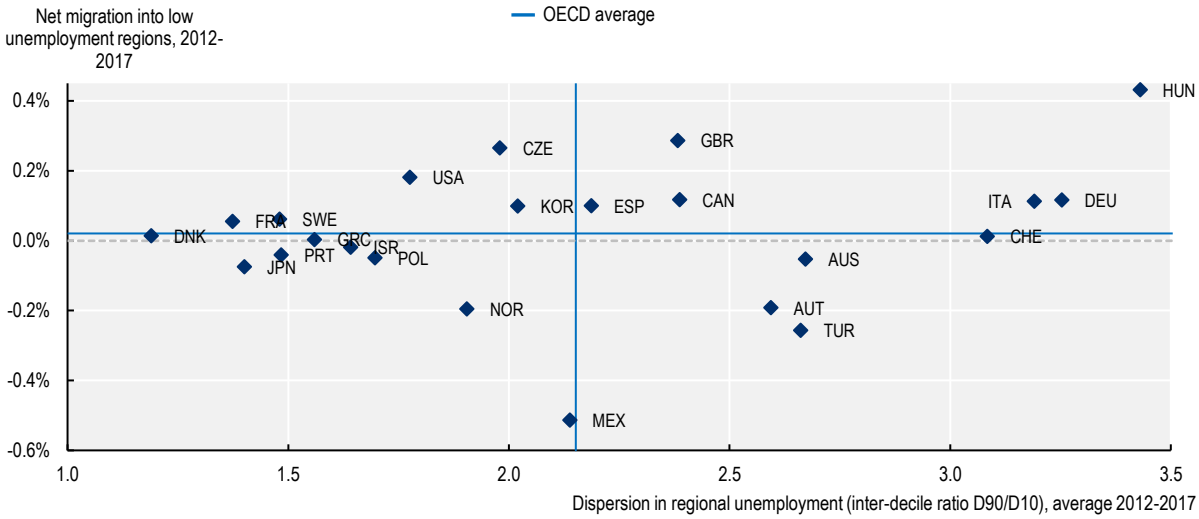
- In a number of OECD countries such as Australia, France, Korea and the United States, high-income[5] regions tend to experience negative net migration, that is, less inflows than outflows from other regions. Interestingly, these countries have been identified among those experiencing a trend decline in migration (Figure 10.2).[6] Migration appears more responsive to regional income disparities in lower income OECD countries (Figure 10.3).
- There is no systematic link between the degree of unemployment dispersion between regions and that of net migration to low-unemployment regions (Figure 10.4): net migration to low-unemployment regions is for example negative in Austria and Türkiye, which feature relatively high levels of unemployment dispersion.

Figure 10.3. Regional migration and regional dispersion in economic performance



Source: OECD Regional database, EU LFS for migration data for FRA, GRC, PRT, IRS for US migration data.

Figure 10.4. Dispersion in regional unemployment and net migration into low unemployment regions



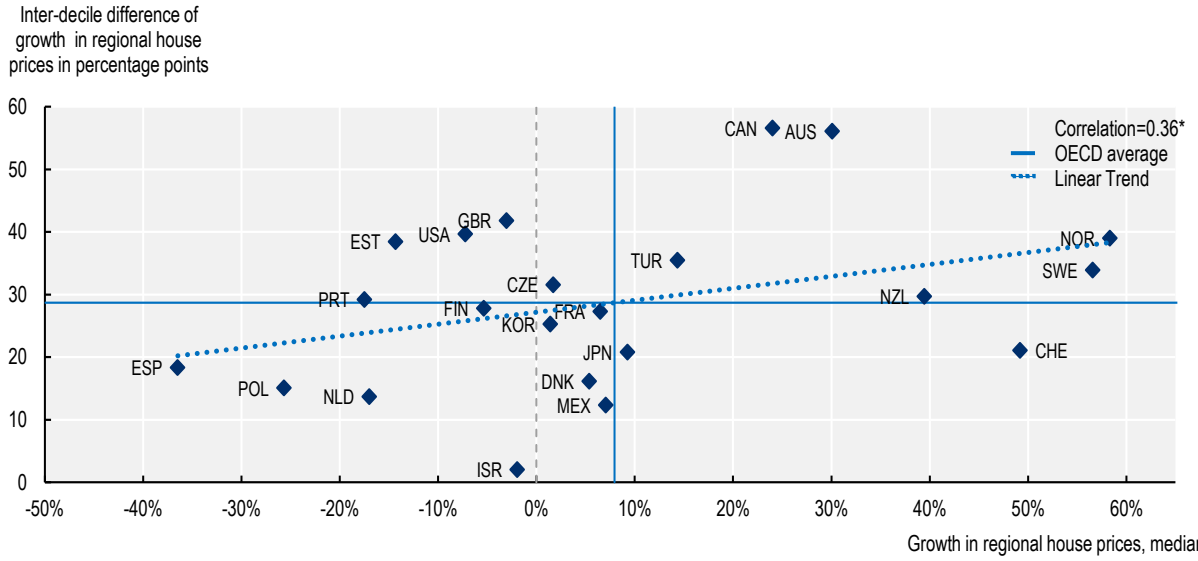
Note: Net migration (in percent) at the country level is computed as the sum of the absolute values of regional net flows divided by two and by the total population one year before. Low-unemployment regions are identified by means of a two-step procedure. First, all regions are ranked in ascending order according to their unemployment rate in the first year of the period considered. Then, the regional active labour force is summed across the ranked regions, starting with the region exhibiting the lowest unemployment rate, and regions are identified as low-unemployment until the cumulative active labour force passes one third of the total active labour force. The last region in the calculation is included with an appropriate fractional weight. Net migration rates are computed as the sum of (fractionally weighted) net migrants across the respective regions divided by the (fractionally weighted) total population one year before. Fractional weights are based on the first period.
The regional unemployment dispersion (measured by the inter-decile ratio of unemployment) refers to the average over the period 2012-2017 with the following exceptions: AUS (2012-2016), AUT (2012-2013), NOR (2012-2016), SWE (2013-2017). The average values for net migration rates refer to the period 2012-2017 with the following exceptions: AUS (2012-2016), DEU (2012-2016), DNK (2012-2016), FRA (2013-2015), GBR (2013-2015), ISR (2012-2016), ITA (2012-2015), MEX (2015), SWE (2014-2017), TUR (2012-2015), USA (2013-2014, 2016).
TL3 regional classification with the following exceptions (in TL2): CAN, DNK, ISR, JPN, MEX, POL, FIN, FRA, GRC, PRT, TUR, USA.
Source: OECD Regional database, EU LFS for migration data for FRA, GRC, PRT, IRS for US migration data.

The responsiveness of inter-regional migration to local economic conditions is likely to also depend on living costs, especially housing costs. This has been put forward in a number of papers as one of the major explanations beyond the trend decline in internal migration in the United States, in particular for low-educated workers. The wage premium associated with a move has been shown to be too small to compensate for the rise in living costs due to local differences in house prices in high-productivity locations (Bayoumi and Barkema, 2019[7]; Ganong and Shoag, 2017[8]; Diamond, 2016[9]).[7] Evidence linking inter-regional migration to regional house prices is much scarcer for other countries and inexistent in a cross-country perspective, given the lack of comparable data on regional house prices. This data gap has recently been addressed by the OECD as new harmonised regional house price indices have been produced and made publicly available. This allows to deliver insights on regional house price dynamics from a cross-country comparative perspective (Figure 10.5):

- OECD countries have been experiencing a “great divergence” in regional house price dynamics.[8] Between 2005 and 2017, median regional house prices grew by almost 60% in Norway and Sweden, while they declined by around 20% in Poland and Portugal. Growth was extremely unequal within all countries, with house price growth at the top of the distribution being around 30 percentage points higher than at the bottom.
- There tends to be a positive cross-country correlation between median growth in regional house prices and inter-regional house price growth dispersion (Figure 10.5), which could suggest common underlying factors contributing to increasing house prices across many regions but also

widening the gap between regions. However, there are outliers, as some countries experienced negative house price growth for the median region but marked differences between top and bottom regions: this is the case for the United Kingdom and the United States, where top regions saw house prices increase by around 20% while bottom regions saw house prices decline by around 20%.

Figure 10.5. Growth in regional house prices and inter-decile difference of house price growth



Note: The growth rate is based on the period 2005-2017 with the following exceptions: CZE (2006-2015), ESP (2007-2016), EST (2005-2016), ISR (2018), JPN (2008-2017), POL (2006-2017), TUR (2010-2017). Only countries with data for more than four regions on house prices are considered. *p<0.1.
Source: OECD database on regional house prices.

Differences in housing affordability may act as a barrier to mobility for households seeking employment in parts of the country where labour demand is higher but they cannot afford to move due to differences in house prices. The extent to which regional house prices hinder inter-regional mobility and labour market adjustment is an empirical question that is formally addressed below.

10.3. The core drivers of inter-regional migration flows

The baseline analysis draws on the OECD Regional database, which provides a set of harmonised regional statistics and indicators for about 2 000 regions in 30 countries from 2000 to 2017. The advantage of this dataset is harmonisation, making it well suited for cross-country analyses. This is particularly true when it comes to regional classifications, because in any analytical study conducted at the sub-national level, the choice of the territorial unit is of prime importance. In this respect, the territorial grid applied by the OECD reflects the administrative organisation of countries. The regions are defined either at the territorial level 2 (TL2), which corresponds to the middle-tier of the sub-national government, for example, the Ontario Province in Canada, or at the territorial level 3 (TL3), which corresponds to local governments, with the exception of Australia, Canada and the United States. The empirical strategy, including the estimation of regression equations, is presented and explained in more detail in Causa et al. (2021[1]).

- On average, regional GDP per capita is the strongest economic driver of regional migration inflows. For example, an increase in regional income by 10% triggers an increase in regional inflows by 5%. The strength of income as an in-migration factor likely reflects agglomeration effects that

encourage individuals, and particularly, younger people, to move to cities or metropolitan areas which are characterised by income levels that are much higher than those of other areas.

- House prices at the regional level are the second most important driver after income. The elasticity of regional migration inflows with respect to regional house prices implies that an increase in regional house price growth by 10% triggers a decline in regional inflows by around 2%. The finding that unaffordable housing has prevented people from moving has been put forward in the case of the United States (Bayoumi and Barkema, 2019[7]): the current results suggest that it applies also across a larger set of advanced economies.
- The labour market situation at the regional level is also a highly significant economic driver of migration, in line with the literature (e.g. Bayoumi and Barkema (2019[7]), Liu (2018[10]). The estimated elasticity implies that an increase in regional unemployment by 10% triggers a decline in regional inflows by around 1.3%.

A number of other potentially influential variables (e.g., regional population, industrial structure, education, innovation, availability of public services and environmental quality) were tested in the estimation. However, only population was significant with a positive effect, reflecting well-documented agglomeration effects and the attraction of metropolitan areas.

10.4. Policies shape the pass-through of regional economic conditions to regional migration

In a second step, the empirical approach exploits cross-country time-series variation in policies and institutions to assess the role of policy settings in influencing the responsiveness of inter-regional migration to local economic conditions.[9] While boosting inter-regional migration is not a policy objective in itself, making inter-regional migration responsive to economic conditions can be considered as a legitimate policy objective, because it enhances labour market dynamism, with benefits for economic and social resilience (e.g., individual and macro-level adjustment to local economic shocks), equality of opportunities (e.g., transitioning from joblessness to a job or towards higher quality jobs) and economic efficiency (e.g., matching between workers and jobs). For example, in the area of housing policy, the literature has shown that a less responsive housing supply reduces residential mobility (Causa and Pichelmann, 2020[11]; Caldera Sánchez and Andrews, 2011[12]). One policy question that is addressed in this chapter is whether a less responsive housing supply makes migration less responsive to local economic conditions.

The choice of the policies considered in the analysis draws on previous evidence on the effects of policies on internal migration, residential and labour mobility. The current analysis complements existing evidence with a novel angle on the effects of policies on the responsiveness of migration to local economic conditions. Against this background, the indicators included in the analysis cover three broad policy areas, namely housing-related policies, labour market and social protection policies, and regulatory policies:[10]

- Housing-related policies include: rental market regulations covering both tenant-landlord regulation (rules regarding tenant eviction, tenure security and deposit requirements) and rent control (rules regarding the setting of rent levels and rent increases); housing supply elasticity, that is, the responsiveness of housing supply to price signals, which is partly policy-driven by e.g., land-use regulations; housing-related social transfers, both in kind (social housing) and cash allowances.
- Labour market and social protection policies include: active labour market policies, job protection, unemployment benefits, minimum wages and collective bargaining institutions, as well as labour taxation. In addition, the analysis considers the effect of a set of labour-market related features which can be considered as partly policy-driven and may influence incentives and the possibility to move across regions: regional wage differences as well as labour force education and skills.

- Regulatory policies include: various dimensions of product market regulation such as barriers to entrepreneurship, administrative requirements for limited liability companies and personally-owned enterprises, and regulations of professional services; and occupational entry restrictions, e.g., licensing procedures and administrative burdens applying to personal and professional services.

10.4.1. Policy results

Housing-related policies and institutions are found to significantly influence the responsiveness of inter-regional migration to regional economic conditions, in particular with respect to labour market conditions:

- Where housing supply is more responsive to housing demand, inter-regional migration is found to be more responsive to both regional GDP per capita and regional unemployment. This result is in line with studies finding a direct positive effect of the housing supply elasticity on residential mobility (e.g. Causa and Pichelmann (2020[11]), Andrews et al. (2011[13])) and with studies finding that low supply responsiveness implies that house prices rise more following stronger demand, which contributes to a rising regional dispersion of house prices, typically between higher-income cities and lower-income rural areas (e.g. OECD (2017[14])). Taken together, this evidence suggests that when housing supply is weakly responsive to demand, inter-regional migration is relatively less responsive to regional economic conditions because expected income gains from moving are more than offset by increases in living costs due to large differences in regional house prices.
- Stricter rental market regulations, both rent controls and landlord-tenant regulations, are associated with a lower pass-through from regional labour market conditions to inter-regional migration. This result is in line with studies finding a direct negative effect of rental market regulations on residential mobility (e.g. Causa and Pichelmann (2020[11]), World Bank (2018[15]), Caldera Sánchez and Andrews (2011[12])). Tenants in rent-controlled dwellings may be reluctant to move and give up their below-market rents. This result could also reflect an indirect channel going from rental market regulations to housing supply and the dispersion of regional house prices: strong de-linking of rents from housing market conditions have been found to curtail the size of rental markets by reducing supply (Cavalleri, Cournède and Özsöğüt, 2019[16]) with negative repercussions for affordability. Too strict rent control could then make tenants in rent-controlled dwellings less responsive to move towards places with better labour market opportunities and, also, make it unattractive to do so because of unaffordable housing in such places.
- High housing transaction costs in terms of notary and legal fees associated with buying or selling a property are found to reduce the pass-through elasticity from regional labour market conditions to inter-regional migration. This result is consistent with previous studies finding a negative effect of housing transaction costs on residential mobility, especially among young households (e.g. Causa and Pichelmann (2020[11]), World Bank (2018[15]), Hilber and Lyytikäinen (2017[17]), Caldera Sánchez and Andrews (2011[12])). High levels of notary fees associated with housing transactions may increase relocation costs and thereby reduce incentives to migrate for labour-related reasons among prospective buyers, most often relatively young mobile households.
- Housing-related social transfers, both in-kind in the form of social housing and in cash in the form of housing allowances are associated with a lower responsiveness of inter-regional migration to regional income and, for social housing, to labour market conditions. This suggests that social housing may, in the presence of constraints to the portability of benefits, create “lock-in effects” whereby social tenants have lower incentives to move for better economic opportunities as they may lose access to social housing. This result is in line with various micro-studies of the decision to move finding that social tenants and tenants in subsidised housing are less likely to move than private tenants and owners (e.g. Causa and Pichelmann (2020[11]), World Bank (2018[15]), Caldera Sánchez and Andrews (2011[12])). While housing allowances are in principle more mobility-friendly, the current results tend to suggest that they may also create disincentives to move for economic

reasons, which may reflect weak portability. At the same time, not all evidence goes in the same direction as Causa and Pichelmann (2020[11]), who found that social spending on housing (the same variables), which includes both cash and in-kind transfers, is associated with higher residential mobility.

Labour market and social protection policies shape the pass-through of regional economic conditions, in particular regional GDP per capita, to inter-regional migration:

- Strong job protection of regular contracts is found to significantly reduce the pass-through elasticity from both regional income and regional unemployment to inter-regional migration. Workers enjoying strong protection have little incentive to move to another region, even if this would be associated with a better job match or a higher wage. This result is in line with previous empirical evidence on: i) the negative effect of job protection of regular contracts on workers' reallocation, in particular on job-to-job transitions (Bassanini and Garnero, 2012[18]) and, ii) the negative effect of job protection of regular contracts on residential mobility, especially among youth and low-educated individuals (Causa and Pichelmann, 2020[11]). This result is also in line with findings in Adalet McGowan and Andrews (2015[19]) showing that less stringent job protection is associated with lower mismatch amongst youth, since it provides scope to improve the quality of job-worker matching, which in turn, is associated with higher residential mobility.
- Spending on active labour market policies is associated with lower migration responsiveness with respect to both regional GDP per capita and regional unemployment, and this result applies in particular to the spending categories of sheltered and supported employment, and public employment services. This suggests that the design or delivery of active labour market policies may provide little incentive for jobseekers to look for a job in another region. One reason could be that when jobseekers are engaged in a local programme, they have little time to seek better opportunities elsewhere and incentives to engage in an intense job search decrease with the length of the programme, as found in the literature on "lock-in effects" associated with programme participation (Wunsch, 2016[20]). This interpretation is confirmed by the significant effect found for spending on sheltered and supported employment as jobseekers benefitting from such public work programmes in their region may miss better work opportunities in another region. Another explanation could be a lack of co-ordination between local agencies in different regions as counselling services are delivered at the local level (OECD, 2020[21]), as well as little incentive or possibilities for workers in such agencies to counsel the unemployed on job opportunities in other regions. These results indicate that active labour market policies, do not seem to successfully encourage labour market reallocation and labour market dynamism.
- Unemployment benefits influence migration with respect to regional GDP per capita. The effect varies depending on the duration of unemployment: benefits tend to weaken responsiveness at the early stage of unemployment (after 6 months), especially for lone parents, while they tend to increase responsiveness at a later stage of unemployment (after 12 months). On the one hand, adequate income support during the unemployment spell is essential to help jobseekers to find a job. On the other hand, too generous income support may reduce jobseekers' incentives to search for a job, including by moving region. Some studies have found more generous benefits to be associated with higher residential mobility (Causa and Pichelmann, 2020[11]; Caldera Sánchez and Andrews, 2011[12]), while others have found that more generous benefits reduce the probability of finding a job in another geographical area more than it reduces the probability of finding a job locally (Kristoffersen, 2016[22]; Antolin and Bover, 1997[23]). The current finding that higher replacement rates dampen migration elasticities in the short run, but increase them in the medium-run may indicate that unemployment benefit systems tend to balance the objective of protecting jobseekers from potentially disruptive short-term relocation following temporary shocks and that of helping them coping with medium-term relocation following shocks that turn out be of a more permanent nature.

- Personal income taxes and cash transfers have a weak, significant positive effect on the pass-through of regional labour market conditions to inter-regional migration. This may indicate that income support provided by the tax and transfer system can help low-income households and workers to move towards better opportunities, and ultimately contribute to better spatial labour reallocation.

Labour market institutions affecting wage dispersion are found to affect the responsiveness of migration, in particular with respect to regional labour market conditions

- Countries with higher collective wage-bargaining coverage tend to display less responsive migration with respect to inter-regional GDP differences. Similarly, higher labour costs at the bottom of the distribution and minimum wages are found to reduce migration responsiveness to regional unemployment. This could reflect a relatively compressed wage distribution across industries and regions, which may reduce workers' incentives to move, as well as a downward wage rigidity that may slow down regional adjustment following local labour market shocks. This is corroborated by the finding that more centralised wage-bargaining, which is typically associated with lower levels of wage dispersion,[11] also reduce the pass-through of regional GDP and unemployment to regional migration. This result is line with Poghosyan (2018[24]), who argues that in the case of Finland the wage bargaining system promotes wage compression which tends to reduce inter-regional migration. It also echoes recent findings by Boeri et al. (2019[25]) who find that the more centralised wage bargaining in Italy compared to the more decentralised in Germany tends to reduce spatial reallocation. Finally, these findings are also consistent with recent OECD work on wage premia documenting that the pass-through from firm productivity to wages, and therefore wage dispersion, is lower in countries characterised by highly centralised bargaining systems and higher minimum-to-median wages (Adrjan et al., 2021[26]).
- Wider labour tax wedges, reflecting both employers' and employees' social security contributions, are associated with lower responsiveness of migration. This may arise because of the potential disincentive effects from higher taxation on labour supply, both at the extensive (moving from jobless to job) and at the intensive margin (increasing hours worked). Evidence shows that such effects are particularly strong among the low-skilled but also among people at the early stages of their career (Blundell, 2014[27]) which are likely to be the most geographically mobile to start with.

The argument that a lower wage dispersion may reduce incentives for inter-regional labour market mobility, especially among low-wage earners, is also supported by the estimated negative correlation between earnings inequalities and the responsiveness of migration to regional economic conditions. The estimates suggest that the "overall" inequality effect (D9/D1 ratio) may be driven by a "lower-tail" effect (D5/D1 ratio and incidence of low pay). Moving to the impact of skills, the results indicate that a better educated workforce is more responsive to regional economic dispersion and shocks: where the share of the working-age population with below upper-secondary education and skill shortages are higher,[12] inter-regional migration is less responsive with respect to both GDP and unemployment. This result is in line with micro-based evidence finding that the probability to change residence rises with the education level (Causa and Pichelmann, 2020[11]; Caldera Sánchez and Andrews, 2011[12]).[13]

Policy barriers to business dynamism can affect labour market dynamism and labour mobility:

- Policy barriers to business dynamism, such as barriers to entrepreneurship and administrative burdens, are found to reduce the pass-through from regional economic conditions on inter-regional migration. This result is in line with results in Adalet McGowan and Andrews (2015[19]) showing that less stringent product market regulations are associated with lower skill mismatch, which in turn, is associated with higher residential mobility.
- Stringent regulations of professional services (e.g., lawyers, accountants, engineers and architects) are found to dampen the dynamism of regional migration, in particular with respect to regional GDP.

- Stringent occupational licensing for workers in professional and personal services is found to significantly reduce the responsiveness of inter-regional migration to GDP and, to a lesser extent, labour market conditions. This result is coherent with the previous one on regulations of professional services, as such regulations dampen opportunities to move to another region to start a small business. This result is also fully consistent with the evidence for the United States, documenting a strong negative effect of stringent state-level occupational licensing on inter-state mobility, job-to-job-mobility and labour market dynamism (OECD, 2020[28]; Hermansen, 2019[29]; Johnson and Kleiner, 2017[30]).[14] The current findings suggest that the dampening effect of overly stringent occupational licensing on labour market dynamism is present in a wider set of countries beyond the United States. This is also in line with recent cross-country evidence on the detrimental effects of strict country-level occupational licensing on labour reallocation-driven productivity (Bambalaite, Nicoletti and von Rueden, 2020[31]).

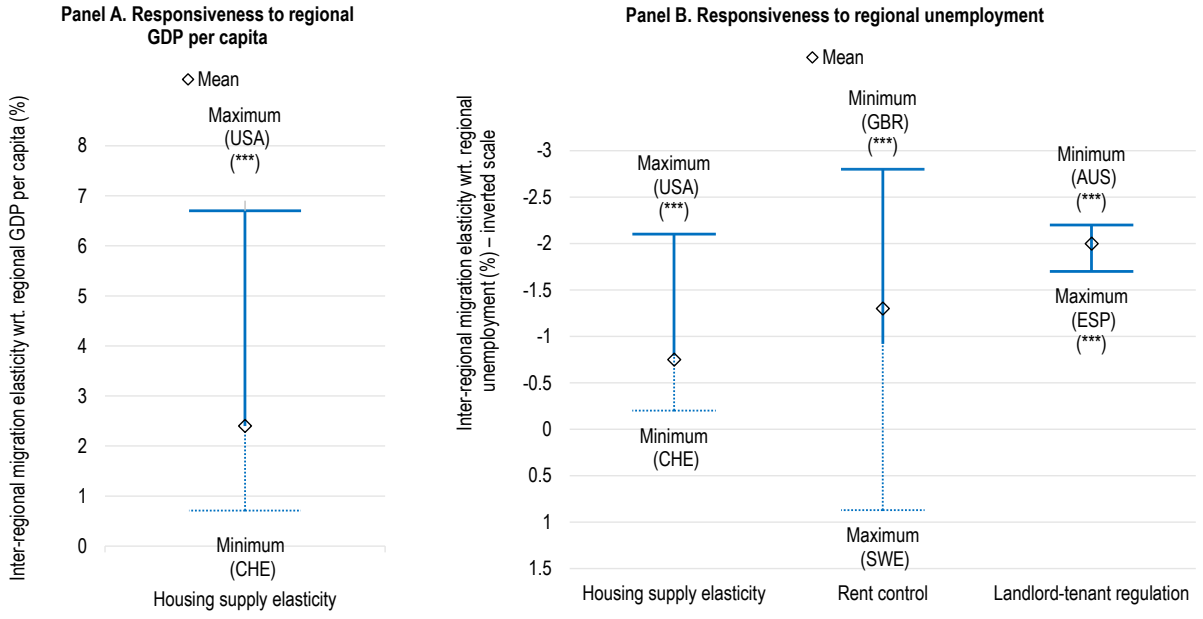
10.4.2. Making internal migration more responsive to regional economic conditions: Illustrative policy simulations

In order to provide an order of magnitude of the estimated policy effects, the empirical results are used to run some illustrative policy simulations. The direction of the policy change is chosen to enhance labour market dynamism by making internal migration more responsive to regional economic conditions. The simulations are reported in various figures showing how different policies influence the pass-through of GDP and unemployment to migration. Each dot is the estimated pass-through evaluated at the cross-country policy average, taking the latest available data point for the policy indicator. The distance between the cross-country minimum/maximum and the average is the change in the pass-through associated with a policy change from average to minimum/maximum. Since the simulations are based on estimated interaction effects between country-level policies and regional GDP (unemployment), they allow to identify cases where, below or above a certain policy threshold, the pass-through is no longer statistically significant.

This illustrative quantification exercise delivers the following results:

- When housing supply is weakly responsive to housing demand, internal migration is unresponsive to regional economic shocks (Figure 10.6, Panels A and B). Moving from the average housing supply responsiveness to the maximum would be associated with an increase in the pass-through from unemployment to internal migration from less than 1% to around 2% (Figure 10.6, Panel B).
- Relaxing rental market regulations, especially rent control, would contribute to make internal migration more responsive to regional unemployment shocks (Figure 10.6, Panel B). According to the estimates, moving from the average rent control to the minimum would be associated with an increase in the pass-through from unemployment to internal migration from around 1% to around 3%. Moving from the maximum to average tenant protection would be associated with an increase in the pass-through from unemployment to internal migration from around 1.7% to close to 2%, a statistically significant but economically negligible impact.

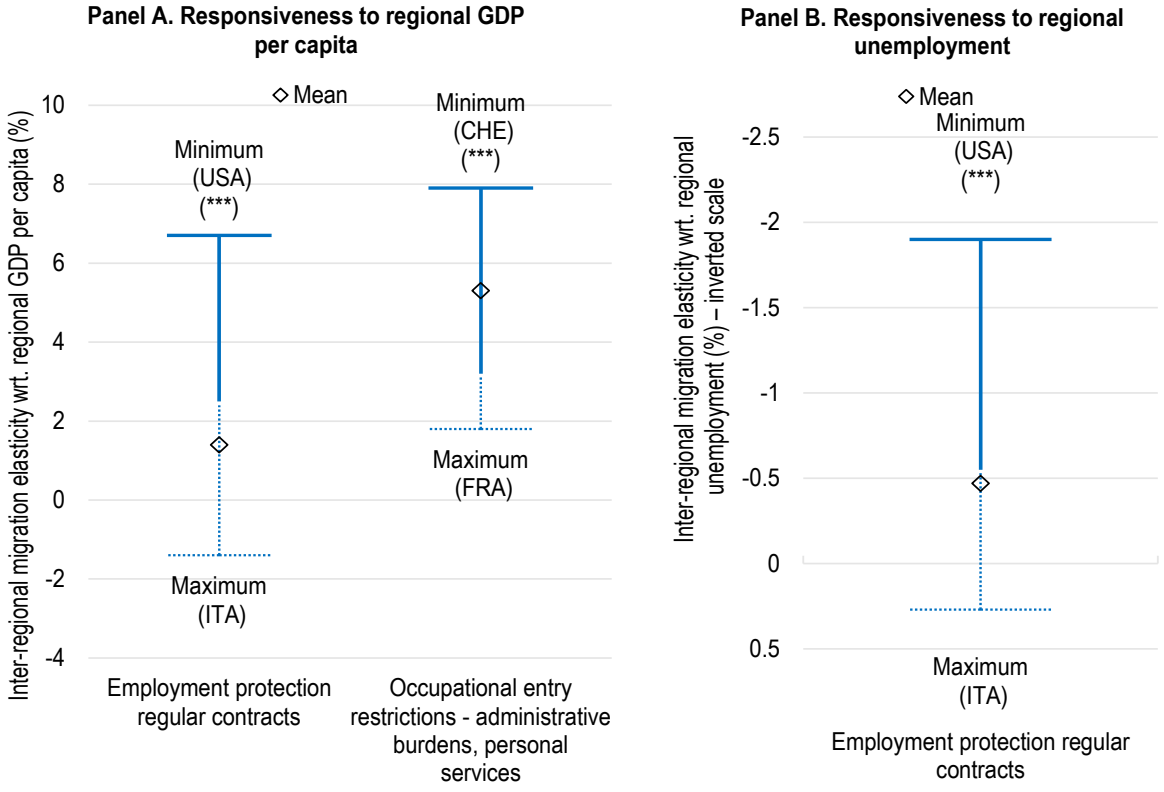
Figure 10.6. Making housing supply more elastic and relaxing rental market regulation



Note: OECD calculations based on selected interaction effect estimates from a regression of inter-regional migration on the interaction between a policy variable and regional unemployment, among other variables, see Causa et al. (2021[1]). The dot is the estimated in-migration elasticity evaluated at the average of the policy indicator. The distance between the Min/Max and the average is the change in the estimated elasticity associated with a policy change. Dashed line means that the estimated elasticity is no longer statistically significant. *, **, *** denote the statistical significance of the estimated elasticity (i.e., 10%, 5%, 1%).
How to read: An increase (decline) in regional GDP per capita (regional unemployment) by 10% is estimated to trigger a statistically insignificant change in in-migration at and below the average of the cross-country distribution of housing supply elasticity, while it is estimated to trigger a rise in in-migration by 6.7% (2%) at the maximum of the cross-country distribution of the housing supply elasticity. A decline in regional unemployment by 10% is estimated to trigger a statistically insignificant change in in-migration at the maximum of the cross-country distribution of rent control, while it is estimated to trigger a rise in in-migration by 1.3% at the mean and 2.8% at the minimum of the cross-country distribution of rent control. The policy indicators used refer to the latest available year.

- When job protection is very restrictive for workers on regular contracts, internal migration is found to be unresponsive to both regional unemployment and GDP (Figure 10.7, Panels A and B). Reducing job protection of regular contracts from the average to the minimum level would be associated with an increase in the pass-through from unemployment to internal migration from around 0.5% to close to 2%. Reforms to ease occupational licensing restrictions in service sectors would also contribute to make internal migration more responsive to regional GDP: moving from the lowest level of restriction to the average is estimated to increase the income-migration pass-through from about 2% to around 5%.

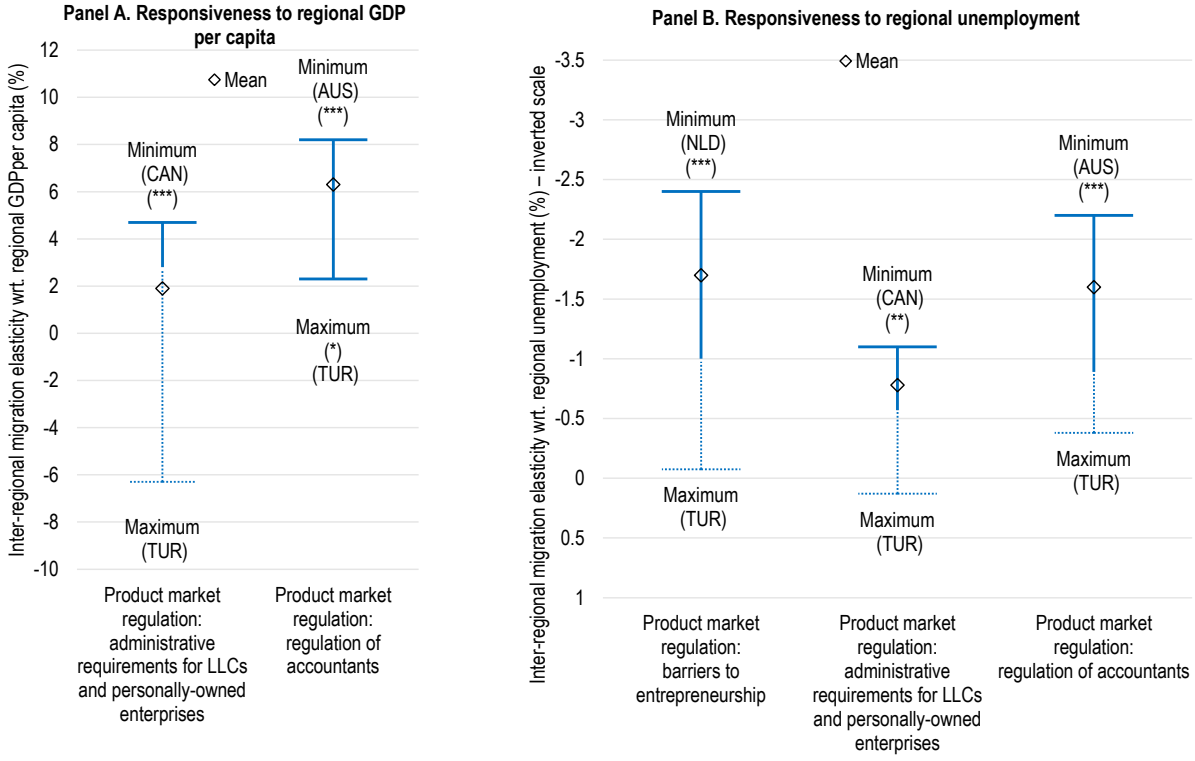
Figure 10.7. Reducing job protection on regular contracts and occupational licensing restrictions in service sectors



Note: OECD calculations based on selected interaction effect estimates from a regression of inter-regional migration on the interaction between a policy variable and regional unemployment, among other variables, see Causa et al. (2021[1]). The dot is the estimated in-migration elasticity evaluated at the average of the policy indicator. The distance between the Min/Max and the average is the change in the estimated elasticity associated with a policy change. Dashed line means that the estimated elasticity is no longer statistically significant. *, **, *** denote the statistical significance of the estimated elasticity (i.e., 10%, 5%, 1%).
How to read: An increase in regional GDP per capita by 10% is estimated to trigger a statistically insignificant change in in-migration at and above the average of the cross-country distribution of job protection of regular contracts, while in-migration would increase by 6.7% at the minimum of the cross-country distribution of job protection of regular contracts. An increase in regional GDP per capita by 10% is estimated to trigger a statistically insignificant change in-migration at the maximum of the cross-country distribution of occupational entry restrictions, while it is estimated to trigger a rise in in-migration by 5.3% at the mean and 7.9 % at the minimum of the cross-country distribution (of occupational entry restrictions). The policy indicators used refer to the latest available year.

- Product market reforms aimed at easing overly restrictive administrative burdens for business and barriers to entrepreneurship would facilitate internal migration in response to regional unemployment and GDP (Figure 10.8, Panels A and B). According to the estimates, reducing barriers to entrepreneurship from the maximum to the average level would move the pass-through from unemployment to migration from statistically insignificant to close to 1.7%. The same result applies to regulations of professional services. Reforms that relax barriers to entry in accounting services are reported as an example, with an estimated order of magnitude similar to the one reported for overall barriers to entrepreneurship (Figure 10.8).

Figure 10.8. Easing administrative burdens for business and barriers to entrepreneurship



Note: OECD calculations based on selected interaction effect estimates from a regression of inter-regional migration on the interaction between a policy variable and regional unemployment, among other variables, see Causa et al. (2021[1]). The dot is the estimated in-migration elasticity evaluated at the average of the policy indicator. The distance between the Min/Max and the average is the change in the estimated elasticity associated with a policy change. Dashed line means that the estimated elasticity is no longer statistically significant. *, **, *** denote the statistical significance of the estimated elasticity (i.e., 10%, 5%, 1%).
How to read: A decline in regional unemployment by 10% is estimated to trigger a rise in in-migration by 0.8 % at the mean of the cross-country distribution of product market regulations with respect to administrative requirements for LLCs and personally-owned enterprises, 0.1% at the maximum, and -1.1% at the minimum. An increase in regional GDP per capita by 10% is estimated to trigger a rise in in-migration by 6.3 % at the mean of the cross-country distribution of product market regulation in professional services - accountants, 2.3 % at the maximum, 8.2% at the minimum. The policy indicator used refers to the latest available year.

10.5. Country-by-country results

The cross-country analysis presented above is complemented by a country-by-country study based on Cavalleri et al. (2021[2]). A gravity model is used to detect and exploit country-specific differences and characteristics in terms of drivers of inter-regional migration. Often, the results from the cross-country exercise are confirmed, yet the relevance of these drivers differs across countries. Housing affordability is an important barrier to migration in countries having experienced strong increases in the level and cross-regional dispersion of house prices, while less so in countries where commuting is an alternative to migration. Table 10.1 summarises the country-specific results:

Table 10.1. The responsiveness of inter-regional migration to regional economic factors

The responsiveness of regional migration in the destination region with respect to:	GDP per capita	Unemployment rate	House prices
Strong effect	ITA CHE CAN POL GBR JPN	CAN SWE CHE USA	AUS SWE ITA ESP CAN
Mild effect	NLD DNK KOR AUS USA	ESP ITA FIN AUS GBR	KOR GBR JPN DNK USA
No effect	SWE FIN ESP	NLD KOR DNK POL JPN	FIN NLD POL CHE

Note: Migration responsiveness refers to the responsiveness of inter-regional migration with respect to GDP per capita, unemployment and house prices in destination regions. Countries are ranked in descending order according to the size of effects of regional GDP per capita, unemployment rate and house prices on inter-regional migration.

10.5.1. GDP and wage bargaining

The results reveal that the perspective of enjoying higher living standards in the destination region tends to be the strongest driver of mobility in a majority of countries. On average across the countries covered, a 10% rise in GDP per capita in the destination region increases migration by about 5%. This effect is more pronounced in countries characterised by relatively large regional income disparities, such as Italy and Canada.

Wage bargaining systems can influence economic incentives to move as well. Centralised (decentralised) settings reduce (increase) the dispersion of wages across firms and locations, but also the link between local productivity and local wages. When the regional dispersion in wages is low due to centralised wage bargaining, workers may opt to remain in a low-productivity region where housing costs are lower because the salary gains from moving into a high-productivity region are smaller in real terms and may not compensate for the higher housing costs. Empirical evidence based on the comparison between Italy and Germany suggests that centralised bargaining may create barriers to mobility, resulting in an inefficient spatial allocation of labour and persistent regional inequalities (Boeri et al., 2019[25]). Consistent with this, in this study, internal migration appears to be more responsive to regional GDP per capita in countries where wage bargaining systems are relatively decentralised (e.g., Canada, Poland, Switzerland, the Netherlands and the United Kingdom) and less so in countries where wage bargaining systems are relatively centralised (e.g. Finland and Spain).[15]

10.5.2. Local labour markets

Local labour market conditions are significant drivers of inter-regional migration in several countries. Yet, the magnitude of this effect is smaller than that of income and house prices: on average across the countries covered, a 10% rise in unemployment in the destination region is found to reduce migration by about 1.6%. This is consistent with evidence that employment opportunities are not the main reason for changing residence (Causa and Pichelmann, 2020[11]).

Still, labour market conditions matter more in countries suffering from relatively high unemployment (e.g., Italy and Spain), or cross-regional dispersion (e.g., Canada, Switzerland and Finland) (Figure 10.5). This may indicate that inter-regional migration can act as a labour market adjustment mechanism.[16] Labour market conditions have a consistently smaller effect on migration in countries where labour market adjustments are less needed, either because of low average unemployment (Korea, Japan) or because of a low cross-regional dispersion in unemployment (Denmark).

Cross-country differences in labour market policies may explain cross-country differences in the responsiveness of migration to local labour market shocks. For example, strong job protection of regular

contracts, high barriers to entrepreneurship and strict occupational licensing tend to reduce the responsiveness of internal migration to local labour market shocks. By contrast, policies that favour the portability of social protection and risk-taking at the individual level can encourage geographic and labour mobility. Such is the case of well-designed portable housing allowances as well as active and passive income support for the unemployed that do not discourage reallocation. In addition, the literature has pointed to the risk that social housing may unintentionally create lock-in effects (Salvi del Pero et al., 2016[32]) This can arise when households are not willing to move to areas offering better labour market opportunities because of fear of losing the entitlement to social housing. This could explain, for example, the low responsiveness of migration to labour market incentives observed in countries with large social housing sectors, such as Denmark, the Netherlands and the United Kingdom. However, while housing allowances are in principle more mobility-friendly than direct housing support, they may also create disincentives to cross-regional mobility, especially when their portability is limited due to the regional provision of such benefits. Overall, the extent of barriers to geographic mobility that housing-related social benefits can create depend crucially on the design of such schemes.

10.5.3. Housing costs

Housing costs matter for mobility decisions in almost all countries covered by this study. On average, a 10% increase in house prices in the destination region reduces inward migration by more than 3%. Yet, this average estimate masks substantial heterogeneity across countries. House prices have a strong impact on internal mobility in countries such as (Sweden, Australia and Canada, where house prices have strongly increased over the last decade. In other countries where the impact of house prices is estimated to be more muted, a modest decline in house prices for the median region hides widening regional house price dynamics (e.g., the United States and the United Kingdom), signalling that some areas are growing increasingly unaffordable relative to others. Rising cross-regional differences in house prices may have important consequences for the level and composition of inter-regional migration flows, for instance by creating barriers to the mobility of low-skilled workers from lagging regions to metropolitan areas, as shown for the United States (Autor, 2019[33]).

Rising house prices or rents may not be particularly concerning if income rises at the same pace and housing affordability across all socioeconomic groups is maintained. Yet, empirical evidence suggests that this is not the case. Estimates by Bricongne et al. (2019[34]) show that over the course of a generation, a number of countries covered in this study, especially Sweden, the United Kingdom and Australia, have experienced a sharp increase in the years of average household disposable income required to buy a home. This is in line with the finding that across many OECD countries, housing costs have risen faster than median income and overall inflation, contributing to eroding the purchasing power of the middle class (OECD, 2019[35]).

Housing costs can also alter the nature of labour mobility to the extent that people choose to reside in a region and commute to work in another. When house prices tend to increase in urban areas and the transportation system works well, households can choose to live in suburbs around major cities. In fact, the share of workers that commute for work to another region has increased in the past ten years across European countries and it is very high in some of the countries covered by this study, that is, the United Kingdom, Switzerland, Denmark and the Netherlands. The rise in teleworking since the Covid pandemic may accentuate this phenomenon, potentially increasing the distance between workplace and residence (Davis, Ghent and Gregory, 2021[36]). This would also make housing-related factors even more relevant for migration decisions.

GDP per capita and house prices in the destination region tend to be the strongest drivers of migration in most countries, while labour market conditions seem to play a secondary role. At the same time, the results also point to large cross-country differences[17] in the estimated responsiveness of internal migration to local economic conditions and living costs.

10.6. Policy considerations

Drawing on the empirical results reported in this paper, policy interventions to support inter-regional migration can be subsumed under two broad categories: addressing policy-driven lock-in effects and removing policy obstacles to mobility. Yet policy interventions may be needed not only for movers but also for stayers. There is a case for policies that create opportunities in places where those are currently lacking, which could, if successful, encourage locals to stay instead of migrating; and attract migrants coming from other regions.

10.6.1. Addressing policy-driven lock-in effects

Addressing policy-driven lock-in effects requires policy interventions in the area of social benefits and active labour market and training policies, including:

- Activation and training programmes providing adequate cash benefits that help unemployed people searching for and finding quality jobs including outside their region of residence.

  To achieve this, information sharing and co-operation between local public employment services in different regions should be encouraged, so as to inform jobless people about job availability in other regions (OECD, 2020[37]).
- Jobseekers claiming benefits are in some cases expected to commute or to move to a new location where suitable employment is available, albeit within certain limits. A small number of countries can even require moves to a different region as part of the availability requirement and suitable work criteria (Immervoll and Knotz, 2018[38]). This requirement may speed-up reallocation but risks lowering the quality of matching and jobs.
- Social housing eligibility rules should support mobility, alongside with fully portable housing allowances. Policy design is key to help residential and labour mobility among social housing tenants and incentivise employment, so as to ensure that vulnerable households have access to affordable housing options in other and potentially distant labour markets that offer better employment opportunities (OECD, 2020[21]). This can be achieved by removing queuing or residency requirements in the case of employment take-up, such as the “Right to Move” policy implemented in English housing associations in 2015. This may also require reinforcing institutional support, as residential mobility of the most vulnerable may be dampened by informational barriers and a lack of support in housing search and application processes. One approach recently introduced in the Paris region is an online platform, echangerhabiter.fr, that collects information from 24 major social housing providers (representing around 60% of the regional social housing stock) to enable social housing tenants to exchange their dwellings. In addition, mobility barriers and lock-in effects for lower-income social housing tenants can be reduced by gradually phasing out social rent benefits at higher income levels, as with the income-dependent rent increases introduced in the Netherlands or in France. Such measures can reduce waiting lists for social housing units, which in turn would make residential moves within the social housing system easier.

10.6.2. Removing policy obstacles to mobility

Removing policy obstacles to mobility requires policy interventions in the area of housing, labour and product markets, including:

- Removing poorly-designed land-use regulations contributing to rigid housing supply and therefore to housing unaffordability and house price divergences.

  Increasing the responsiveness of housing supply to demand would contribute to reduce living costs in attractive metropolitan areas, making it possible for prospective low-income movers to move there to enjoy better opportunities. Reforms in this area often imply revising the design of land-use

governance arrangements to avoid overlap in the allocation of housing policy functions across the different levels of administration and to favour planning at the metropolitan level rather than lower levels of government. This can facilitate the matching of supply and demand within broader catchment areas and therefore increase the responsiveness of supply to evolving demand, mitigating upward pressure on prices and making housing more affordable.

- Reviewing local rental market regulations in places where evidence suggests that they curtail the size of the rental market.

  Reforms to make rental market regulations such as rent control and tenure security more flexible have the potential to contribute to reducing obstacles to mobility as well as making housing markets more efficient and affordable in the long term. Still, they could undermine affordability for some households in the short term, especially for incumbents. There is a case for providing tenants with reasonable security over tenure and rent levels: a compromise can be a system of rent stabilisation, whereby rents can be varied for new contracts and renewals but regulated in line with market developments during the duration of the contract.

- Reforming labour and product market regulations where such policy settings tend to favour insiders over outsiders.

  Job protection reforms can contribute to reducing barriers to job mobility and are especially relevant in countries characterised by labour market duality. In such cases, reforms are likely to reduce spatial misallocation and make labour markets more inclusive by better integrating outsiders, often the jobless, less-qualified, women and young people. Policy action to reduce labour market duality also involves aligning social contributions and working conditions between temporary and regular contracts.[18]

- Reducing barriers to firm entry and entrepreneurship, including by reviewing occupational entry regulations, may reduce obstacles to job mobility along with promoting labour and business dynamism. Empirical evidence by Bambalaite et al. (2020[31]) suggest that many countries have ample scope for achieving public goals in terms of safety and consumer satisfaction with lighter occupational entry requirements. In particular, easing regulations concerning qualification requirements in personal services would eliminate mobility restrictions that create unnecessary labour market rigidities, with disproportionate benefits for low or middle-income workers such as aestheticians, hairdressers, nurses, painters, plumbers and taxi drivers. Reforms in this area would thus achieve both productivity and inclusiveness objectives.

10.6.3. The case for place-based policies

Creating opportunities does not necessarily imply moving individuals out of less developed regions. It can be deploying quality infrastructure and amenities in such regions, for instance to allow individuals to live there and work elsewhere, especially in a context of rising digitalisation and teleworking. This is about helping stayers, which could contribute to achieve several objectives: i) reducing regional labour market imbalances and raising productivity growth; ii) reinvigorating and rejuvenating left-behind places;[19] iii) reducing congestion and air pollution in metropolitan areas; and iv) making housing more affordable in cities and thus reducing regional divergences in house prices. Another argument in favour of this approach is based on evidence that falling migration rates have often been associated with limited migration from struggling to thriving places (Figure 10.2 and Figure 10.3). While for some countries this is likely to be a policy concern in itself, it may raise the returns to local interventions, making it less likely that the benefits from such interventions are captured by those who initially live outside the target location, or by landowners in the struggling region.

Place-based policies to support stayers in lagging-behind regions require investing in quality infrastructure, transport and public amenities:

- Hospital and medical facilities
- Quality childcare, schools, vocational training and universities[20]
- Digital coverage and connectivity
- Well-functioning public transportation infrastructure, for instance to improve access to urban areas.

Place-based policies have recently regained prominence in many countries and international organisations (OECD, 2020[37]; OECD, 2020[39]; OECD, 2019[40]; Iammarino, Rodriguez-Pose and Storper, 2018[41]; Shambaugh and Nunn, 2018[42]). However, they often continue to be associated with spatial subsidies and compensatory policies so as ex-post redistribution interventions instead of ex-ante policy interventions that would exploit the growth potential of lagging regions. Place-based policies go beyond direct support for lagging regions, to include recognition of and adaptation to specific territorial assets, investment strategies, involvement of stakeholders, the search for complementarities across different sectoral policy lines and the implementation of an effective multi-level governance system (OECD, 2019[40]).

10.6.4. Articulating structural with place-based policies

Social policies to promote inclusiveness and crisis resilience are very likely to require articulating "spatially-blind" with "spatially-aware" measures. One relevant area of policy intervention is that of jobseekers' support. Unemployment benefits are usually established at the national level yet lessons from crisis episodes suggest that allowing them to vary in response to local labour market shocks can promote resilience. For example, as part of the COVID-19 crisis, Canada has allowed an automatic extension of maximum duration according to the regional unemployment rate (Box 2.6 in OECD (2020[39])). Adequate, potentially state-contingent, income support needs to be complemented with locally-provided activation and training policies. These could involve local employers and take into account the local context in terms of unemployment level and persistence, socioeconomic composition and skills of the workforce, availability of jobs or increasingly demanded jobs, as well as sectoral specialisation in declining/expanding sectors.

Finally, place-based policies may imply to direct more investment funds towards disadvantaged regions, where the marginal value of public spending could be highest. In the context of the COVID-19 crisis, a number of OECD countries have been taking action to bridge the digital divide across regions (OECD, 2020[43]). For example, in Portugal, in October 2020, the European Commission approved the reallocation of EUR 1 billion from EU Cohesion policy funds to support seven Portuguese regions. Funds will also support the digitalisation of schools, SMEs and the tourism sector. In the United States, several states have adopted measures to bridge the digital divide. For example, the City of Los Angeles is partnering with the private sector to provide options for low-cost internet, access to computer and digital literacy services, as well as device and digital training resources to its residents through its 'Get Connected' programme.

References

Adalet McGowan, M. and D. Andrews (2015), "Skill Mismatch and Public Policy in OECD Countries", *OECD Economics Department Working Papers*, No. 1210, OECD Publishing, Paris, https://doi.org/10.1787/5js1pzw9lnwk-en. [19]

Adrjan, P. et al. (2021), "Will it stay or will it go? Analysing developments in telework during COVID-19 using online job postings data", *OECD Productivity Working Papers*, No. 30, OECD Publishing, Paris, https://doi.org/10.1787/aed3816e-en. [26]

Andrews, D. and A. Caldera Sánchez (2011), "The Evolution of Homeownership Rates in Selected OECD Countries: Demographic and Public Policy Influences", *OECD Journal: Economic Studies*, https://doi.org/10.1787/eco_studies-2011-5kg0vswqpmg2. [48]

Andrews, D., A. Caldera Sánchez and Å. Johansson (2011), "Housing Markets and Structural Policies in OECD Countries", *OECD Economics Department Working Papers*, No. 836, OECD Publishing, Paris, https://doi.org/10.1787/5kgk8t2k9vf3-en. [13]

Antolin, P. and O. Bover (1997), "Regional Migration in Spain: The Effect of Personal Characteristics and of Unemployment, Wage and House Price Differentials Using Pooled Cross-Sections", *Oxford Bulletin of Economics and Statistics*, Vol. 59/2, pp. 215-235, https://doi.org/10.1111/1468-0084.00061. [23]

Autor, D. (2019), "Work of the Past, Work of the Future", *AEA Papers and Proceedings*, Vol. 109, pp. 1-32, https://doi.org/10.1257/pandp.20191110. [33]

Bambalaite, I., G. Nicoletti and C. von Rueden (2020), "Occupational entry regulations and their effects on productivity in services: Firm-level evidence", *OECD Economics Department Working Papers*, No. 1605, OECD Publishing, Paris, https://doi.org/10.1787/c8b88d8b-en. [31]

Bassanini, A. and A. Garnero (2012), *Dismissal Protection and Worker Flows in OECD Countries: Evidence from Cross-Country/Cross-Industry Data*, https://sites.google.com/site/bassaxsite/home/files/. [18]

Bayoumi, T. and J. Barkema (2019), *Stranded! How Rising Inequality Suppressed US Migration and Hurt Those Left Behind, WP/19/122, June 2019*. [7]

Ben-Shahar, D., S. Gabriel and R. Golan (2020), "Can't get there from here: Affordability distance to a superstar city", *Regional Science and Urban Economics*, Vol. 80, p. 103357, https://doi.org/10.1016/j.regsciurbeco.2018.04.006. [46]

Blundell, R. (2014), "How responsive is the labor market to tax policy?", *IZA World of Labor*, https://doi.org/10.15185/izawol.2. [27]

Boeri, T. et al. (2019), "Wage Equalization and Regional Misallocation: Evidence from Italian and German Provinces", *NBER Working Paper N. 25612*. [25]

Bricongne, J., A. Turrini and P. Pontuch (2019), "Assessing House Prices: Insights from "Houselev", a Dataset of Price Level Estimates | European Commission", *European Economy Discussion Papers*, Vol. 101. [34]

Caldera Sánchez, A. and D. Andrews (2011), "To Move or not to Move: What Drives Residential Mobility Rates in the OECD?", *OECD Economics Department Working Papers*, No. 846, OECD Publishing, Paris, https://doi.org/10.1787/5kghtc7kzx21-en. [12]

Causa, O., M. Abendschein and M. Cavalleri (2021), "The laws of attraction: economic drivers of inter-regional migration, housing costs and the role of policies", *OECD Economics Department Working Papers No. 1679*. [1]

Causa, O. and J. Pichelmann (2020), "Should I stay or should I go? Housing and residential mobility across OECD countries", *OECD Economics Department Working Papers*, No. 1626, OECD Publishing, Paris, https://doi.org/10.1787/d91329c2-en. [11]

Cavalleri, M., B. Cournède and E. Özsöğüt (2019), "How responsive are housing markets in the OECD? National level estimates", *OECD Economics Department Working Papers*, No. 1589, OECD Publishing, Paris, https://doi.org/10.1787/4777e29a-en. [16]

Cavalleri, M., N. Luu and O. Causa (2021), "Migration, housing and regional disparities: A gravity model of inter-regional migration with an application to selected OECD countries", *OECD Economics Department Working Papers*, No. 1691, OECD Publishing, Paris, https://doi.org/10.1787/421bf4aa-en. [2]

Ciani, E., F. David and G. de Blasio (2019), "Local responses to labor demand shocks: A Re-assessment of the case of Italy", *Regional Science and Urban Economics*, Vol. 75, pp. 1-21, https://doi.org/10.1016/j.regsciurbeco.2018.12.003. [45]

Davis, M., A. Ghent and J. Gregory (2021), "The work-at-home technology boon and its consequences", *NBER Working Paper N. 28461*, https://doi.org/10.3386/w28461. [36]

Diamond, R. (2016), *The determinants and welfare implications of US Workers' diverging location choices by skill: 1980-2000*, American Economic Association, https://doi.org/10.1257/aer.20131706. [9]

Ganong, P. and D. Shoag (2017), "Why has regional income convergence in the U.S. declined?", *Journal of Urban Economics*, Vol. 102, pp. 76-90, https://doi.org/10.1016/j.jue.2017.07.002. [8]

Greenwood, M. (1997), "Chapter 12 Internal migration in developed countries", in *Handbook of Population and Family Economics, Handbook of Population and Family Economics Volume 1*, Elsevier, https://doi.org/10.1016/s1574-003x(97)80004-9. [5]

Hermansen, M. (2019), "Occupational licensing and job mobility in the United States", *OECD Economics Department Working Papers*, No. 1585, OECD Publishing, Paris, https://doi.org/10.1787/4cc19056-en. [29]

Hilber, C. and T. Lyytikäinen (2017), "Transfer taxes and household mobility: Distortion on the housing or labor market?", *Journal of Urban Economics*, Vol. 101, pp. 57-73, https://doi.org/10.1016/j.jue.2017.06.002. [17]

Iammarino, S., A. Rodriguez-Pose and M. Storper (2018), "Regional inequality in Europe: evidence, theory and policy implications", *Journal of Economic Geography*, Vol. 19/2, pp. 273-298, https://doi.org/10.1093/jeg/lby021. [41]

Immervoll, H. and C. Knotz (2018), "How demanding are activation requirements for jobseekers", *OECD Social, Employment and Migration Working Papers*, No. 215, OECD Publishing, Paris, https://doi.org/10.1787/2bdfecca-en. [38]

Johnson, J. and M. Kleiner (2017), *Is Occupational Licensing a Barrier to Interstate Migration?*, National Bureau of Economic Research, Cambridge, MA, https://doi.org/10.3386/w24107. [30]

Kaplan, G. and S. Schulhofer-Wohl (2017), "Understanding the Long-run Decline in Interstate Migraion", *International Economic Review*, Vol. 58/1, pp. 57-94, https://doi.org/10.1111/iere.12209. [49]

Kristoffersen, M. (2016), *Geographical Job Mobility and Wage Flexibility*, Danmarks Nationalbank. [22]

Liu, L. (2018), *Regional Labor Mobility in Spain, WP/18/282, December 2018*. [10]

Molloy, R. and C. Smith (2019), "U.S. Internal Migration: Recent Patterns and Outstanding Puzzles", https://www.hamiltonproject.org/blog/americans_arent_moving_to_economic_opportunity. [44]

Molloy, R., C. Smith and A. Wozniak (2011), "Internal migration in the United States", *Journal of Economic Perspectives*, Vol. 25/3, pp. 173-196, https://doi.org/10.1257/jep.25.3.173. [4]

OECD (2020), *Capacity for remote working can affect lockdown costs differently across places*, https://www.oecd.org/coronavirus/policy-responses/capacity-for-remote-working-can-affect-lockdown-costs-differently-across-places-0e85740e/. [39]

OECD (2020), *Cities policy responses*, https://www.oecd.org/coronavirus/policy-responses/cities-policy-responses-fd1053ff/#part-d1e211. [43]

OECD (2020), *OECD Economic Surveys: United States 2020*, OECD Publishing, Paris, https://doi.org/10.1787/12323be9-en. [28]

OECD (2020), *OECD Employment Outlook 2020: Worker Security and the COVID-19 Crisis*, OECD Publishing, Paris, https://doi.org/10.1787/1686c758-en. [37]

OECD (2020), *OECD Regions and Cities at a Glance 2020*, OECD Publishing, Paris, https://doi.org/10.1787/959d5ba0-en. [3]

OECD (2020), *Social housing: A key part of past and future housing policies*, https://oe.cd/social-housing-2020. [21]

OECD (2020), *TALIS 2018 Results (Volume II): Teachers and School Leaders as Valued Professionals*, TALIS, OECD Publishing, Paris, https://doi.org/10.1787/19cf08df-en. [47]

OECD (2019), *OECD Regional Outlook 2019: Leveraging Megatrends for Cities and Rural Areas*, OECD Publishing, Paris, https://doi.org/10.1787/9789264312838-en. [40]

OECD (2019), *Under Pressure: The Squeezed Middle Class*, OECD Publishing, Paris, https://doi.org/10.1787/689afed1-en. [35]

OECD (2017), *The Governance of Land Use in OECD Countries: Policy Analysis and Recommendations*, OECD Regional Development Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264268609-en. [14]

Poghosyan, T. (2018), *Regional Labor Mobility in Finland, WP/18/252, November 2018*. [24]

Salvi del Pero, A. et al. (2016), "Policies to promote access to good-quality affordable housing in OECD countries", *OECD Social, Employment and Migration Working Papers No. 176*, https://doi.org/10.1787/5jm3p5gl4djd-en. [32]

Shambaugh, J. and R. Nunn (eds.) (2018), *Place-Based Policies for Shared Economic Growth - The Hamilton Project*, Brookings Institution. [42]

Treyz, G. et al. (1993), "The Dynamics of U.S. Internal Migration", *The Review of Economics and Statistics*, Vol. 75/2, p. 209, https://doi.org/10.2307/2109425. [6]

World Bank (2018), *Living and Leaving: Housing, Mobility and Welfare in the European Union*. [15]

Wunsch, C. (2016), "How to minimize lock-in effects of programs for unemployed workers", *IZA World of Labor*, https://doi.org/10.15185/izawol.288. [20]

Notes

[1] In this chapter, inter-regional migration refers to movements of the population from one region to another within the same country. The focus is on internal as opposed to international migration. Migration flows across regions are sourced from the OECD Regional database.

[2] On the United States, references include: Bayoumi and Barkema (2019[7]), Molloy and Smith (2019[44]), Ganong and Shoag (2017[8]), Kaplan and Schulhofer-Wohl (2017[49]) and Molloy et al. (2011[4]). On Europe, see Ciani et al. (2019[45]) on Italy, Liu (2018[10]) on Spain, Poghosyan (2018[24]) on Finland; also Ben-Shahar et al. (2020[46]) on Israel.

[3] Inter-state migration in the United States has been mostly measured on the basis of two sources: the Current Population Survey (CPS), which is a standard micro-based survey that allows to cover a long time period, and the Internal Revenue Statistics (IRS), which is based on tax declarations and is considered as a superior source to track migration, but is only available for the latest decade. Panel B of Figure 10.2 presents changes since the mid-2000s on the basis of both CPS and IRS. The CPS tends to overstate the decline in migration. See Molloy and Smith (2019[44]) for a discussion.

[4] It is important to recognise that the level of regional disaggregation used in this chapter, which is dictated by data availability, may fail to fully capture regional dispersion. OECD (2020[3]) provides evidence that regional inequalities increase with the level of the regional disaggregation. This is driven by high levels of inequalities between cities (or metropolitan areas) and rural areas within granularly-defined regions.

[5] Income is measured by real GDP per capita, consistent with the regression analysis. Household disposable income cannot be used in the regression analysis because of data availability issues, especially in the time series dimension. While household disposable income is a better measure of living standards relative to GDP per capita, GDP per capita is more likely to capture destination factors associated with higher wages and agglomeration effects. In addition, household disposable income includes income redistribution through country-level income taxes and cash transfers, which may influence international more than internal migration.

[6] This is in line with more granular US evidence, e.g. Shambaugh and Nunn (2018[42]).

[7] By contrast, Molloy and Smith (2019[44]) and Kaplan and Schulhofer-Wohl (2017[49]) argue that regional house price divergence cannot explain the decline in migration in the United States.

[8] These findings are in line with OECD Statistical insights available here http://www.oecd.org/sdd/prices-ppp/statistical-insights-location-location-location-house-price-developments-across-and-within-oecd-countries.htm.

[9] Regional-level policies cannot be considered in the analysis, mainly because of data availability issues.

[10] Some inevitable arbitrariness in the assignment of each policy under each area along with some overlap across areas for given policies needs to be acknowledged. For example, occupational licensing can be considered as both a labour market policy and a regulatory policy.

[11] The correlation between collective bargaining coverage and wage centralization, with these indicators averaged over the period 2000-2015, is -0.8879 and significant at the 1% level.

[12] The variable "skill needs" from the OECD's new Skills for Jobs Indicators database measures the shortage or surplus of technical skills: positive values indicate skill shortage while negative values point to skill surplus. The larger the absolute value, the larger the imbalance.

[13] The finding of an opposite effect between the dispersion of wages in the workforce and the level of education of the workforce may tentatively reflect the equalising effect of education.

[14] The indicators of occupational licensing in this chapter are at the country-level as region-level indicators are not yet available on a cross-country basis.

[15] However, Italy and Sweden are exceptions. In Sweden, the wage bargaining system is more decentralised but the gravity model does not yield significant estimates of the wage/income term. On the contrary, in Italy, the wage bargaining system is more centralised, but the income elasticity of migration is very high. Other factors than the wage setting system likely explain migration decisions in these countries, including: (*i*) regional differences in disposable income (relatively high in Italy and low in Sweden); and (*ii*) the prevalence of homeownership (relatively high in Italy and relatively low in Sweden), which is negatively associated with housing mobility (Causa and Pichelmann, 2020[11]; Andrews and Caldera Sánchez, 2011[48]).

[16] Sweden is an exception to this rule, as the gravity regression reports a high elasticity of migration to local labour market effects despite small regional differences in unemployment rates.

[17] Cross-country differences in estimated elasticities could partly reflect differences in the definition of regions and on their size. Most country estimates are based on the TL2 classification, with the exception of Korea, Japan, Finland, and Denmark (TL3). It is in principle possible to estimate gravity models at the TL2 level for these four countries. However, this is not done because: (i) aggregating the data from TL3 to TL2 triggers information losses and (ii) Denmark and Finland would need to be excluded from the empirical study due to an insufficient number of observations, as these countries have very few TL2 regions.

[18] See Chapter 3 in OECD (2020[37]) for a focus on developments in job protection legislation.

[19] See OECD (2020[43]; 2019[40]) for comprehensive data analysis and discussion of regional inequities with respect to megatrends such as ageing and automation.

[20] Evidence suggests large cross-regional disparities in spending and quality. For example in France, there are large geographical variations in spending per student, especially in primary and secondary. In a recent survey (OECD, 2020[47]), two out of five school directors in France complained of insufficient internet access in school which hampers the schools' capacity to provide quality education. Close to 60% also lament lack of computer hardware and software. These gaps appear mostly in disadvantaged zones, rather than in big cities.

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