European Commission

ISSN 2443-8014 (online)

Housing Market Developments

Thematic Note to Support In-Depth Reviews

INSTITUTIONAL PAPER 197 | APRIL 2023

EUROPEAN ECONOMY

Economic and Financial Affairs

This paper represents work underpinning in-depth reviews under the Macroeconomic Imbalance Procedure (MIP), work that is still ongoing at time of this paper's publication. On 22 November 2022 in its Alert Mechanism Report (AMR), the Commission concluded that in-depth reviews (IDRs) are warranted for 17 Member States. These in-depth reviews are country-specific, with results due to be published in late Spring 2023. In the AMR the Commission stated that it "*will carry out in-depth thematic assessments on three issues of key relevance at the current juncture. […] This will inform the country-specific IDRs in the spring package of the European Semester.*"

As a consequence, three thematic notes had been prepared in early 2023, among which "*An in-depth thematic note on housing market developments will look at the risks and drivers associated with house price developments and mortgage markets and household debt. The note will focus on Czechia, Estonia, Germany, Hungary, Latvia, Lithuania, Luxembourg, the Netherlands, Portugal, Slovakia and Sweden.*" This note had been discussed at the Economic Policy Committee on 17 February 2023. The content of that note is being reproduced in this paper, adjusted only for minor clerical errors. The original note also contains country-specific text, which is not reproduced in this paper, but whose content underpins the IDR reports due late Spring 2023.

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Luxembourg: Publications Office of the European Union, 2023

PDF ISBN 978-92-76-61646-7 ISSN 2443-8014 doi:10.2765/ 87943 KC-BC-23-004-EN-N

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Directorate-General for Economic and Financial Affairs

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CONTENTS

1. EXECUTIVE SUMMARY

House prices have been increasing steadily across the EU for the last decade, with an acceleration since the onset of the pandemic, but housing market developments are changing. House prices have risen to historically high levels in many cases, as result of sustained increases over recent years, and a sharp acceleration since the onset of the pandemic. The change in economic conditions as a result of Russia's war of aggression in Ukraine brings with it the prospect of change in the housing market. Interest rates have been rising, and are expected to continue doing so, while household disposable income is under pressure from inflation. New buyers will be more constrained in the prices that they can pay for property; existing mortgage-holders may face difficulties meeting their monthly payments. The situation in the housing market merits a closer look, in order to assess the extent of risk and possible need for policy action.

The current prospects for housing markets are different to those from the financial crisis of 2010, as the underlying dynamics leading to the increases have also been different. The experience of the financial crisis from 2010 showed the impact that a sharp correction in housing can have on countries' economies, spreading widely via the banking sector and driving a contraction in activity as construction stops. At the present juncture, there are significant differences relative to fifteen years ago. The house price growth of the last decade has been much less driven by strong credit growth, in part due to the adoption of macroprudential measures such as countercyclical buffers, borrower-based measures or more stringent risk weighted assets for real estates. Banks have more capital and liquidity and are subject to stress tests as well as greater supervisory scrutiny. Instead housing demand has been supported by a decade of low interest rates, and housing supply has been muted. More recently, the gap between supply and demand was further exacerbated since the pandemic, and there may have been shifts in housing preferences. While the housing market was not at the epicentre of the pandemic crisis, the pandemic amplified some of the developments of the previous decade.

The current economic conditions point to a slowdown in house-price growth that may involve reductions in house prices, at least in some countries. The following scenarios are possible and different ones are likely in different countries:

- A continuation of house price and credit growth, albeit at a lower rate to that seen since the pandemic: The economic recovery and eventual stabilisation of household incomes, as inflation comes down, may continue to support demand. Changes in housing preferences may add to demand, while increased construction costs, partly due to higher environmental standards may keep prices high. Pre-existing supply constraints, including those linked to long construction completion times, may lead to continued increase in vulnerabilities, after a possible short-lived dip.
- A gradual downward correction or price stagnation: As increases in mortgages rates limit the households' borrowing capacity and credit conditions tighten, this could lead to decline in housing demand. While prices should moderate, insufficient supply should slow the price correction, unless economic conditions deteriorate. The long-standing reduction in affordability will take time to correct, given the large increases in house prices that have taken place. Once higher interest rates feed their way through house prices and household incomes recover from the inflationary impact, house price growth should return, unless supply constraints are addressed.
- An abrupt downward correction in house prices: This is more likely to occur where supply is not significantly constrained, housing demand has been strongly dependent on low interest rates (as may be the case in countries with very long mortgage terms), if economic conditions deteriorate further or if there were other temporary drivers of house price increases that cease to be present, such as high inflationary expectations driving investment. Strongly overvalued house prices are an additional risk factor, as is high household debt, particularly when recently acquired.

This note takes stock recent developments in housing markets, with a particular focus on eleven Member States set out in the 2023 Alert Mechanism Report: Czechia, Germany, Estonia, Hungary, Latvia, Lithuania, Luxembourg, the Netherlands, Portugal, Slovakia and Sweden. The aim of the note is to provide input into the

In-Depth Reviews that will be published in spring 2023, under the Macroeconomic Imbalance Procedure. These countries have been selected due to a combination of particularly high house price increases in recent years and/or overvalued house markets, along with other concerns, principally high or rapidly increasing household indebtedness or wider inflationary pressures, including strong rises in unit labour costs. Sweden and the Netherlands have been found to have macroeconomic imbalances that relate to their private debt, and to house prices in the case of Sweden, and the drivers and effects of house prices have been analysed in In-Depth Reviews over the years. Germany and Portugal have also been found to have imbalances under the Macroeconomic Imbalance Procedure, although not related to their housing markets, but display house price dynamics that merit a close look.

This note focuses on housing markets at a time of change and of rising risks associated with them. It takes stock of the developments in house prices and associated debt, in both recent years and over the last decade, and puts it in a historical context in section 2, discussing the drivers in different countries. Section 3 discusses the context of house price increases in recent years, looking at household borrowing developments and housing supply. Section 4 discusses the prospects at the current juncture, when both interest rates and household incomes point to a moderation in either house prices or their rate of growth. Section 5 provides an overview of policies affecting housing markets, and annex 1 contains country-specific synopses in the form of fiches.

2. HOUSING MARKET DYNAMICS

House prices have been growing in recent years across the EU, and particularly so in the countries covered by this note. This section looks at house prices according to different metrics, to present an overall picture of how they have changed, and to underpin an assessment about their evolution and their level. Increases in house prices need not be a concern in themselves, insofar as they reflect changes in economic conditions and prices, and the ability of households to pay for housing. However, where house prices rise too fast and result in overvalued housing or are driven by dynamic credit growth and high indebtedness, they can result in economic vulnerabilities. These may be macro-financial or economic ones. At the present juncture, house prices have started to moderate in most Member States, which is supported by high-frequency data, raising the possibility of pressure on the banking sectors and of economic consequences associated with a correction in prices. As an immediate response to rising risks and falling prices, banks have tightened their credit standards and demand for loans has fallen.[1] Even in the absence of a correction, too high prices can result in negative economic effects such as stifling labour mobility and increasing production costs for firms, resulting in the displacement of economic activity, suboptimal allocation of capital lowering productivity growth or reducing overall demand in the economy.

Assessing whether house prices are too high is not a straightforward exercise, and it is necessary to consider different aspects of house prices. Section 2.1 considers house prices first in nominal terms, to gain an overview of the magnitude and the timing of the increases in prices across countries. Section 2.2 then considers house prices as a share of income. Household income is a key driver of demand for housing but increases in house prices that exceed household income growth raise questions about the affordability of housing. In recent years, low interest rates have reduced the cost of mortgage borrowing and enabled households to finance larger loans. The impact of this is considered in Box 1 in section 2.2. Section 2.3 looks the evolution of house prices relative to rental prices, to reflect the value of housing as an asset. Section 2.4 presents the assessments of whether housing is over – or correctly – valued in the countries in question, based on the methodology used by the European Commission. This considers the evolution of the metrics discussed in the first sections of this chapter against their longer-term trend, and complements this with the output of valuation model, which considers the impact of fundamental economic drivers on house prices.

2.1 NOMINAL HOUSE PRICES IN RECENT YEARS

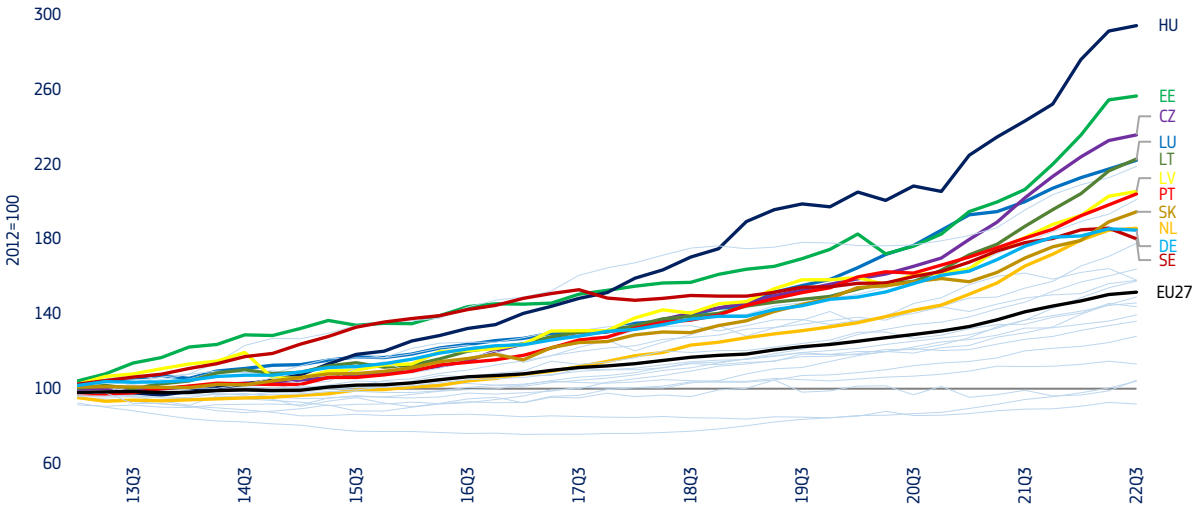
Following years of sustained house price growth, house prices are close to record high in nominal terms in all the countries this note focuses on. As can be seen in graph 1, over the last decade, house prices have been consistently growing across most of the European Union, following the resumption of more favourable economic conditions once the impact of the global financial crisis had made its way through different countries' economies. As a result of this sustained growth, house prices are now at their highest level in nominal terms in ten out of eleven countries under consideration in this note, ranging from just over 80% higher than they were in 2012 in the case of Germany, to nearly 190% higher in the case of Hungary, well above the increase of general price index. It is evident, that some of the largest increases have taken place in countries that have experienced significant growth in both real and nominal terms, and the following subsections of this note put these increases in a wider economic context.

While house price growth has been substantial over the last decade in most cases, there has been a marked acceleration under the pandemic and a recent slowdown in house prices. In the three years between Q2 2019 and 2022, nominal house prices have increased by a total of over 50% in Estonia and Czechia, over 40% in the Netherlands, Luxembourg, Hungary and Lithuania, over 30% Germany, Latvia,

[1] ECB (2022): Euro area bank lending survey, October 2022.

Portugal and Slovakia, and over 20% in Sweden. This represents an acceleration in all countries, with Luxembourg, the Netherlands, Lithuania and Czechia displaying growth rates that are over double the average of recent years, and Germany, Estonia, Slovakia, Portugal and Latvia growing nearly 50% faster. In all countries except Sweden, over half the increase in nominal house prices that has taken place since 2012 has done so over the last three years. In the case of Sweden, the figure corresponds to 40% of the total increase. Nominal house prices have slowed down in most countries and a reduction is now evident in Germany, the Netherlands and Sweden. House price growth has been negative for a number of quarters, in the case of Sweden.

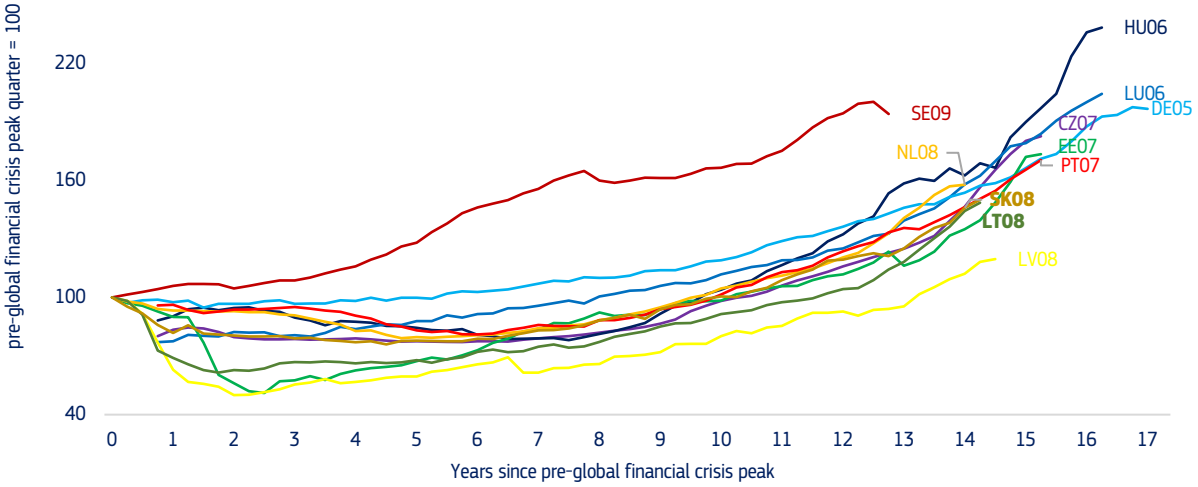
Graph 1: **House price index, nominal terms, relative to 2012**



Source: Eurostat.

These years of solid increase followed a boom-bust scenario that took place in the global financial crisis for most, but not all countries. The different housing dynamics and timing of the financial crisis meant that the extent of the boom-bust and its timing differed by countries. Nevertheless, all these countries except Germany and Luxembourg experienced a sizeable drop in their nominal house values starting at some point between 2006 and 2008, and in many cases did not return to their highest levels for over a decade. Graph 2 shows the evolution of nominal house prices starting from their highest peak, pre-global financial crisis. It shows that while house prices fell by up to 10% in Czechia, Germany and Sweden, they fell by up to 25% in Hungary, the Netherlands, Portugal and Slovakia, while they fell by close to 40% in Estonia, Lithuania and Latvia. While Germany and Sweden, had made up for the loss in house prices by end 2009, it was not until 2015 that Hungary regained its loss value, 2016 for Czechia and Portugal, 2017 for Estonia, 2018 for the Netherlands and Slovakia and 2020 and 2021 for Lithuania and Latvia, respectively. In all cases, house prices are now above their pre-crisis peaks, for some countries very significantly so.

Graph 2: **Nominal house price levels, indexed to their highest pre-global financial crisis level**



Source: European Commission services.

2.2 HOUSE PRICES AND INCOMES

Household incomes are an important driver of housing demand. The demand for housing is affected by a range of factors, including demographics, availability of buildable land as well as level and distribution of incomes. Evidence from the economic literature suggests that housing has a high income-elasticity of demand, with increasing incomes resulting in increased demand for housing.[2] In the absence of an adequate supply response, rising household incomes can lead to sustained increases in prices. Comparing house prices to incomes places developments in house price indices in a context relative to households' nominal per-capita gross disposable income. An increased house price-to-income ratio can be the result of an inadequate supply response, putting pressure on housing affordability over time[3], or can point to unsustainable dynamics of prices with a risk of a sharp correction. It can be the result of changes to the relationship between income and the ability to meet the cost of house purchase, as a result, for example, of changes to mortgage terms. This is discussed in Box 1, which shows that while, overall, interest rates have enabled households to afford higher house prices in recent years, the increase in house prices relative to incomes since the pandemic is substantially higher than what can be attributed to financing conditions. Some structural shifts may have taken place, resulting in changed preferences which could have contributed to an increase in demand for larger houses. The longer-term impact of green transition could also be affecting house prices, as energy efficiency improvements are factored into higher prices.

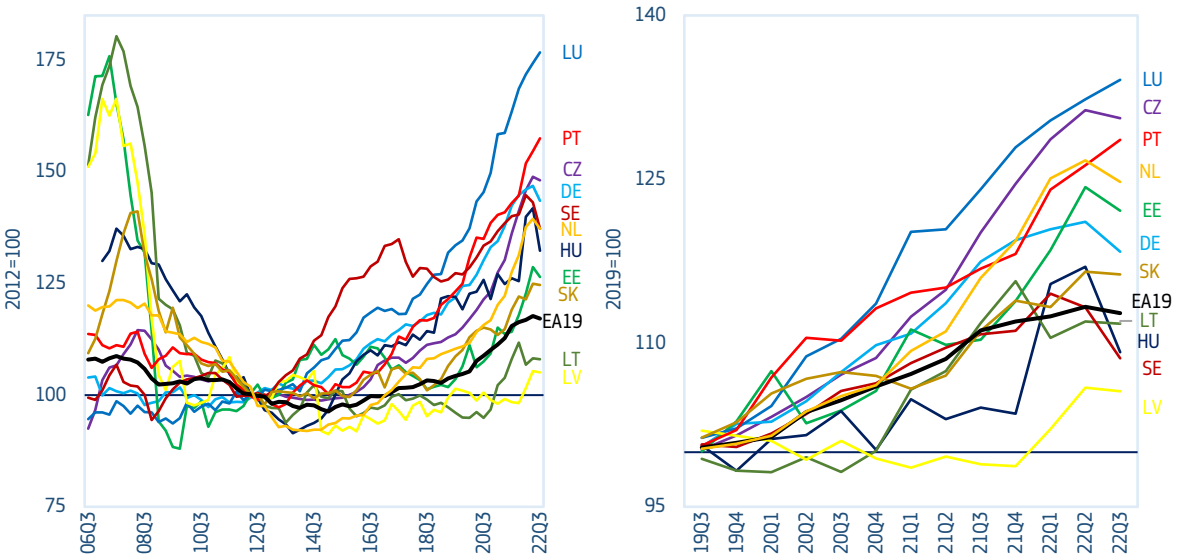
Comparing house price increase to income shows a sharp acceleration of house prices relative to incomes with the pandemic, following diverse country specific developments in recent years. As shown in graph 3, the price-to-income ratio now stands considerably above its level from a decade ago in all countries covered in this note. In the cases of Sweden, Luxembourg, and Germany the increase of prices over income occurred shortly after the resumption of growth, with Sweden displaying particularly strong increases from 2012 to 2017. Germany and Luxembourg followed a similar path of regular sustained increases. In Portugal, the Netherlands, Czechia, and Hungary house prices were marked by steady – albeit lower than Germany and Luxembourg – increase as a share of income until 2019. In the cases of Lithuania, Slovakia and

[2] Cheshire, P. and S. Sheppard (1998): "Estimating the demand for housing, land, and neighbourhood characteristics", *Oxford Bulletin of Economics and Statistics*, 60, 357-382.

[3] Frayne, Ch., A. Szczypińska, B. Vašíček and S. Zeugner (2022): "Housing Market Developments in the Euro Area: Focus on Housing Affordability", European Economy Discussion Paper, No. 171.

Estonia, house prices closely tracked or grew less strongly than household incomes until very recently. In these countries, house prices only started to rise as a share of income in late 2018 or 2019, and were then marked by very large increases, as shown in graph 4. In the case of Latvia, house price-to-income ratios have been rising since 2014 but have only just caught up with their 2012 level in 2019, given the drop that took place in early 2014.

Graphs 3 and 4: **Price-to-income ratios, select countries, normalised to 2012** (left) **and 2019** (right).



Source: European Commission services.

House price-to-income ratios accelerated strongly in the pandemic for all countries. As can be seen in graph 4, in the three years since early 2019, house price growth has exceeded income growth by around or over 10 percentage points in Czechia, Estonia, Luxembourg, the Netherlands and Portugal, and by over 5 percentage points annually in Germany, Lithuania, Slovakia and Sweden. Hungary reported a sharp increase in the last year. In the case of Latvia, the increase has been more modest. In all cases, this is an acceleration relative to the pre-pandemic period, and this is particularly marked in the cases of Lithuania, Estonia, Czechia, the Netherlands, Luxembourg, and Slovakia. The case of Luxembourg in recent years shows how a sharp acceleration is possible in a short period of time, despite a historically high starting ratio.

The price-to-income ratios are above their pre-global financial crisis peaks in most countries covered in this note. As can be seen in graph 3, most countries are above the peak price-to-income ratios that they experienced at the height of the global financial crisis, although this does not hold for the countries that had sharp drops as a result of steep recessions. Specifically, in the cases of Estonia, Latvia, Lithuania and Slovakia, the increased price-to-income ratios are markedly lower than those experienced in 2007 and 2008, when prices reached their peak before the strong corrections that took place. For all other countries covered in this note, the price-to-income ratios, are at the highest since the pre-global financial crisis period. While some countries did not see much (or any) correction in the price-to-income ratios in the period starting in 2007, in the cases of the Netherlands, Portugal, Czechia and Hungary current price-to-income ratios are now considerably above the peak before the global financial crisis correction, while for Sweden, Luxembourg and Germany they are much higher than the levels recorded then, although no correction took place.

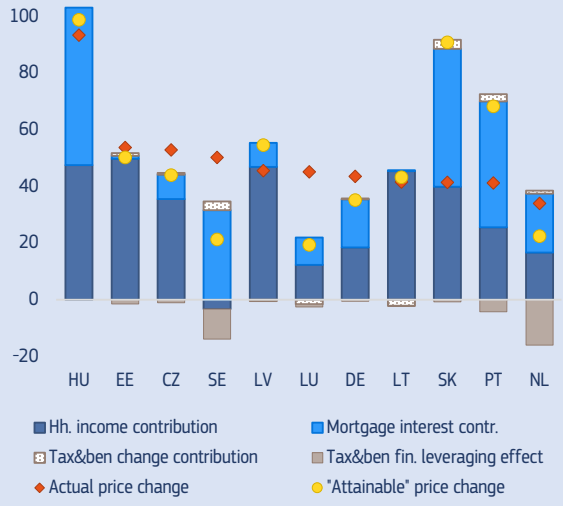
Box 1: **Household ability to pay for mortgages over time**

The demand for housing is affected not just by income directly, but also by other factors that translate income into the ability to pay for house purchases. Demand-side drivers of house prices factors include income, demographic changes (including ageing, migration and household formation), cost and availability of finance for housing (principally, mortgages), returns and tax on alternative investment and tax and benefits to both owner-occupied and rental housing. On the supply side, the major determinants are land availability and land-use policies, the cost of construction and real estate taxes. Among the demand factors, the cost and availability of finance are affected by market developments (including interest rate) and can vary in time.

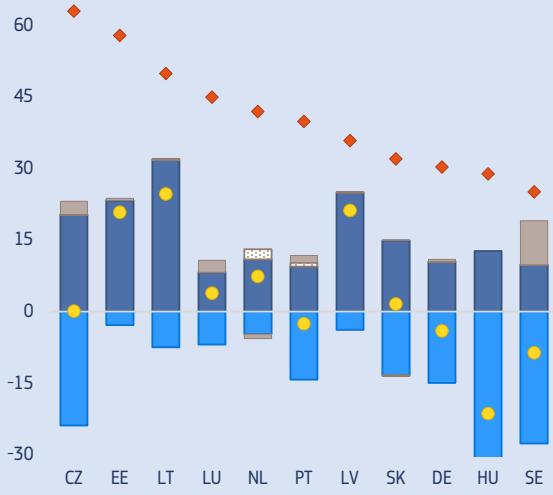
During the last decade, lower mortgage interest rates played an important role in enabling households to financing increased mortgage payments. Graphs 5 and 6 show the evolution of house prices, against the evolution of households' mortgage payment capacity. An explanation of the methodology used is included in annex 2. The analysis estimates the price increases that households can afford in terms of their capacity to service loan repayments, including the principal. It uses standard asset-pricing mechanics to map the effect that income, interest rates, as well as tax and benefits have on the demand-side of real estate prices, at a given point in time, based on the assumption of households devoting a constant share of their income to servicing debt. As the graph shows, the decline of mortgage interest rates during the 2010s allowed households to finance more expensive property, all else being equal.

Until 2019, in many countries house prices increased by less than households' mortgage payment capacities, but since then the opposite has occurred. During the 2010s, rising nominal household incomes and declining mortgage interest rates contributed to increasing the prices that could be financed by household mortgages. As a result of higher household incomes and declining mortgage interest rates, house prices increased in line with mortgage repayment capacity in Estonia and Lithuania and improved slightly in Latvia and more so in Slovakia and Portugal as interest payments fell sharply. Conversely, despite lower interest payments, house price growth strongly exceeded households' ability to financing mortgages in Germany and the Netherlands, and particularly so for Luxembourg. Since 2019 house price growth has exceeded the ability of households to finance mortgages. With the exception of Latvia, and marginally so for Slovakia, house price growth over 2020 has been much stronger than the change in the ability of households to finance mortgages.

Graph 5: **House price increases and the change in the ability of households to finance mortgage payments, 2013-19**



Graph 6: **House price increases and the change in the ability of households to finance mortgage payments, 2019-22**



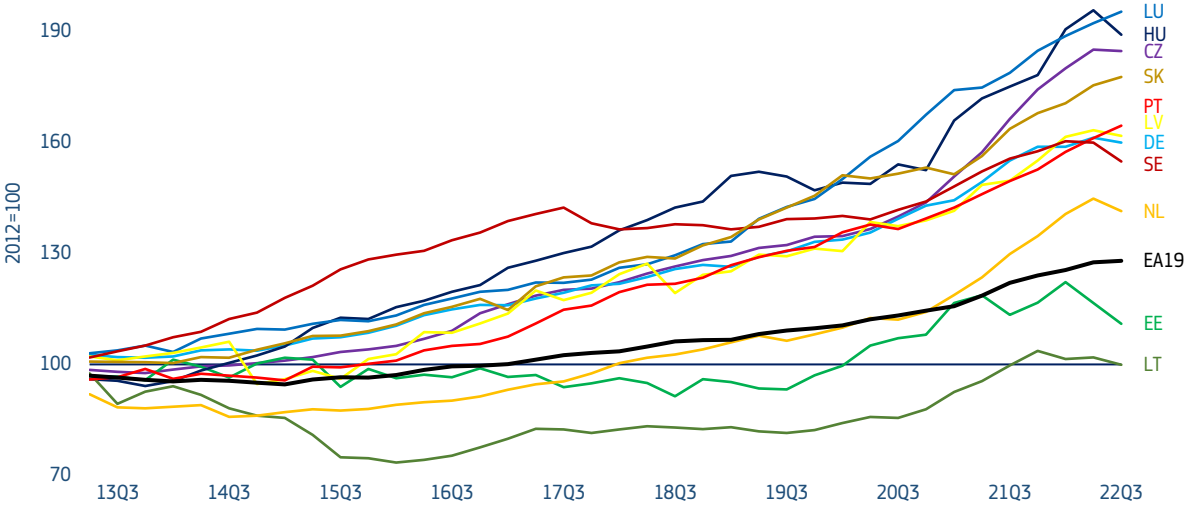
Source: Commission's calculations based on Eurostat.

2.3 THE ROLE OF RENTAL MARKETS

The price-to-rent ratio considers the evolution of house prices against a measure of their value as an asset. The monitoring of the price-to-rent ratio reflects the idea that the price of housing should reflect the present value of the dividends it produces – which is measured as the rental yields – based on the idea that households should be indifferent between owning and renting a home. This measure is often used to evaluate the presence of housing bubbles. In line with the considerations about how financial conditions affect the relationship between the cost of a house and households' incomes, so too, other market effects play a role in the relationship between the price of housing and its rental value. Specifically, interest rates, or rather the discount rate used to translate the cost of capital into present value terms change the long-term relationship between house prices and rental costs. The impact of changes in the price-to-rent ratio needs to be interpreted in terms of country specific market conditions. For countries where the rental sector is small and largely based on social rents, it can be expected that an increase in house prices will lead to sizeable increase in the price-to-rent ratio, as there is little scope of rental prices to adjust.

In nearly all countries under consideration in this note, price-to-rent ratios have been on an upward trend for the last decade. As it is evident in graph 7, Lithuania is an outlier, where house and rental prices are at broadly similar relative levels as a decade ago, when prices have first fallen relative to rental prices, before picking up since 2016. Estonia has displayed muted price increases relative to rentals, in the sense that prices have not exceeded rental increases by much. Given the sharp rise in price-to-income ratios, this indicates that rental costs have increased sharply too. Among the countries covered in this note, it is the only country other than Lithuania where the price-to-rent ratio has increased by less that the euro area average over the last decade. In all other countries except the Netherlands, house prices are over 50% more expensive relative to rental costs than they were a decade ago, while in the Netherlands the ratio is just under 50% higher. This indicates that purchasing housing is, at first view, more expensive relative to the alternative of renting in all these countries, compared with a decade ago. As set out in the previous paragraph, this needs to be interpreted with caution given the speculative motive for some purchases, particularly in some countries. Small or highly regulated rental markets affect the interpretation that can be given to this indicator.

Graph 7: **Price-to-rent ratio, 2012=100**



Source: Eurostat, European Commission services.

The evolution of rental prices is strongly affected by country-specific market conditions, which also affect the relative attractiveness of buying versus renting residential property. In a number of countries, rental markets are underdeveloped, providing little alternative to house purchases. This is often linked to rental market regulation or lack of it, as set out in section 4.3. In Hungary and Slovakia, under 10% of the population lives in rented accommodation, and this has decreased over the last decade, while in

Lithuania it is just over 10%. In Czechia, Estonia, and Latvia, the share is between 15-22%. In Luxembourg and Sweden around one third of the population rents their housing, rising to around half in Germany.[4] In parallel, in a number of countries, the search for yield in a low investment environment supported the attractiveness of housing as an investment, with increasing involvement of institutional investors and a significant expansion of short-term rentals in many touristic areas. While these trends may be reversed amid increasing interest rates, a more limited access to mortgages may increase the appetite for long-term rentals as an alternative to home purchase. In Czechia, Slovakia, Hungary, Estonia and Lithuania (and to some extent in Latvia), countries with deregulated rental markets, rental prices have accelerated above their long-term growth rates since the pandemic, alongside the sharp increase in house price.[5]

Box 2: **Rental markets - examples from selected Member States**

Developments of the Swedish rental market have been limited, with rent increases predominantly reflecting increases in energy prices. The collective bargaining of 2022/23 rents has stalled in many locations, as landlords have requested a full inflation compensation which is opposed by the tenant's association. The results of these negotiations have strong effects across the rental market, as they set the rate which is normally accepted by the rent control boards.

In the Netherlands, about 30% of the population lives in rental housing, of which a large part pays a regulated rent based on dwelling characteristics (among other conditions), limiting the degree to which rental prices can react. The provision of social housing is rather untargeted leading to long waiting lists. The private rental market remains underdeveloped and recorded annual average rent increases of around 3% since 2018, about 1 percentage point higher than the regulated segment. It is set to shrink further as the government is imposing regulated rents on large parts of the so far unregulated part of the private rental market as of 2024.

In Luxembourg, just under one third of households are tenants, although they are more than half among those at poverty risk and more than two thirds pay a rent at market price. Rental prices (for all existing contracts) have grown at a slower pace compared with real estate prices, especially since 2020 when they grew below consumer prices. Despite this, housing cost overburden has worsened in the rental market, particularly for households having recently accessed the housing market, since rents from new contracts have increased faster and are priced 60% higher than rents from existing contracts on average.

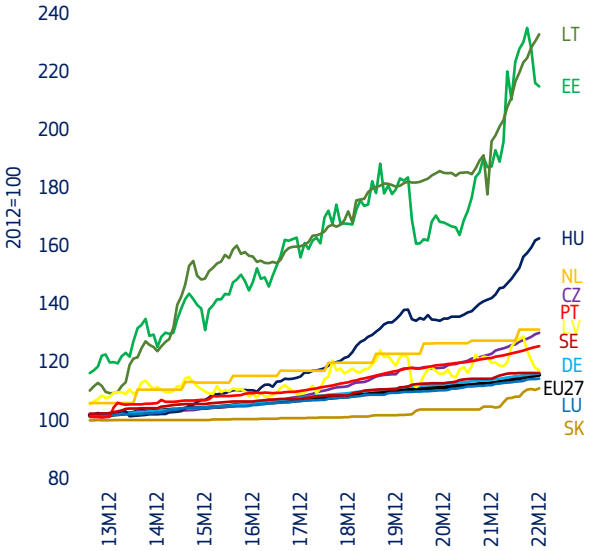
In Lithuania, almost 90% of households own their home, and the rental market is underdeveloped in most regions, with the exception of the biggest cities (such as Vilnius or Kaunas). As rental contracts are not fixed and allow great flexibility, increases in general inflation translate quickly into rental prices. As a result, the elevated inflation in 2022 instantly affected rental prices, with the average rental price index increasing by 22 percentage points in 2022. The large influx of Ukrainian asylum seekers in 2022 also affected rental prices, especially in the capital city. The availability of social housing is still very limited, with the average waiting time amounting to between 3 and 12 years, varying between municipalities (based on 2019 data). As increases in social benefits are not catching up with the increases in rental prices, the affordability of rentals for some social groups has significantly deteriorated in the last year.

In Portugal, both property and rental prices vary significantly among regions and are strongly affected by the dynamics in the tourism sector, including the increasing use of residential properties for short-term rents via online platforms, as well as demand by non-residents for purchase of property.

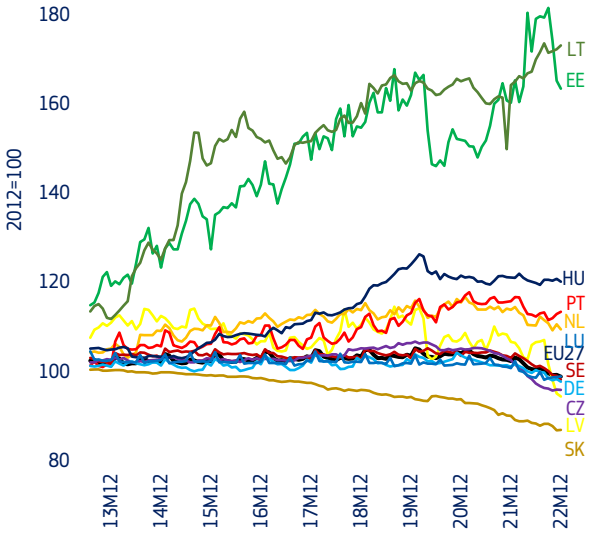
[4] European Commission services.

[5] Year-on-year growth rate of Q3/2022 and 2013-2022 YoY average: CZ 5% / 3%, SK 6.5% / 1.5%, HU 13% / 5%, EE 30% / 10%, LV 4% / 4%, LT 18% / 10%, NL 2.5% / 2.5%, LU 2% / 1.5%, DE 2% / 1.5%, SE 1.5% / 1.5%, PT 3% / 3%. Include chart. Affordable Rental Housing: Making It Part of Europe's Recovery in: Departmental Papers Volume 2021 Issue 013 (2021) (imf.org).

Graph 8: **Rent price index, 2012 = 100**



Graph 9: **Deflated rent price index, 2012 = 100**



Source: Eurostat, European Commission services.

Notes: In the right panel the rent index is deflated using HCPI excluding energy, food, alcohol and tobacco.

2.4 ARE HOUSE PRICES TOO HIGH?

In order to assess whether house prices are too high, the Commission uses two benchmarks and the results of its valuation model. The benchmarks[6] are based on long-term averages of the price-to-income and price-to-rent ratio; they assess whether house price developments are subject to a potential correction as their growth rate exceeds the growth rate in income to such an extent that housing could become unaffordable at some stage, in the former case, and how house prices compare with the user-cost of housing.[7] These benchmarks are intuitive and are widely used, including by many central banks and international organisations, to provide a sense of the appropriateness or risk that may be underling house price developments. In addition, the Commission valuation model uses an econometric model based on a cointegration analysis to assess whether house prices are overvalued or undervalued. It considers various drivers of house price developments, including income variables, as well as cost variables and demographics, and is estimated in a country specific way. The valuation model does not attempt to determine whether house prices represent fair value for consumers, but rather how they relate to the fundamental drivers in the economy as a means to assessing whether they are at risk of correction.

The Commission valuation methodology show that house prices are overvalued in most countries under consideration. Graph 8 shows the overall Commission valuation gap in the bar chart, along with its three components: the valuation gaps based on price-to-income, price-to-rent and the econometric model.

[6] These are described in Philiponnet, N. and A. Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048.

[7] To estimate valuation gaps, the two benchmark compare price-to-income and price-to-rent ratios, respectively, to their long-term averages. These long-term averages are computed using data starting in 1995 and running until 2021, for the estimates undertaken in 2022. They are complemented by the results of a Vector Error Correction Model estimated for a panel of all EU countries, using a system of six fundamental variables; the nominal house price, total population, housing stock, real disposable income per capita, real long-term interest rate and the private expenditure deflator. These variables capture the fundamental drivers of house prices that are outside the short or medium-term influence of policies and are not subject to the same boom and bust cycles as house prices. A country-specific estimation on top of the panel estimates is conducted leading to a valuation gap calculated as a simple average of the individual and the panel estimate. The gap is interpreted as a third valuation indicator.

The graph also shows the valuation gap estimated by the European Central Bank.[8] As can be seen, both the overall Commission valuation estimate, and the ECB, show substantial overvaluation for all countries except Lithuania, but with some sizeable differences both across countries and across components for individual countries. Both the Commission and the ECB estimate the overvaluation to be most substantial in Luxembourg, where prices are overvalued by between 55-70% according to these estimates. In the case of the Commission valuation gap, it is the price-to-income and price-to rent ratios that contribute the most, with the fundamental drivers underlying the econometric model (namely population, interest rates and housing supply), explaining a part of the price increase, and yielding an overvaluation estimates of just over 20%. For all other countries, house prices are estimated to be overvalued in the region of 10-35%, with Czechia, Germany, Hungary, the Netherlands, Portugal and Sweden showing the overvaluation over 20% according to the Commission and Slovakia showing large estimates according to the ECB.

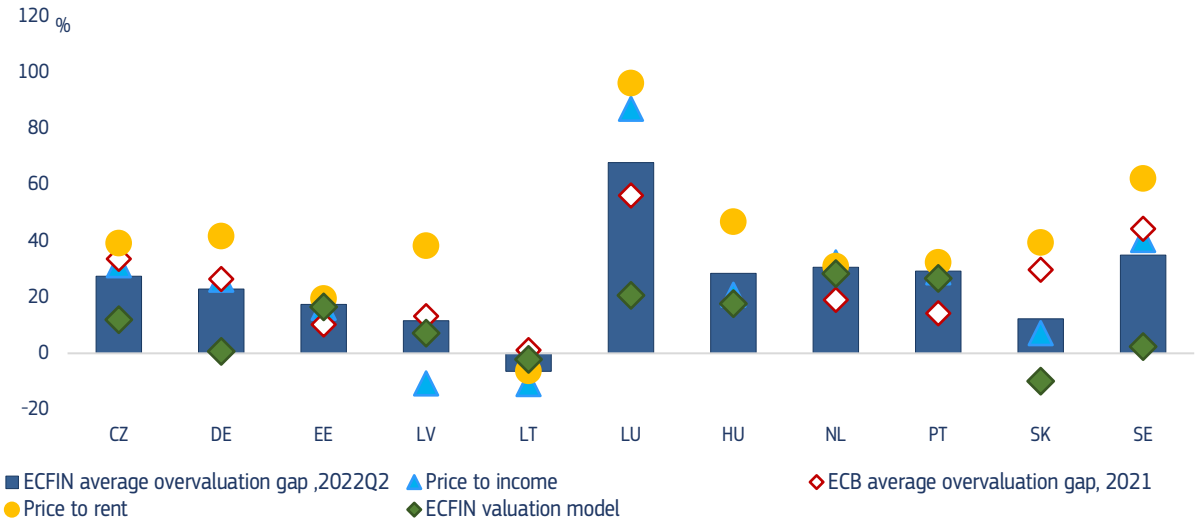
The Commission valuation assessment is in most cases consistent with those of National Central Banks (NCBs). While the Commission and the ECB use average valuation of different methods that are applied homogeneously across the Member States, the NCBs use sometimes alternative approaches that are adjusted to the specific domestic situation. Most of valuation assessment by NCBs is consistent with that of the Commission. The NCBs assess valuation gaps as follows: Czechia 40% (as of Q4 2021, CNB FSR 2022), Hungary 21.5% (as of Q2 2022, MNB FSR 2022), Germany 15%-40% (depending by city, as of Q4 2021, Bundesbank FSR 2022), Lithuania 9% (Q4 2021, LB FSR 2022),[9] Luxembourg 26% (1Q 2022, BdL FSR 2022). The remaining countries do not report valuation gaps, but the NCBs make the following assessments of house price. In Slovakia the NCB's housing affordability index is close to historical heights indicating that affordability is at its lowest level, while the central bank's composite indicator assesses house price developments as being a potential high risk (NBS EMD, Autumn 2022). In Latvia the NCB concludes that risks of abrupt housing price correction is low, while imbalances in the housing market may increase (LB FSR 2022). In Portugal the NCB indicates that all six of its valuation approaches indicate overvaluation (Q4 2021, BdP FSR 2022).[10] The Netherlands' NCB states that rising mortgage rates and the deteriorating economic outlook increase the likelihood of a price correction in the housing market (DNB FSR 2022). In Sweden the Riksbank refers to risks of abrupt house price correction (MPR, November 2022).

[8] ECB SDW.

[9] The Bank of Lithuania recommends using the sustainable income growth indicator (indexed to the general inflation level and productivity increase) instead of general income growth indicator when comparing it to the house prices. This is important in case of Lithuania as labour market is experiencing imbalances: wages have been growing much faster than labour productivity in the last 3 years.

[10] It should be also noted that in countries with significant foreign investment in properties, like Portugal, house prices are significantly affected by specific market segments that have very limited links to the disposable income of domestic households and the domestic banking system. House price indices in popular tourism areas also reflect the increasing use of residential property for commercial purposes, helped by the rapid expansion of online short-term rental platforms (such as Airbnb).

Graph 10: **Estimates of over-valuation according to the Commission and ECB methodologies 2022**



Source: European Commission services, ECB.

3. THE CONTEXT OF HOUSE PRICES INCREASES IN RECENT YEARS: HOUSEHOLD BORROWING DEVELOPMENTS AND HOUSING SUPPLY

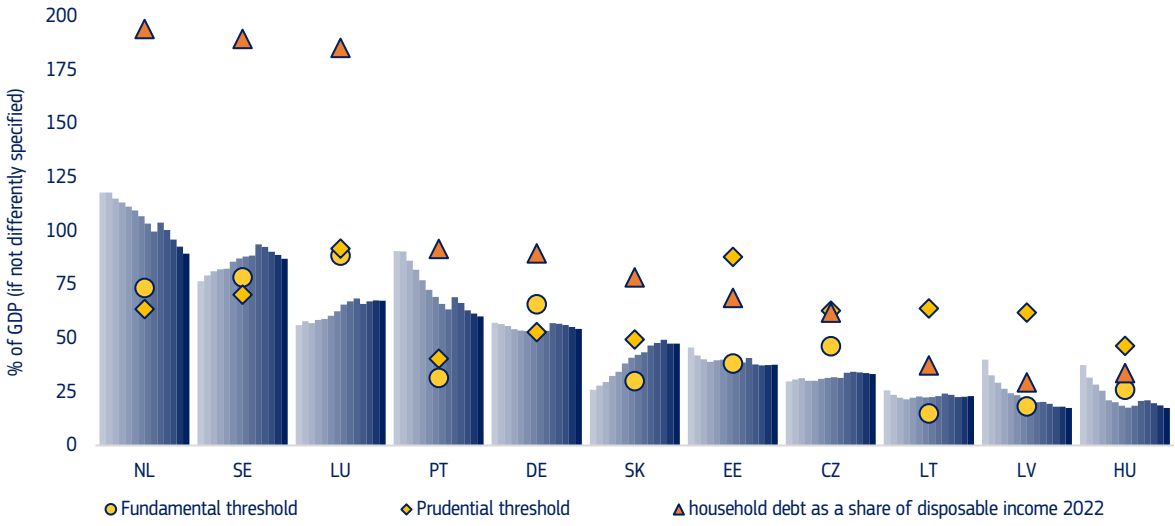
The context within which house price increases have occurred affects both the risks and prospects at the current juncture. As section 2.2 showed, house price growth has considerably exceeded household income growth in all countries except Latvia in recent years. This section considers the two key elements that can drive house prices: (*i*) the evolution of credit, which is a primary factor in the demand for housing and (*ii*) the evolution of housing supply, which can be central to house price developments. Section 3.1 shows how household debt and mortgages have evolved in recent years, pointing to important differences between countries. An expansion of credit can drive increases in house prices and can represent both a macro-financial risk and an economic cost when economic conditions deteriorate. Section 3.2 discusses the supply of housing, which has been generally muted over the last decade, relative to before the global financial crisis. A muted housing supply leads to demand pushing up prices and reduces the prospect of a sharp correction in prices. It also indicates a lower direct link between house prices and the real economy, reducing the feedback links between house price corrections and a slowdown in economic activity. However, if its causes are not addressed, it is likely that house price pressure will continue in future, even if there is a reduction in house price growth in the coming months.

3.1 HOUSEHOLD DEBT AND MORTGAGES

The increase in house prices has occurred alongside a reduction in household debt in many countries, but this is not universal and a recent uptick in debt is visible. Graph 9 shows the evolution of household debt relative to GDP since 2011, and including the Commission forecasts until 2024 and also sets out the prudential and fundamental thresholds used in the assessments under the macroeconomic imbalance procedure.[11] It shows that while Portugal and the Netherlands started with the highest levels of debt, these have been gradually decreasing – the impact of the pandemic notwithstanding – while in Sweden and Luxembourg the opposite effect has been taking place with marked increases of already high household debt levels. The graph also shows the sharp increase in household debt in Slovakia, which has increased by over 20 percentage points over a decade, to reach nearly 50% of GDP this year. It has exceeded its fundamental threshold and is now close to its prudential threshold. In most other countries household debt levels have increased somewhat in very recent years. And in nearly all cases they are forecast to fall over the next year or two, as the Commission forecasts internalise the impact of falling GDP on house prices and house purchases.

[11] Bricongne, J.C., L. Coutinho, A. Turrini, and S. Zeugner (2020): "Is Private Debt Excessive?", *Open Economies Review*, 31, 471–512.

Graph 11: **Household debt as share of GDP, 2011-2024**



Source: Eurostat, Ameco, European Commission services.

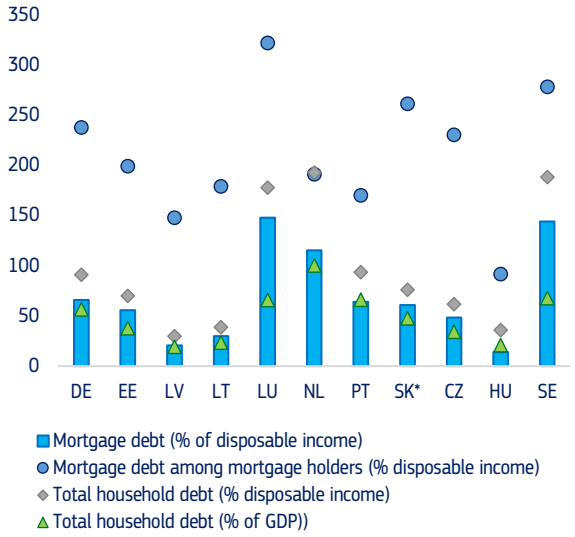
Measuring household debt as a share of disposable income reflects the burden that it places on households. Graph 12 shows the share of both mortgage and household debt as a share of household disposable income for each country as a whole. While household debt as a share of GDP represents the size of the debt overall, measuring it as a share of disposable income reflects the burden that it places on household finances, which is higher in all cases. This reflects the fact that disposable income is based on a national rather than domestic income, and so excludes primary income that is produced in the country but forms part of the national income of other countries, and second it excludes income that accrues to corporations rather than household. The differences between GDP and household disposable income are greatest for Luxembourg, but is also substantial for Sweden and the Netherlands, compared with other countries. In this way household debt as a share of disposable income equals between 175% and 200% for those three countries, despite household debt as a share of GDP lying between 65% and 100%.

The share of the population with a mortgage differs considerably across countries, and has changed in some cases, in recent years. The bars in graph 13 show the level of home ownership across countries in both 2011 and 2021 and include the proportion of households with mortgages. As can be seen, the countries with the highest rates of owner occupation – Estonia, Latvia, Lithuania, Slovakia, Hungary and Czechia have comparatively low levels of mortgage holders. High homeownership rates in these countries are a result of a privatisation of the state-owned properties in the 1990s at a preferential price (OECD, 2022). In all these cases except Hungary, the share of people living in households that own their home and have a mortgage or loan, increased between 2011 and 2021. This increase is most marked in Estonia, where the owner occupation rate with mortgages has increased from 17% to 28% in 10 years, In Lithuania, where it has risen to 7 to 17% and in Slovakia, where it has risen from 8 to 23%, with similar reductions in owners with no mortgages.

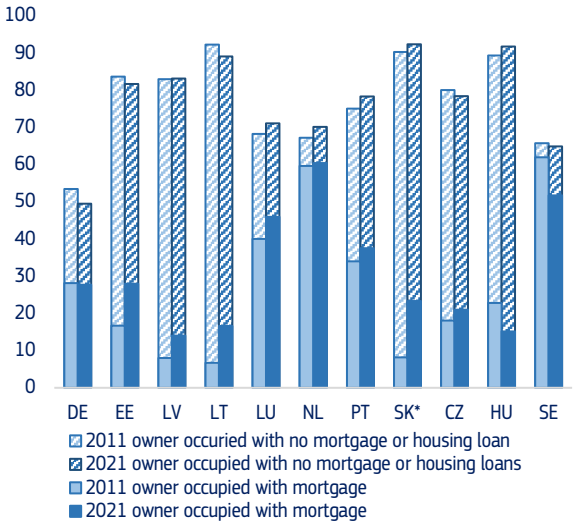
For mortgage holders, mortgage debt represents multiple of annual disposable income. Graph 12 also displays mortgage debt (as measured by loans for home purchase) as a share of average disposable income, both for the country as a whole and among mortgage holders. Not all household debt is linked to mortgages: consumer credit and other forms of household borrowing also contribute to household debt. As a result, mortgage debt is a lower stock of debt than overall household debt. However, as it is only held by the subset of the population that has a mortgage, it can constitute a much higher burden than headline figures would indicate at first glance. As shown in the graph, some countries with comparatively moderate household debt to GDP ratios, have mortgage debt that is a very substantial share of average disposable income, for the subset of the population that holds this debt, because it is highly concentrated. In this way, while mortgage debt among mortgage holders represents over 300% of average disposable income in Luxembourg, it lies between 250% and 300% in Slovakia and Sweden, and is close to or above 200% in

Germany, Czechia, Estonia and the Netherlands. In the cases of Lithuania and Latvia, it is also substantially higher than headline figures would indicate. The graphs show mortgage debt as a share of average national disposable income. Mortgage holders are disproportionately higher income households, and therefore have higher disposable income the average for the country. There are also significant differences across countries regarding insolvency and foreclosure legislation as set out in section 5.2.

Graph 12: **Household and mortgage debt, as a share of disposable income in 2021**



Graph 13: **Owner occupation rates, according to mortgage status**



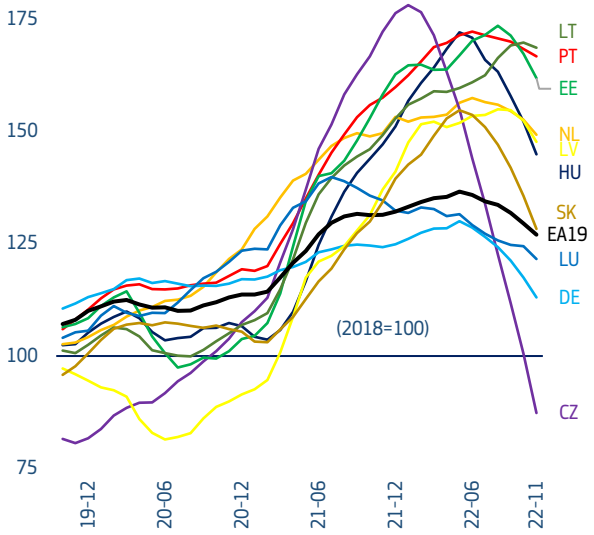
Source: Eurostat, ECB, European Commission services.

While the mortgage credit growth has lagged house price growth in the last decade, it accelerated in the last years. In the run-up to the global financial crisis, mortgage growth grew faster and ahead of house price growth; since then, and until recently, mortgage credit has grown at a slower pace than house prices and was mostly lagging them. This can be at least in part due to macroprudential limits in place that prevented risky credit provision despite very favourable credit conditions. An acceleration of mortgage credit has been apparent since the pandemic, being supported by still very favourable credit conditions and increase of house prices. In order to mitigate the impact of the pandemic on borrowers and on the banking system, some countries also temporarily eased their macroprudential tools as set out in section 5.1.

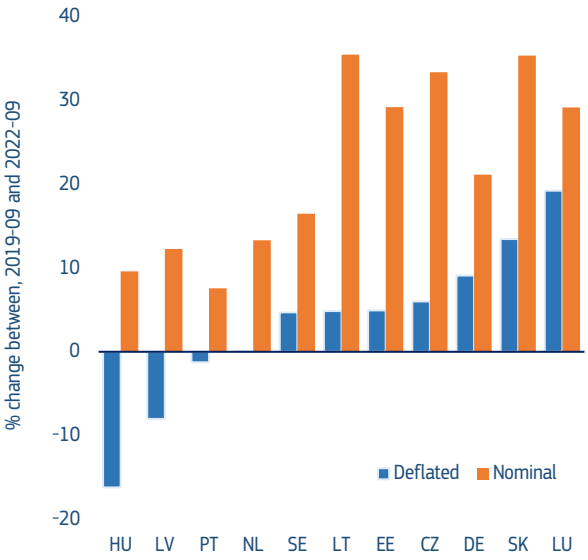
Credit growth has been strong in 2021 and continued into early 2022 with a slowdown recorded in late 2022. Most countries have seen very strong loan flows over the years of the pandemic, adding to the overall loan stock. Graph 14 shows the 12 month-moving average of pure loans for house purchases, with the 2018 level representing the base; these figures exclude renegotiations of mortgages, and are net additions to the loan stock, as well as household loan flows as a share of the stock, as well as the deflated and nominal change to the loan stock. They show a sharp acceleration with the end of the pandemic, with loan flows being over 50% higher than in 2018 in 2021 or 2022, in the case of all countries except Germany and Luxembourg, although those too showed an acceleration in loan flows. In the case of Czechia, a very sharp increase took place following a fall in loans under the pandemic, before a turning point was reached in early 2022. In the case of Hungary, loan flows grew strongly before reaching a turning point in early 2022. Slovakia, which has seen sharp increases in household debt over the last decade, consistently displays high credit flows and increased in its loan stock, although a turning point might be evident. For many countries,

loan flows have started to moderate, and to fall in the late months of 2022.[12,13] These increased loans flows represent particular risks both in terms of the recent past, but also for the near future if they do not reduce, as they reflect purchases during accelerating house prices, and amid very difficult economic circumstances. Overall, with the exception of Hungary, Latvia and Portugal, there has been an increase in the loan stock in real terms, for all other countries.

Graphs 14: **Pure new loans for house purchase, year-on-year growth**



Graph 15: **Loans stock for house purchase, real and nominal increase between September 2019 and September 2022**



Source: ECB, Eurostat, European Commission services.

Notes: In Graph 14, data for Sweden is missing.

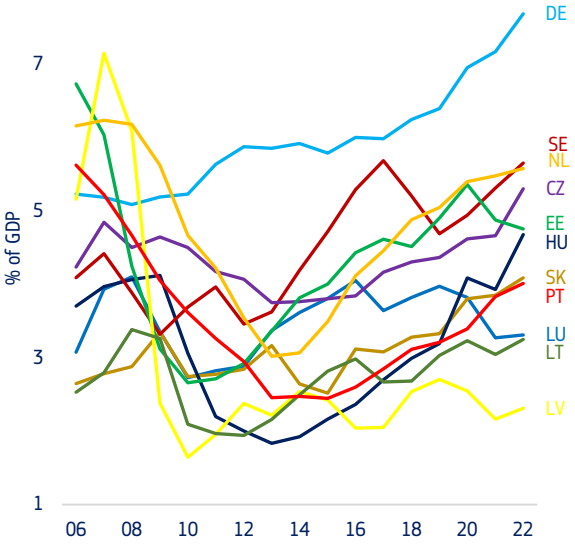
3.2 SUPPLY OF HOUSING

Increases in house prices over the last decade have not been accompanied by sufficiently increased supply of housing, in most cases. Residential construction fell sharply after the global financial crisis – in part because its high levels had been induced by housing bubbles. While residential construction activity has gradually increased in recent years, there has been a marked reduction in construction compared with recent decades. As can be seen in graph 14, the share of residential construction on GDP hovers around 4-5% in most countries, although is lower in Latvia, Lithuania and Luxembourg and higher in Germany. Part of the recovery in residential construction reflects renovations related due to new energy efficiency requirements than new buildings. There was a dip in construction during the pandemic, although for most countries a recovery was evident in 2021, with Luxembourg showing further decline.

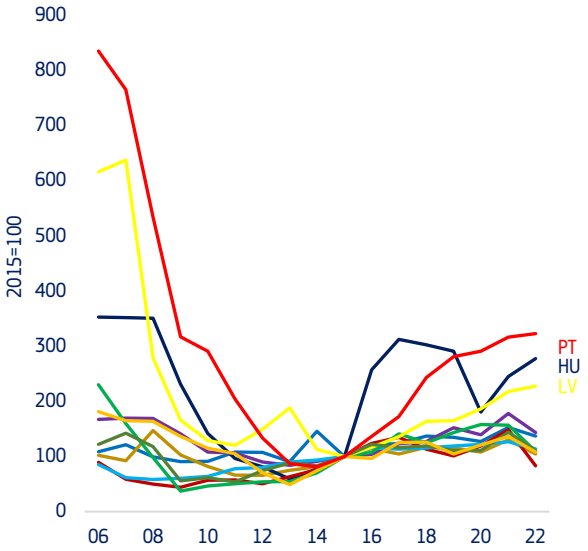
[12] In Q3 2022 demand for loans decreased driven by the increased costs of borrowing, reduced consumer confidence and concerns about the overall state of the housing market.

[13] According to Riskbank, mortgage growth in Sweden has decelerated and was at its lowest in November (4.5% yoy) since measurements started in January 2006.

Graph 16: **Residential construction as a share of GDP**



Graph 17: **Building permits (2015=100)**



Source: Ameco, Eurostat.
Notes: In graph 17, 2022 data corresponds to 2022Q3.

A muted supply response to house price pressure can also be seen in the evolution of construction permits. Graph 15 shows the evolution in permits issued for residential construction, normalised to Q1-2012. As can be seen in the graph, for many countries, and particularly for the cases of Estonia, Latvia, Portugal, but also Hungary, the Netherlands, Slovakia and Sweden, the pre-financial crisis period was marked by a comparatively high issuance of housing permits, that fell sharply once the house prices fell. Subsequently, housing permits have been more muted in all cases except Hungary and Portugal, where they have increased to levels similar to those from some 10-15 years ago. The interpretation of permit levels is a difficult one and does not always correlate very closely with actual construction.

Estimates for the supply elasticity of housing show that it is not sufficiently responsive to demand pressures. The OECD[14] presents estimates for the supply elasticity. They estimate that supply elasticities are below 1 for Portugal (slightly), Germany and especially the Netherlands. In Portugal however residential construction increased from a historic low of 2.4% of GDP in 2015 to 3.8% in 2021 and supply in regions with high demand has increased quite significantly. This indicates that the housing stock is not fully responsive to demand increases, with demand translating into higher prices. Conversely, in the cases of Hungary, but especially Slovakia and Sweden they find supply elasticities above 1, so that demand translates into increased construction activity. Data are not available for Czechia, Luxembourg, Estonia, Lithuania[15] and Latvia, but estimates point towards limited elasticities of supply in the cases of Czechia and Luxembourg[16]. In parallel, the OECD also stress the regional dimension of land. Especially in the capital cities, the annual supply of new housing represents only a minor fraction of estimate demand due to population growth. This is often driven by geographical constrains but often also by strict zoning and building regulation that prevents new developments (see section 5.3).

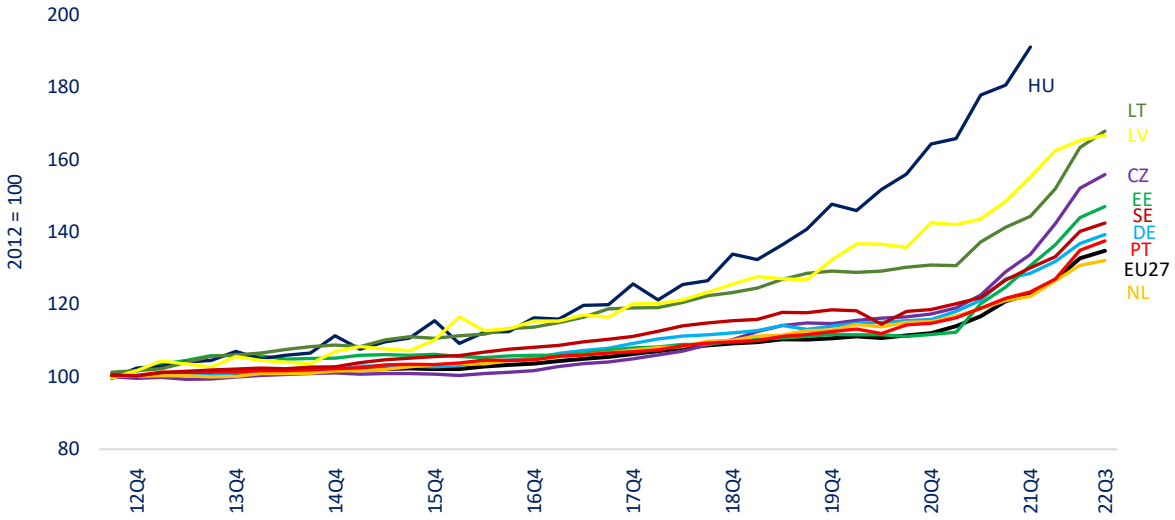
[14] Cavalleri, M., B. Cournède and E. Özsöğüt (2019): "How responsive are housing markets in the OECD? National level estimates", OECD Economics Department Working Papers, No. 1589. They estimate the following long-run supply elasticities: Germany 0.67, Hungary 1.08, the Netherlands 0.4, Portugal 0.84, Slovakia 1.56 and Sweden 2.01.

[15] The Bank of Lithuania assumes supply to be inelastic in the short or medium term but does not specify the exact value of elasticity. See Naruševičius, L., T. Ramanauskas, L. Gudauskaitė and T. Reichenbachas (2019): "Lithuanian house price index: modelling and forecasting", Bank of Lithuania, Occasional Paper, No. 28.

[16] For Luxembourg, Girshina, A., F. Koulischer and U. von Lilienfeld-Toal (2022): "Tax Subsidies and Housing Affordability", Swedish House of Finance Research Paper, No. 21, compute an estimate of 0.48.

In recent quarters, house price pressure has been sustained by a significant increase in construction input prices, pushing up the cost of supplying housing. This increase is driven by the prices of material and labour, both during and since the end of the acute phase of the pandemic, alongside lasting supply chain disruptions and increases in commodity prices including energy have and continue to play a role. Graph 16 shows the increase in construction costs since 2012. A marked acceleration costs is evident since the pandemic and has also increased the relative prices of new versus existing properties in recent quarters. While the increases that are related to global supply issues linked to the pandemic can be expected to correct over time, there may also be more lasting underlying effects, at least in some countries, that may continue to push prices up. In the cases of Lithuania and Latvia, a gradual increase in construction costs is evident over the last decade, and this is also the case – but more marked – for Hungary.

Graph 18: **Construction cost (2012=100)**



Source: Eurostat.
Note: No data available for Luxembourg and Slovakia.

4. PROSPECTS FOR HOUSING MARKETS IN THE NEAR FUTURE

At present, increases in interest rates and falling disposable incomes indicate a turning point in housing markets. Mortgage interest rates have been rising since early 2022 and disposable incomes are under pressure from high inflation. In a number of countries, house price growth has started to fall or moderate. This section considers the near-term prospects for housing markets. Section 4.1 discusses the possible impact that increases in mortgage rates may have across different countries, based on the level, distribution and structure of household debt. Section 4.2 discusses the prospects for house prices, giving an overview of how different countries may be affected.

4.1. MORTGAGE INTEREST RATES

Since the end of the pandemic, financial conditions have tightened, leading to a sharp increase in new mortgage interest rates in some cases. These have been rising overall but have been particularly sharp among non-euro area countries. Graph 19 shows the change in the average interest rate for new household mortgages. Very sharp rises have already taken place for Hungary and Czechia, of over 5pp and 3-4pp respectively; the tightening of monetary policy started earlier outside of the euro area and the pace of raising the interest has been faster. For euro are countries, the increases seen so far have been more muted, corresponding to some 1-2 pp. These increases will have two effects: first they will undermine housing demand, for both primary residences, but also for investment purposes. This is already apparent in the recent ECB Consumer Expectations Survey[17], which suggest decreasing expectation of price growth while expectation of mortgage growth increase, whereas intention to buy or build home in the new two years significantly declines.[18] Second, the existing empirical literature suggests not only that increasing mortgage interest rate have direct impact on house prices and investment[19] but also that their effect may be larger in a low interest rate environment.[20]

The impact of increased interest rates can have a substantial impact on the share of disposable income spent on mortgage interest in some countries. Graph 20 shows the share of disposable income spent on interest payments in 2021 in dark blue, and the share that this would correspond to based on the latest interest rate in light blue.[21] The graph is based on simple extrapolation of the changes in interest rates that have already taken place to the average interest burden present among households. It does not account for any future changes to interest rates, nor for any changes in disposable income, and is based on aggregate data. The share of disposable income spent on interest payment is typically low in countries with low levels of mortgage debt but represents a more sizeable share of disposable income for households that are holders of debt. The graph also shows the share of average disposable income that mortgage holders spend on their interest payments, which is estimated to range from 2 to over 11% (except for Portugal), and would increase to between 3 and 16%, once all the interest rates increases have fed through.

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[17] ECB (2022): The Consumer Expectations Survey (CES), October 2022.

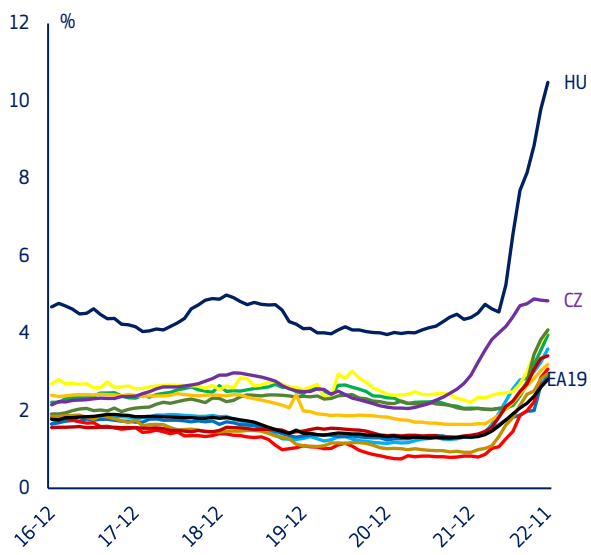
[18] ECB (2022): Financial stability review, December 2022.

[19] Vašíček, B. and V. Žďárek (2022): "Links between housing and real economy in the euro area", Quarterly Report on the Euro Area, No. 21/3, 19-28.

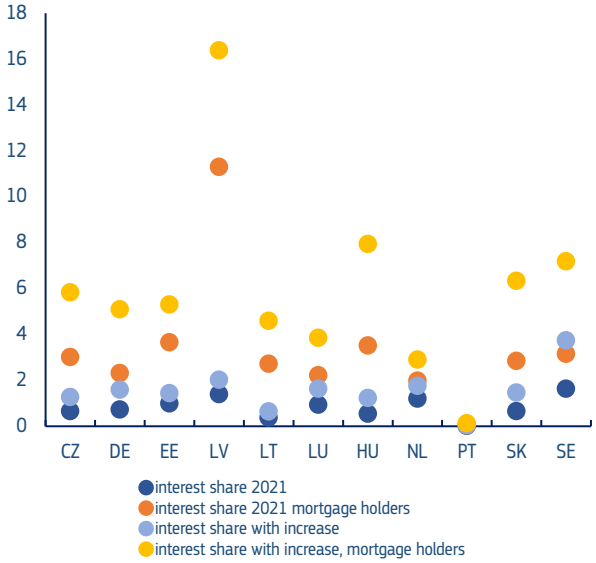
[20] Battistini, N., G. Johannes and M. Roma (2022): "The impact of rising mortgage rates on the euro area housing market", Economic Bulletin Boxes, European Central Bank, vol. 6.

[21] This simple extrapolation does not account for changes in disposable income and is not adjusted for the particular characteristics of mortgage holders.

Graph 19: **Average interest rate for new household mortgages**



Graph 20: **Share of disposable income spent on mortgage interest payments, under various scenarios**



Source: ECB, European Commission services.

The effect of increased interest rates will mainly affect demand rather than ability to pay existing loans, in countries where mortgage rates are typically fixed over the short and medium terms. At present, the countries that have seen the sharpest rises in interest rates on new mortgages – Hungary and Czechia – have relatively low shares of mortgages with fixation rate of under a year. In Hungary, the transmission of higher interest rates for outstanding loans is also mitigated by a regulatory cap on variable rate mortgages, in effect until 30 June 2023. There is no definitive source of data on mortgage rate fixation across the EU, but table 1 sets out a range of estimates based on data from the European Mortgage Federation and the ECB and analysed by Commission services. The table shows shares of flexible or very short fixation periods of up to 2% in Hungary and Czechia. This means that immediate impact of interest rate rises will be in terms of reducing demand for mortgages, rather than on the households' abilities to meet their mortgage obligations, although the reduction in household purchasing power is an important factor at this point in time.

For countries with large shares of variable rate mortgage loans, the increase in interest rates will add to the pressure on indebted households. Among non-euro area countries, the share of new loans based on the variable interest rate is relatively high in Sweden, and within the euro area countries covered in this note, variable interest rate-based mortgages dominate in Estonia, Latvia, Lithuania and Portugal. In these countries, the pass through of interest rates increases will be much faster, although as set out in graph 19, in the case of Portugal the starting interest burden is very low. Overall, housing loans based on the fixed interest rate have various periods of fixation and therefore may differ in terms of the risk assessment for highly indebted households. Both short and long periods of fixation may pose risks at different times, depending on interest rate developments and the fixation periods. Overall, for countries with medium-length fixation periods, increased interest rates will start feeding through as more households end their fixation periods and could put pressure on household finances over the coming years. There is a particular risk factor for recent purchases; not only do these correspond to purchases undertaken when prices were higher and interest rates lower, resulting in larger increases in interest payments, but the households themselves are less likely to have experienced substantial income growth, enabling them to meet these additional costs. In this way, the continued house price and mortgage pressure in Estonia and Lithuania represent a risk factor as higher rates feed through, while in the case of Slovakia, the substantial increase in mortgage debt in recent years will also move out of its fixed rate, to higher new interest rates.

Table 1: **Interest rate fixation periods for new mortgages**

Country	ECB Data	EMF Data (2nd quarter 2022)				ECFIN data (2022 1st semester)			
	Variable rates, % share (ECB, 2022)	Variable rates, % share	Short-term fixed (1-5 yrs), % share	Medium-term fixed (5-10 yrs), % share	Long-term fixed (>10 yrs), % share	Variable rates, % share	Short-term fixed (1-5 yrs), % share	Medium-term fixed (5-10 yrs), % share	Long-term fixed (>10 yrs), % share
Czechia	1.9%	1.7%	55.0%	43.4%	0.0%	1.9%	48.0%	48.5%	1.6%
Estonia	81.7%	na, most common is 30-year mortgage, floating rate				82.2%	7.4%	7.2%	3.3%
Germany	10.6%	9.6%	6.8%	38.9%	44.7%	11.1%	4.3%	40.4%	44.2%
Hungary	0.4%	0.6%	15.9%	31.9%	51.7%	0.6%	14.6%	36.9%	47.8%
Latvia	94.1%	na, most common is floating interest rate.				94.8%	2.3%	na	2.8%
Lithuania	95.8%	na, most common is floating interest rate.				94.2%	3.1%	na	2.7%
Luxembourg*	44.4%	43.8%	2.9%	9.0%	44.3%	47.3%	na	na	52.7%
The Netherlands	12.2%	9.8%	6.3%	31.1%	52.9%	11.2%	na	27.6%	61.2%
Portugal	67.2%	67.2%	32.8%			67.2%	26.9%	5.9%	na
Slovakia	2.7%	na, most common is fixed rate for 3-5 years				3.1%	84.8%	10.1%	1.9%
Sweden	67.4%	61.3%	28.7%	10.0%		72.9%	na	na	na

Sources: ECB, EMF, Eurostat, European Commission calculations, Central Bank of Luxembourg.

Box 3: **Mortgage structures in selected Member States**

Hungary: after the financial crisis, foreign currency mortgage lending was largely prohibited and outstanding stocks were converted to local currency in 2014. The share of mortgages with a longer interest fixation period increased steadily. This was supported both by low interest rates and by policy incentives. To foster competition among banks and to decrease the share of flexible rate mortgages, the Hungarian Central Bank introduced in 2017 a certified trademark for mortgages with standardised and transparent terms and conditions, and an interest fixing of at least 5 years. In recent years, these certified mortgages accounted for some two-thirds of new mortgage lending.

Luxembourg: Household debt has steadily increased since 2000, with mortgage loans representing almost 80%. The increase in household indebtedness can be largely explained by the increase in real estate prices since 2000. About 46% of the population are homeowners with an outstanding mortgage, compared with 30% in the euro area. However, this share drops to 17% of the population in the first quantile of the income distribution. Between 2012 and 2020, the share of new loans with variable rates fell from 83% to 33%, although this trend reverted in 2021 and nearly half of the debt stock remains at variable rates. On aggregate, real estate exposure in the banking sector is relatively moderate. Household mortgage debt accounts for 13% of total sector loans. However, mortgage borrowing is highly concentrated in the domestic banking sector (4.2% of the total number of banks hold 90% of mortgage debt).

Netherlands: the vast majority of existing mortgages are fixed for periods of five years or longer. Mortgage-financed home ownership is subsidised through interest deductibility. Monthly new mortgages with rates fixed for one year or less have roughly doubled between February and September 2022 albeit starting from low levels, while overall mortgage demand is falling substantially. Interest-only mortgages were popular before the financial crisis but stopped being attractive after they were excluded from mortgage interest deductibility. Due to high house prices and low interest rates demand for this model has increased again in recent years. Mortgage provision is largely bank-based with a significantly growing role of institutional investors in the past years.

Lithuania: only around 50% of housing purchases is done using financing from mortgages. The vast majority of existing mortgages have flexible interest rates, and so, changes in interest rates immediately translate into household payments. Mortgage provision is almost exclusively bank-based. In November 2022, the interest rate for new mortgages for house purchase was still increasing and amounted to 4.09%. Significant increase of mortgage rates has already impacted the housing market: the house price growth has slowed down in Q3 2022, followed by a slight decrease in new mortgages growth in November 2022.

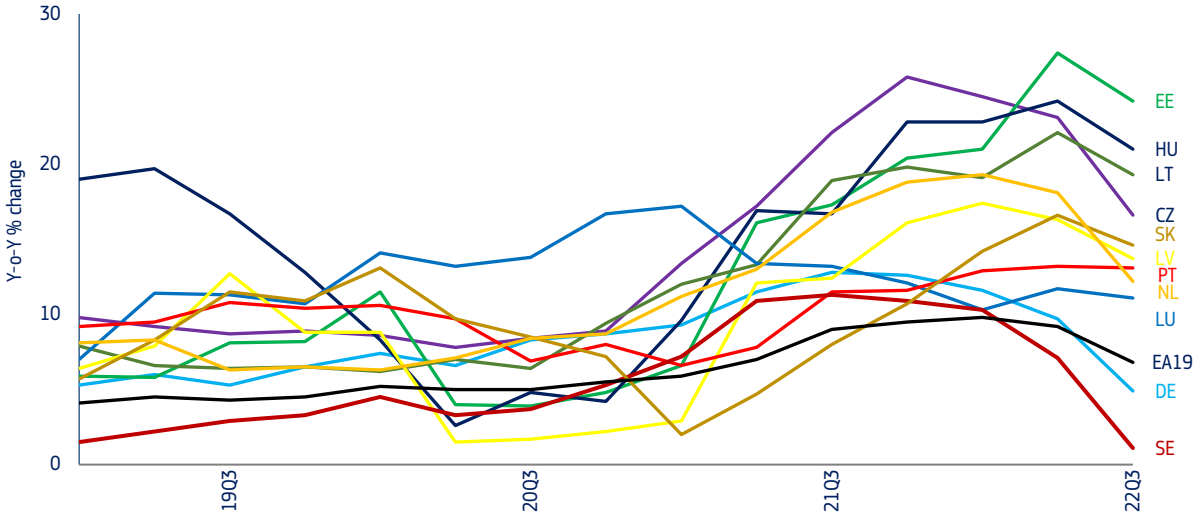
Before the global financial crisis in many Central and Eastern European Countries (CEEC) a large part of mortgages was taken in the form of the foreign currency denominated loans. They became a popular product due to lower interest rates and therefore lower monthly payments in the domestic currency. However, after the crisis, the local currencies depreciated against the Swiss Franc which was the main foreign currency the mortgages were denominated in. The negative effect on households was strengthened when the Swiss Central Bank abandoned the cap against the euro in 2015. The Baltic countries were largely protected due to their currency board with the euro area and adopted the euro soon after the global financial crisis. In Hungary, the mortgages denominated in the Swiss Francs were converted into forint shortly before the abandonment of the cap on the Swiss franc. Furthermore, banks were legally obliged in 2015 to compensate borrowers for unilateral interest rate increases after 2008, which were deemed illegal in the court. These measures decreased the monthly payments for the households and reduced to the probability of insolvency.

The lessons learnt from the global financial crisis mean that foreign currency loans are not a major risk factor anymore. The measures introduced mostly by the Central and Eastern European Countries after the global financial crisis eradicated to a large extent the foreign currency loans and related risks. Such products are not necessarily the most attractive for the customers in the long term and may also affect the financial sector stability. Currently, the share of foreign currency denominated mortgages is very low.

4.2. FORECASTS: WHERE ARE HOUSE PRICES GOING?

The pandemic-related acceleration of house price growth seems to have been reversed in most countries by early 2022. As graph 21 shows, the most recent quarterly data show a reduction in the year-on-year changes to house prices in almost all countries. In Czechia, the Netherlands, Latvia, Germany, Sweden, and Luxembourg, the growth rates already started to slow down already in 2021, while for the other countries only in 2022. In most cases, however, year-on-year house price growth remains above 10%, well above the euro area average.

Graph 21: **Nominal house price growth**



Source: Eurostat.

The change in economic conditions can be expected to have a short-term effect on house prices but cannot be expected to affect longer term structural effects. Reduced household incomes and

increased interest rates can be expected to moderate house prices over the short term. The extent of the moderation will doubtlessly vary by country, and in some cases a reduction in house prices may occur or has already started. Insofar as recent house price growth has been the result of the very particular circumstances that developed with and since the onset of the pandemic, it can be expected that at least a part of these will reverse and short terms increases linked to the pandemic will correct. However, in countries where house price, and mortgage, growth is the result of longer-term structural trends, which include also demographics, there is little prospect for a substantial change over the medium-term, once the immediate period of moderation or correction ends. This means that any change in the near future is unlikely to be a correction of underlying dynamics which are structural in nature, and strong increases are likely to return once economic conditions normalise.

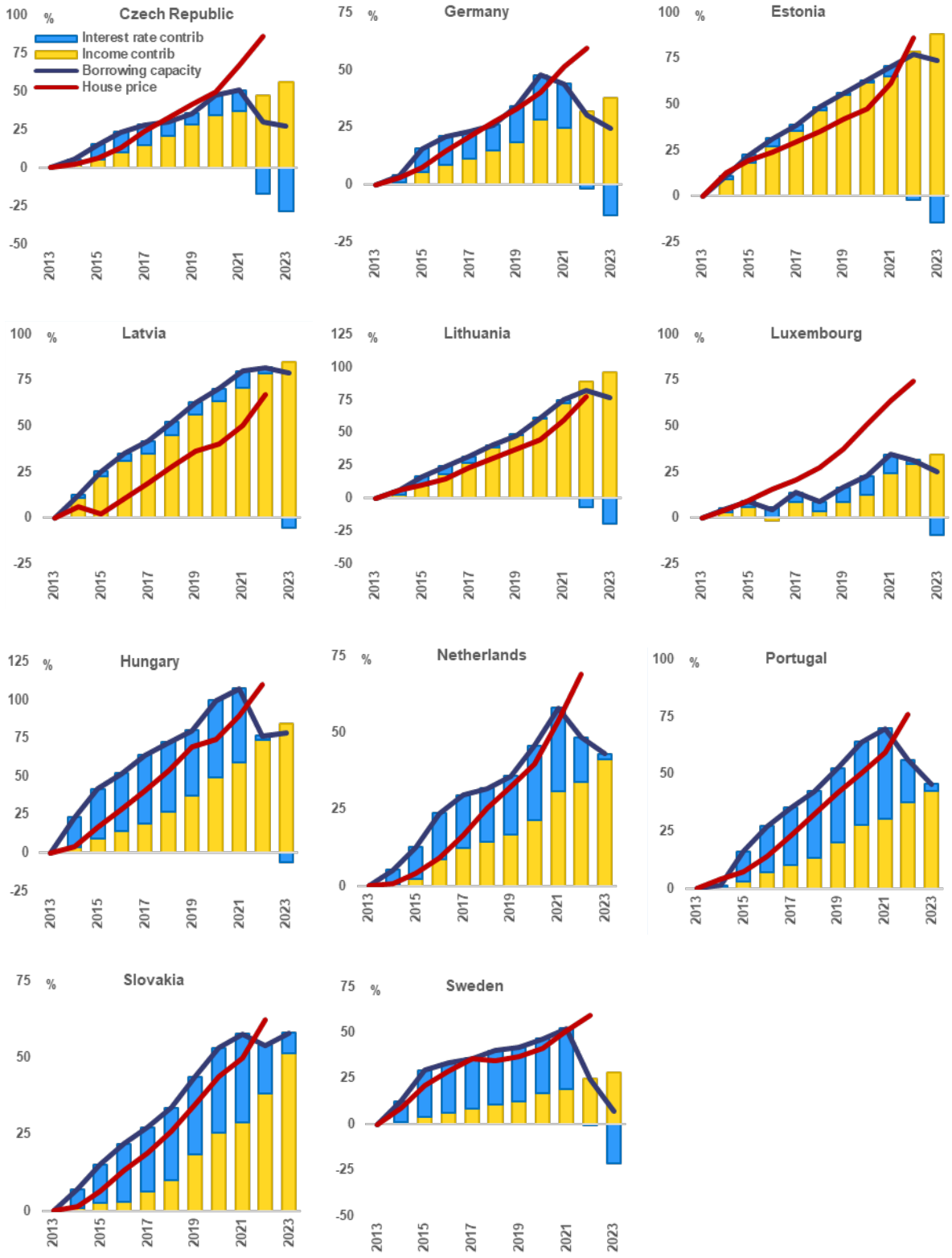
House price forecasts are subject to very high uncertainty and are particularly unreliable at turning points. A range of house price models are used by different forecasting bodies, based on applying long term relationships to forecast data. Such models typically are conditioned on lagged data and are therefore particularly unable to predict house prices at turning points. Overall, growth rates are expected to be substantially lower in 2023 and 2024, but it is difficult to attach any confidence to any the results.[22] The ECB recently concluded[23] that while down risks to euro area real estate prices have increased, especially in countries with more stretched valuations, a pronounced downturn remains a tail risk as households benefited from favourable labour market conditions and higher share of fixed-rated mortgaged increased resilience of borrowers.

Increases in mortgage interest rates will have a very different impact on households' abilities to borrow, depending in part on the structure of the mortgage market, and this is likely to affect house prices. Graph 22 presents the change in households' borrowing capacity for 2022, and for 2023 based on a further 1pp increase in mortgage rates for new mortgages, based on the same methodology as in box 1 and as described in annex 2. It estimates the impact that higher interest rates would have on the level of borrowing that an average household can sustain, while devoting a stable share of income to their mortgage payments. Importantly, the simulations are based on forecasts for nominal household income. This means that they do not model the impact of higher inflation on real disposable income, and therefore, other things being equal, overestimate the amount households can borrow. Moreover, house prices may also be affected by increased energy efficiency, which may is positive for environmental goals. The simulations show a reduction in the amount households can borrow in 2022, which is estimated to have fallen by over 30% in Hungary and Sweden, over 10% in the Netherlands, Portugal, Czechia and Germany, and some 5% in Luxembourg. A further 1pp increase in 2023 would lead to a further reduction of around or just under 10% in Germany, the Netherlands and Luxembourg, around 15% in Portugal and over 40% in Sweden.

[22] The house price forecast is product of different methods used in the Commission (error-correction model used for housing valuation, ARIMA and for EA countries panel BVAR).

[23] ECB (2022): Financial stability review, December 2022.

Graph 22: **House prices and borrowing capacity change (%), vis-à-vis 2013**



Source: Eurostat, ECB, Ameco, JRC, European Commission services.
Notes: Vis-à-vis 2007 for Hungary. Interest rate 2022 corresponds to 2022Q3, and 2023 is equal to 2022Q3 plus one percentage point. Loan maturity is the average of maximum maturity as provided by JRC. Income is the median equivalised income of the average household. For 2022 and 2023, the series as provided by Eurostat is extended with European Commission forecasts for household income.
References: Andrle, M. and M. Plašil (2019): "Assessing House Prices with Prudential and Valuation Measures", IMF Working Paper, No. 19/59.

Instead of forecasting house price reductions, a qualitative assessment of economic developments and previously accumulated vulnerabilities can provide an outlook for the housing market. At the present juncture, there are a range of factors putting *downward pressure* on house prices. Table 2 summarises them and presents a tentative assessment of the importance of different factors across countries (in columns). In terms of the downward pressure these factors include: (*i*) higher interest rates on mortgages, (*ii*) increased risk of recession, (*iii*) existing house price overvaluation, (*iv*) a weaker investment motive due to reduction of rental yields, negative house prices outlook or measures against short-term rentals, (*v*) weak lending dynamics due to deterioration of fundamentals and tightening of credit conditions, (*vi)* a high stock of household debt. However, some pre-existing factors will continue to put *upward pressure* on house prices and mitigate the possibility of strong corrections: (*i*) limited supply, driven by physical constrains in urban areas but more generally by zoning and building regulation, (*ii*) high construction cost related to high general price / wage growth but also structurally higher environmental standards, (*iii*) increased housing demand due to preference shift after the pandemic. The relative importance of these factors is likely to differ across the Member States and their future house price developments may diverge.

Table 2: **Overview of factors that will affect house prices developments in the near future**

	Factors putting downward pressure on house prices						Factors putting upward pressure on house prices			
Country	(i) Higher mrtg. rates	(ii) Recession risk	(iii) Price overall	(iv) Low. invest. motive	(v) Weak lending	(vi) High HH debt	(i) Limit. supply	(ii) Higher contr. cost	(iii) Pref. shift	(iv) Popul. increase
Czechia	++	+	++	+	++	-	+*	++	?	+
Estonia	++	++	+	+	+	-	*	++	?	-
Germany	++	++	++	+	+	+	+	++	?	+
Hungary	++	+	++	+	++	-	-	++	?	-
Latvia	+	++	++	-	+	+	+*	++	?	-
Lithuania	++	+	-	-	-	+	+*	++	?	-
Luxembourg	++		++	+	+	-	+*	+	?	++
The Netherlands	+	+	++	+	+	++	+	+	?	+
Portugal	++	+	++	-	+	++	-	++	?	-
Slovakia	+	-	++	+	++	+	-	++	?	
Sweden	+	++	++	+	++?	++	-	++	?	++

Note: Factors of downward pressure on house prices: (i) Higher mortgage rates (+/++ increase over the last year up to 2pp/above 2pp), (ii) Recession risk (-/+/++ GDP growth in 2023 according to the WiF 2023 forecast above 1%/ 0.5-1%/ below 0.5%), (iii) Price overvaluation (-/+/++ none/up to 10%/above 10% according overall COMM valuation gap in 2021), (iv) Lower investment motive (-/+rental yield according to Global Property Guide in November 2022 higher/lower than 5%), (v) Weak lending (-/+/++ year-on-year growth rate of pure new mortgage credit in M11/2022 positive/negative/negative with decline of above 50%), (vi) High HH debt (-/+/++ below/above either the COM fundamental benchmark or prudential benchmark/above both benchmarks).
Factors of upward pressure on house prices: (i) Limited supply (-/+ OECD housing supply elasticity close to 1 or above/below 1, * is missing and used expert judgement), (ii) Higher construction cost (, (iii) Preference shift, (iv) Population increase (-/+/++ - none/ below/ above 5% over last 10 years).
Source: Eurostat and European Commission calculations.

5. HOUSING MARKET RELATED POLICIES

Housing market developments are affected by wide range of public policies, which have diverse objectives. There are numerous public policies implemented affecting housing markets. Some of them are aimed specifically to affect housing market outcomes by pursuing objectives of financial stability (e.g. macroprudential policy) or housing affordability (e.g. social housing provision), others by pursuing other objectives (e.g. fiscal) affect also housing markets. The degree regulation and public involvement in housing markets differ significantly across the 11 EU countries under consideration.

The appropriate policy mix both over time and at the current juncture is country specific, as there are different dynamics underlying the house price increases in different countries. Specifically, for countries that have a short-term acceleration in house prices since the pandemic, the focus should be ensuring that this ends soon and the economic impact on recent purchasers and on the banking sector does not result in scarring effects with wider consequences. For countries with long term increases, the reduction in prices or moderation in growth that is underway should not be taken to solve underlying issues, and structural problems leading to house price increases should be addressed. In cases where indebtedness is a cause for concern, policy action could be needed to either reduce the economic and social impact of pressure on indebted households, and/or to address the factors that have resulted in the accumulation of excessive debt.

Addressing structural drivers of house price growth can be difficult and housing policies need to be well calibrated at national level. The application of an appropriate housing policy at the national level is challenging, as different policies interact and affect both the supply and the demand side, their impact often varies across time and may have unintended consequences. Many of the structural policies that affect the ability to build are in the hands of regional or local actors despite the overall impact of these is national; in some cases, particularly for small Member States the impact may be international.

Demand-side policies often contribute to house price pressures unless accompanied by an expansion of housing supply. When faced with rising prices, demand side policies can be appealing in the short term as they can appear to support access to housing, but these policies typically drive price increases higher over time. The staggered supply response is often the outcome of previous policy decisions and unresolved structural problems such as stringent zoning regulations, long approval processes for new constructions, rigid or undeveloped rental markets or insufficient investment in social housing. On the demand side, features of the property tax system, such as mortgage interest tax deductibility or outdated cadastral values often support home ownership[24] and increase household indebtedness. However, these measures also often overstimulate housing demand leading to higher prices, which may outweigh the fiscal benefits. In order to address rising prices effective supply side measures are a better remedy, although other structural changes to housing – including rental – markets can also be beneficial.

The section looks at broad categories of policies that affect housing and household mortgage debt, to present an overview of the situation in the countries under consideration. Section 5.1 considers macro-prudential policy, which has an aim of protecting the financial system, but also has implications for house price growth. Section 5.2 considers supply side policies which are important in ensuring that the supply of housing is able to respond in an appropriate manner to demand. Section 5.3 considers the tax and benefit system which can affect the incentives for house-buying and therefore drive housing demand. Finally, section 5.4 considers insolvency regimes, which affect the context within which households borrow, and may prove important if households come under stress in terms of their abilities to meet their mortgage payments. Although these regimes are less connected to house prices than the other policies

[24] Mortgage tax deductibility always support existing home owners by increasing their disposable income. It may increase also new home ownership if the housing supply is sufficiently elastic.

covered in this section, they would be of increased relevance in the event of difficulties in meeting mortgage payments, particularly if accompanied by a reduction in house prices.

5.1. MACROPRUDENTIAL POLICY AND MORTGAGE-RELATED REGULATION

Macro-prudential policy aims at preventing financial threats to macroeconomic stability, including those that result from mortgage debt. It restrains the build-up of systemic risks by moderating credit and asset price cycles, while ensuring the presence of sufficient buffers in the financial system. Macro-prudential regulation can be tailored to risks of specific sectors, such as housing, or loan portfolios, such as mortgages. In contrast to policy rate hikes, macro-prudential tightening need not entail a generalised reduction of economic activity, limiting the potential costs of policy intervention.

While macroprudential policy aims at safeguarding financial stability by limiting credit, it can also moderate demand and affect house prices. The macroprudential tools are targeted at ensuring financial stability, i.e. to prevent excessive credit growth and leverage, excessive maturity mismatch and market illiquidity, direct and indirect exposure concentration, and misaligned incentives. These policies typically reduce demand and result in lower house prices, although cross-country evidence (e.g. Alam et al., 2019) suggests that macroprudential tools have a stronger impact on mortgage credit than on house prices. By restricting credit supply, macroprudential tools may have also distributional consequences and affect access to credit and home ownership, particularly among younger households with low equity.

Macroprudential tools have been introduced across the EU over the last decade but vary across countries. The experience of recent years when house prices significantly outpaced the credit growth may well partly reflect the impact of macroprudential measures. Most EU countries have implemented a mixture of macroprudential measures targeting the lenders (countercyclical capital buffer (CCyB), sectoral capital requirements (sectoral SyRB), risk weights) and/or the borrowers (limits on loan-to-value (LTV) ratios, limits on debt-service-to-income (DSTI) ratio, limits on loan-to-income (LTI).[25] Some non-EA countries including Hungary have also implemented new instruments to better deal with the risks of foreign currency loans.[26] However, as Table 3 indicates the parameters of the measures differ by country. Namely, Germany does not have legally binding borrower-based measures at all and DSTI and LTI are not in place in several countries. Luxembourg or the Netherlands have relatively loose LTV limits, and Sweden allows for multigenerational duration of mortgages.[27]

Some macro-prudential measures were relaxed during the pandemic alongside other policy support tools. After the onset of the pandemic, Czechia and Portugal temporarily eased some borrower-based measures and capital-based measures were eased in most of the 11 countries, to support credit

[25] Borrower-based measures represent the main macroprudential instrumented targeting housing market developments. Loan-to-value (LTV) caps limit the amount of loans below a share of the dwelling price. Tighter LTV caps face lower crisis risks but usually imply less vigorous recoveries. Debt-service-to-income ratios (DSTIs) require households to pay no more than a certain proportion of their income to service their housing loans. They can also be based on total rather than only housing debt servicing costs. Loan-to-income ratios (LTIs) limit the amount of debt to a certain fixed multiple of income and are less common. Differently from DSTIs, they don't get looser in times of booms, when interest rates are low and banks offer more accommodative credit conditions. LTV, LTI, DSTI standards are already imposed by banks, but government measures can make them more stringent. There are alternative measures that can be tuned in, such as risk weights that increase the amount of capital required to fund riskier mortgages (Cavalleri, M.C., B. Cournède and V. Ziemann (2019): "Housing markets and macroeconomic risks", OECD Working Paper, No. 1555.). Tightening of DSTI-caps could be a better instrument than tightening LTV-caps in curbing credit growth (Kuttner, K.N. and I. Shim (2016): "Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies", Journal of Financial Stability, No. 26, 31-44). A DSTI-limit has the potential to work anti-cyclical as interest rates tend to move with the business cycle. On another note, LTI caps present the advantage, over DSTI and LTV caps, of not being sensitive to fluctuations in interest rates or house price movements.

[26] Hungary, for instance, introduced specific borrower-based measures (LTV and DSTI) for foreign currency loans and increased mandatory capital and liquidity buffers. Poland also introduced specific LTV and DSTI caps for FX loans and increased the associated risk weights.

[27] While the maximum mortgage duration is generous in Sweden, there is an amortisation requirement in place for mortgages > 50% of LTV. For smaller mortgages, the macroprudential risks seem very limited.

provision at time of short-term and temporary disruption due to the pandemic. This can also be seen in table 3, where the different measures are set out according to the dates when they apply. While the impact of the temporal easing is difficult to assess, the transmission of macroprudential measures may be asymmetric: these measures are aimed at preventing a credit driven boom and the effects of a relaxation in the downturn are untested. The table shows that looser limits remained in place in all countries except Luxembourg throughout 2022, and in many cases are not set to expire until 2023.

Macroprudential measures are monitored by the European Systemic Risk Board (ESRB). The ESRB has assessed systematically medium-term residential real estate (RRE) vulnerabilities in the European Economic Area (EEA) countries since 2016.[28] The ESRB can issue warnings if it sees the need to flag vulnerabilities and trends that have the potential to disrupt financial stability, while recommendations are issued not only to flag financial stability risks but also to point to necessary remedial actions. The last assessment was published in February 2022. Out of the 11 countries under considerations, warnings in 2022 were issued for Hungary and Slovakia and recommendation for Germany. In 2019, warnings were issued for Czechia and Hungary and recommendation for Luxembourg, the Netherlands and Sweden. In February 2022, the ESRB also provided assessment of stock and flow risks as well of policy sufficiency and appropriateness for most.[29] In September 2022, the ESRB issued a general warning indicating that vulnerabilities in the EU/EEA residential real estate sector are 'severe' due to, in part, buoyant house price and mortgage growth. In January 2023, the ESRB issued recommendation to national authorities to improve the monitoring of systemic risks stemming from the commercial real estate sector.

[28] ESRB (2016): "Vulnerabilities in the EU residential real estate sectors", November 2016, ESRB (2019): "Vulnerabilities in the residential real estate sectors of the EEA countries", September 2019 and ESRB (2022): "Vulnerabilities in the residential real estate sectors of the EEA countries", February 2022.

[29] The Macroeconomic Imbalance Procedure (MIP) Regulation (Regulation EU No. 1176/2011) calls on the Commission to take into account any warnings or recommendations addressed by the ESRB to Member States subject to an In-depth Review (IDR).

Table 3: **Macroprudential measures and ESRB assessment**

Country	Loan to value ratio (max)	Duration of mrtg. loan (max)	DSTI limit	DTI limit	Risk weights	Capital-based meas.	ESRB assessment
Czechia	80%, 90% below 36 years	30	45% 50% for below 36	8.5 9.5 for below 36		CyCB 1.5% (10/2022) 2% (1/2023) 2.5% (4/2023)	Warning in 2019 Risk assessment in 2022 – stock risk medium, **flow risk high** Policy appropriate and sufficient
Estonia	85%, 90% if guaranteed	30	50%		15% for IRB	CyCB 0% (1/2016) 1% (12/2022)	Risk assessment in 2022 – stock risk medium, **flow risk high** Policy appropriate and sufficient
Germany						CyCB 0% (4/2020) 0.75% (2/2023) sectoral SyRB 2%	Warning in 2019 / Recommendation in 2022 Risk assessment in 2022 – stock risk medium, **flow risk high** Policy **partially** appropriate and **partially** sufficient
Hungary	80%	30	50% 60% for higher inc.			CyCB 0% (1/2016) 0.5% (7/2023)	Warning in 2022 Risk assessment in 2022 – stock risk low, **flow risk high** Policy **partially** appropriate and **partially** sufficient
Latvia	90%, 70% buy to let	30	40%	6		CyCB 0% (2/2016)	Not assessed
Lithuania	85%, 90%	30	40%			CyCB 0% (7/2019) sectoral SyRB 2%	Risk assessment in 2022 – stock risk low, **flow risk high** Policy appropriate and sufficient
Luxembourg	80%, 90% prim.res., 100% first time buyers	35			15% for IRB 75% loans with LTV over 80%	CyCB 0.5% (1/2021)	Recommendation in 2019 Compliance report 2022: fully compliant Risk assessment in 2022 – **stock risk high, flow risk high** Policy **partially** appropriate and **partially** sufficient - **partially**
The Netherlands	100%	30	10.5-35% based on income and int. payment		12% for part of loan with LTV over 55%, 45% for the rest of loan	CyCB 0% (1/2016) 1% (5/2023)	Recommendation in 2019 Risk assessment in 2022 – **stock risk high, flow risk high** Policy appropriate and **partially** sufficient
Portugal	80%, 90% prim.res.	30 (on average for new mortgages)	50% (for at least 85% of mortgages)			CyCB 0% (1/2016)	Risk assessment in 2022 – stock risk medium, **flow risk high** Policy appropriate and sufficient

Slovakia	80% for 20% of new loans LTV up to 90%	30	60%	8		CyCB 1% (8/2020) 1.5% (8/2023)	**Warning** in 2022 Risk assessment in 2022 – stock risk medium, **flow risk high** Policy appropriate and **partially** sufficient
Sweden	85%	60			25% for IRB	CyCB 1% (6/2022) 2% (6/2023) 3 banks SyRB 2%	Recommendation in 2019 Risk assessment in 2022 – **stock risk high, flow risk high** Policy appropriate and **partially** sufficient

Source: ECB, ESRB, NCBs.

5.2 STRUCTURAL REGULATION AND HOUSING SUPPLY

The response of housing supply is a critical factor affecting house prices in the long run, and it is affected by a range of constraints and policies. In countries where there has been sustained increase in house prices over time, addressing any supply side issues may be the only means to substantially moderate house prices over time. Supply side policies can create extra housing and encourage better stock use through improving matching and transaction costs. They include building regulations, land use regulations, zoning laws, the availability of developable land or energy standards for new construction, but also the provision of infrastructure to increase the attractiveness and access to new locations, and regulations – including rental regulations – to provide incentives for new and existing homes to be placed on the market. The regional aspect in this is important, as house price pressure is typically most acute in major cities (although tourist areas are also often affected, but for different reasons) and there may be geographical constraints to consider. In many large European cities, a major increase in housing supply is needed. However, delivering this in an effective way requires not just housing but supporting investments such as an expansion of critical infrastructure, including public transport and local amenities.

5.2.1 ZONING AND BUILDING REGULATION

Land use regulation is the most important determinant of housing supply mostly putting upward pressure on house prices. Zoning, land use, density and building regulations have significantly increased over the decades pursuing diverse objectives. The economic literature on the effects of regulation on housing supply provides evidence that stricter land use regulation is associated with less construction and, by extension, lower housing supply and higher house prices.[30] In many cases, these regulations are in the hands of a diverse set of national actors and have a range of objectives which may be at odds with the need to increasing housing supply. For example, restrictions on the total number of housing units allowed, urban growth limitations or a restriction of the floor area size may result in a smaller housing stock, while environmental rules may also restrict the scale or location of construction activity.[31]

Aggregated indicators for construction regulations allow some cross-country comparison. The nature of many supply side policies means that they are difficult to summarise and compare; the quality of zoning and building regulation is difficult to measure as it often relies on sub-national authorities. The World Bank's reports some indicators for construction regulations that could be used as proxy despite being focused

[30] See Gyourko, J. and R. Molloy (2015): "Regulation and housing supply", In *Handbook of regional and urban economics*, Vol. 5, 1289-1337, Elsevier. Molloy, R. (2020): "The effect of housing supply regulation on housing affordability: A review", *Regional Science and Urban Economics*, 80(C), 1-5.

[31] See Brueckner, J.K. (2009): "Government land use interventions: An economic analysis." In *Urban land markets: Improving land management for successful urbanization*, Springer, 3-23.

on business and not households. These are summarised in table 4. The score for dealing with construction permits takes into account the procedures, time, cost to deal with construction permits, as well as the building quality control index that evaluate the quality of building regulations, the strength of quality control and safety mechanisms, liability and insurance regimes and professional certification requirements. The transfer of property costs is the total of official costs associated with completing the procedures to transfer the property, expressed as a percentage of the property value. The quality of land administration considers the reliability of infrastructure, transparency of information, geographic coverage, land dispute resolution and equal access to property rights. The usefulness of this indicator is limited by the fact that it refers to an imaginary commercial real estate project, whereas the regulations for housing could be different.

Table 4: **Construction regulation**

Country	Dealing with construction permits (score)	Days to complete all construction procedures	Transfer of property costs (% of property value)	Quality of land administration (score)
Czechia	56.2	246	0.0%*	83.3
Germany	78.2	126	6.6%	76.7
Estonia	82.6	103	0.5%	91.7
Latvia	73.5	192	2.0%	75.0
Lithuania	84.9	74	0.8%	95.0
Netherlands	69.4	161	6.1%	95.0
Portugal	73.2	160	7.3%	66.7
Slovakia	59.4	300	0.0%	85.0
Sweden	78.0	117	4.3%	91.7
Hungary	67.0	192.5	5.0%	86.7
Luxembourg	83.9	155	10.1%	85.0

Source: World Bank, Doing Business database, data for 2020
Notes: *Transfer tax for CZ was eliminated in 2020.

5.2.2 RENTAL MARKET REGULATION

The regulation of rental markets affects housing market developments and can take a range of different forms. A range of policy measures regulating rental markets are in place across different countries and affecting both house prices and the conditions under which alternatives to house ownership are available. Many countries regulate rent levels. In many countries rental price caps either for all or for a subset of renters. Price caps on the private rental market can have short-term appeal in the sense of restricting increases at a time of rental cost pressures. However, they also have important drawbacks, particularly over the medium-term. If they are applied to only a subset of the rental stock or of renters, they can create dual rental markets, resulting in affordable rent for only a part of the population, and reduce the supply of rental properties due to lower rates of returns. They create a disincentive for landlords and developers to invest in rental housing: this can both discourage maintenance or upgrades and decrease the supply in the long run.

Table 5: **Rental market regulation and support for rentals**

Country	Initial rent control	Regulated increases	Min level of quality	Short-term holidays rent.reg.	Rent control strictness*	Tenure security *	Tax relief rent. cost	Social rent. housing
Czechia	no	no		Ad-hoc tax treatment	0.33	0.35		yes
Estonia	no	no	size		0.23	0.39	yes	yes

Germany	in some areas rent cannot exceed reference level by more than 10%	no	size; comfort	Local rules in big cities and touristic hotspots	0.75	0.73	yes	yes
Hungary	no	no	comfort					yes
Latvia	no	no	yes		0.41	0.28		yes
Lithuania	no	no	yes	no			no	yes
Luxembourg	Rent ceiling in % of capital invested	Agreed by both parties. Automatic indexation not allowed.	size; comfort		0.58	0.30	yes + subsidies	Yes (reform underway)
The Netherlands	All rents up to a certain value are regulated	Inflation +1% max	yes	local rules set by municipalities. Permit required	0.47	0.34	subsidised	yes
Portugal	no	most rents are increased with national price index[32]	yes	Permit required	0.38	0.65	yes	yes
Slovakia	no	no	yes					yes
Sweden	Rent to not exceed rent of comparable units (5% diff is reasonable)	Increases must be collectively bargained	yes		0.94	0.54		no

Sources: OECD Questionnaire on Affordable and Social Housing; OECD (2021): Brick by Brick: Building Better Housing Policies.
Note: Index made by OECD based on QUASH survey; 1= maximum strictness.

The regulation of rent levels and increase is widely used, although it has reduced over time. The regulation of rents is the main tool of rental market regulation across the EU and has been gradually softened during the last decades, although as rent controls have been gradually phased out, there has been also a long-term increasing trend of other regulations such as eviction protection or minimum contract duration.[33] Table 5 summarises the main rental control measures in place, both on initial rent and regular increases, and regulations on tenant-landlord relations, lease type and duration, quality of rental dwellings, short-term holidays based on information from the OECD. Several EU countries, including Germany, the Netherlands, and Sweden have systems with regulated rent increases. As set out in section 4.3.3, rental

[32] In Portugal, for the year 2023 the annual update for the different types of rural and urban rents was capped at 2%.

[33] Kholodilin, K. (2020): "Long-term, multicountry perspective on rental market regulations", *Housing Policy Debate*, No. 30(6), 994-1015.

regulation is sometimes accompanied by other support measures, such as tax relief related to rental cost, and the provision of social rental housing.

5.2.3 SOCIAL AND AFFORDABLE HOUSING

Investment in social housing can contribute to easing supply bottlenecks while improving affordability for low-income household segments. Social housing, if well targeted, enables the government to deliver housing to low-income households. It usually takes the form of rental housing at regulated price but can also include properties for sale below the market value and under restrictive conditions. The provision of social housing expands the supply without fuelling demand, in contrast to housing allowances to vulnerable groups. Importantly, social housing also enables the state to benefit from any economic rent accruing to owners of property, which can be used to increase economic efficiency. While public investment in housing construction has decreased sharply in recent decades across the EU, there are other measures such as grants, preferential loans, tax deduction that can increase housing supply of housing at rent/prices below market rates.[34]

The concept of social housing differs across the EU and its share has been falling over time. While European countries with developed welfare states pioneered the concept of social housing, its role across the EU has been falling.[35] The definition and objectives of social housing differ across countries, the size, financing, and entitlement conditions. Table 6 sets out some key figures in the provision of social housing. Of the countries under consideration in this note only the Netherlands have substantial social housing sector. Conversely, the central and eastern countries mostly privatised their public housing stock as part of the economic transition leading to low availability of social housing, alongside high ownership rates.[36] At these low levels of social housing provision, a marked expansion would be needed to have a considerable impact on house prices, but some distributional affordability challenges could be addressed. The Netherlands is the only country where the social housing sector is much larger than the private rental sector but it is relatively untargeted and is not reaching those that need it the most with long waiting times, which creates distortions to economic decision making. For the remaining countries, the stock of social housing is fairly limited and mostly decreasing in time.

Table 6: **Social housing and other support**

Country	Social housing as % of total, 2020 ca	Social housing as % of total, 2010 ca	Housing development support, type of aid	Housing development support, tenure type
Czechia		0.4%	Grants; Preferential loans	Affordable rental
Estonia	1.1%	1.1%		
Germany	2.7%	3.7%	Tax deductions; Subsidised land	Affordable rental & owner-occupied
Hungary	2.6%	3.0%		
Latvia	1.9%			

[34] Good examples of support to the construction sector can be found in Denmark and Austria.

[35] Regarding trends in the supply of social housing, during the last decades the investment in this area has declined in most euro area countries, but at a slower rate compared to the 1990s, the scale of change being greater in former socialist countries where it overlapped with restitution and privatisation policies. For evidence on different EU countries see e.g., Scanlon, K.J. and C. Whitehead (2015): "Social housing in Europe", *European Policy Analysis*, No. 17, 1-12, Whitehead, C. (2017). "Social housing models: past and future", *Critical Housing Analysis*, No. 4(1), 11-20.

[36] There are some other examples from EU countries not covered in this note. France introduced temporary tax breaks with additional tax credits to private investors increasing the supply of new housing at controlled rents. In Italy and Spain public policies supported the development of an *affordable* housing sector which is in-between rented social housing and the private rental market. In Spain 'social' housing can refer to dwellings being sold at reduced rates to eligible households, usually funded by construction such 'social apartments' on government-owned land. In Cyprus, social housing encompasses the transfer of publicly owned land to eligible households.

Lithuania	0.8%		Grants; Preferential loans	Affordable rental
Luxembourg		1.6%	Grants	Affordable owner-occupied
The Netherlands	34.1%	38.0%	Grants; Short-term loans; better access to construction sites; fast planning and construction procedures	Affordable rental & owner-occupied
Portugal	2.0%	2.0%	Tax deductions	Affordable rental & owner-occupied
Slovakia		1.6%	Loans	Affordable rental

Source: OECD Questionnaire on Affordable and Social Housing, PT: Social Housing Characterization Survey for 2015 (Instituto Nacional de Estatística).

5.3 TAX AND BENEFITS SYSTEMS

Tax and benefit systems affect housing market developments and house prices. Across the EU, and the countries covered in this note, a range of tax instruments are in place, and they induce different incentives on buyers, sellers and owners of property and as a result can and do affect property prices and household debt levels. A general efficiency rule is that a tax system should not distort the choice between alternative ways of investing in capital,[37] and – in the specific case of housing – the choice between renting and owning properties.[38] In addition, taxation can be used in parallel to macro-prudential measures to dampen demand for credit, and act to counter increases in house prices.

5.3.1 HOUSING-RELATED TAXES

Property taxes offer the possibility of financing to the public sector that does not distort economic activity, while acting to reduce pressures on house prices. The taxation of capital gains accruing to house owners can lead to economic efficiency gains, particularly if new taxes are used to replace more distortionary taxes and can reduce the incentives to purchase housing for investment rather than consumption purposes. The holy grail in economic terms is the imposition of a land value tax that eliminates the scope for property to be used to extract economic rent, if set at an appropriate level. A range of other improvements are possible in many cases that can remove some of the more perverse incentives for the economy to divert resources to the accumulation of property.

Transaction or transfer taxes and stamp duties are applied in some countries. Table 7 shows the while most countries levy tax on property transactions, this is not the case for Czechia, Slovakia and Lithuania, while the tax rate is negligible in Estonia. In Hungary, Luxembourg and Germany, transaction taxes are a non-negligeable percentage of the property's value.[39] Transaction taxes are assumed to stabilise housing markets by reducing speculative purchases, but the empirical evidence does not clearly confirm that high transaction taxes lower house price volatility and the risk of bubbles.[40] New residential properties are usually exempt of the transfer tax but are instead subject to the value added tax (VAT), sometimes at a reduced rate.

[37] Mirrlees, J. A. (1971): "An exploration in the theory of optimum income taxation", *The Review of Economic Studies*, 38(2), 175-208.

[38] Poterba, J. M. (1984): "Tax subsidies to owner-occupied housing: an asset-market approach", *The Quarterly Journal of Economics*, 99(4), 729-752.

[39] In Hungary, deductions and exemptions exist, e.g. for beneficiaries of certain homebuying subsidy schemes. Furthermore, in case the buyer sells another property, the duty is levied only on the price differential.

[40] Macroprudential measures were found to be more suitable for this purpose. See e.g. Crowe, Ch., G. Dell'Ariccia, D. Igan, and P. Rabanal (2011): "How to Deal with Real Estate Booms: Lessons from Country Experiences", IMF Working Paper, No. 11/91.

Recurrent taxes on residential property can be an efficient source of taxation and reduce speculative demand, but generally only generate low revenues where they exist. Recurrent taxes on immovable property can capture economic rents and apply to a stable tax base, making them difficult to avoid. While recurrent property taxation on an annual basis is implemented in some form in most EU countries, they are not applied in Estonia and Hungary. Where they do exist, they typically generate limited revenues. The reluctance of governments to increase revenues from such taxes comes from a variety of factors: taxes on residential property are highly visible, assessing and updating the relevant tax base is often contentious, the incidence of the tax is often unclear and, given that residential taxes are often paid to local authorities, an increase may require balancing out revenues at different government levels.[41]

The introduction of a land value tax could help dampen house prices but is subject to difficulties that require careful planning and a gradual operationalisation. In some EU countries including Luxembourg, land ownership is highly concentrated and used as wealth accumulation strategy and is mostly untaxed unlike other capital gains.[42] This has an adverse impact on housing supply and puts upward pressure on house prices. While the incentives attached to a land tax favour economic growth, the imposition of the tax introduces a windfall loss on the owners of property. This means that any introduction or increase of such a tax needs to be done gradually, taking into account the impact on highly leveraged individuals and ensuring that it is calibrated to dampen speculation in the future. In parallel, in order to work effectively, land taxes require reliable and up-to-date information on land values, which may not be readily available.[43]

The taxation of capital gains relating to housing and/or of imputed rents could reduce demand for house ownership. The taxation of capital gains relating to housing applies to the accumulated increase in value at the time of sale, and it can reduce the incentive to invest in housing for speculative purposes. However, this form of taxation in the case of primary residences is only used in Sweden – among the countries considered here – where is applies at a rate of 22%. Conversely, other forms of capital gains – such as from other assets such as stocks or investment funds – are typically more widely taxed, generating differential incentives and encouraging investment in housing. When applied at the time of sale, capital gains tax can retain some of the attractive properties of a land value tax in that it applies to the increase in value.[44] In parallel, only the Netherlands imposes a tax on imputed rent, which acts to reduce the distortion in the incentives between purchasing and renting housing, though only to a limited extent. In Czechia, the real estate recurrent tax value is based on area built and municipality size and does not follow property values. Given the cancellation of the transfer tax in 2020, the real estate taxation in Czechia appears to be one of the lowest and most supportive for home ownership in EU comparison. Taxing actual rents more than imputed rents makes owner-occupied property attractive and increases demand.

Table 7: **Housing-related taxes, 2020**

Country	Transfer Tax	Property Tax	Rental income Tax	Capital gain tax	Other Taxes
Czechia	0.0%	0.11%	15.0%	15%	Capital gain tax at 15%. Also applied for real estate but with exceptions possible (holding period more than 5/10 years, owner

[41] For a detailed overview of modalities of recurrent property taxation see Leodolter A., S. Princen and A. Rutkowski (2022): "Immovable property taxation for sustainable and inclusive growth", European Economy Discussion Paper, No. 156.

[42] Murray, C. (2020): "Time is money: How landbanking constrains housing supply", *Journal of Housing Economics*, 49, 101708–101710. Paccoud, A., M. Hesse, T. Becker and M. Górczyńska, M. (2022): "Land and the housing affordability crisis: landowner and developer strategies in Luxembourg's facilitative planning context", *Housing Studies*, 37(10), 1782-1799.

[43] A pure land value tax – which excludes the value of the buildings built on the land – might suffer from a lack of up-to-date land values, whereas overall property values (including values of land and of buildings) might be more readily available. This may contribute to governments choosing taxes on overall property values over land value taxes. These difficulties mean that any move towards a land value tax requires careful preparation and communication, in order to ensure a successful introduction with the least disruption to existing property owners.

[44] Unlike a land value tax though, it applies – as other property-related taxes do too – to the property overall, rather than just the land. The lack of recurrence facilitates the imposition of the tax as it does not require regular updating of values.

					occupied etc).
Estonia	0.1%		20.0%	20%	Land value tax
Germany	5.3%	0.12%	9.92%		
Hungary	4.0%		15.0%	15%	
Latvia	2.0%	0.09%	20.0%	20%	
Lithuania	0.0%	0.11%	15.0%	15%	Capital gain tax at 15%. Also applied for real estate but with exceptions possible (holding period more than 10 years, owner occupied etc).
Luxembourg	7.0%	0.06%	0%	19.48%	
The Netherlands	2.0%	0.55%	13.42%	1.62%	Imputed rent
Portugal	2.1%	0.30%	28.0%	28%	
Slovakia	0.0%	0.03%	19.0%	25%	
Sweden	1.5%	0.44%	20.0%	30%	Capital gains (22%)

Source: JRC, Housing Taxation Database.

Notes: the transfer tax denotes the minimum tax rate on the transfer of property. The property tax measures the tax revenues from recurrent property taxation measured as a share of GDP.

5.3.2 INCENTIVES FOR HOMEOWNERSHIP

Many governments have established demand-side measures supporting households in buying a home or helping them in financial distress. There are three main channels through which governments support homeownership (OECD): i) grants to households for the purchase and construction of a dwelling, ii) subsidised mortgages and mortgage guarantees, and iii) mortgage relief for over-indebted homeowners, to avoid foreclosure of residential dwellings (see Table 8). Depending on the nature of the housing market, these financial aids can increase affordability for those that they are aimed at. However, they also push up demand and are at least partially a transfer to the owners of property that these favoured groups buy from. In some countries, such support measures can be quite significant: they cost about 1.3% of GDP in the Netherlands and 0.3% in Luxembourg.[45]

Owner-occupied housing is subject to favourable tax treatment in many countries, which often drives house prices up. Home buyers and owners benefit in many EU countries from favourable tax treatment. Such tax relief consists primarily of tax exemptions for costs associated with the purchase of a home (such as property transfer tax, stamp duty, legal fees/notary deeds), as well as the deductibility of mortgage interest and the absence of taxation of imputed rent.[46] Mortgage interest tax relief reduces the tax burden on mortgage-financed owner-occupied housing and adds to the tax bias favouring home ownership. This serves to drive up asking prices[47] (to the extent the supply is inelastic) and acts as a windfall gain to the owners of property, making it particularly regressive. Mortgage-interest tax deductibility impacts directly on the incentives to take up debt, thereby contributing to creating the conditions for credit-fuelled housing

[45] OECD Questionnaire on Affordable and Social Housing.

[46] Some Member States apply mortgage interest relief for all mortgages, e.g. Estonia, Luxembourg and the Netherlands (though the Netherlands reduced somewhat the high level of mortgage interest rate deductibility and adjusted transaction taxes). Member States where it only applies to mortgages taken up before mortgage interest relief was abolished include for example Lithuania and Portugal. In Portugal, mortgage interest relief only applies to mortgages taken before 2012 and in Lithuania to those taken before 2009. See, Leodolter A., S. Princen and A. Rutkowski (2022): "Immovable property taxation for sustainable and inclusive growth", European Economy Discussion Paper, No. 156.

[47] Vangeel, W., L. Defau and L. De Moor (2022): "The influence of a mortgage interest deduction on house prices: evidence across tax systems in Europe", *The European journal of finance*, 28(3), 245-260 document in a sample of 14 European countries that a tax relief on mortgages have a significant price-increasing effect but also that it does not hold where dual-income tax is applied.

booms. It can contribute to increased and more volatile house prices[48] and may, in fact, even reduce home ownership by crowding-out financially constrained households (Andrews and Caldera-Sanchez, 2011). Also, it has been shown to benefit households with higher incomes more than those with lower incomes and to increase income inequality.[49] Limiting the scope of mortgage-related tax relief has been recommended both by the ESRB (2016 and 2019) and the OECD (2021).

All countries considered in this note have support measures in favour of home ownership. Table 8 presents and overview of the measures that are in application at the moment. It shows that nearly all countries provide some form of subsidies or guarantees to mortgage – with Portugal and Sweden being the exceptions, while all except Germany and Lithuania provide tax relief for home ownership. Estonia, Germany Hungary, Latvia, Luxembourg and the Netherlands provide grants and/or subsidies for homebuyers, and Czechia, Estonia, Luxembourg, the Netherlands, Slovakia and Sweden provide some form of mortgage interest relief. This is most significant in the cases of the Netherlands and Luxembourg, where it represents some 1.3% and 0.3% of GDP respectively.

Table 8: **Home-ownership support measures**

Country	Grants / subsidies to homebuyers	Subsidised mortgages, guarantees to homebuyers	Support for overindebted households	Mortgage interest relief	Other forms of tax relief
Czechia		Yes		Yes	
Estonia	Yes	Yes		Yes	Land tax exemption
Germany	Yes	Yes			
Hungary	Yes	Yes	Mortgage to rent scheme, cash support for mortgage payments	No	one-off tax relief for first-time home buyers
Latvia	Yes	Yes			One-off registration fees reduction
Lithuania	No	Yes	Postponement of mortgage payments, mortgage refinancing	No	Tax exemptions for owner-occupied housing
Luxembourg	Yes	Yes	Postponement of mortgage payments	Yes	Preferential taxation of savings
Netherlands	Yes	Yes	Temporary mortgage reduction	Yes	Exemption from imputed rent tax for owners without/with little remaining mortgage ('Wet Hillen'); Reduced transaction tax rate for first-time buyers
Portugal			Cash support for mortgage payments	No (recently eliminated)	PIT reduction [50] or stamp duty exemption
Slovakia		Yes	Postponement of mortgage payments	Partial (tax bonus for	

[48] Turk, R.A. (2015): "Housing Price and Household Debt Interactions in Sweden", IMF Working Paper, No. 276.

[49] For a discussion of the home ownership tax bias and the impact of mortgage interest tax relief see Leodolter A., S. Princen and A. Rutkowski (2022): "Immovable property taxation for sustainable and inclusive growth", European Economy Discussion Paper, No. 156 (2022) and Leodolter A. and A. Rutkowski (2022): "The Fiscal and Distributional Effects of Removing Mortgage Interest Tax Relief in EU Member States", European Economy Economic Briefs, No. 72.

[50] For 2023, a reduction of the PIT withholding tax rate was made available for employees holders of housing loans for their own permanent housing and that earn a monthly remuneration below a pre-defined threshold.

				18-35 y.o.)	
Sweden				Yes	Reduced property fee for pensioners

Source: OECD Questionnaire on Affordable and Social Housing; JRC Housing Taxation Database; and other national sources.

5.4 INSOLVENCY AND FORECLOSURE REGULATION FOR HOUSEHOLDS

Insolvency frameworks define procedures for dealing with insolvent debtors and would be relevant if borrower face stress in meeting their mortgage payments. They set out the conditions for initiating insolvency procedures, outline creditors' and debtors' rights and obligations, describe the role of courts, the procedures to be followed and the timeframe. Effective insolvency frameworks are important as they reduce risks associated with household debt. They can free up resources stuck in unproductive activities and mitigate deadweight costs. Ex ante, insolvency frameworks shape the incentives of creditors and borrowers. Ex post, they determine how much value is rescued for the creditor and how quickly debtors are released from their obligations. Insolvency proceedings usually foresee the liquidation of collateral liquidation, but schemes for restructuring debt and enhancing repayment capacity are also common. At the present juncture, the possibility of a marked downturn in the housing market and an increase in distressed borrowers, requires that particular attention is paid to insolvency frameworks, to reduce the economic impact.

Loan enforcement framework vary across countries in terms of both their effectiveness and speed. Table 9 summarises the key features of frameworks for the countries under consideration in this note, showing their net and gross recovery rates, time to resolution, costs and features of the foreclosures system where available. It shows that the Netherlands and Luxembourg have procedures that are better able to recover more debt, with Slovakia also being at the higher end. The Netherlands, Slovakia and Sweden are also relatively fast at reaching resolution. Conversely, Czechia and Hungary have relatively limited recovery rates, and require over 4 years on average to resolve foreclosure cases. Specialised courts, which are associated with higher recover rates for creditors and are correlated with a shorter time to recovery, exist in Czechia and Germany.

The existence of out of court settlements and the extent of debtors' liabilities may affect incentives to launch foreclosure proceedings. The table also sets out OECD data on whether out of court foreclosures exist and whether foreclosures are full or non-recourse, for the four countries where these data are available. Out of court foreclosures, which facilitate foreclosures[51] are available in Luxembourg, the Netherlands and Sweden, but not in Germany. In the Netherlands and Sweden mortgages are full recourse, meaning that borrowers remain liable for any unpaid part of their mortgage after foreclosure proceedings, and this must be paid with other assets and future income. Conversely, in Luxembourg loans are non-recourse, so lenders are only able to seize housing collateral in a foreclosure.[52] In the case of Germany, a hybrid system exists. The extent of debtors' liabilities after foreclosure is an important factor if house prices decline, as they either the household or the bank may be left with a loss ("negative equity") if foreclosure proceedings are launched. This, alongside the ease of pushing through foreclosure proceedings, can be a factor in whether foreclosure proceedings are launched.

Table 9: **Loan enforcement frameworks, residential real estate**

Country	Gross recovery rate	Net recovery rate	Time to resolve insolvency (years)	Judicial costs	Out of court foreclosures	Specialised courts for foreclosures	Full recourse/ non-

[51] Lenders are twice as likely to foreclose on delinquent homeowners in states that offer out-of-court foreclosures as they limit borrowers' legal efforts to prevent foreclosure. In-court and out-of-court foreclosure proceedings often coexist, although out-of-court procedures are generally the most used route when available. See Mian, A., A. Sufi, A. and F. Trebbi (2015): "Foreclosures, house prices, and the real economy", *The Journal of Finance*, 70(6), 2587-2634.

[52] Empirical work shows that borrowers are more likely to default on their mortgages in non-recourse States. See Ghent, A.C. and M. Kudlyak (2011): "Recourse and residential mortgage default: evidence from US states", *The Review of Financial Studies*, 24(9), 3139-3186.

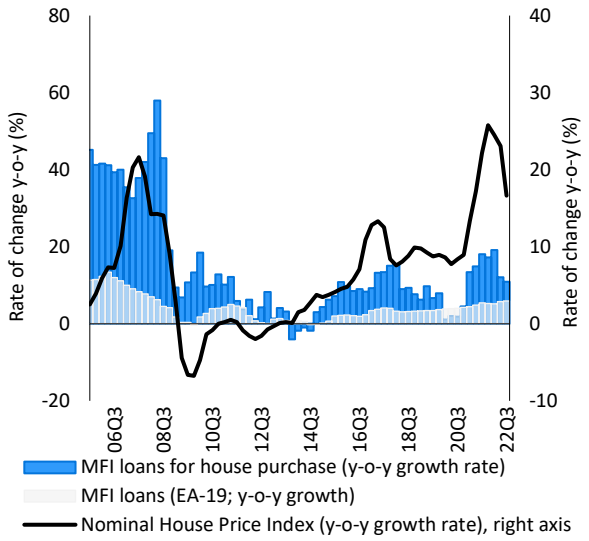
							recourse
Czechia	55.5%	55.4%	4.1	1.3%		yes	
Estonia	68.0%	65.1%	3.1	na			
Germany	69.8%	68.7%	2.1	1.7%	no	yes	uncertain
Hungary	41.6%	39.0%	4.1	2.4%			
Latvia	49.9%	48.7%	3.3	1.3%			
Lithuania	61.3%	60.2%	3.2	0.3%	no		
Luxembourg	91.0%	90.8%	3.2	0.2%	yes	no	Non-recourse
Netherlands	82.9%	82.5%	1.2	0.3%	yes	no	Full recourse
Portugal	63.8%	61.4%	3.2	1.8%			
Slovakia	76.3%	75.1%	1.1	1.6%			
Sweden	68.1%	68.0%	1.4	0.2%	yes	no	Full recourse

Source: EBA, OECD.

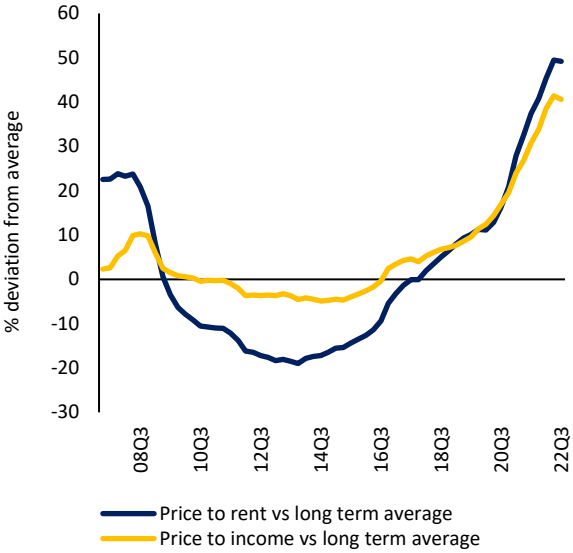
ANNEX 1: COUNTRY-SPECIFIC FICHES

1. CZECHIA

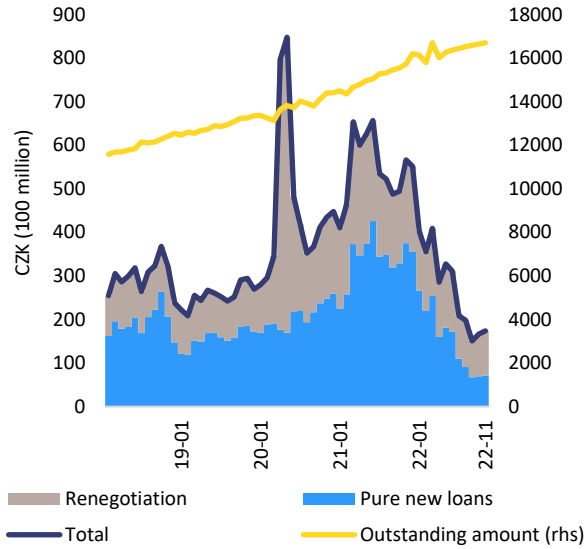
1) **Mortgage and house price growth**



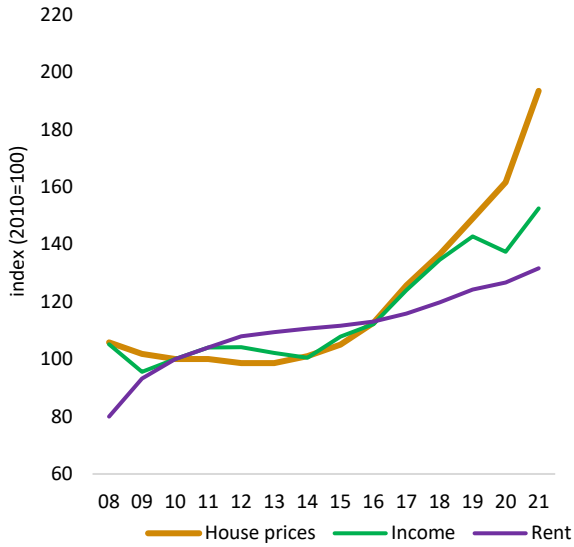
2) **Price-to-rent and price-to-income**



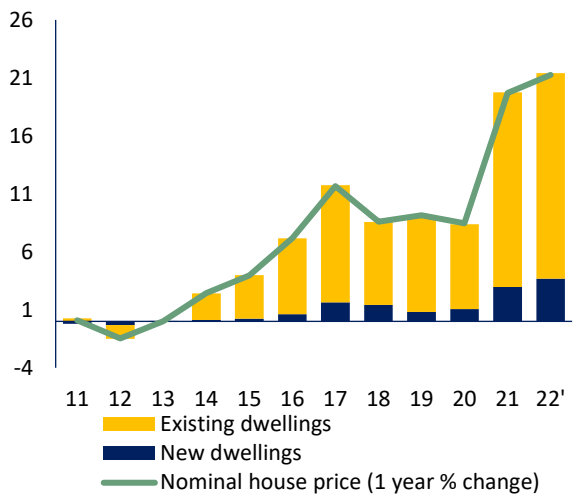
3) **House loans for households**



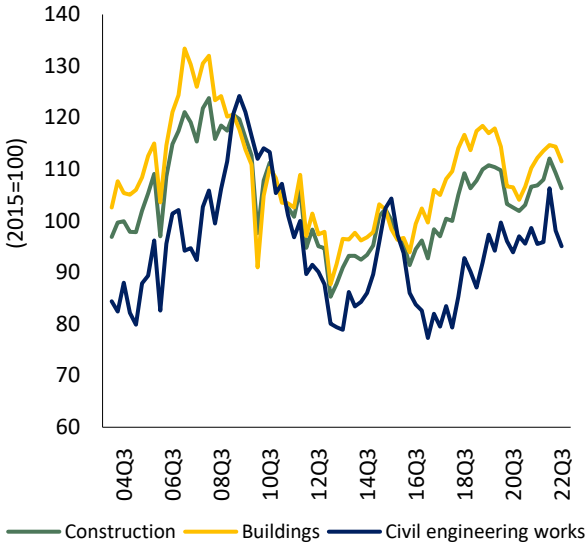
4) **House price, rent and income**



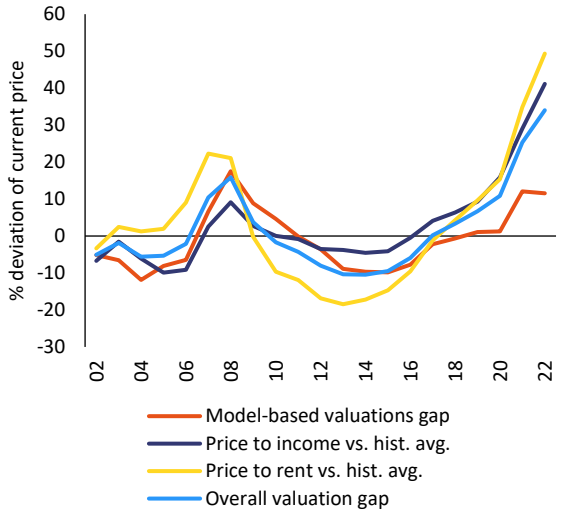
5) **Contribution to change in nominal house price (in %)**



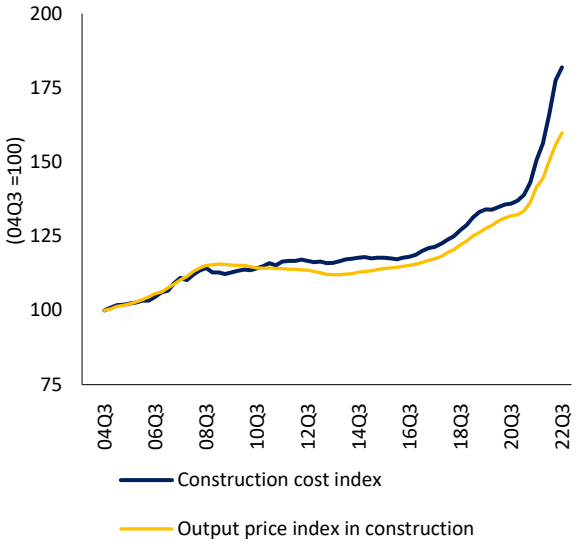
6) **Production in construction**



7) **House price overvaluation**



8) **Construction cost and output price**



Selected Housing indicators, Czech Republic			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	5.8	-0.8	4.4	6.2	5.4	16.4	1.8	20.2	11.3	6.2	-1.7
Nominal house price, yoy growth	%	(a)	7.8	1.2	5.6	9.2	8.5	19.7	19.6	25.8	24.5	23.1	16.6
Price to income in level (1)	years	(b)	7.4	7.9	7.7	8.5	9.0	10.0	11.1	10.3			
Rent price developments													
Nominal rent price index	2015=100	(a)	58.7	86.5	101.4	110.4	113.8	116.5	122.3	123.1	123.5	124.2	125.0
Nominal rent price, yoy growth	%	(a)	2.7	9.2	1.7	3.7	3.1	2.4	4.9	15.4	16.2	17.1	18.3
Valuation gaps													
Price to income gap (2)	%	(c)	-4.8	1.5	-0.4	9.3	15.9	29.1	41.1	33.9	38.6	41.4	40.6
Price to rent gap (2)	%	(c)	7.4	-3.5	-9.5	9.7	15.4	34.9	49.3	40.8	45.4	49.5	49.2
Model valuation gap (3)	%	(c)	-5.3	5.4	-6.5	1.1	1.3	12.1	11.6	17.3	14.3	13.0	10.3
Average house price gap (4)	%	(c)	-0.9	1.2	-5.5	6.7	10.9	25.3	34.0	30.7	32.7	34.6	33.3
Housing credit													
Bank mortgages (% GDP)	%	(d)	9.2	17.8	21.7	23.2	25.4	27.0					
Bank mortgages, yoy growth	%	(d)	40.4	11.4	6.8	7.9	4.5	17.3					
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	4.4	4.4	3.9	4.4	4.6	4.7	5.3				
Residential construction - dwellings, yoy growth	%	(e)	21.0	-1.8	6.5	2.0	3.8	-0.9	6.0				
Non-residential construction (% GDP)	%	(e)	9.2	8.2	6.5	6.7	6.7	6.4	7.0				
Value added in the construction sector, yoy growth	%	(e)	-2.2	-1.3	1.0	-1.7	-10.2	-2.7					
Building permits index	2015=100	(a)	157.2	122.9	104.9	152.4	139.5	178.0		179.4	169.9	188.5	143.6
Building permits, yoy growth	%	(a)	6.2	-11.4	6.2	19.8	-8.5	27.6		41.0	26.0	-2.9	-29.5
Number of transactions, yoy change	%	(f)											
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	10.6	15.8	19.3	21.9	21.8	21.0					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

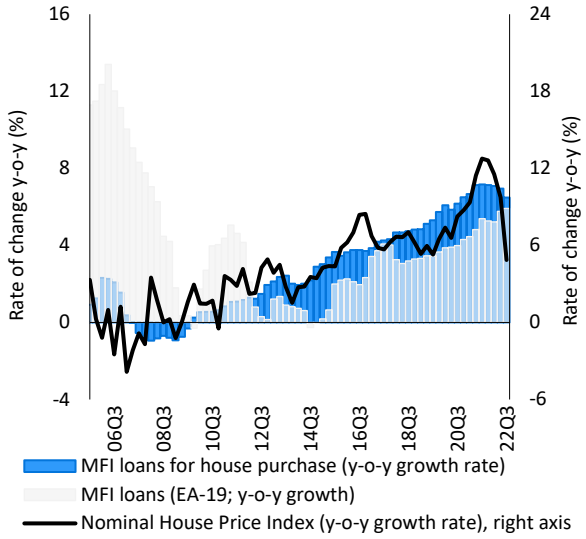
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

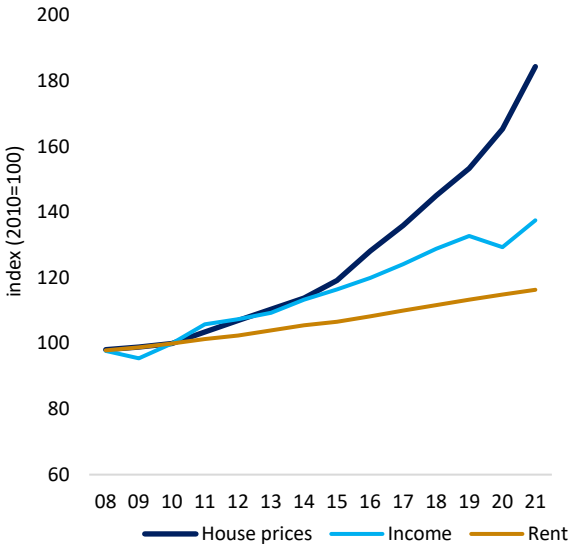
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

2. GERMANY

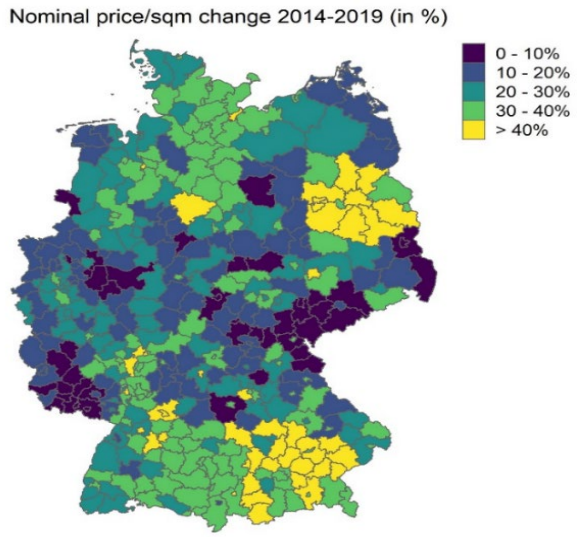
1) **Mortgage and house price growth**



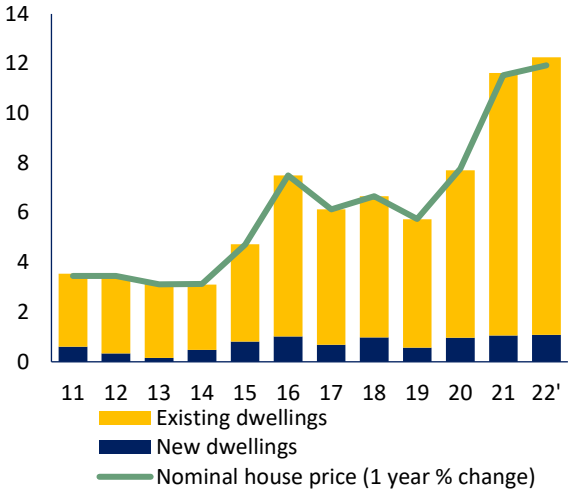
2) **House price, rent and income**



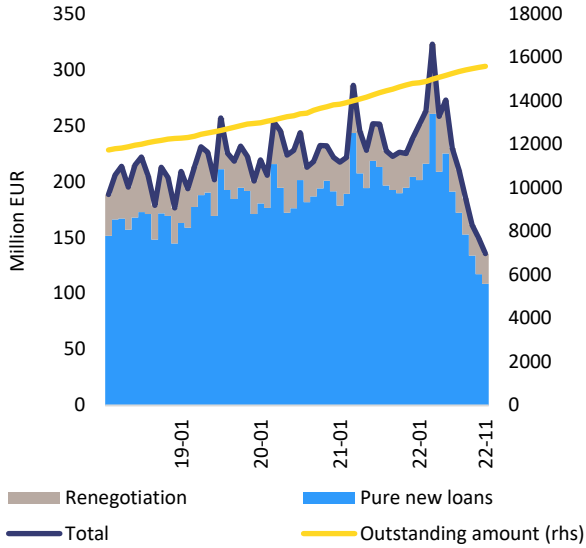
3) **Nominal price/sqm 2014-2019 (change in %)**



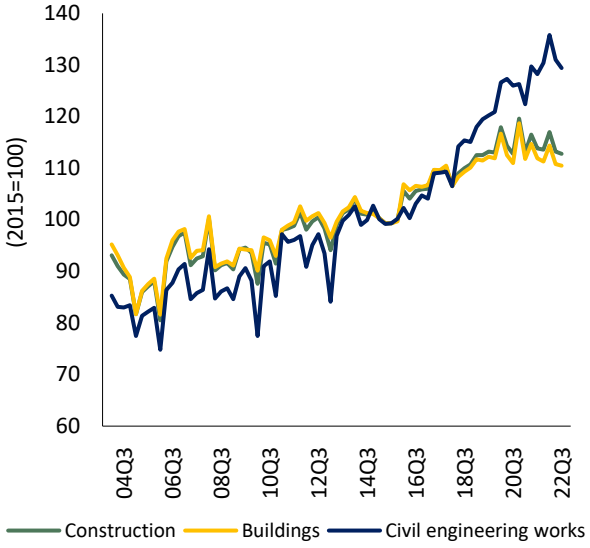
4) **Contribution to change in nominal house price (in %)**



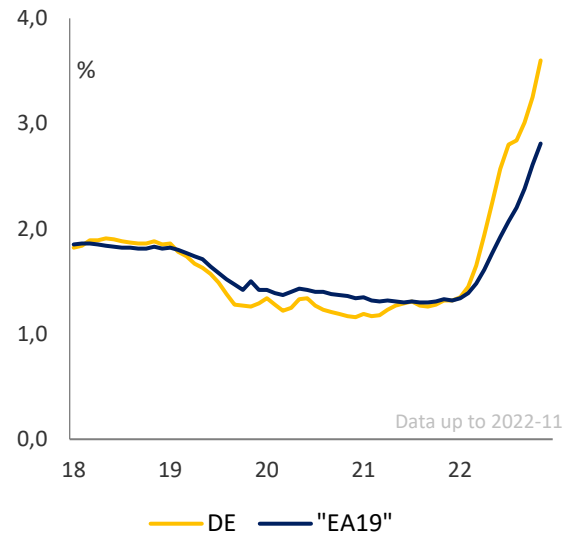
5) **House loans for house purchase**



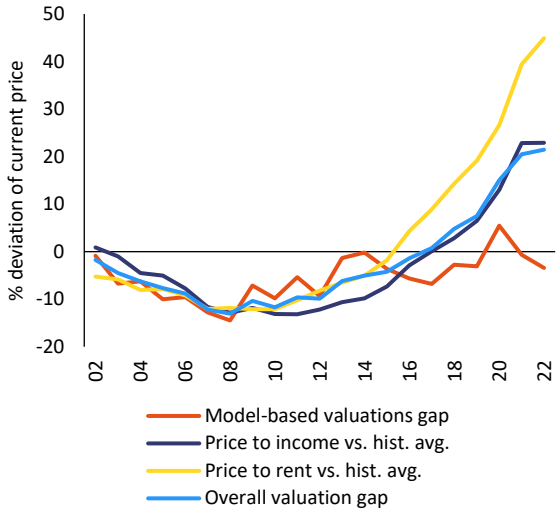
6) **Production in construction**



7) **Avg. interest rate for new hh. mortgage business**



8) **House price overvaluation**



Selected Housing indicators, Germany			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	-1.8	0.7	4.1	4.4	7.1	8.2	0.5	7.5	6.3	2.9	-2.3
Nominal house price, yoy growth	%	(a)	-0.5	2.0	5.2	5.8	7.8	11.5	7.6	12.6	11.6	9.7	4.9
Price to income in level (1)	years	(b)	8.0	7.4	8.1	9.1	9.6	10.5	10.5	10.8			
Rent price developments													
Nominal rent price index	2015=100	(a)	88.9	93.8	100.8	106.1	107.6	109.0	110.8	111.2	111.4	111.6	111.7
Nominal rent price, yoy growth	%	(a)	1.0	1.2	1.4	1.5	1.4	1.3	1.7	6.1	6.4	6.8	7.0
Valuation gaps													
Price to income gap (2)	%	(c)	-6.0	-12.6	-4.6	6.5	13.0	22.8	22.9	26.2	23.6	23.9	21.4
Price to rent gap (2)	%	(c)	-8.6	-10.9	2.4	19.1	26.6	39.4	44.9	43.0	43.0	45.2	44.0
Model valuation gap (3)	%	(c)	-9.1	-9.2	-3.4	-3.1	5.5	-0.7	-3.4	-0.5	-2.0	-2.4	-4.3
Average house price gap (4)	%	(c)	-7.9	-10.9	-1.9	7.5	15.0	20.5	21.4	22.9	21.5	22.2	20.4
Housing credit													
Bank mortgages (% GDP)	%	(d)	41.1	37.4	35.9	37.3	40.5	41.1	40.5				
Bank mortgages, yoy growth	%	(d)	0.8	0.6	3.5	5.7	6.5	7.1	5.5				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	5.3	5.4	6.0	6.4	7.0	7.2	7.7				
Residential construction - dwellings, yoy growth	%	(e)	-5.5	2.3	1.7	1.4	4.6	0.6	-1.6				
Non-residential construction (% GDP)	%	(e)	3.9	4.1	3.9	4.1	4.3	4.4	4.8				
Value added in the construction sector, yoy growth	%	(e)	-8.6	1.2	0.9	-3.6	2.0	-1.4					
Building permits index	2015=100	(a)	85.6	68.1	104.6	119.1	122.0	126.7		131.2	125.0	125.6	113.6
Building permits, yoy growth	%	(a)	-7.6	5.7	6.4	3.2	2.4	3.9		-0.6	-2.6	1.3	-7.7
Number of transactions, yoy change	%	(f)											
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	29.4	28.0	26.3	25.8	31.4	27.7					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

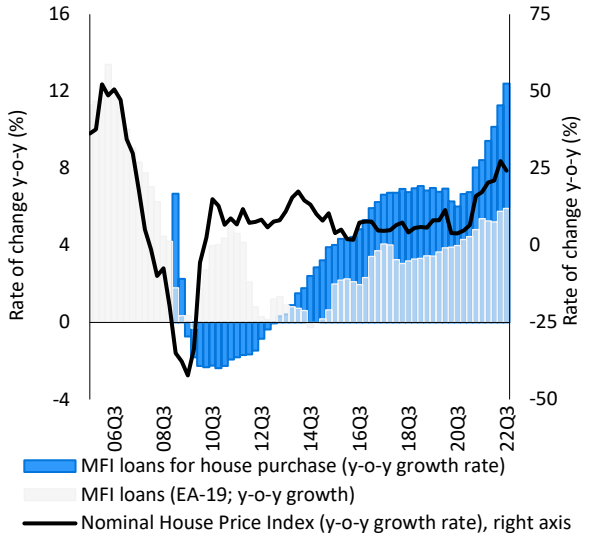
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

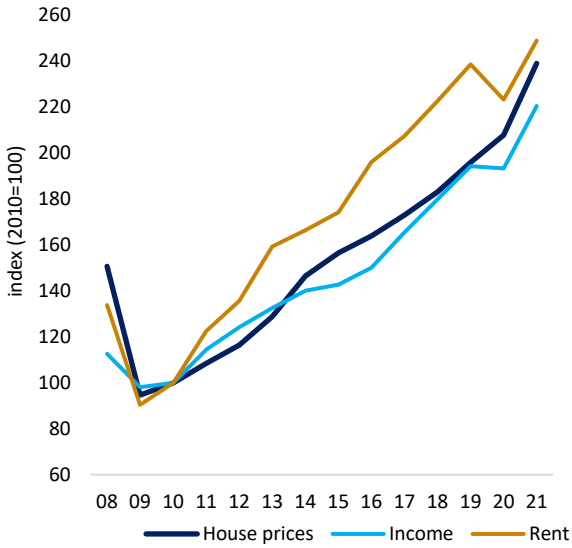
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

3. ESTONIA

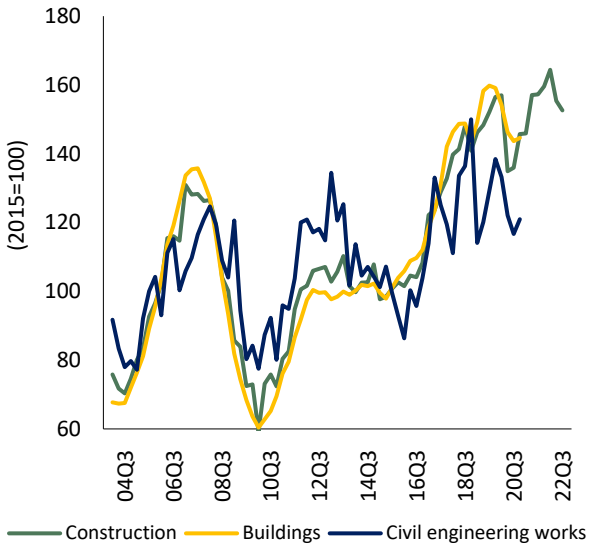
1) **Mortgage and house price growth**



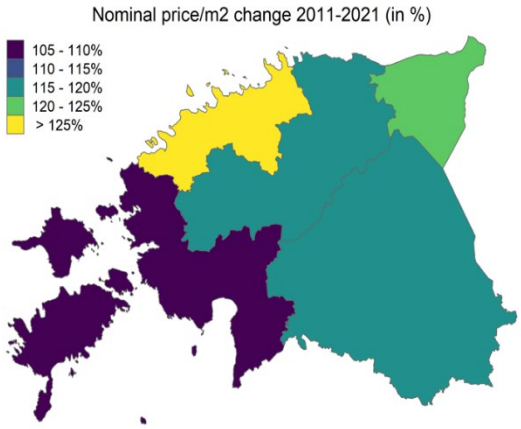
2) **House price, rent and income**



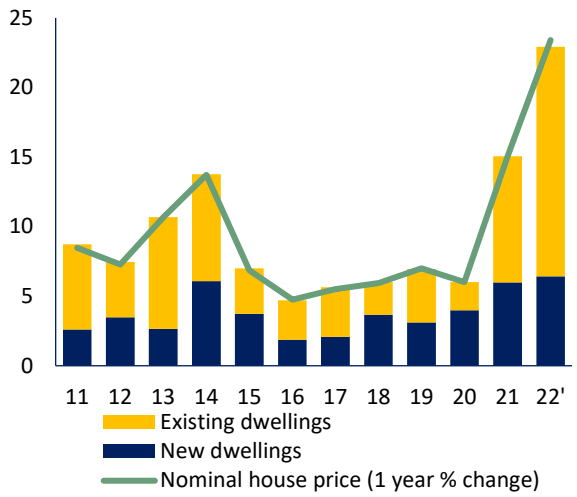
3) **Construction activity**



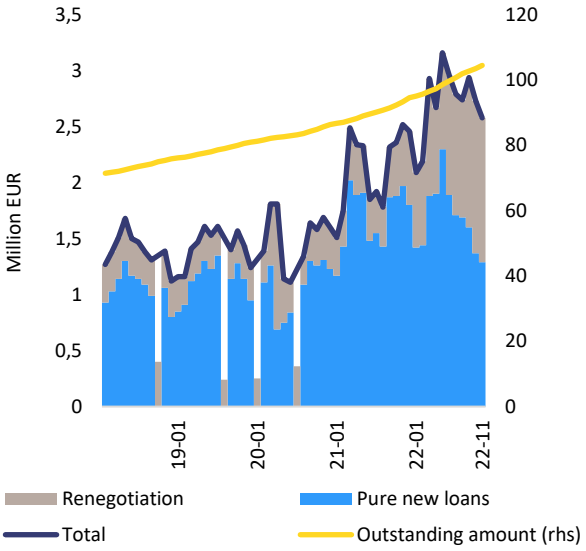
4) **Nominal price/sqm 2014-2019 (change in %)**



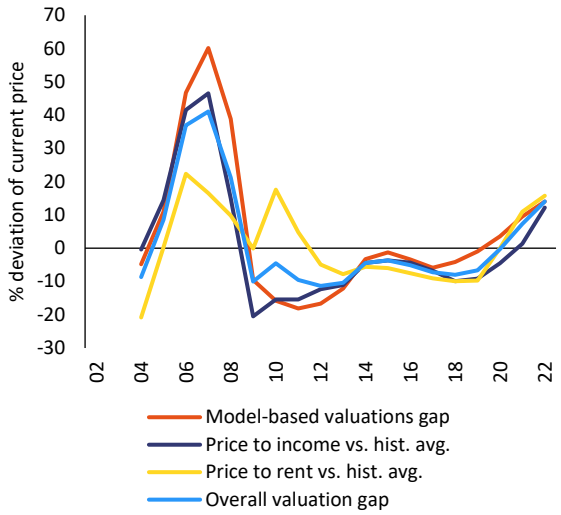
5) **Contribution to change in nominal house price (in %)**



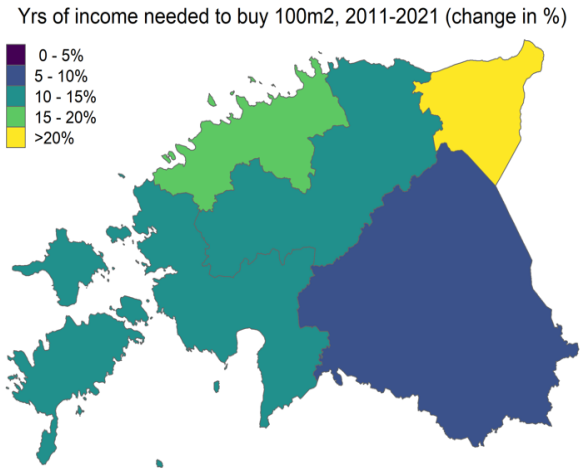
6) **House loans for house purchase**



7) **House price overvaluation**



8) **Yrs income/100sqm 2014-2019 (change)**



Selected Housing indicators, Estonia			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	27.2	-9.0	5.8	4.4	7.0	10.4	5.3	10.5	8.0	8.4	3.7
Nominal house price, yoy growth	%	(a)	34.3	-5.1	7.9	7.0	6.0	15.1	24.7	20.4	21.0	27.4	24.2
Price to income in level (1)	years	(b)	15.7	11.3	11.7	11.3	11.9	12.6	14.0	12.2			
Rent price developments													
Nominal rent price index	2015=100	(a)	62.4	65.3	103.4	130.7	125.2	129.9	158.6	173.1	167.7	159.2	158.3
Nominal rent price, yoy growth	%	(a)	12.5	-1.0	8.9	6.8	-4.2	3.7	22.1	40.2	32.2	27.2	33.6
Valuation gaps													
Price to income gap (2)	%	(c)	25.5	-9.7	-6.7	-9.1	-4.6	1.3	12.2	3.4	7.6	12.8	10.9
Price to rent gap (2)	%	(c)	4.6	5.4	-7.6	-9.7	0.0	11.0	15.8	13.7	19.1	13.6	8.1
Model valuation gap (3)	%	(c)	28.3	-4.3	-5.0	-1.0	3.5	9.5	14.0	11.5	14.5	16.4	12.5
Average house price gap (4)	%	(c)	19.5	-2.9	-6.5	-6.6	-0.3	7.3	14.0	9.5	13.7	14.3	10.5
Housing credit													
Bank mortgages (% GDP)	%	(d)		37.7	30.2	29.2	31.5	30.1	29.3				
Bank mortgages, yoy growth	%	(d)		-1.6	4.5	6.8	6.7	9.4	11.3				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	4.9	3.1	4.1	4.9	5.4	4.9	4.8				
Residential construction - dwellings, yoy growth	%	(e)	83.8	-10.8	12.1	10.3	14.0	-2.5	-1.5				
Non-residential construction (% GDP)	%	(e)	13.6	11.6	9.9	9.4	9.0	7.9	7.9				
Value added in the construction sector, yoy growth	%	(e)	44.4	0.3	3.6	-4.3	8.4	6.8					
Building permits index	2015=100	(a)	156.8	57.2	99.8	143.6	158.1	157.0		147.7	132.5	103.5	108.9
Building permits, yoy growth	%	(a)	38.3	-11.9	16.5	14.8	10.1	-0.7		28.5	-11.4	-31.1	-39.7
Number of transactions, yoy change	%	(f)	-1.3	-4.1	6.4								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	13.8	15.9	19.8	22.8	27.3	28.0					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

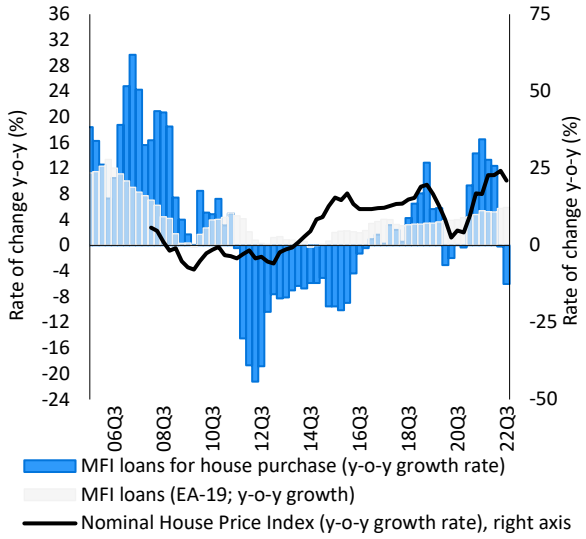
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

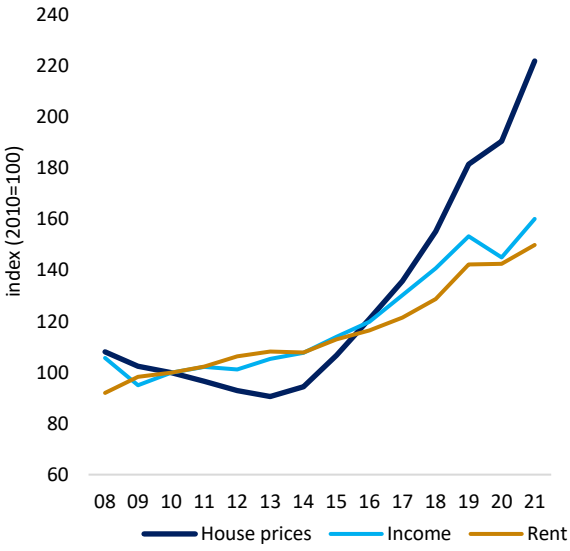
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco € Ameco (f) ECB.

4. HUNGARY

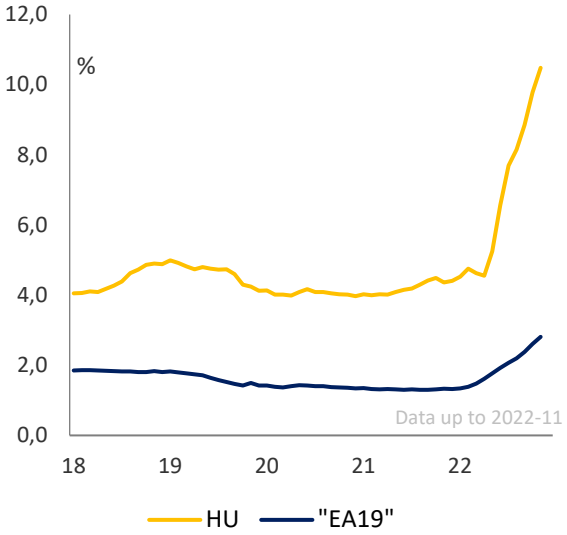
1) **Mortgage and house price growth**



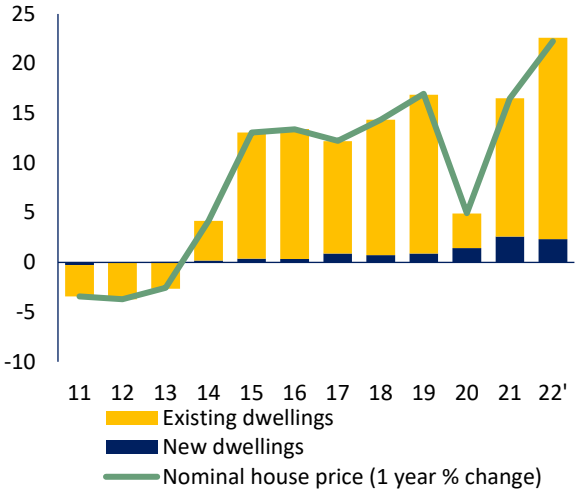
2) **House price, rent and income**



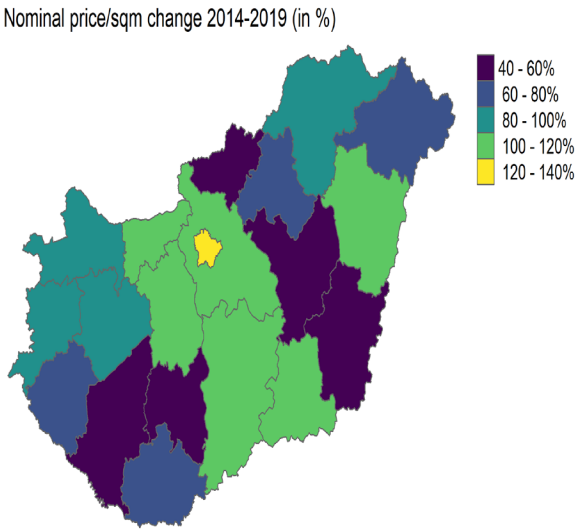
3) **Avg. interest rate for new hh. mortgage business**



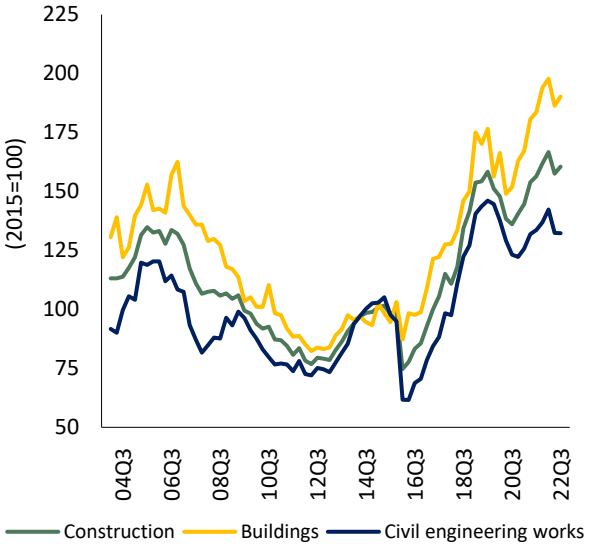
4) **Contribution to change in nominal house price (in %)**



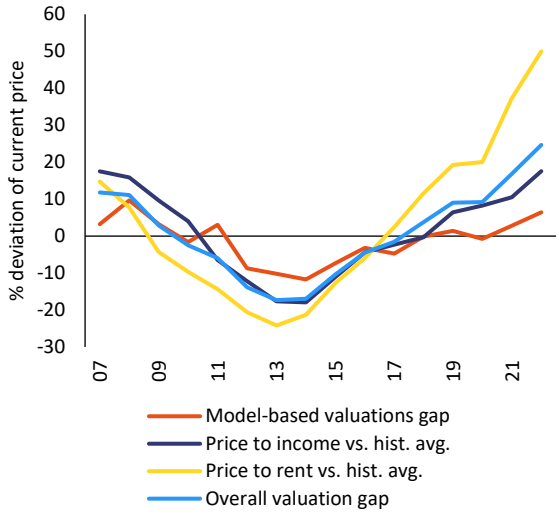
5) **Nominal price/sqm 2014-2019 (change in %)**



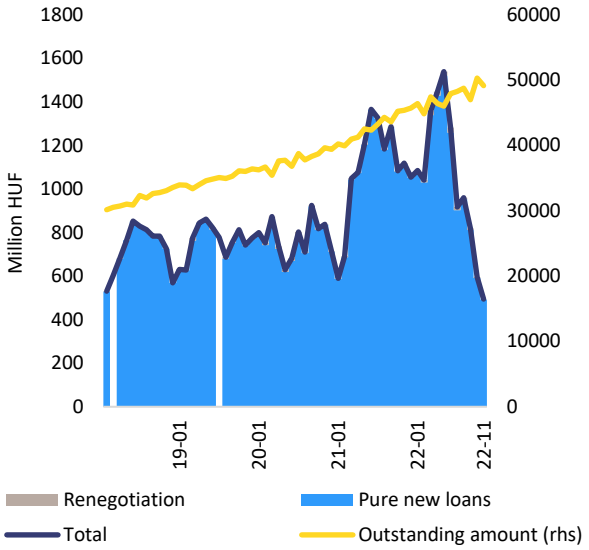
6) **Production in construction**



7) **House price overvaluation**



8) House loans for house purchase



Selected Housing indicators, Hungary			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)		-6.7	7.1	11.8	1.5	10.0	5.1	13.7	10.8	9.9	1.7
Nominal house price, yoy growth	%	(a)		-2.5	9.1	17.0	4.9	16.5	20.7	22.8	22.8	24.2	21.0
Price to income in level (1)	years	(b)	8.8	7.6	6.8	7.9	8.1	8.2	8.6	8.1			
Rent price developments													
Nominal rent price index	2015=100	(a)	67.0	89.6	103.9	124.6	129.9	132.4	146.3	151.2	152.9	155.3	155.9
Nominal rent price, yoy growth	%	(a)	6.7	5.0	2.9	9.4	4.3	1.9	10.5	31.7	34.1	37.2	38.4
Valuation gaps													
Price to income gap (2)	%	(c)	17.5	2.2	-8.9	6.4	8.2	10.5	17.6	12.0	18.4	20.7	18.1
Price to rent gap (2)	%	(c)	14.7	-8.2	-8.3	19.2	20.0	37.2	50.0	41.6	51.4	55.5	50.3
Model valuation gap (3)	%	(c)	3.2	1.1	-6.2	1.4	-0.7	2.8	6.5	4.7	9.3	9.9	3.9
Average house price gap (4)	%	(c)	11.8	-1.6	-7.8	9.0	9.2	16.8	24.7	19.4	26.4	28.7	24.1
Housing credit													
Bank mortgages (% GDP)	%	(d)	10.1	14.0	8.8	7.5	8.0	8.1					
Bank mortgages, yoy growth	%	(d)	21.5	0.2	-2.3	5.8	-0.3	13.3					
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	4.5	3.1	2.3	3.2	4.1	3.9	4.7				
Residential construction - dwellings, yoy growth	%	(e)	9.3	-11.8	9.8	7.0	21.5	-4.2	9.7				
Non-residential construction (% GDP)	%	(e)	7.5	7.2	7.6	10.5	9.7	10.3	11.2				
Value added in the construction sector, yoy growth	%	(e)	21.1	-5.4	7.1	13.1	-8.6	9.2					
Building permits index	2015=100	(a)	401.9	180.2	184.7	291.1	180.3	245.2		245.8	267.0	326.9	277.6
Building permits, yoy growth	%	(a)	-0.6	-24.2	34.7	-3.7	-38.1	36.0		42.7	14.7	17.8	23.5
Number of transactions, yoy change	%	(f)		-13.2	12.1								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	11.5	20.9	17.4	15.3	15.5	15.1					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

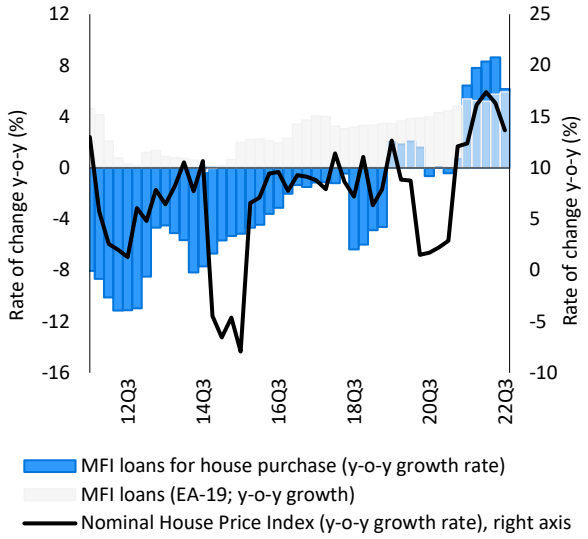
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

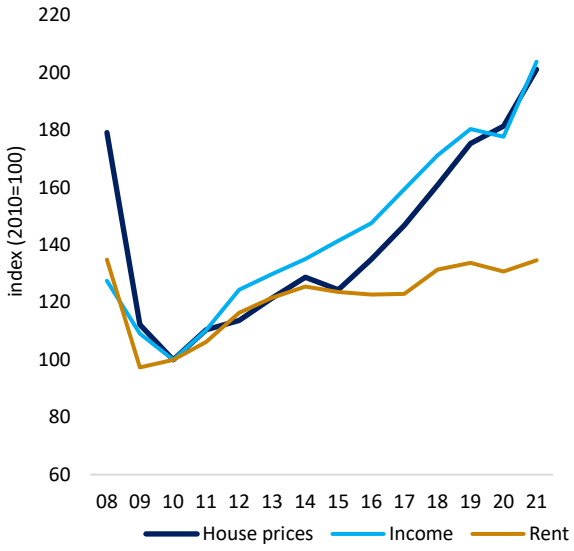
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

5. LATVIA

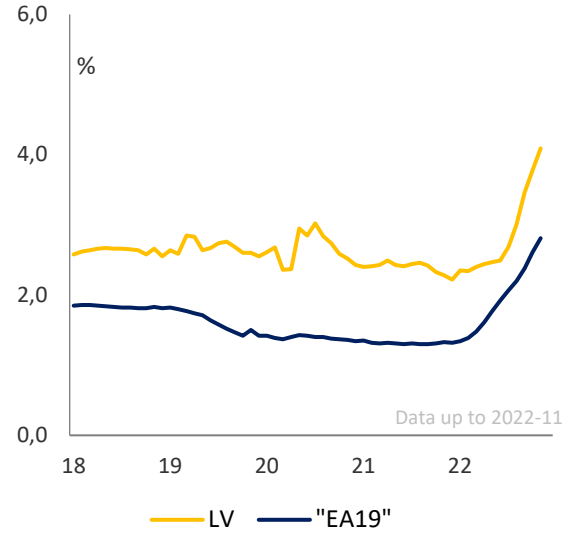
1) **Mortgage and house price growth**



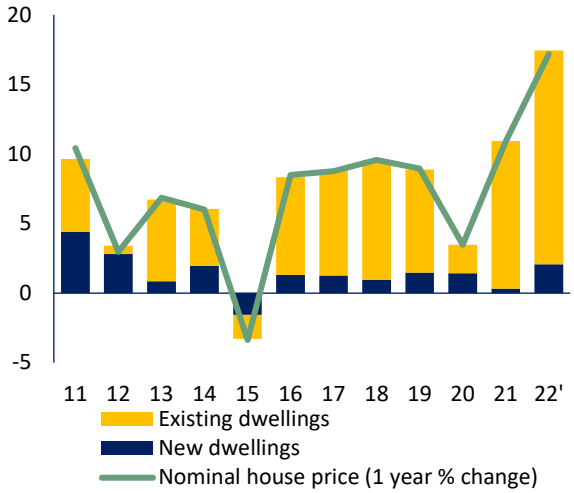
2) **House price, rent and income**



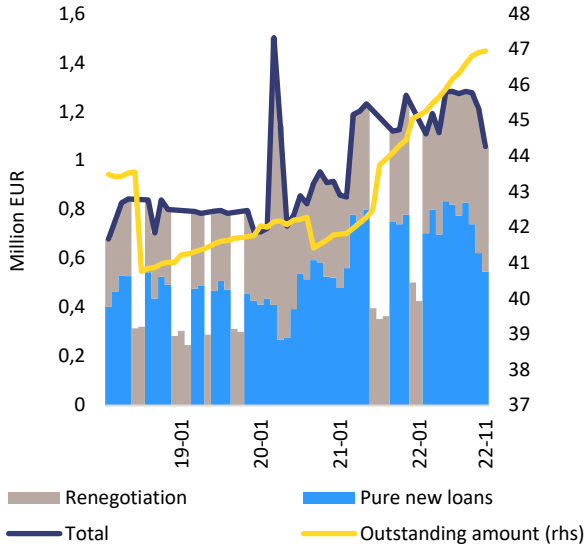
3) **Avg. interest rate for new hh. mortgage business**



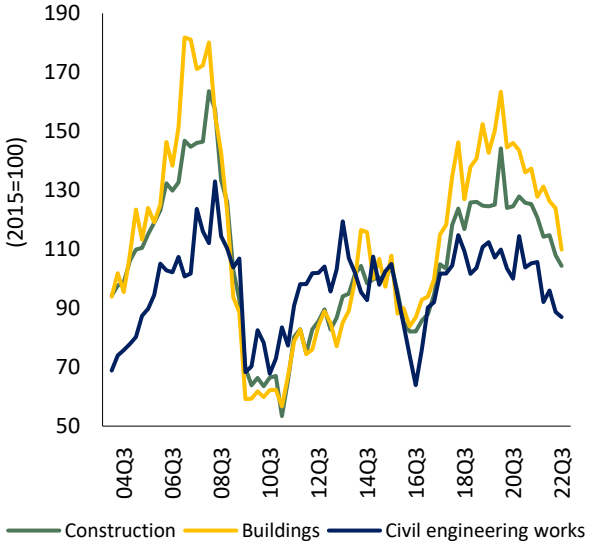
4) **Contribution to change in nominal house price (in %)**



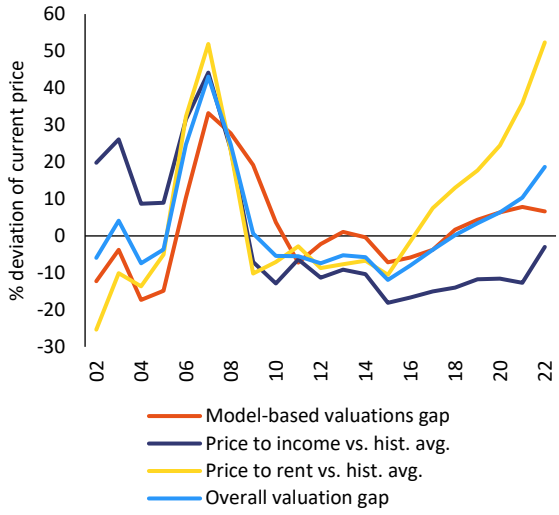
5) **House loans for house purchase**



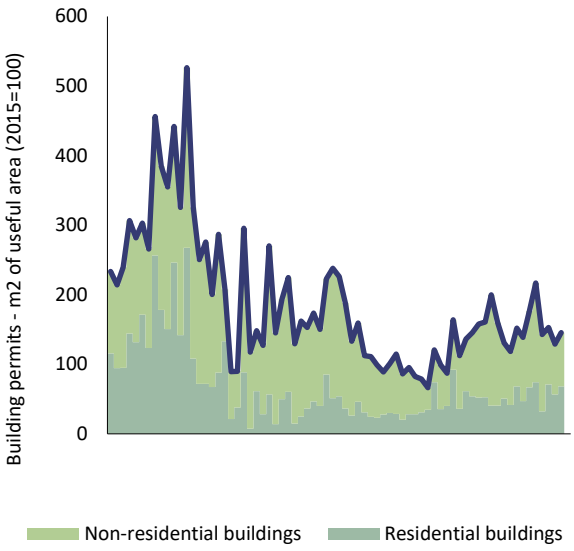
6) **Production in construction**



7) **House price overvaluation**



8) **Building permits**



Selected Housing indicators, Latvia			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	17.7	-10.2	4.5	5.8	2.7	7.3	0.5	8.9	8.3	2.2	-2.7
Nominal house price, yoy growth	%	(a)	28.1	-6.8	6.1	9.0	3.5	10.9	17.4	16.1	17.4	16.3	13.7
Price to income in level (1)	years	(b)	11.0	8.7	7.7	7.9	7.9	7.8	8.5	7.6			
Rent price developments													
Nominal rent price index	2015=100	(a)	65.4	88.6	98.9	107.1	104.8	106.5	109.6	111.1	108.2	105.8	105.2
Nominal rent price, yoy growth	%	(a)	10.3	2.4	2.3	4.6	-2.2	1.6	2.9	2.8	5.0	3.3	5.6
Valuation gaps													
Price to income gap (2)	%	(c)	23.9	-2.8	-13.9	-11.7	-11.6	-12.7	-3.0	-10.9	-7.8	-4.4	-4.7
Price to rent gap (2)	%	(c)	11.1	-1.1	-1.0	17.7	24.5	35.9	52.3	39.2	45.0	46.6	45.2
Model valuation gap (3)	%	(c)	1.5	8.2	-2.4	4.4	6.4	7.8	6.6	9.7	9.8	7.8	5.1
Average house price gap (4)	%	(c)	12.2	1.4	-5.7	3.5	6.4	10.3	18.7	12.7	15.6	16.7	15.2
Housing credit													
Bank mortgages (% GDP)	%	(d)		30.4	18.0	13.6	13.8	13.4	12.4				
Bank mortgages, yoy growth	%	(d)		-9.8	-4.3	1.8	0.0	7.8	4.6				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	3.9	2.9	2.3	2.7	2.6	2.2	2.3				
Residential construction - dwellings, yoy growth	%	(e)	38.6	-13.8	3.0	3.8	-9.4	-7.0	0.8				
Non-residential construction (% GDP)	%	(e)	11.8	10.9	9.4	9.6	9.2	8.3	8.7				
Value added in the construction sector, yoy growth	%	(e)	60.6	-8.7	4.1	1.3	-7.2	-9.8					
Building permits index	2015=100	(a)	443.9	168.6	136.1	165.0	186.4	217.7		332.8	263.2	174.9	227.5
Building permits, yoy growth	%	(a)	49.2	-20.3	4.7	0.7	13.0	16.8		82.9	70.0	-5.4	14.7
Number of transactions, yoy change	%	(f)											
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	3.3	8.1	10.2	13.1	12.4	14.0					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

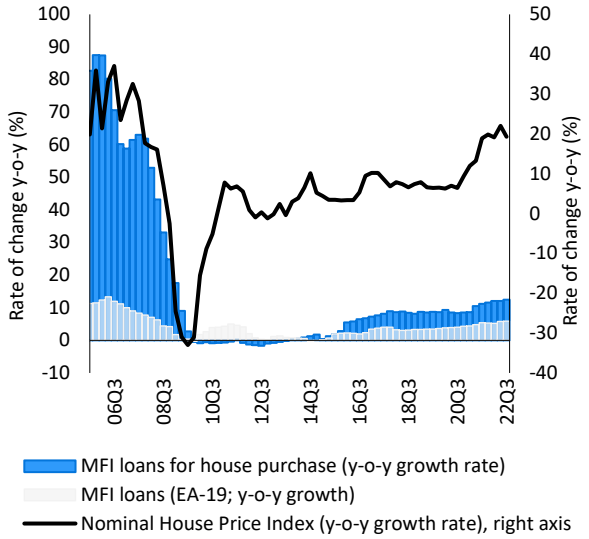
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

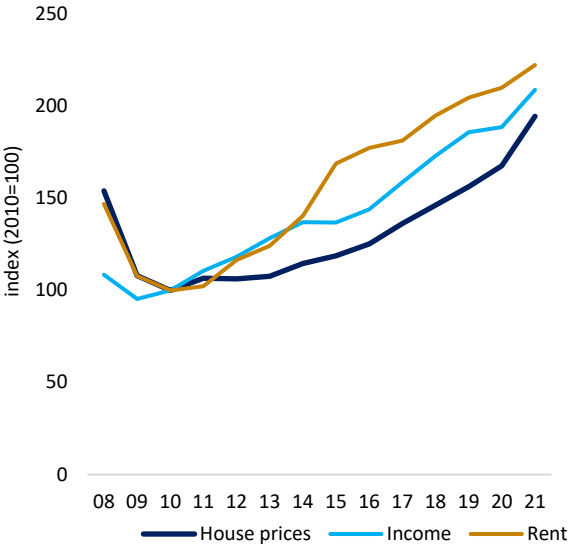
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

6. LITHUANIA

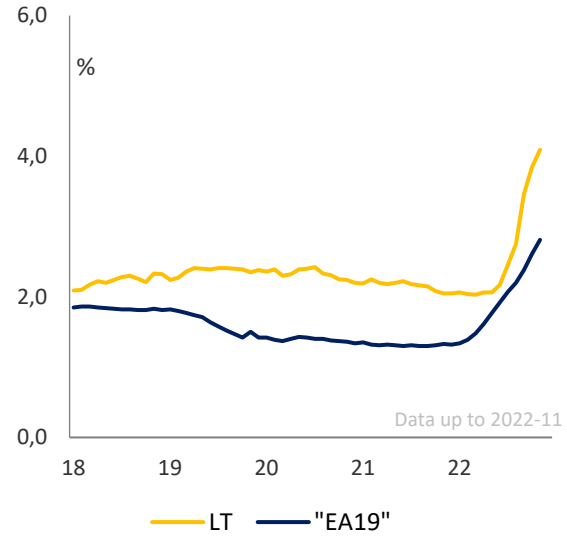
1) **Mortgage and house price growth**



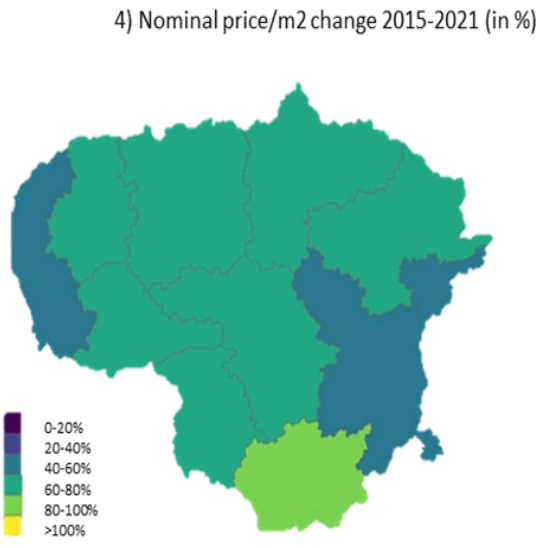
2) **House price, rent and income**



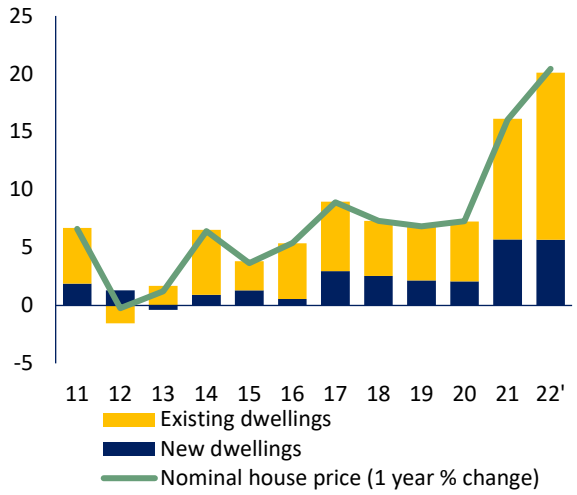
3) **Avg. interest rate for new hh. mortgage business**



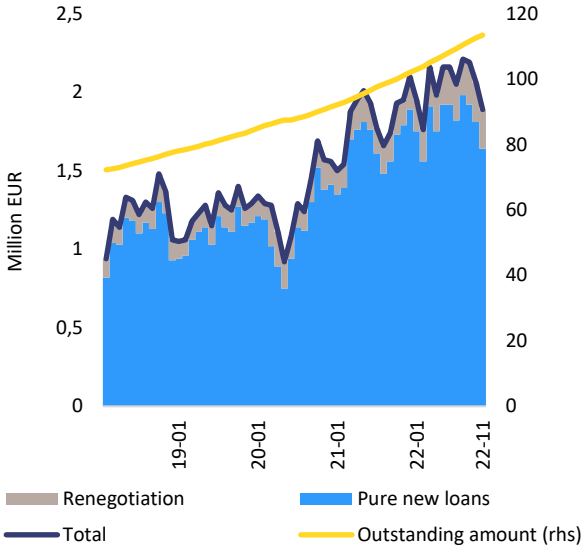
4) **Nominal price/sqm 2014-2019 (change in %)**



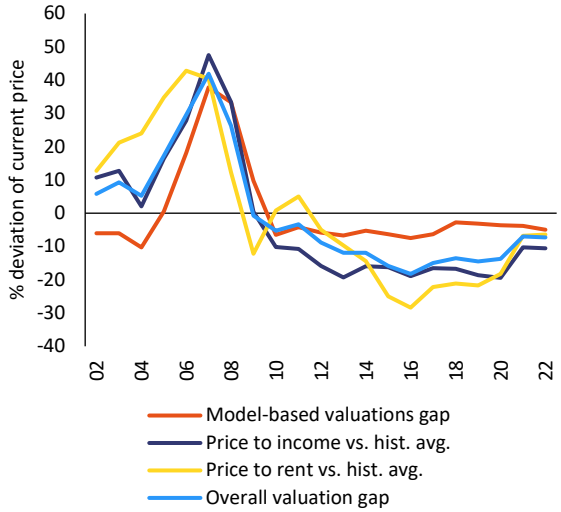
5) **Contribution to change in nominal house price (in %)**



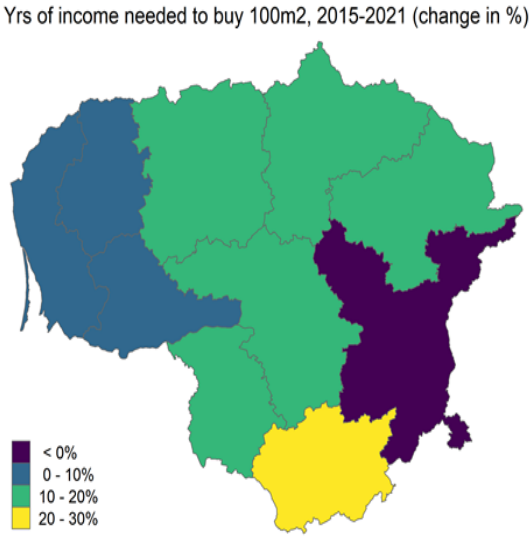
6) **House loans for house purchase**



7) **House price overvaluation**



8) **Yrs income/100sqm 2014-2019 (change)**



Selected Housing indicators, Lithuania			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	16.9	-8.9	4.3	4.5	6.1	11.0	0.9	9.8	4.9	3.0	-1.8
Nominal house price, yoy growth	%	(a)	19.6	-4.4	5.5	6.8	7.3	16.1	19.9	19.8	19.1	22.1	19.3
Price to income in level (1)	years	(b)	12.0	9.8	8.2	8.0	8.0	8.9	9.0	8.9			
Rent price developments													
Nominal rent price index	2015=100	(a)	44.6	72.3	99.6	126.1	129.4	131.8	153.0	158.8	161.5	162.9	164.6
Nominal rent price, yoy growth	%	(a)	14.6	3.8	8.9	7.7	2.6	1.8	16.1	34.3	36.9	39.6	41.8
Valuation gaps													
Price to income gap (2)	%	(c)	21.3	-0.6	-17.3	-18.7	-19.4	-10.3	-10.6	-7.9	-12.0	-10.8	-11.0
Price to rent gap (2)	%	(c)	32.6	0.2	-20.1	-21.7	-18.2	-6.8	-6.4	-4.0	-6.0	-5.6	-7.5
Model valuation gap (3)	%	(c)	8.0	5.3	-5.8	-3.2	-3.6	-3.8	-5.0	-3.4	-3.4	-4.8	-5.7
Average house price gap (4)	%	(c)	20.6	1.6	-14.4	-14.5	-13.7	-7.0	-7.3	-5.1	-7.1	-7.1	-8.1
Housing credit													
Bank mortgages (% GDP)	%	(d)	10.9	19.8	16.8	17.2	18.4	18.2	17.1				
Bank mortgages, yoy growth	%	(d)	69.8	4.4	4.8	8.6	8.5	11.6	12.7				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	2.2	2.5	2.6	3.0	3.2	3.0	3.3				
Residential construction - dwellings, yoy growth	%	(e)	38.2	-1.9	8.6	14.7	5.8	-0.2	12.8				
Non-residential construction (% GDP)	%	(e)	11.8	9.2	8.1	8.7	8.5	8.2	7.8				
Value added in the construction sector, yoy growth	%	(e)	47.8	-6.6	5.1	7.5	-0.3	3.0					
Building permits index	2015=100	(a)	91.7	72.8	104.7	111.1	111.2	144.1		148.8	128.7	140.6	110.4
Building permits, yoy growth	%	(a)	35.7	-6.8	8.8	-6.6	0.1	29.6		7.6	-18.8	1.7	-15.8
Number of transactions, yoy change	%	(f)											
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	4.5	7.2	9.6	12.2	14.0	16.6					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

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(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

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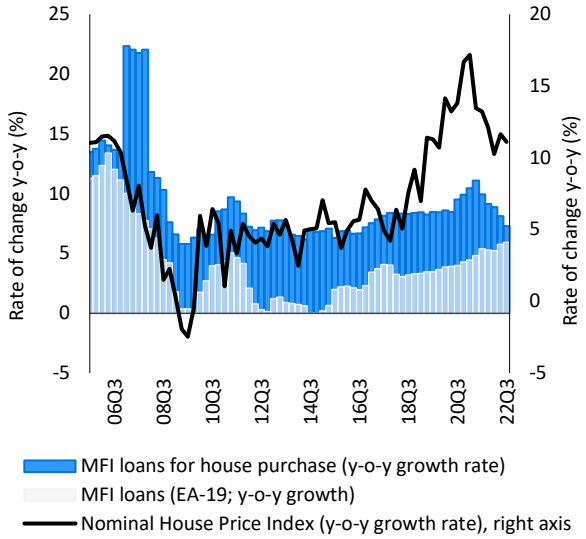
(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

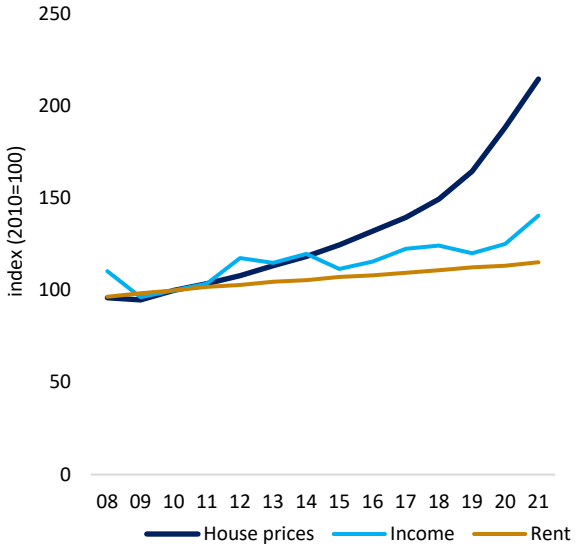
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco € Ameco (f) ECB.

7. LUXEMBOURG

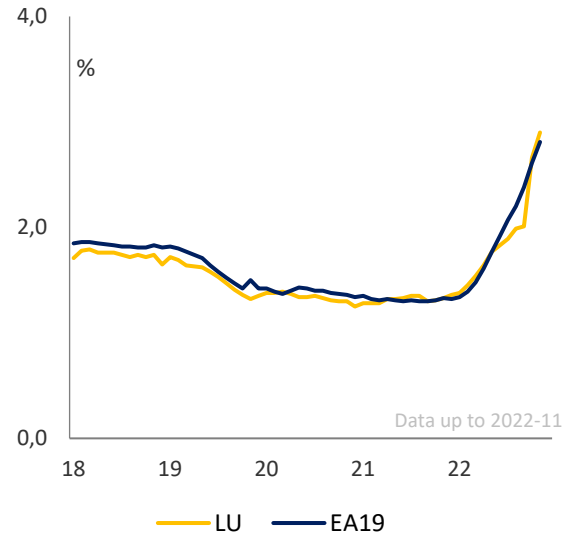
1) **Mortgage and house price growth**



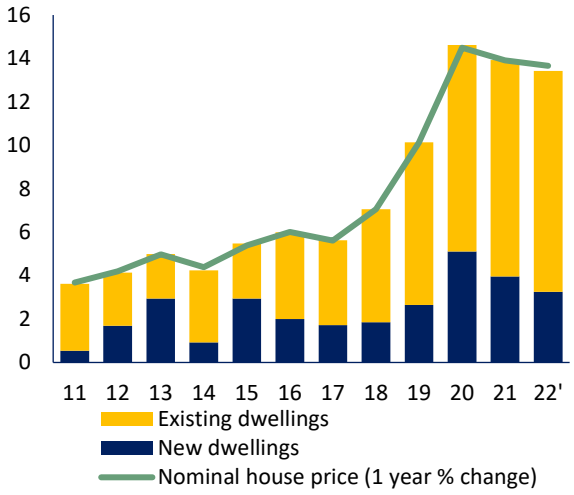
2) **House price, rent and income**



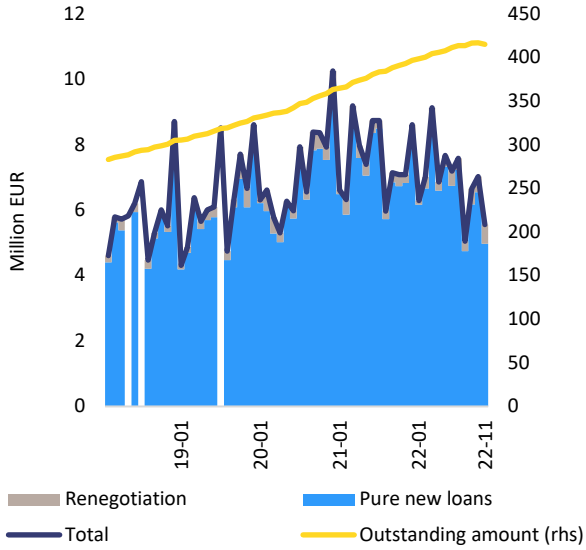
3) **Avg. interest rate for new hh. mortgage business**



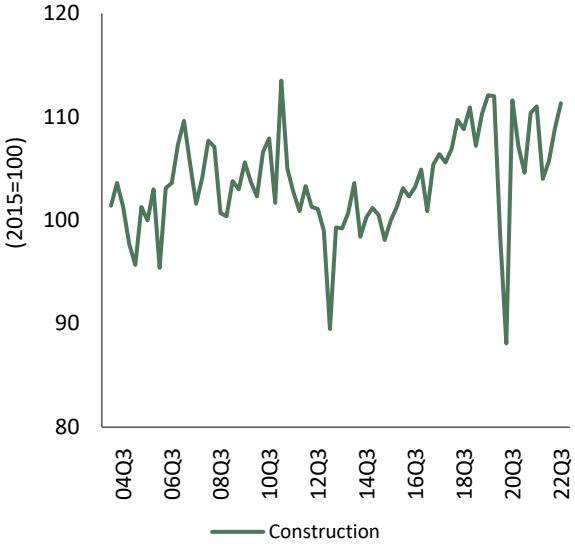
4) **Contribution to change in nominal house price (in %)**



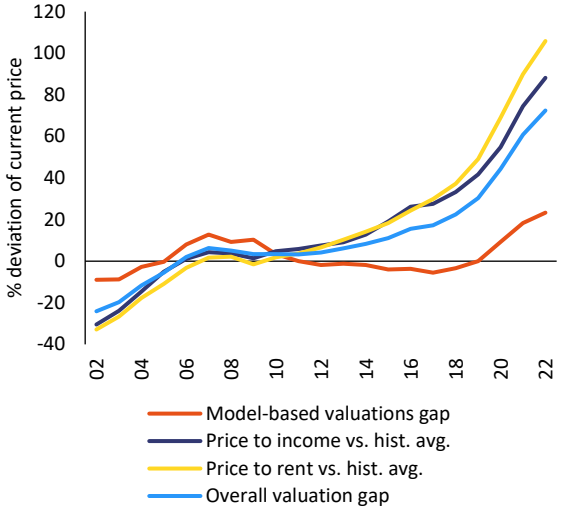
5) **House loans for house purchase**



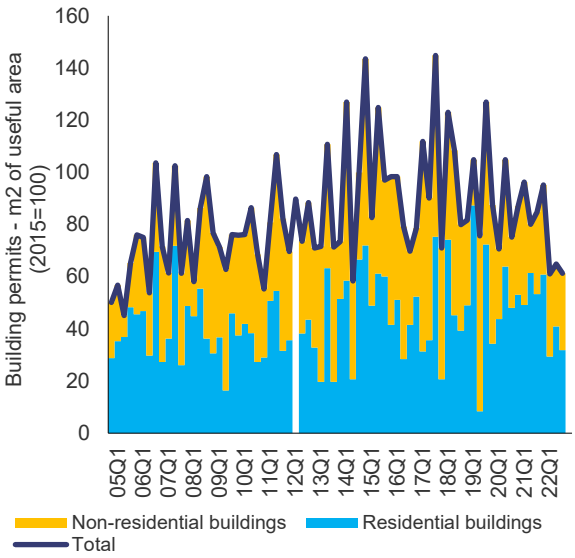
6) **Production in construction**



7) **House price overvaluation**



8) **Building permits**



Selected Housing indicators, Luxembourg			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	8.2	1.2	4.2	8.3	13.1	12.4	5.1	9.4	5.5	5.1	5.1
Nominal house price, yoy growth	%	(a)	10.9	3.1	5.6	10.1	14.5	13.9	12.3	12.1	10.3	11.7	11.1
Price to income in level (1)	years	(b)	9.0	10.2	11.8	13.8	15.1	17.0	18.6	15.6			
Rent price developments													
Nominal rent price index	2015=100	(a)	83.0	92.9	100.3	104.7	105.9	107.3	109.2	109.8	109.9	109.9	110.1
Nominal rent price, yoy growth	%	(a)	2.1	2.1	1.3	1.3	1.1	1.4	1.7	5.9	6.2	6.7	6.9
Valuation gaps													
Price to income gap (2)	%	(c)	-7.6	4.7	21.3	41.7	54.8	74.5	88.2	78.1	81.5	84.2	86.7
Price to rent gap (2)	%	(c)	-11.3	2.6	22.4	49.2	68.9	89.8	105.8	93.5	97.6	101.3	104.5
Model valuation gap (3)	%	(c)	1.8	4.2	-3.3	0.0	9.2	18.3	23.3	19.6	22.4	21.7	24.2
Average house price gap (4)	%	(c)	-5.7	3.8	13.5	30.3	44.3	60.9	72.4	63.8	67.2	69.1	71.8
Housing credit													
Bank mortgages (% GDP)	%	(d)	32.8	40.6	46.1	53.0	56.1	54.8	53.7				
Bank mortgages, yoy growth	%	(d)	15.4	7.5	7.4	8.5	9.9	9.1	5.1				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	3.1	3.2	3.7	4.0	3.8	3.3	3.3				
Residential construction - dwellings, yoy growth	%	(e)	24.4	-3.3	8.0	4.9	-2.9	-11.2	1.0				
Non-residential construction (% GDP)	%	(e)	8.9	7.9	6.4	6.5	6.0	6.5	6.6				
Value added in the construction sector, yoy growth	%	(e)	16.1	-0.5	2.2	12.9	-9.1	3.2					
Building permits index	2015=100	(a)	104.3	99.3	119.7	134.8	127.4	152.6		146.8	108.2	94.0	137.1
Building permits, yoy growth	%	(a)	11.4	-1.7	8.0	-1.8	-5.5	19.8		10.6	-44.8	-23.4	-5.3
Number of transactions, yoy change	%	(f)	10.5	0.3	5.7								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	43.2	40.9	43.1	41.8	42.6	45.9					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

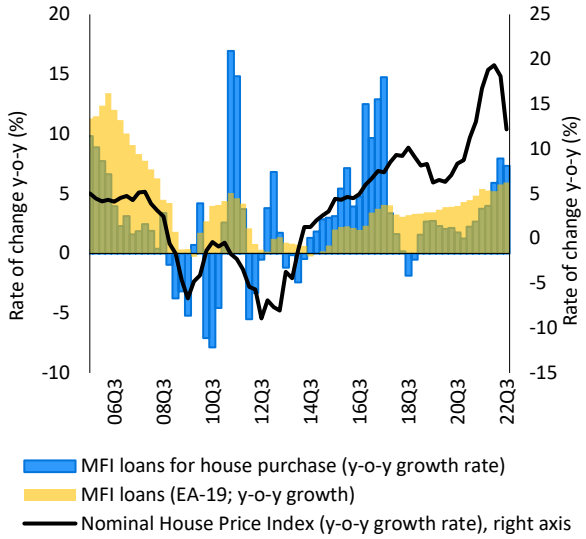
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

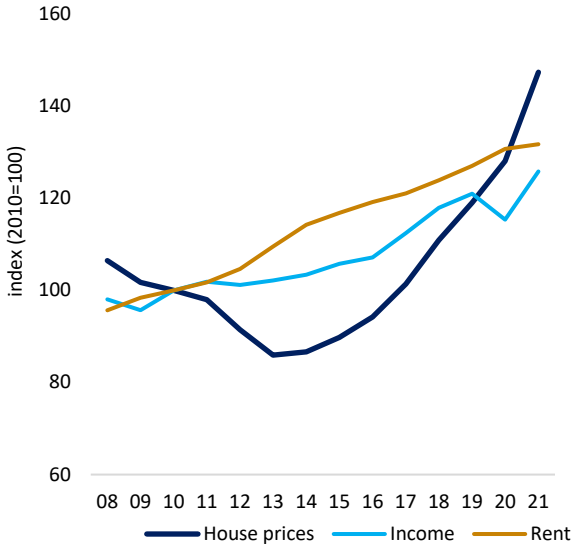
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

8. NETHERLANDS

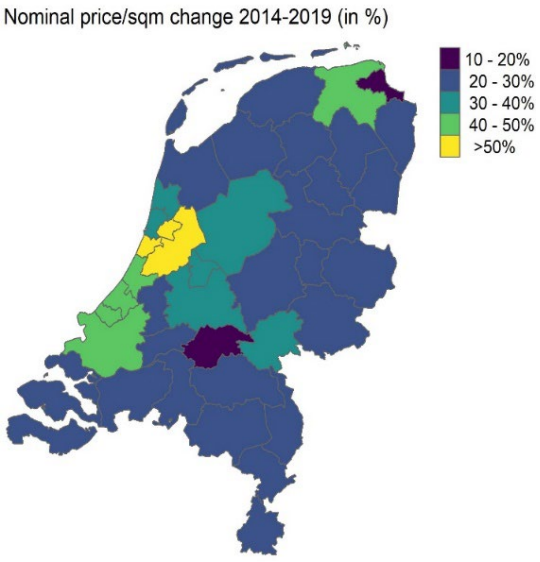
1) **Mortgage and house price growth**



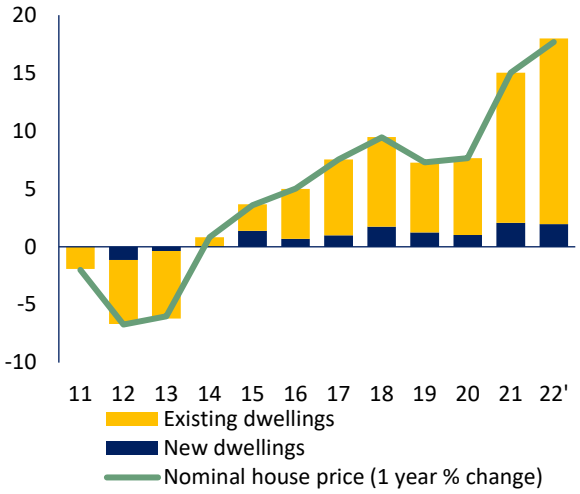
2) **House price, rent and income**



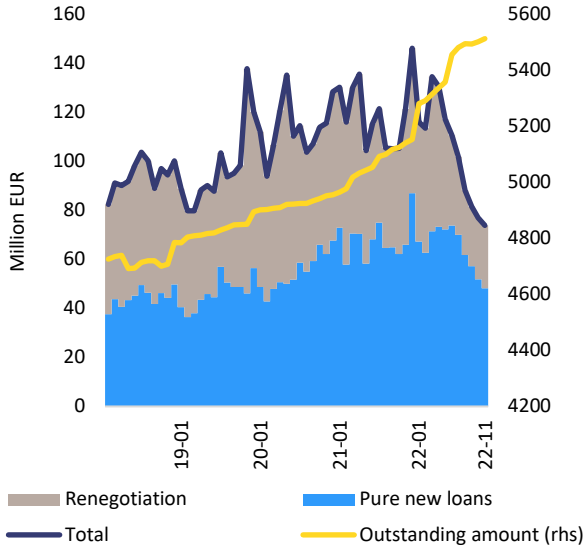
3) **Nominal price/sqm 2014-2019 (change in %)**



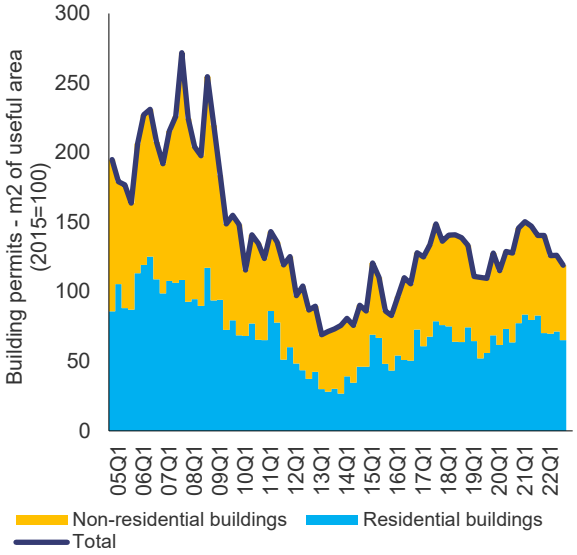
4) **Contribution to change in nominal house price (in %)**



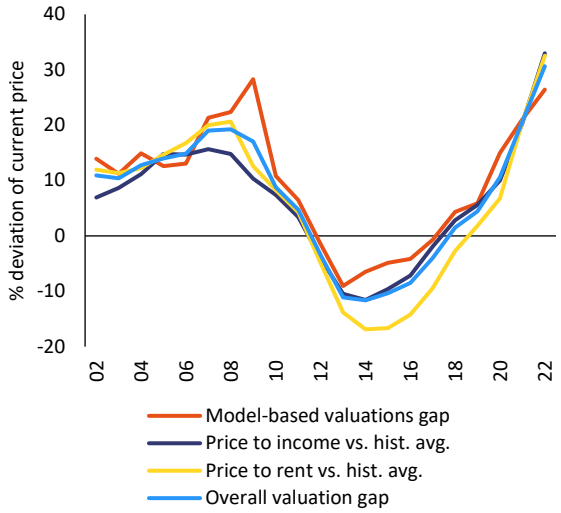
5) **House loans for house purchase**



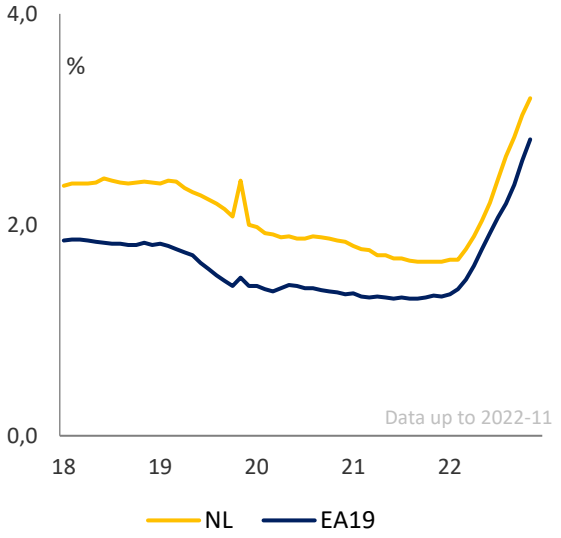
6) **Building permits**



7) **House price overvaluation**



8) **Avg. interest rate for new hh. mortgage business**



Selected Housing indicators, Netherlands			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	2.0	-3.6	2.2	4.6	6.2	11.2	7.0	13.5	13.3	11.2	3.1
Nominal house price, yoy growth	%	(a)	4.1	-2.5	3.4	7.3	7.6	15.0	14.5	18.8	19.3	18.1	12.2
Price to income in level (1)	years	(b)	10.7	10.1	8.9	10.0	10.4	11.4	12.7	12.1			
Rent price developments													
Nominal rent price index	2015=100	(a)	77.1	85.7	100.2	108.6	111.5	113.6	115.7	117.4	117.4	117.4	117.4
Nominal rent price, yoy growth	%	(a)	2.6	2.0	2.9	2.4	2.7	1.8	1.9	9.5	9.5	12.0	12.0
Valuation gaps													
Price to income gap (2)	%	(c)	13.0	6.4	-6.3	5.6	10.0	20.3	33.0	24.4	31.2	34.4	33.6
Price to rent gap (2)	%	(c)	15.0	8.2	-12.3	1.9	6.7	20.6	32.5	25.4	30.9	34.8	31.6
Model valuation gap (3)	%	(c)	14.6	13.3	-3.5	5.9	14.9	21.0	26.4	24.0	26.6	27.7	25.8
Average house price gap (4)	%	(c)	14.2	9.3	-7.4	4.5	10.6	20.7	30.6	24.6	29.6	32.3	30.3
Housing credit													
Bank mortgages (% GDP)	%	(d)	62.0	58.0	61.6	60.2	62.2	60.2	59.4				
Bank mortgages, yoy growth	%	(d)	5.8	0.5	3.7	2.3	1.2	4.0	6.9				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	5.9	4.9	3.8	5.1	5.4	5.5	5.6				
Residential construction - dwellings, yoy growth	%	(e)	6.6	-9.3	9.6	3.4	-0.6	3.3	3.0				
Non-residential construction (% GDP)	%	(e)	5.6	5.9	5.3	5.6	5.9	5.8	5.8				
Value added in the construction sector, yoy growth	%	(e)	7.0	-3.9	4.2	5.6	-1.2	2.1					
Building permits index	2015=100	(a)	156.5	118.2	95.2	104.5	120.8	136.4		150.2	127.0	114.7	107.8
Building permits, yoy growth	%	(a)	5.8	-14.9	13.7	-17.1	15.6	12.9		4.9	-7.4	-23.5	-0.6
Number of transactions, yoy change	%	(f)	3.1	-9.6	17.5								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	56.4	59.6	60.3	60.4	60.7	60.4					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

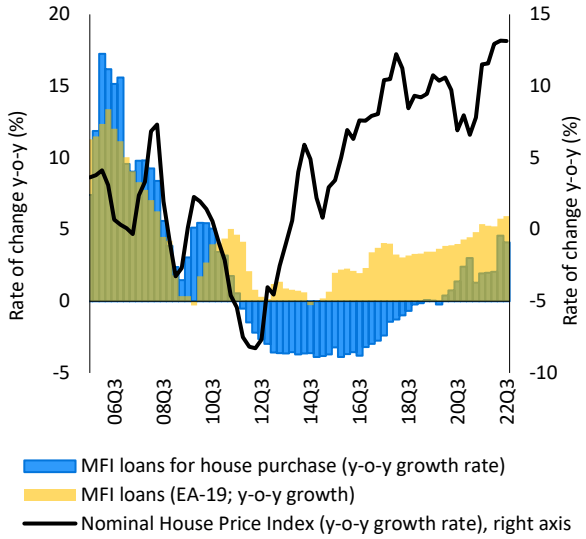
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

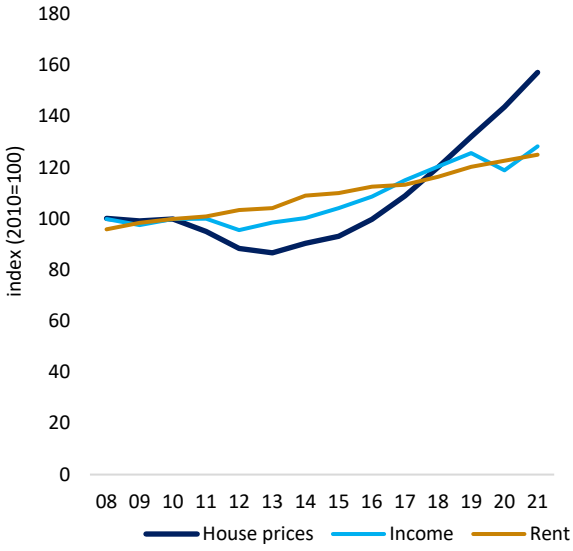
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

9. PORTUGAL

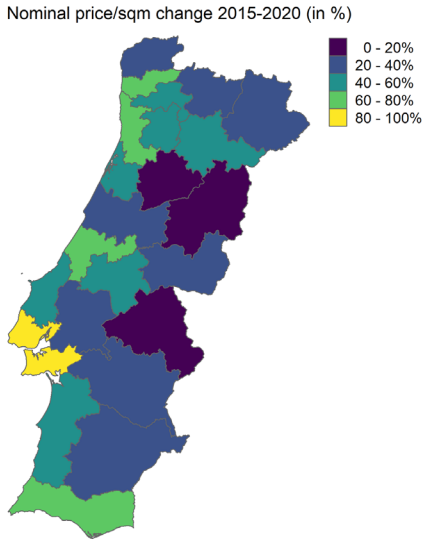
1) **Mortgage and house price growth**



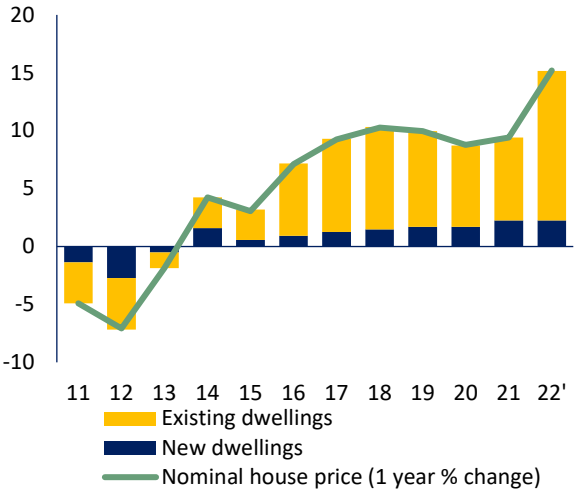
2) **House price, rent and income**



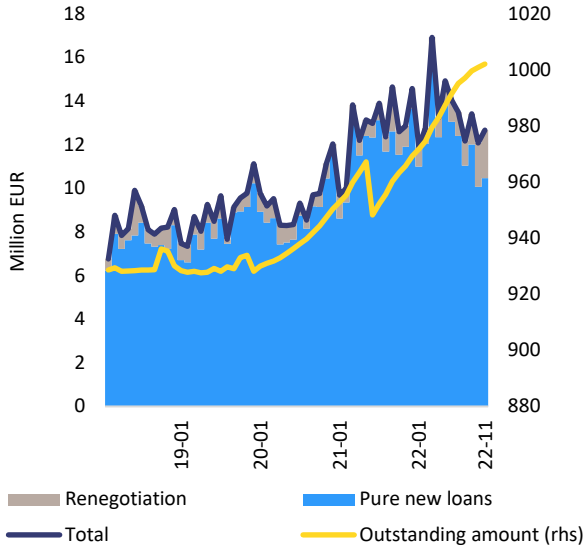
3) **Nominal price/sqm 2014-2019 (change in %)**



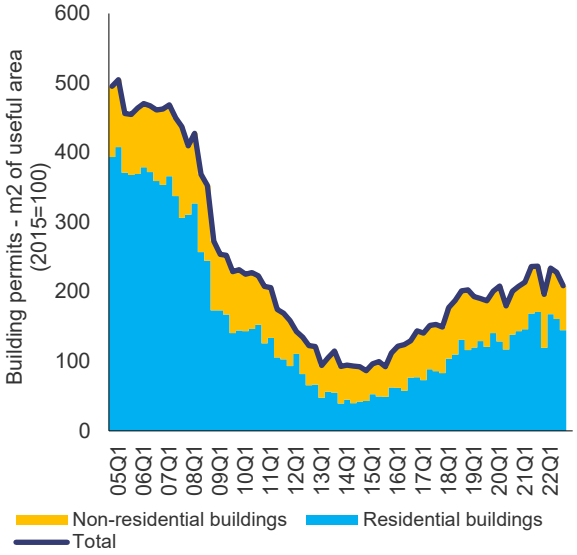
4) **Contribution to change in nominal house price (in %)**



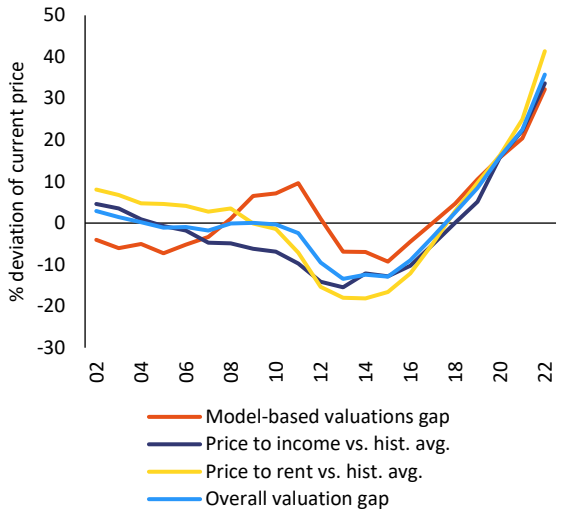
5) **House loans for house purchase**



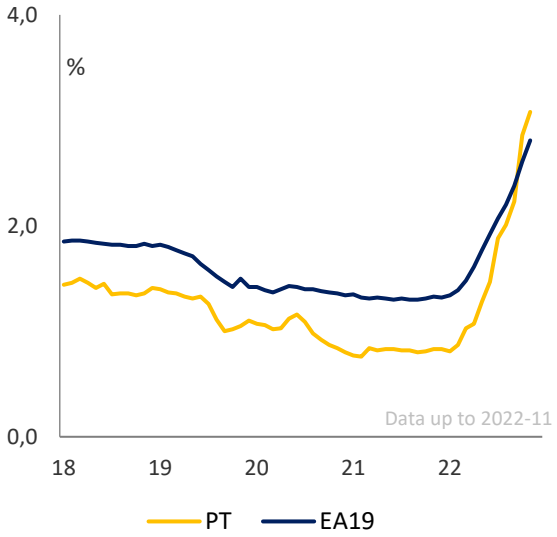
6) **Building permits**



7) **House price overvaluation**



8) **Avg. interest rate for new hh. mortgage business**



Selected Housing indicators, Portugal			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	-1.8	-2.9	4.3	9.0	8.1	7.9	11.1	8.8	9.0	7.2	6.4
Nominal house price, yoy growth	%	(a)	1.5	-1.7	5.3	10.0	8.8	9.4	17.8	11.6	12.9	13.2	13.1
Price to income in level (1)	years	(b)	7.1	6.6	6.5	7.5	8.3	8.8	9.6	8.2			
Rent price developments													
Nominal rent price index	2015=100	(a)	80.0	90.4	100.5	108.0	110.8	112.8	115.8	116.6	117.0	117.3	117.6
Nominal rent price, yoy growth	%	(a)	2.5	2.1	1.9	3.2	2.6	1.8	2.7	11.0	11.7	12.2	12.7
Valuation gaps													
Price to income gap (2)	%	(c)	-0.6	-8.4	-9.3	5.2	15.8	22.2	33.6	24.0	25.9	27.4	29.1
Price to rent gap (2)	%	(c)	4.6	-4.1	-11.1	9.7	16.3	25.0	41.4	27.4	31.4	34.5	37.3
Model valuation gap (3)	%	(c)	-5.4	5.1	-3.8	10.5	15.8	20.4	32.2	22.1	25.6	26.2	28.8
Average house price gap (4)	%	(c)	-0.4	-2.5	-8.1	8.4	16.0	22.5	35.7	24.5	27.6	29.4	31.7
Housing credit													
Bank mortgages (% GDP)	%	(d)	50.9	62.7	53.1	43.3	47.4	45.2	42.4				
Bank mortgages, yoy growth	%	(d)	11.0	1.8	-2.7	-0.2	2.4	2.0	3.5				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	5.8	3.7	2.7	3.2	3.4	3.8	4.0				
Residential construction - dwellings, yoy growth	%	(e)	-5.1	-11.4	1.3	1.4	-6.9	12.2	3.2				
Non-residential construction (% GDP)	%	(e)	8.3	7.6	5.3	6.2	7.0	7.2	7.5				
Value added in the construction sector, yoy growth	%	(e)	-0.3	-8.7	-0.7	5.0	0.0	4.6					
Building permits index	2015=100	(a)	861.1	296.0	136.8	281.2	291.1	316.6		288.2	369.8	356.7	322.7
Building permits, yoy growth	%	(a)	-7.1	-28.7	14.3	15.5	3.5	8.8		-6.0	16.4	6.8	-1.1
Number of transactions, yoy change	%	(f)		-12.8	15.3								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	27.4	32.1	36.2	36.2	38.9	37.5					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

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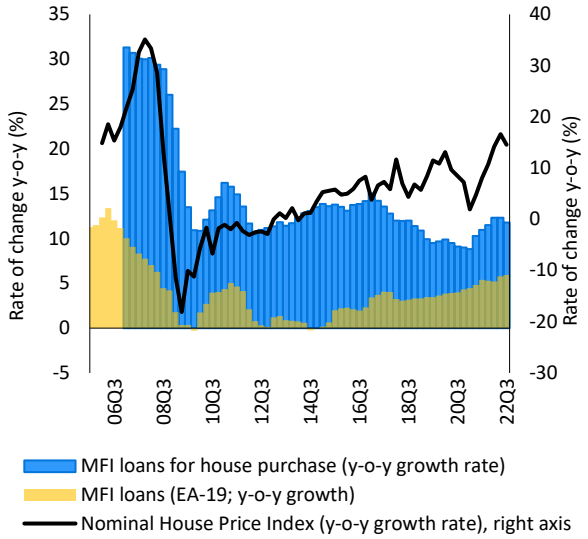
(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

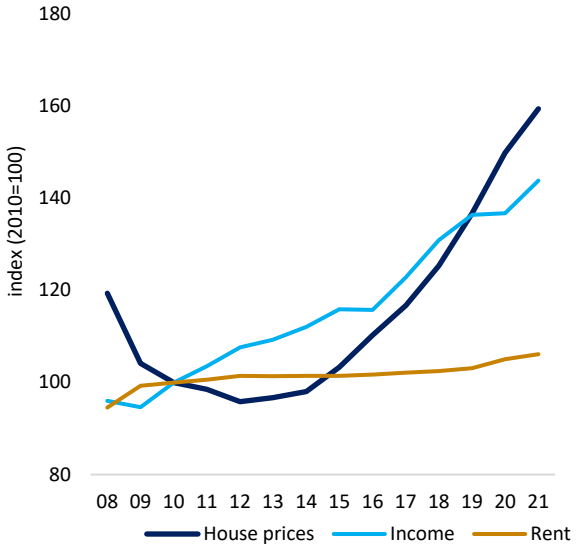
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco (e) Ameco (f) ECB.

10. SLOVAKIA

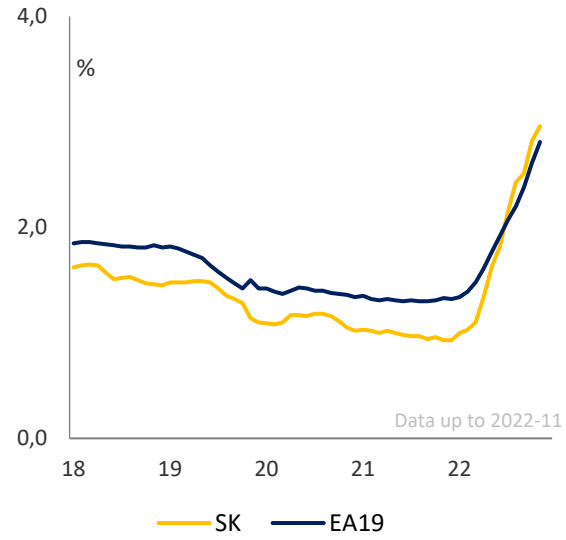
1) **Mortgage and house price growth**



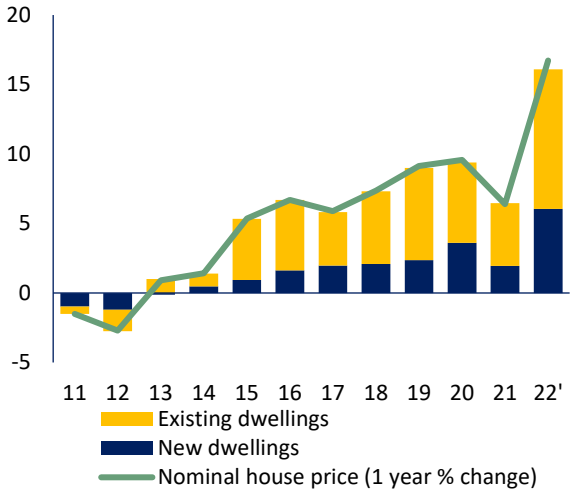
2) **House price, rent and income**



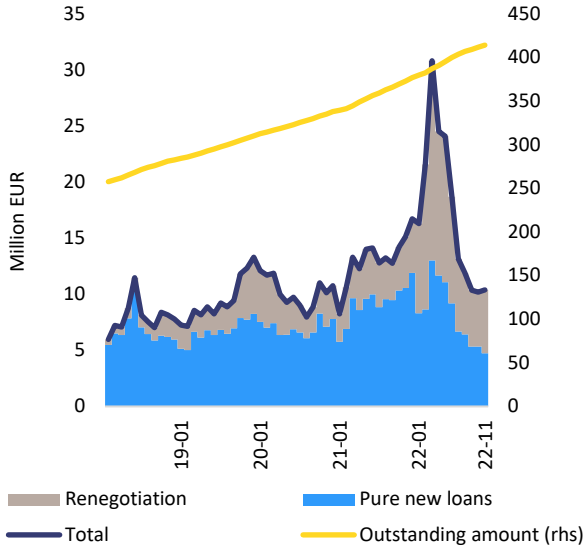
3) **Avg. interest rate for new hh. mortgage business**



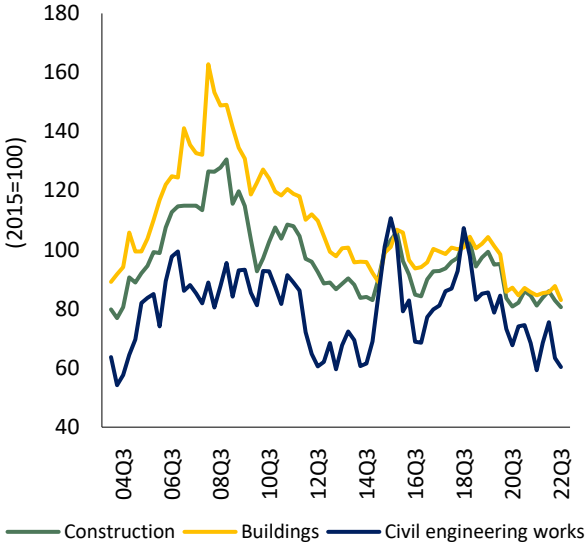
4) **Contribution to change in nominal house price (in %)**



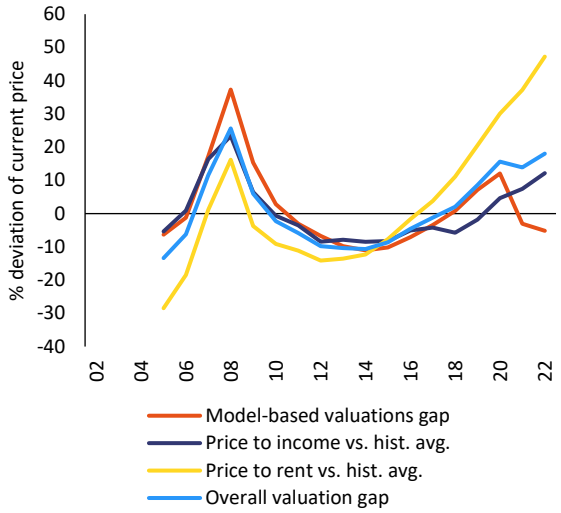
5) **House loans for house purchase**



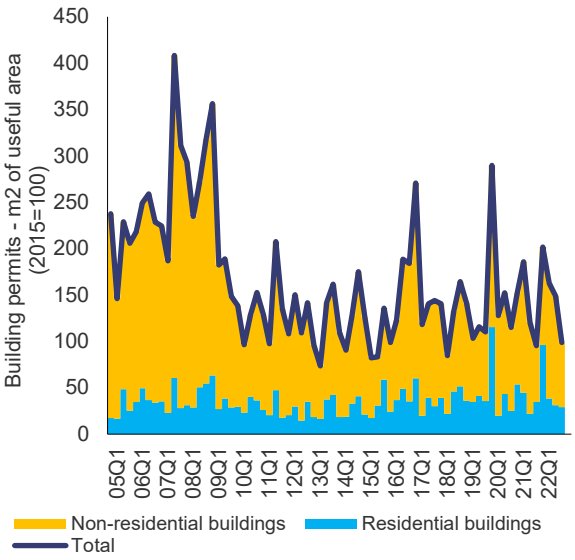
6) **Production in construction**



7) **House price overvaluation**



8) **Building permits**



Selected Housing indicators, Slovakia			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	18.5	-3.2	3.8	6.2	7.2	3.0	1.8	4.7	2.8	3.3	1.6
Nominal house price, yoy growth	%	(a)	22.8	-0.6	4.6	9.1	9.6	6.4	14.6	10.7	14.2	16.6	14.6
Price to income in level (1)	years	(b)	8.7	8.7	7.9	8.3	8.8	9.0	9.5	8.8			
Rent price developments													
Nominal rent price index	2015=100	(a)	80.5	97.2	100.3	101.4	103.0	103.9	108.2	110.4	110.7	110.3	110.9
Nominal rent price, yoy growth	%	(a)	13.3	2.2	0.2	0.6	1.5	0.9	4.1	9.5	9.8	9.4	10.0
Valuation gaps													
Price to income gap (2)	%	(c)	4.0	3.5	-6.6	-1.8	4.7	7.5	12.2	10.8	10.3	13.4	13.2
Price to rent gap (2)	%	(c)	-15.2	-4.4	-3.4	20.6	30.1	37.2	47.2	40.5	42.8	46.8	48.7
Model valuation gap (3)	%	(c)	3.3	9.1	-6.8	7.2	12.0	-3.1	-5.2	-3.4	-7.8	-5.4	-3.8
Average house price gap (4)	%	(c)	-2.7	2.7	-5.6	8.6	15.6	13.9	18.1	16.0	15.1	18.3	19.4
Housing credit													
Bank mortgages (% GDP)	%	(d)	11.7	15.8	26.2	32.8	36.2	38.2	38.5				
Bank mortgages, yoy growth	%	(d)	30.0	15.3	12.8	9.7	9.0	11.5	10.4				
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	3.1	2.9	3.0	3.3	3.8	3.9	4.1				
Residential construction - dwellings, yoy growth	%	(e)	64.0	2.9	4.8	2.9	9.9	2.0	2.0				
Non-residential construction (% GDP)	%	(e)	8.4	7.2	6.1	5.4	5.6	4.9	5.2				
Value added in the construction sector, yoy growth	%	(e)	14.6	4.5	0.2	-16.6	-7.2	-7.3					
Building permits index	2015=100	(a)	85.5	92.7	98.6	115.5	108.0	129.9		161.1	92.8	135.3	104.5
Building permits, yoy growth	%	(a)	17.3	-2.1	10.5	-0.9	-6.5	20.3		47.3	0.7	0.8	-20.8
Number of transactions, yoy change	%	(f)											
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	4.1	7.8	13.1	20.6	23.3						

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

(1) Price to income in level is the number of years of income necessary to buy an assumed 100m2 dwelling. See Bricongne, J-C., A. Turrini, and P. Pontuch, 2019, "Assessing House Prices: Insights from HouseLev, a Dataset of Price Level Estimates", European Economy Discussion Paper, No. 101, available in "https://ec.europa.eu/info/publications/assessing-house-prices-insights-houselev-dataset-price-level-estimates_en".

(2) Price to income and price to rent gaps are measured in deviation to the long-term average (from 1995 to the latest available year).

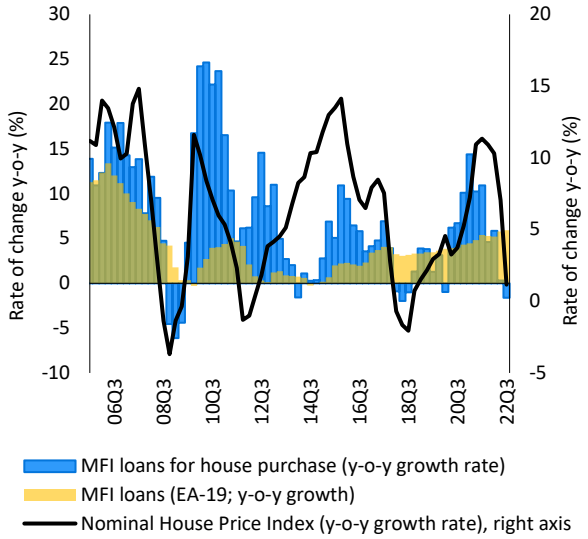
(3) The model valuation gap is estimated in a cointegration framework with nominal house prices as the dependent variable and five fundamental explanatory variables: total population, real housing stock, real disposable income per capita, real long-term interest rate and price deflator of final consumption expenditure. See Philiponnet and Turrini (2017): "Assessing House Price Developments in the EU", European Economy Discussion Paper, No. 048, available in "https://ec.europa.eu/info/publications/economy-finance/assessing-house-price-developments-eu_en" and revision notes presented to LIME in October 2019 and June 2020.

(4) The average house price gap is the simple average of the price-to-income, price-to-rent and model valuation gaps.

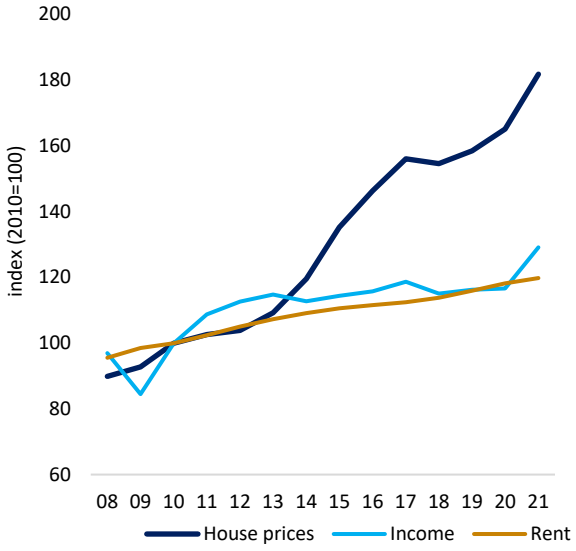
Sources: (a) Eurostat, (b) Eurostat, OECD, ECB, BIS, Ameco, national sources, European Commission calculations, (c) European Commission calculations, (d) ECB, Ameco € Ameco (f) ECB.

11. SWEDEN

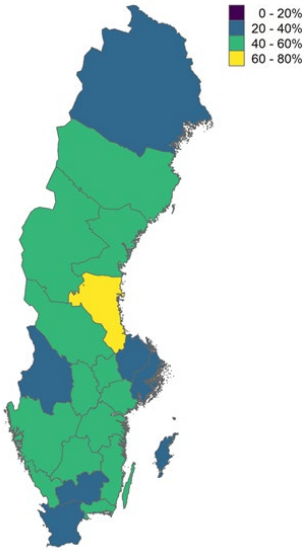
1) **Mortgage and house price growth**



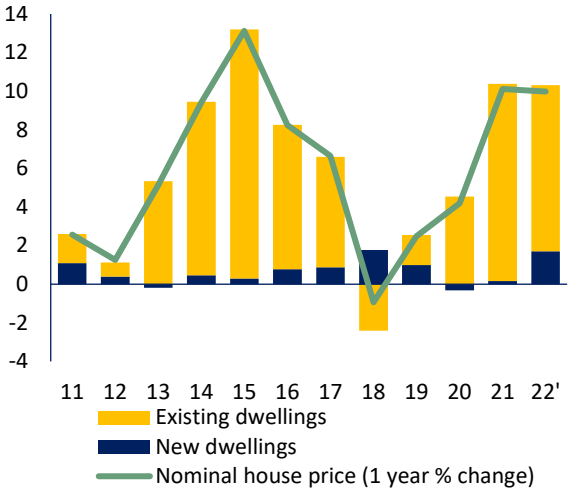
2) **House price, rent and income**



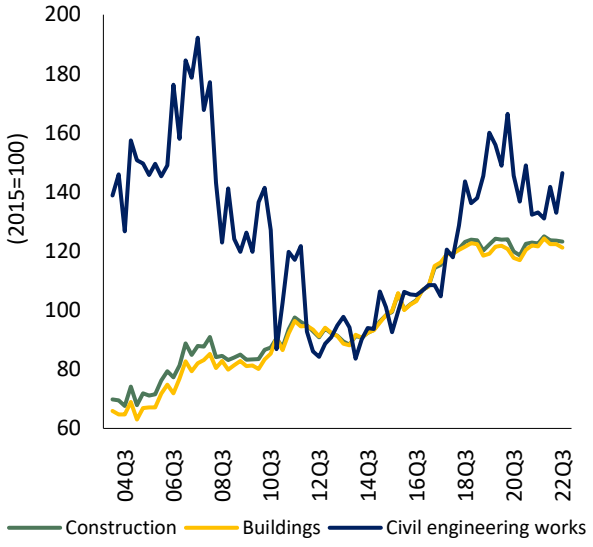
3) **Yrs income/100sqm 2014-2019 (change)**



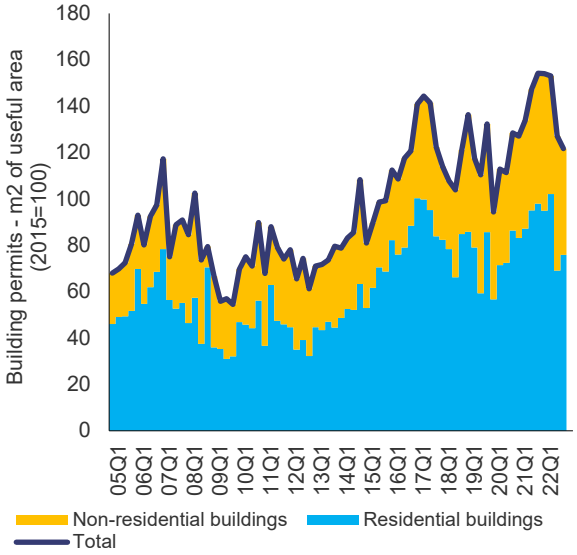
4) **Contribution to change in nominal house price (in %)**



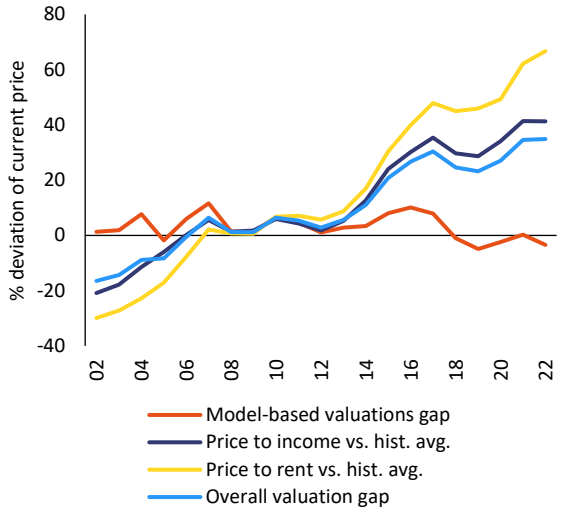
5) **Production in construction**



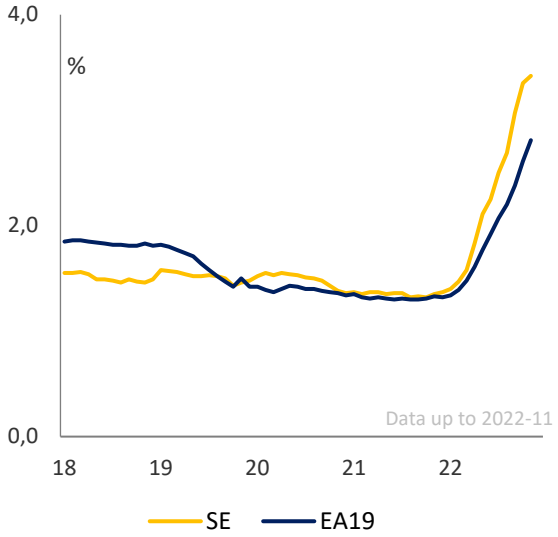
6) **Building permits**



7) **House price overvaluation**



8) **Avg. interest rate for new hh. mortgage business**



Selected Housing indicators, Sweden			2003-07	2008-12	2013-18	2019	2020	2021	2022'	21Q4	22Q1	22Q2	22Q3
House price developments	Unit	Source											
Real house price, yoy growth	%	(a)	9.0	1.6	5.6	0.4	3.3	8.1	-2.5	7.8	6.0	0.9	-6.6
Nominal house price, yoy growth	%	(a)	10.1	3.2	6.9	2.5	4.2	10.1	5.6	10.9	10.3	7.1	1.1
Price to income in level (1)	years	(b)	7.8	8.5	10.1	10.6	11.1	11.7	11.6	12.1			
Rent price developments													
Nominal rent price index	2015=100	(a)	81.2	90.5	100.1	104.7	106.6	108.2	110.1	110.4	110.4	110.4	110.4
Nominal rent price, yoy growth	%	(a)	2.1	2.4	1.4	1.8	1.8	1.4	1.8	7.1	7.1	7.2	7.3
Valuation gaps													
Price to income gap (2)	%	(c)	-5.9	3.0	22.9	28.6	34.1	41.4	41.3	43.1	44.0	42.7	36.8
Price to rent gap (2)	%	(c)	-14.6	4.2	31.5	46.0	49.3	62.1	66.7	65.0	67.9	67.5	62.1
Model valuation gap (3)	%	(c)	5.1	3.0	5.2	-4.9	-2.4	0.3	-3.4	1.5	2.9	-0.9	-7.0
Average house price gap (4)	%	(c)	-5.1	3.4	19.9	23.2	27.0	34.6	34.9	36.6	38.3	36.5	30.7
Housing credit													
Bank mortgages (% GDP)	%	(d)	40.2	55.7	63.8	69.1	75.5	70.7					
Bank mortgages, yoy growth	%	(d)	13.6	10.1	3.7	3.1	10.1	4.6					
Housing supply													
Residential construction - dwellings (% GDP)	%	(e)	3.7	3.7	4.8	4.7	4.9	5.3	5.7				
Residential construction - dwellings, yoy growth	%	(e)	44.7	-4.6	8.1	-6.5	1.6	10.2	8.2				
Non-residential construction (% GDP)	%	(e)	4.8	5.4	5.4	6.1	6.2	5.6	5.6				
Value added in the construction sector, yoy growth	%	(e)	13.9	-0.7	2.9	-0.9	2.6	1.0					
Building permits index	2015=100	(a)	62.5	51.9	101.9	101.2	119.2	148.7		173.6	125.0	139.5	87.0
Building permits, yoy growth	%	(a)	15.8	-1.8	15.6	-10.8	17.8	24.7		38.4	0.6	-20.4	-28.4
Number of transactions, yoy change	%	(f)	4.8	-2.5	1.6								
Other housing market indicators													
Share of owner-occupiers, with mortgage or loan	%	(a)	54.0	57.9	55.6	51.4	52.1	51.7					

Notes: (') Forecast. The forecast of house prices is computed on the basis a housing valuation model shared with Member States in the context of the EPC LIME working group. The forecasts represent real house price percentage changes expected based on economic fundamentals (population, disposable income forecast, housing stock, long-term interest rate, and the price deflator of private final consumption expenditure), as well as the error correction term summarising the adjustment of prices towards their long-run relation with fundamentals. The source for the forecast of other variables is Ameco.

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