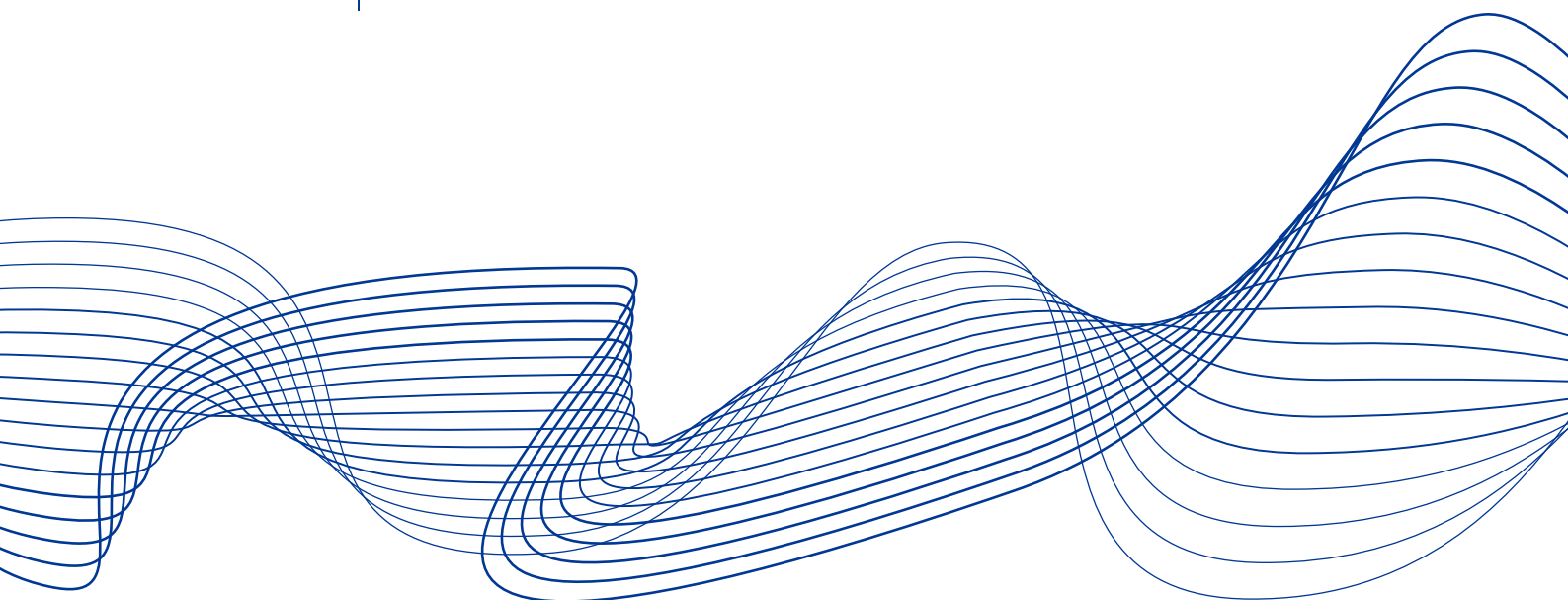


**Vulnerabilities
in the EU residential
real estate sector**

November 2016



ESRB
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European System of Financial Supervision

Contents

Executive summary	2
Section 1 Addressing vulnerabilities in residential real estate: a key task for macroprudential policymakers	12
1.1 The importance of residential real estate in the economy and for macroprudential policy	12
1.2 The nature and effects of financial crises relating to residential real estate	14
1.3 Analysing vulnerabilities in residential real estate: collateral, household and banking stretches	16
Section 2 Analysing vulnerabilities in residential real estate	21
2.1 Horizontal analysis of residential real estate vulnerabilities in EU countries	22
2.2 Vertical analysis of RRE vulnerabilities	41
Conclusions	141
List of tables and charts	143
Abbreviations	145
List of contributors	147
Annex A Overview of process and mandates	151
Annex B Methodology – Horizontal method	153
Annex C Additional key indicators for focus countries	158
Annex D Overview of assessments by third parties	161
Imprint	169



Executive summary

Developments in the residential real estate sector can have significant implications for financial stability and the real economy. Residential real estate (RRE) represents a major part of households' wealth and constitutes a major source of collateral for lenders. Moreover, mortgages often make up large parts of banks' balance sheets, and are the largest and most common form of debt among households. Furthermore, housing construction is typically an important component of the real economy, as a source of employment, investment and growth. Experiences show that systemic risk relating to RRE – stemming from excessive risk-taking, high leverage, misaligned incentives and boom/bust tendencies, etc. – may lead to significant risks to domestic financial stability and serious negative consequences for the real economy, as well as potentially leading to negative spillovers to other countries. Vulnerabilities in RRE may manifest themselves through direct effects – through losses of capital or funding among lenders – and indirect effects in terms of foregone economic output, which may have second-round effects on the financial system. The underlying sources of such vulnerabilities differ. However, they often emerge from domestic structural features, from social and economic policies (e.g. tax deductibility of mortgage interest payments), from cyclical developments, or combinations thereof.

Given the importance of RRE for financial and macroeconomic stability, analysing vulnerabilities in RRE markets is a key responsibility of macroprudential authorities. Taking a forward-looking approach and seeking to prevent the build-up of vulnerabilities is especially important.¹ Analysing vulnerabilities is also the task of the European Systemic Risk Board (ESRB), which is mandated to conduct macroprudential oversight of the financial system within the European Union (EU) in order to contribute to the prevention or mitigation of systemic risks.²

With this aim, the ESRB has analysed the vulnerabilities across EU countries relating to RRE.³ The ESRB has investigated whether there are vulnerabilities related to the RRE sector in EU countries that may be a direct or indirect source of systemic risk to financial stability, and may also have the potential for serious negative consequences for the real economy. The results of the vulnerability assessment of the EU RRE sector – which represents a continuation of previous work by the ESRB – are presented in this report.⁴

The analysis of vulnerabilities is based on a comprehensive approach. First, an indicator-based cross-country framework, developed jointly by the ESRB and the European Central Bank (ECB), was applied to identify a set of focus countries for further analysis. Next, a country-specific analysis of the focus countries was performed, taking account of factors relating to structural and

¹ From a cost-benefit perspective, it is likely that preventing the build-up of risk is less costly than addressing vulnerabilities that are already high.

² **Regulation (EU) No 1092/2010** of the European Parliament and of the Council of 24 November 2010 on European Union macro-prudential oversight of the financial system and establishing a European Systemic Risk Board (OJ L 331, 15.12.2010, p.1).

³ An ESRB task force was created to undertake this analysis. The task force consists of various teams with representation from the ESRB membership to ensure fair and consistent analysis. Participants in the task force are shown in the list of Participants, above. See Annex A for an overview of the teams including their mandates and main forms of interaction.

⁴ The previous work includes that of the ESRB Expert Group on Real Estate ("**Report on Residential Real Estate**", ESRB Expert Group on Real Estate, 2015 - hereafter "ESRB 2015"), the **ESRB Recommendation 2013/1 on intermediate objectives and instruments of macro-prudential policy (2013/C 170/01)** and the **ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector** (2014).



institutional features and policy measures. Building on previous work by the ESRB, vulnerabilities were identified and separated into three “stretches” – collateral, household and banking – where collateral stretch captures the price levels and dynamics in RRE markets, household stretch captures the implications of household borrowers’ debt for their consumption and other behaviour, and banking stretch captures the potential impact of RRE developments on lenders.

The horizontal analysis revealed vulnerabilities stemming from developments in the RRE sector in a number of EU Member States. The ESRB identified a group of eleven countries where vulnerabilities have risen to an extent that they required further investigation from a systemic perspective. These countries comprise: Austria, Belgium, Denmark, Estonia, Finland, Luxembourg, Malta, the Netherlands, Slovakia, Sweden and the United Kingdom. These countries (hereafter referred to as the “focus countries”) were subject to a second stage of in-depth, country-specific analysis of vulnerabilities and policy measures. Overall, the findings of the country-specific analysis were the following (also summarised in Table E.1):

- **Austria:** vulnerabilities for Austria are related to the robust growth, particularly recently, in RRE prices and mortgage credit and the risk of a further loosening in lending standards. RRE prices in Austria have been increasing rapidly, particularly since 2011. Also, prices appear to be above levels in line with fundamentals in Vienna, but are broadly in line with fundamentals in the rest of Austria. More recently, the strong house price dynamics have coincided with robust mortgage credit growth. First indications from an Oesterreichische Nationalbank (OeNB) survey on lending standards show that standards may be weakening somewhat; in particular, there are groups of households with new loans that have high debt-to-income (DTI) and loan-to-value (LTV) ratios.⁵ Austria currently lacks borrower-based macroprudential legal tools, although steps have been taken to make these instruments available and soft measures (communication of expectations) have recently been used. While the policy measures that have been taken by the Austrian authorities are appropriate given the nature of RRE vulnerabilities in Austria, they may not be sufficient to fully address the robustly growing RRE prices and mortgage credit, signs of weakening lending standards and groups of households with elevated debt levels.
- **Belgium:** the main RRE-related vulnerability in Belgium concerns the fast increase in overall household indebtedness combined with groups of already highly indebted households, against the background of a significant increase in RRE prices over the past few years. Together with the low risk weights applied to mortgage lending by some banks, this suggests that vulnerabilities are present in Belgium for the collateral, household and banking stretches. Belgium has experienced robust increases in lending for house purchases and presents non-negligible loan segments characterised by high LTV and debt service-to-income (DSTI) ratios which are more vulnerable to adverse economic shocks. RRE prices are increasing and are now close to their pre-crisis level, presenting signs of overvaluation compared with fundamentals. While vulnerabilities related to the banking stretch have been addressed through the imposition of a macroprudential risk weight add-on of 5 percentage points (p.p.) on the domestic mortgage loan exposures of banks using the internal ratings-based (IRB) approach, measures that explicitly address risks related to the groups of highly indebted

⁵ There are a number of caveats in the OeNB survey; hence the results should be interpreted with care: (1) it covers only a relatively small market share (about 20-25% of housing loans collateralised by residential real estate); (2) its sample size changes over time; and (3) the variance in the data between banks is quite large, also due to different methods of calculation between banks. For this reason the results must be interpreted with care.



households have not yet been introduced. Furthermore, the trend of tightening lending standards appears to have ended, which – given the very high credit growth – indicates that vulnerabilities could be building up. For these reasons, the policy stance for the collateral and household stretches is appropriate, but not expected to be sufficient.

- **Denmark:** the main vulnerabilities are considered to be the rapidly rising RRE prices – in particular in the major cities – in combination with highly indebted households. In addition, if risks were to materialise, there may be potential spillover effects on other countries in the Nordic-Baltic region. Households' debt levels are very high in relation both to income and GDP, and particularly for some households. At the same time, RRE prices are increasing, driven by fast increases in major cities where they are approaching pre-crisis levels. Overall, credit growth has not been very rapid, but mortgage credit institutions are increasing lending in the major cities. Credit standards are tightening, but the high stock of household debt is not expected to significantly decline within an appropriate time horizon given that it is not directly addressed by the policy stance. There is a risk that the rapidly increasing RRE prices will lead to a further increase in household indebtedness. For these reasons, the policies in place are assessed as appropriate, but may not be sufficient to address the vulnerabilities in the collateral and household stretches. This assessment reflects the fact that some of the measures have only been in effect for a limited period of time and are entering into force gradually, while some of them only apply to new borrowers.⁶
- **Estonia:** vulnerabilities related to residential real estate in Estonia are concentrated in the collateral stretch. RRE prices had been rising quickly since 2009 and are close to their pre-crisis peak levels. However, the price growth has been driven mainly by income (which outpaced productivity growth) rather than by credit, and RRE prices have stabilised somewhat in the past year. Furthermore, different valuation methods suggest that, on average, RRE prices are in line with fundamentals for the moment. Risks and vulnerabilities in the household and banking stretches appear more contained, owing to relatively low indebtedness of the household sector, moderate growth in RRE lending and high capital adequacy of the banking sector. The Estonian authorities have implemented a combination of precautionary policy measures to prevent RRE lending standards from loosening from their current level and to increase the resilience of the banking sector. The policy measures are appropriate and expected to be sufficient given the current level of and trend in vulnerabilities.
- **Finland:** in Finland, the main vulnerabilities are considered to be the high and increasing household indebtedness, especially among some groups of households. In addition, if risks were to materialise, there may be potential spillover effects on other countries in the Nordic-Baltic region. DTI and household debt-to-GDP ratios are at their historical peaks and relatively high by European comparison. The groups of highly indebted households are a source of concern. The debt is concentrated in certain households: 10% of households – accounting for almost half of the total household debt – have DTI ratios above 300%, and a significant proportion of these have DTIs above 400%. RRE price indicators suggest that prices relative to income and rents are close to their long-term averages; however, given the weak economic outlook, the likelihood of a manifestation of risks in the market over the short-to-medium term

⁶ The LTV limit only affects new loans, while the “supervisory diamond” and the seven best practices for lending are a mix of flow and stock measures. The change in interest deductibility will not be fully phased in before 2020 and the supervisory diamond will not be fully implemented before 2020.



is elevated. The Finnish banking sector is highly concentrated, with large exposures to RRE; it is also strongly connected to the banking systems in other Nordic-Baltic countries where there are also RRE-related risks to financial stability. The Finnish authorities have applied several banking capital measures and an LTV limit was set through a legislative amendment in July 2016; however, the macroprudential authority currently lacks powers to implement certain measures such as LTI, DTI and DSTI ratio limits. For these reasons, the policy stance is assessed as appropriate and expected to be sufficient with respect to the collateral and banking stretches; however, it may not be sufficient for the household stretch.

- **Luxembourg:** the main vulnerability is considered to be the combination of high RRE prices and increasing household indebtedness. The collateral stretch is driven by a steady increase in RRE prices in recent years, which has brought prices to an unprecedentedly high level. These price developments have been sustained by a structural imbalance between strong housing demand - fuelled, inter alia, by both demographic factors and policy incentives – and supply-side limitations in terms of the availability of housing. Vulnerabilities in the household stretch are signalled by rising levels of household mortgage debt relative to disposable income. On average, the LTV and DSTI ratios in Luxembourg's mortgage market are robust and this is a mitigating factor. However, the distribution of the LTV and DSTI ratios for both new and existing mortgages suggests that there is a noticeable share of loans with high LTV and DSTI ratios, which could lead to negative direct and indirect effects on financial stability in the event of economic or financial shocks. Moreover, mortgages in Luxembourg predominantly have variable rates. Measures have been taken to address banking stretch and these are assessed as being sufficient. However, the policy stance for the collateral stretch is not appropriate and not sufficient since no measures have been taken in this area. Also, for household stretch, while the measure that has been taken is appropriate, it is not expected to be sufficient given the nature of the vulnerabilities.
- **Malta:** the main vulnerabilities associated with the RRE market in Malta relate to the household and collateral stretches. Growth of household debt is rapid and mainly driven by an increase in mortgage debt. Malta has a relatively high debt level and debt service burden compared with other countries. At the same time, RRE prices have increased noticeably in recent years and now exceed their highest levels reached before the 2007-08 financial crisis. While some vulnerabilities relating to household and collateral stretches have been identified in Malta, these are mitigated by several factors and are assessed not to present systemic risks at present. Furthermore, there are no impediments in national law hindering a rapid deployment of borrower-based measures should vulnerabilities increase. It is important that the Maltese authorities continue to monitor developments and analyse more granular data on the distribution of household indebtedness.
- **The Netherlands:** the main vulnerabilities are considered to be the persistently high household debt levels combined with low mortgage collateralisation. In particular, there is a large group of households, especially younger mortgagors, which have debt levels that exceed the value of their home (one-quarter of homeowners and around 50% of first-time buyers). While most of the risk indicators have moved in the right direction in recent years, aggregate data show that the Dutch DTI, debt-to-GDP and LTV ratios are still among the highest in Europe, but credit growth is currently not very rapid. Moreover, RRE prices are increasing and are approaching previous peak levels. The measures that have been introduced are being tightened at a slow pace over a long time horizon, which may not be fully sufficient given the current level of risks. Thus the current policy stance is assessed as appropriate, but is not expected to be sufficient in addressing vulnerabilities in the household and collateral stretches. While the policy measures taken for the Netherlands are appropriate



given the nature of RRE vulnerabilities, they may not be sufficient to fully address household and collateral stretch vulnerabilities since most measures are only being gradually phased in and their calibration will not be very constraining even after full implementation.

- **Slovakia:** the main vulnerabilities in the Slovakian RRE market are related to the collateral and household stretches. In particular, rapid credit growth (albeit from low levels) may signal rising vulnerabilities from the household stretch and could lead to a build-up of excessive household indebtedness in the future. In addition, RRE prices have been picking up since early 2015 which, in combination with the increasing debt, suggests increasing risks of collateral stretch. There had been signs of relaxing credit standards in recent years, although recently the share of new loans with high LTV ratios has been decreasing. Overall, given that the identified RRE-related vulnerabilities are assessed to be low although increasing, the proactive policy stance in Slovakia is assessed as being appropriate and is expected to be sufficient to curb a future build-up in vulnerabilities. The policy measures that have been taken by the Slovakian authorities have already had an impact in reducing vulnerabilities.
- **Sweden:** the main vulnerabilities are considered to be the increasing RRE prices that appear to be overvalued, and high and increasing indebtedness especially among some groups of households. In addition, if risks were to materialise, there may be potential spillover effects on other countries in the Nordic-Baltic region. High and rising debt-to-disposable income ratios and loans for house purchases indicate that vulnerabilities are building up in relation to household stretch. Also, the collateral stretch is highlighted by the prolonged and continuous increase in RRE prices – price growth has slowed down in the past six months, but Sweden remains one of the most overvalued countries in Europe in terms of RRE. While the current policy measures are appropriate given the nature of RRE vulnerabilities in Sweden, they may not be sufficient to fully address the household and collateral stretches. Given that the measures apply only to new housing loans, it will take time for the vulnerabilities related to the level of household indebtedness to substantially decrease. Tools that could directly address the high debt relative to income are not in place; this is related to the fact that the mandate of the Swedish macroprudential authority is unclear with respect to some measures. Furthermore, the high and overvalued RRE prices are not directly addressed by current policy measures.
- **The United Kingdom (UK):** there is currently a high degree of uncertainty about the medium-term outlook for the UK housing market, which may be at a turning point following the UK's referendum on European Union (EU) membership on 23 June 2016. Before the referendum, the main risks related to the interaction of a household stretch (due to household indebtedness) and a collateral stretch (as indicated by RRE prices that were rising from already elevated levels and decoupling from rent and income growth rates). After the referendum, the outlook for the UK economy and housing market has been revised down. If that forecast proves to be correct, it would slow the pace of build-up in mortgage debt and therefore reduce vulnerabilities in the medium term. But an economic slowdown could lead to the crystallisation of some risks – e.g. if unemployment rises and/or income growth falls, then some households may find it more difficult to service their debts. However, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise. The appropriateness and sufficiency of the policy stance in the UK has not been directly assessed given the high degree of uncertainty about the medium-term outlook for the UK housing market. The appropriate policy response will be scenario-dependent. Therefore, it will be important for the UK authorities to monitor developments closely and adjust macroprudential policy in light of



them. Looking ahead, it will be necessary to ensure that any adjustment in the housing market proceeds at an appropriate pace and that new vulnerabilities do not emerge.

Based on the final assessments for the focus countries, the ESRB has identified in eight countries certain medium-term vulnerabilities as a source of systemic risk to financial stability, which may have the potential for serious negative consequences for the real economy. These are: Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Sweden and the United Kingdom. On the basis of this analysis, on 22 September 2016 the ESRB General Board adopted eight warnings⁷ to these countries about medium-term vulnerabilities in their RRE sectors.

The remainder of the report is structured as follows:

- **Section 1** discusses the importance of RRE to the economy and for macroprudential policy as discussed in the literature;
- **Section 2.1** presents the EU-wide analysis which identified the set of focus countries;
- **Section 2.2** presents the approach to country-specific analysis and the assessments for the eleven focus countries; and
- Conclusions.

The analysis in this report reflects available data and known developments up to mid-September 2016.

Table E.1

Summary assessment and analysis: focus countries

Please find the table on the following four pages

*Appropriate policy measures are those assessed to be conceptually suitable given the nature and timing of risks; sufficient policy measures are ones that are expected to or can be shown to significantly mitigate, or reduce the build-up of, risks over an appropriate time horizon with a limited unintended impact on the general economy.

Notes: For an overview of the results and methodology for the horizontal risk analysis, see Section 2.1 and Annex B. For an overview of the policy assessment including definitions of the terms "appropriate" and "sufficient", see Section 2.2.1.

⁷ In order to contribute to the prevention or mitigation of systemic risks to financial stability in the European Union, the ESRB shall issue warnings when significant systemic risks are identified. (Regulation (EU) No 1092/2010, as above fn. 2). The eight warnings are available on the [ESRB website](#), they are numbered as follows: ESRB/2016/05 (Austria); ESRB/2016/06 (Belgium); ESRB/2016/07 (Denmark); ESRB/2016/08 (Finland); ESRB/2016/09 (Luxembourg); ESRB/2016/10 (the Netherlands); ESRB/2016/11 (Sweden); and ESRB/2016/12 (the United Kingdom).



Country	Key vulnerabilities	Stretches	Assessment: Appropriateness & Sufficiency of policies*	ESRB Warning issued?	Reasoning behind assessment
AT	<ul style="list-style-type: none"> Vulnerabilities for Austria are related to robust growth, particularly recently, in RRE prices and mortgage credit and the risk of a further loosening in lending standards. RRE prices are increasing rapidly, in particular since 2011. In Q1 2016, RRE prices increased by 8.9% (year-on-year) in Austria outside Vienna and by 6.5% in Vienna, and are now above the pre-crisis level in Austria. Overall, RRE prices in Austria are broadly in line with fundamentals, but have increased quickly relative to some fundamentals (e.g. the PTI ratio increased by 27% between Q1 2010 and Q1 2016). At the same time, RRE prices in Vienna appear to be above fundamentals (by 22.8% in Q1 2016) according to OeNB models. Housing credit is growing robustly (loans for house purchase grew by 5% in June 2016 over the year). At the same time, the first indications, which must be interpreted with care, of an OeNB survey indicate a decline in lending standards. The related data suggest that the sample average median DTI ratio among surveyed banks increased to 490% in Q4 2015 from around 400% in Q4 2014 for new mortgages, while the sample average median LTV ratio for new mortgages increased to 65% in Q4 2015 from 60% in Q4 2014. However, the share of the volume of new loans with LTV ratios above 90% increased between Q1 2013 – Q2 2014 and Q3 2014 – Q4 2015. Furthermore, 67% of the volume of new loans had a DTI ratio above 400% in Q4 2015. Given the available evidence, the DSTI ratio has been stable. The share of variable rate and foreign currency mortgages in the stock of loans is still significant despite declining. 	<ul style="list-style-type: none"> collateral household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance is appropriate but not expected to be sufficient for collateral and household stretches</p> <ul style="list-style-type: none"> While the policy measures that have been taken by the Austrian authorities are appropriate given the nature of RRE vulnerabilities in Austria, they may not be sufficient to fully address them. Despite the measures taken, RRE prices and mortgage credit are growing robustly, there are groups of households with elevated debt levels and there is some evidence of weakening lending standards. Even though soft measures have been taken and steps have been taken to make policy instruments legally available, there is a lack of borrower-based macroprudential tools in the law. These measures could effectively prevent an excessive build-up of vulnerabilities and systemic risk. The measures taken for the banking stretch seem sufficient to deal with RRE vulnerabilities relating directly to the banking system. However, given the developments in RRE prices and credit, the measures taken for the collateral and housing stretches may not be sufficient. Appropriate measures have been taken for all stretches.
BE	<ul style="list-style-type: none"> The main RRE-related vulnerability in Belgium is related to the fast increase in overall household indebtedness, combined with significant groups of already highly indebted households, against the background of a significant increase in RRE prices over the past few years. Lending for house purchases has been rapidly increasing, with an annual increase of 8.1% in June 2016 (5.3% when corrected for securitisation operations). At the same time, groups of households are highly indebted, with high DSTI ratios including for new loans (more than 20% of loans have a DSTI ratio at origination above 50% and almost 20% of new loans have a DSTI above 50%, and one-third of loans have LTV ratios above 90%). RRE prices have increased significantly over the past 30 years (a 4% increase in 2015) and have been increasing faster than incomes or rents in recent years. In nominal terms, RRE prices are now close to their level prior to the financial crisis. There are some signs of price overvaluation, but alternative valuation models do not demonstrate this unequivocally. There are low risk weights (10%) for mortgage loans of banks using IRB models (before the 5 p.p. add-on). 	<ul style="list-style-type: none"> banking collateral household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance is appropriate but not expected to be sufficient for collateral and household stretches</p> <ul style="list-style-type: none"> Measures directly addressing the vulnerabilities related to highly indebted households or the continued increase in RRE prices have not been adopted. Furthermore, the trend of tightening lending standards appears to have ended, which – together with very high credit growth – indicates that vulnerabilities could be building up. The add-on of 5 p.p. to risk weights is deemed sufficient to address the banking system stretch. While the policy measures that have been implemented are appropriate given the nature of RRE vulnerabilities in Belgium, they may not be sufficient to fully address them.
DK	<ul style="list-style-type: none"> The main vulnerabilities are considered to be the robustly increasing RRE prices – in particular in the major cities – in combination with highly indebted households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region. Households' debt levels are very high both relative to income (the average DTI ratio is 263%) and to GDP (123%). Debt is particularly high for some households (25% of homeowners have DTIs above 300% and 30% of homeowners have total debt of more than 100% of the value of their house). RRE prices are increasing, driven by fast increases in major cities where they are approaching pre-crisis levels (house prices increased annually by 3.5% in the whole of Denmark in Q1 2016 and by 10.4% in Copenhagen). Even though the overall credit growth does not appear to be fast, mortgage credit institutions are increasing lending in the major cities, which is coupled with rapid price increases. High proportion of interest-only loans (50%) and variable rate loans (60%). 	<ul style="list-style-type: none"> collateral household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance is appropriate but not expected to be sufficient for collateral and household stretches</p> <ul style="list-style-type: none"> While the policy measures taken are appropriate given the nature of the RRE vulnerabilities in Denmark, they may not be sufficient to fully address them. Even though mortgage lenders have themselves reported a tightening in lending standards, this has not yet had a noticeable impact on the level of household indebtedness or real estate prices – on the contrary, both credit and prices are still increasing in the major cities. In the light of the RRE price increases, particularly in the main cities, there is a risk that these developments could lead to a further increase in household indebtedness. Moreover, the high level of household debt is not expected to significantly decline since it is not directly addressed by these policies. It is important to note that this assessment reflects the fact that some of the measures have only been in effect for a limited period of time and are entering into force gradually, while some of them only affect new borrowers. Vulnerabilities related to the high proportion of interest-only loans and variable rate loans seem to be sufficiently addressed by microprudential regulation.



Country	Key vulnerabilities	Stretches	Assessment: Appropriateness & Sufficiency of policies*	ESRB Warning issued?	Reasoning behind assessment
EE	<ul style="list-style-type: none"> • Rapidly increasing RRE prices that are close to their pre-crisis peak levels suggest that vulnerabilities are building up in the collateral stretch (since Q1 2009 real property prices have increased by more than 50%). However, recently, there appears to be some stabilisation in RRE prices. • Furthermore, RRE price increases have been supported by income growth which may not be sustainable in the long run since it has outpaced productivity growth. • Risks and vulnerabilities in the household and banking stretches appear more contained, owing to relatively low indebtedness of the household sector, moderate growth in RRE lending and high capital adequacy of the banking sector. • The Estonian economy is, however, exposed to risks in the global economy and the banking sector is structurally vulnerable due to its high degree of concentration and interconnectedness, in particular with the Swedish banking system. International risks could spill over to Estonia through both credit supply and trade channels. 	<ul style="list-style-type: none"> • collateral 	Appropriate and expected to be sufficient	No	<p>The policy stance is appropriate and expected to be sufficient</p> <ul style="list-style-type: none"> • The Estonian authorities have implemented a combination of precautionary policy measures to prevent RRE lending standards from loosening from their current level and to increase the resilience of the banking sector to structural vulnerabilities in the Estonian economy and financial sector. • Given the comprehensive set of precautionary policy measures aimed at all three stretches, the policy stance is assessed as appropriate. • The measures are also expected to be sufficient given the current level of and trend in vulnerabilities. Nevertheless, the policy stance is forward looking and the measures taken should reduce the misalignment of incentives that could lead banks to issue an excessive number of mortgages in future or households to take on an excessive amount of housing debt.
FI	<ul style="list-style-type: none"> • The main vulnerabilities are high and increasing household indebtedness, especially among some groups of households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region. • Households' debt levels are relatively high in Finland: the DTI ratio is relatively high at 112% as is the debt-to-GDP ratio at 66%. • More concerning are the groups of highly indebted households: 10% of households have DTI ratios above 300% and these households account for almost half of total household debt. • In addition, households appear to be exposed to interest rate risks, since more than 95% of new and existing mortgage loans have variable interest rates. • Price indicators suggest that prices relative to income and rents are close to their long-term average; however, given the weak economic outlook, the likelihood of a manifestation of RRE risks over the short-to-medium term is elevated. • The banking sector is concentrated with large exposures to RRE and is very interconnected with the Nordic banking system and, to some extent, reliant on market funding. Also, the potential direct risks to the banking and financial system could be significant if they were to materialise, especially given the size of the mortgage market in relation to the banking system and the overall economy. 	<ul style="list-style-type: none"> • banking • collateral • household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance is not expected to be sufficient for the household stretch</p> <ul style="list-style-type: none"> • While the measures taken are deemed appropriate and conceptually suitable given the nature of risks, it is not clear that they will significantly mitigate vulnerabilities related to the household stretch (in particular, the high overall indebtedness of households and the large share of highly indebted households). • The recently introduced LTV measure and the planned floor for IRB banks' risk weights are expected to indirectly contribute to a reduction of household stretch, but macroprudential measures such as LTI, DTI or DSTI limits would be more effective in preventing a further rise in the number of highly indebted households (it should also be noted that the introduced LTV measure will only affect new borrowing). • The situation is further complicated by the fact that the Finnish authorities lack the legal instruments to implement certain measures such as LTI, DTI and DSTI limits, preventing them from directly addressing vulnerabilities in the household stretch in the short-to-medium term. • On the other hand, the gradual reduction of mortgage interest tax subsidies is an important policy change impacting households' incentives and going in the right direction. • While these policy measures are expected to be sufficient for the collateral and banking stretches, they may not be sufficient for the household stretch.
LU	<ul style="list-style-type: none"> • The main vulnerabilities are considered to be the combination of high RRE prices and increasing household indebtedness. • Prices are currently at an unprecedentedly high level, and are increasing both in relation to income and the level of rents (in Q1 2016 nominal prices increased 4.5% annually, the PTI index increased by 6 p.p. annually and the PTR index increased by 4 p.p. annually). These price developments have been sustained by structural factors. • Regarding household indebtedness, the latest DTI figure suggests that debt is high (the DTI was 149% in Q1 2016), while the debt-to-GDP ratio appears to be more muted at 57% in Q1 2016. • On average, the LTV and DSTI ratios in Luxembourg's mortgage market are robust and represent a mitigating factor. However, the distribution of the LTV and DSTI ratios both for new and outstanding mortgages suggests that there is a notable share of loans with high LTV and DSTI ratios that could lead to negative direct and indirect effects on financial stability in the event of economic or financial shocks. Moreover, household debt for house purchases is increasing rapidly (an annual growth rate of 6% in June 2016). • The majority of mortgages are variable rate loans (on average between May 2015 and May 2016, 52% of new loans had variable rates). 	<ul style="list-style-type: none"> • collateral • household 	Not appropriate and not sufficient	Yes	<p>Policy stance is not appropriate and not sufficient for the collateral stretch, and appropriate but not expected to be sufficient for the household stretch</p> <ul style="list-style-type: none"> • Given the level and dynamics of identified vulnerabilities, the policy stance regarding the RRE sector in Luxembourg is deemed not appropriate, and therefore also not sufficient, due to a lack of policy measures to address collateral stretch.



Country	Key vulnerabilities	Stretches	Assessment: Appropriateness & Sufficiency of policies*	ESRB Warning issued?	Reasoning behind assessment
MT	<ul style="list-style-type: none"> The rapid growth of households' total debt due to robust mortgage growth, and the relatively high debt level and debt service burden in relation to households' income. During the first half of 2016 mortgage growth decelerated somewhat, but remained rapid at 6.6%. Total financial liabilities of households constituted approximately 70% of GDP in 2015, which is the euro area average. However, total financial liabilities in comparison to wages (compensation of employees) were significantly higher in Malta than in the euro area, and reached nearly 160% (the euro area average is around 140%). The debt service-to-income ratio is relatively high in Malta (at 13%) despite the currently prevailing low level of interest rates. However, using the Central Bank of Malta estimates for disposable income, the DSTI ratio for the corresponding period goes down to 9.3%. In terms of collateral stretch, the official transaction-based RRE price data showed 2.6% annual growth, whereas advertised prices rose by 9.9% in Q1 2016. Both price indices have passed their peaks reached before the last financial crisis, by 1.4% and 16.7% respectively. Different RRE price valuation methods indicate that, on average, real estate prices in Malta are broadly in line with fundamentals. 	<ul style="list-style-type: none"> collateral household 	Appropriate and expected to be sufficient	No	<p>Policy stance is appropriate and expected to be sufficient</p> <ul style="list-style-type: none"> Overall, the policy stance is considered to be appropriate and expected to be sufficient in Malta at present given the current level of risks from the RRE sector. While some vulnerabilities relating to the household and collateral stretches have been identified in Malta, these are mitigated by several factors and are assessed not to present systemic risks at present. There are no impediments in national law hindering a rapid deployment of borrower-based measures should vulnerabilities increase. A number of micro- and macroprudential measures have been taken to address direct risks to the banking sector stemming from RRE vulnerabilities. These are assessed as appropriate and expected to be sufficient, particularly given the high capitalisation of the banking system and high risks weights applied to RRE exposures. It is important that the Maltese authorities continue to monitor the evolution of RRE prices and lending standards due to rapid mortgage growth, and that they ensure access to and analyse more granular data with respect to household stretch.
NL	<ul style="list-style-type: none"> The main vulnerabilities are considered to be the persistently high household debt levels combined with low mortgage collateralisation. In particular, there is a large group of households, especially younger mortgagors, which have debt levels that exceed the value of their home. Household debt levels are very high both in comparison with income (the DTI ratio is 231%), GDP (111%) and house values (the LTV ratio is 94% for new loans and 68% for the stock), despite risk indicators having improved in recent years. Total mortgage lending to households by banks and all other institutions granting mortgage loans has been muted at 1.1%, whereas growth in lending to households by MFIs has been higher at 4% over the last year. A quarter of homeowners and around 50% of first-time buyers have total debt in excess of the value of their property. RRE prices in the cities are approaching peak levels and overall RRE prices in mid-2016 increased by 4.4% annually. 	<ul style="list-style-type: none"> collateral household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance not expected to be sufficient for collateral and household stretches</p> <ul style="list-style-type: none"> Measures are only being gradually tightened at a slow pace over a long time horizon. Even after full implementation, the LTV limit (100% in 2018) and tax deductibility will still be high. While the policy measures taken for the Netherlands are appropriate given the nature of RRE vulnerabilities, they may not be sufficient to fully address them as most measures are only being gradually phased in and their calibration will not be very constraining even after full implementation.
SK	<ul style="list-style-type: none"> Rapid credit growth (credit for house purchases increased by 14% year-on-year in Q2 2016), albeit from low levels, in Slovakia may signal rising vulnerabilities in the household stretch. The credit growth is linked to financial deepening in Slovakia, but could potentially lead to a situation of excessive household indebtedness. There are some signs of household stretch: a high share of households is vulnerable to interest rate increases due to short interest rate fixation periods. Furthermore, RRE prices have been picking up since early 2015, which in combination with increasing debt suggests increasing vulnerabilities in the collateral stretch. Overall, RRE prices do not appear to be overvalued. There has been a tendency to relax lending standards in recent years, but this has somewhat reversed in response to policy measures that have been implemented. There is a practice of "top-up financing" where the fall in the DSTI ratio due to the low interest rates is being taken advantage of to increase the level of household debt. 	<ul style="list-style-type: none"> collateral household 	Appropriate and expected to be sufficient	No	<p>The policy stance is appropriate and expected to be sufficient</p> <ul style="list-style-type: none"> Overall, given that the identified RRE-related vulnerabilities are assessed to be low although increasing, the proactive policy stance in Slovakia is assessed as being appropriate and expected to be sufficient to curb a future build-up in vulnerabilities. There is evidence that the policy measures have already been quite effective, e.g. in stopping a decline in lending standards. In addition, the move to transpose the current recommendations into decrees and to tighten some of the limits should further increase their effectiveness.



Country	Key vulnerabilities	Stretches	Assessment: Appropriateness & Sufficiency of policies*	ESRB Warning issued?	Reasoning behind assessment
SE	<ul style="list-style-type: none"> The main vulnerabilities are considered to be the rapidly increasing RRE prices which appear to be overvalued, and high and increasing indebtedness especially among some groups of households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region. High and rising debt-to-disposable income ratio for households with new loans (406% in 2015, up from 387% in 2014). Credit growth has been rapid (loans to households for house purchases have increased by 8.7% year-on-year in June 2016). A prolonged and continuing increase in RRE prices (by 12% in 2015), which has however slowed down during the last six months. RRE prices are, according to the ECB model, the most overvalued in Europe, though the IMF model shows less overvaluation. 	<ul style="list-style-type: none"> collateral household 	Appropriate but not expected to be sufficient	Yes	<p>Policy stance is not expected to be sufficient for collateral and household stretches</p> <ul style="list-style-type: none"> The current policy measures are appropriate given the nature of RRE vulnerabilities in Sweden, but they may not be sufficient to fully address them. Given that the measures apply only to new housing loans, it will take time for the vulnerabilities related to the level of household indebtedness to substantially decrease. The lack of tools is related to the fact that FI's mandate remains unclear with respect to some measures. Furthermore, the high and somewhat overvalued RRE prices have not been directly addressed.
UK	<ul style="list-style-type: none"> There is currently a high degree of uncertainty about the medium-term outlook for the UK housing market. From a macroprudential perspective, there appear to be risks under different scenarios for the housing market – either through the crystallisation of accumulated vulnerabilities, particularly related to household indebtedness and the interaction with elevated RRE prices, or through the further build-up of vulnerabilities. RRE vulnerabilities had built up before the referendum – they related to the interaction of a household stretch (due to household indebtedness) and a collateral stretch (as indicated by RRE prices that were rising from already elevated levels and decoupling from rent and income growth rates). The UK residential real estate market is potentially at a turning point. Given the uncertainty of the implications of the UK's referendum on EU membership, it is not yet possible to judge whether the vulnerabilities that had accumulated will now begin to crystallise or whether, in time, they might instead continue to grow. The outlook for the UK economy and housing market has been revised down: the Bank of England expected in its August Inflation Report aggregate RRE prices to decline a little over the next year, and the level of mortgage approvals to be lower. If that forecast proves to be correct, it would slow the pace of build-up in mortgage debt and therefore reduce vulnerabilities in the medium term. However, an economic slowdown could lead to the crystallisation of some risks – for example, if unemployment rises and/or income growth falls, then some households may find it more difficult to service their debts. However, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise. 	<ul style="list-style-type: none"> collateral household 	Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market.	Yes	<p>Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market</p> <ul style="list-style-type: none"> But it is considered that, although the build-up of risk through the household income and collateral stretch channels appears to have abated, the probability of risks through these channels materialising has increased in the short-to-medium term, given the increased level of uncertainty and the lower economic growth projections. Conversely, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise. The appropriate policy response is likely to differ between these two scenarios. Therefore, it will be important for the UK authorities to monitor developments closely and adjust macroprudential policy in light of them. Looking ahead, it will be necessary to ensure that any adjustment in the housing market proceeds at an appropriate pace and that new imbalances do not emerge.



Section 1

Addressing vulnerabilities in residential real estate: a key task for macroprudential policymakers

1.1 The importance of residential real estate in the economy and for macroprudential policy

Housing is a key sector in the real economy and represents a major part of household wealth. The residential real estate (RRE) market is among the most important sectors of the economy. Housing represents a major part of households' wealth and constitutes a major source of collateral for lenders. Mortgages often make up large parts of banks' balance sheets, and account for the largest and most common form of debt among households. Furthermore, housing construction is typically an important component of the real economy, as a source of employment, investment and growth (see Chart 1.1).

Excessive risk-taking, leverage and misaligned incentives in RRE may lead to externalities with implications for financial stability and the real economy. The importance of the housing market for the real economy implies that the key actors in this market – households, construction companies and banks/lenders – do not bear the full economic consequences of their behaviour, and that there are potential important externalities for the real economy. Since the economic agents do not consider these spillovers, they tend to take risks that are excessive from society's point of view.

The interaction of various social and economic policies has a strong impact on housing market dynamics and vulnerabilities. The housing market is strongly influenced by social and economic policies. It is indeed one of the most regulated sectors, where multiple policy objectives – such as the availability and affordability of housing, safety and health regulation, environmental regulation, spatial planning, etc. – interact to produce distinct national differences. This vast array of regulatory policy interactions may further skew the incentives for risk-taking among key actors, for instance where tax systems subsidise indebtedness. Also, monetary policy plays a key role by influencing interest rates and margins charged on mortgages, which not only affect bank profitability (and thereby capital levels) and household expenses, but may also transmit into RRE price dynamics. Implicit or explicit subsidies and guarantees for the various actors in the RRE market may further skew incentives and influence RRE prices.⁸

⁸ This could include, for example, systemically important entities or markets directly or indirectly related to RRE (e.g. if mortgage exposures are concentrated in a few domestically systemic banks, or if there a covered bond market of high importance to the domestic financial system).

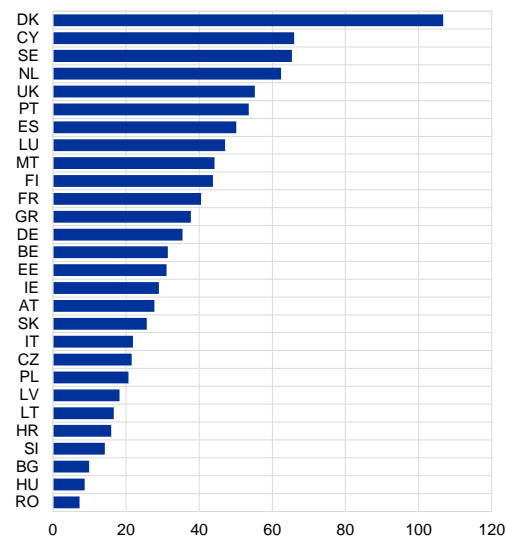


Chart 1.1

Importance of RRE for households, banks and the real economy

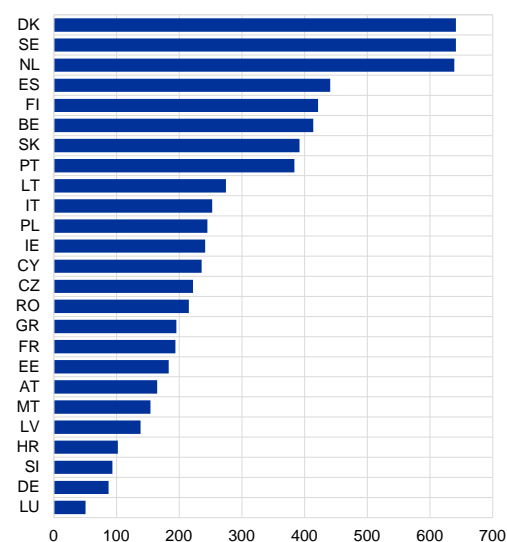
a) Credit for house purchase

(% of annual nominal GDP, Q1 2016)



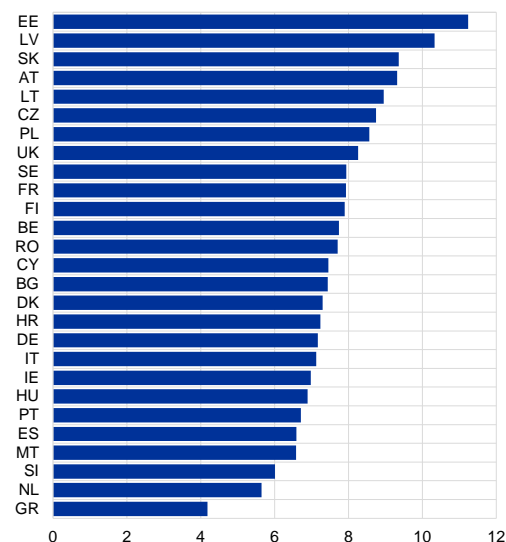
b) Mortgage loans

(% of banks' Common Equity Tier 1, Q4 2015)



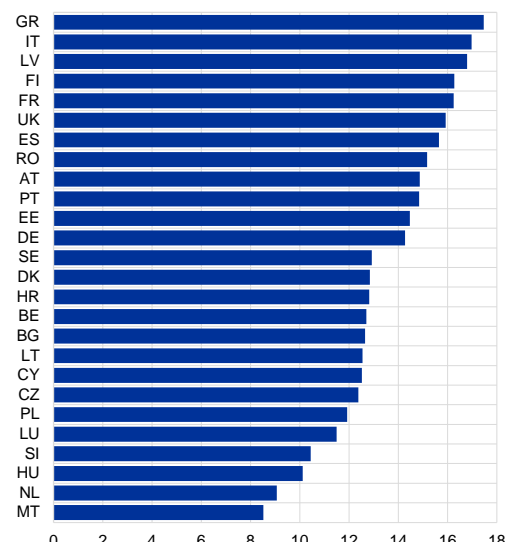
c) Employment in construction and real estate activities

(percentage)



d) Value added (gross) by construction and real estate activities

(percentage of GDP)



Sources: a) ECB Statistical Data Warehouse (SDW), Eurostat and ECB/ESRB Secretariat calculations. b) ECB SDW and ECB/ESRB Secretariat calculations. c) ECB SDW, Eurostat and ECB/ESRB Secretariat calculations. d) Eurostat and ESRB Secretariat calculations.

Notes: a) Credit for house purchase is total lending for house purchase by monetary financial institutions (MFIs) to domestic households.

b) Mortgage loans are loans collateralised by immovable property on a consolidated basis. The ratio for Denmark if domestic mortgage credit institutions are included stood at 469% in Q1 2016.

c) As a share of total employed persons (15 years and over) on average in the four quarters of 2015.

d) Seasonally and calendar-adjusted data as an average over the four quarters of 2015.



National macroprudential authorities and the ESRB have a responsibility to contribute to preventing the build-up of financial stability risks in different sectors of the financial system and the economy. Given the importance of RRE for financial and macroeconomic stability, analysing vulnerabilities in housing markets across countries is a key responsibility of macroprudential authorities. Taking a forward-looking approach and seeking to prevent the build-up of vulnerabilities is especially important. At the EU level, the ESRB has a mandate to “[...] contribute to ensuring financial stability and mitigating the negative impacts on the internal market and the real economy”.⁹ Similar mandates are given to macroprudential authorities across countries in the EU.¹⁰ Careful macroprudential monitoring and analysis of real estate-related vulnerabilities is particularly warranted at this juncture, given the low interest rate environment across the EU. This message has been repeated several times by the ESRB General Board and other influential bodies in the area of macroprudential policy.¹¹

To fulfil this responsibility, the ESRB has analysed the vulnerabilities across EU countries relating to the RRE sector.¹² The ESRB has investigated whether there are vulnerabilities related to the RRE sector in EU countries that may be a direct or indirect source of systemic risk to financial stability, and may also have the potential for serious negative consequences for the real economy. The results of the vulnerability assessment of the EU RRE sector are presented in this report.

1.2 The nature and effects of financial crises relating to residential real estate

Residential real estate markets are prone to “boom/bust” cycles. While RRE markets often display considerable stability over long periods of time, they have also recurrently been prone to boom/bust cycles with detrimental effects on financial stability and the real economy. These cycles are typically characterised by reinforcing and procyclical patterns in price developments and risk-taking among lenders and borrowers.¹³

Vulnerabilities accumulate in the upturn. In the boom phase, strong labour markets, optimistic outlooks and abundant credit feed into high demand, which tends to push real estate prices higher. Price increases lower credit risk by raising collateral values, and may also create expectations of further price increases, feeding back into higher demand. Potential relaxation of lending standards may also fuel the boom – particularly in the current low-yield environment where interest rate margins are under pressure and banks may be tempted to make up for lower margins by increasing

⁹ Recital 10, Regulation (EU) No 1092/2010, as above fn. 2.

¹⁰ For an overview, see for instance Buiter, W., “Housing wealth isn’t wealth”, *Economics - The Open-Access, Kiel Institute for the World Economy*, Vol. 4(22), 2010, pp. 1-29; Jordà, O., Schularick, M. and Taylor, A., “Leveraged Bubbles”, *Journal of Monetary Economics*, Vol. 76, pp. S1-S20.

¹¹ The press release of the ESRB General Board of 24 September 2015 emphasises that the “[...] global environment of low interest rates and low risk premia, while necessary to support the still sluggish nominal growth, is one common driver of the current risk situation and may have unintended effects on some economic sectors or in some countries that may require the adoption of targeted macroprudential measures”. Similarly, the article entitled “**The state of the house price cycle in the euro area**”, *Economic Bulletin*, Issue 6, ECB, 2015 (hereafter “ECB 2015a”), states that price growth in residential real estate needs monitoring, especially when accompanied by increased leverage, against the backdrop of the current accommodative monetary policy.

¹² An ESRB task force was created to undertake this analysis. Participants in the task force are shown in the list of Participants, above. See Annex A for an overview of the teams including their mandates and main forms of interaction.

¹³ Buiter, W. (2010) as above fn. 10; Jordà et al. (2015) as above fn. 10.



volumes. Such reinforcing spirals encourage debt accumulation among households, risk-taking among banks and, in some cases, booms in the construction sector.

Housing downturns can have both direct and indirect effects on financial stability and the real economy.

Whereas the underlying causes and triggers may differ, bust phases in RRE markets are characterised by the opposite developments to the boom phase. First, price drops lower collateral values, which in turn increase the losses that lenders face in the event of a default. Second, household wealth and the prospects of the construction sector are negatively affected, which tends to affect their spending and investment behaviour. This reduces overall economic activity, leads to deteriorating macroeconomic conditions and weakens the outlook and fiscal balances. This in turn reduces lenders' willingness to provide credit and increases the risk of borrower defaults. These negative feedback loops may thus lead to losses, both among lenders (direct effects) and in terms of economic output (indirect effects).¹⁴

Financial crises relating to housing are relatively frequent and have severe repercussions.¹⁵

RRE busts are common causes of banking crises and occur at relatively high frequency. The consequences following an RRE bust are typically severe, not least given the importance of real estate in the balance sheets of households and credit institutions.¹⁶ Despite the fact that the financial sector is often offered public support – in the shape of crisis management and fiscal expansion – in RRE crises, the effects on the capital and funding position of financial institutions are typically material. While it is difficult to compile comparable information on these effects, anecdotal evidence points to the severe repercussions in terms of reduced asset quality, credit contraction and bank failures (see Table 1.1). Also, macroeconomic variables – such as consumption, investment and employment – typically deteriorate significantly. Recessions following RRE busts are common, and tend to be particularly deep and prolonged.

¹⁴ Direct losses could stem from reduced profitability as a result of provisions, higher impairment charges or an increased cost of funding. These effects could be related to other balance sheet items than mortgages, such as shares in real estate investment funds and venture capital funds exposed to RRE. For an extended discussion on direct and indirect effects, see below Section 1.3.

¹⁵ See, for example, *Emerging Horizons in Real Estate – An Industry Initiative on Asset Price Dynamics*, World Economic Forum, 2015, for country case studies; Reinhart, C. M. and Rogoff, K. S., "The Aftermath of Financial Crises", *American Economic Review*, Vol. 99(2), 2009, pp. 466-72, for global evidence; and Mian, A. and Sufi, A., *House of debt: How they (and you) caused the Great Recession, and how we can prevent it from happening again*, University of Chicago Press, 2014, for the US sub-prime crisis.

¹⁶ For an illustration of how RRE-related crises have impacted real GDP growth, see ESRB 2015 and Hartmann, P., "**Real estate markets and macroprudential policy in Europe**", *Working Paper Series*, No 1796, ECB, 2015 (hereafter "ECB 2015b").



Table 1.1

Overview: repercussions of RRE-related crises

Type of effect	Estimation/historical experiences	Source
Asset quality/credit risk	Following the global financial crisis, the increase in bankruptcies was 8.9% on average in countries with housing crises and 2% on average in other countries.	"Report on Residential Real Estate", ESRB Expert Group on Real Estate, 2015
Bank failures/banking crises	2/3 of systemic banking crises have been preceded by housing boom/bust patterns. Also, in a sample of 51 boom/bust episodes, 35 were followed by a crisis.	Crowe, C., Dell'Ariccia, G., Igan, D. and Rabal, P., "How to deal with real estate booms: Lessons from country experiences", Journal of Financial Stability, Vol. 9(3), 2013, pp. 300-319
Economic growth	Output losses in recessions accompanied by housing busts are two to three times greater than in normal recessions.	Claessens, S, Kose, A. and Terrones, M., "What Happens During Recessions, Crunches, and Busts?", IMF Working Paper WP/08/274, 2008
	Recessions associated with RRE price busts are on average over a quarter longer than those without busts.	Claessens, S, Kose, A., Terrones, M. (2008)
	In a global sample of 78 house price booms, 49 ended up in recessions.	Cerutti, E., Dagher, J. and Dell'Ariccia, G., "Housing Finance and Real-Estate Booms: A Cross-Country Perspective", Staff Discussion Notes No 15/12, International Monetary Fund, 2015
	Among crisis-struck EU countries, GDP declined by 2.4% in countries with real estate problems, and increased by 0.4% for countries without real estate problems, following the global financial crisis.	"Report on Residential Real Estate", ESRB Expert Group on Real Estate, 2015
Employment	RRE price busts have on average been associated with a 3.15% increase in the unemployment rate.	Claessens, S, Kose, A. and Terrones, M. (2008)

1.3 Analysing vulnerabilities in residential real estate: collateral, household and banking stretches

A framework to analyse vulnerabilities in RRE that considers the levels of and dynamics in RRE prices, as well as vulnerabilities related to lenders and borrowers, has been developed.

As demonstrated by the frequent boom/bust cycles of RRE markets and the associated financial crises and economic downturns, a framework for analysing vulnerabilities in RRE markets must consider dimensions relating to both RRE prices as well as the positions of lenders and borrowers. Furthermore, to facilitate a more granular investigation of how policies and structural factors interact with vulnerabilities, the analysis also looks at whether vulnerabilities are elevated, rising or both. Indeed, macroprudential tools are best used to prevent the build-up of vulnerabilities and should in this regard be forward-looking.¹⁷ The analytical framework adopted in this report – and developed by the ECB/ESRB – distinguishes between collateral, household and banking stretches:¹⁸

- Collateral stretch: vulnerabilities relating to property markets, particularly in relation to a sudden reversal in RRE price growth. Risks may crystallise through higher losses given default (LGDs) for banks' affecting their balance sheets or reduced household consumption, with possible negative feedback effects to the financial system.

¹⁷ One objective of macroprudential policy is to increase resilience when risks are building up (see e.g. Borio, C., "Towards a macroprudential framework for financial supervision and regulation?", BIS Working Paper No 128, 2003).

¹⁸ These three stretches are introduced and discussed in ESRB 2015.



- Household stretch: vulnerabilities related to borrowers' indebtedness and ability to service and repay debt. Vulnerabilities also relate to borrowers' ability to maintain their consumption pattern. A reduced consumption pattern could have negative feedback effects on housing demand and prices, as well as on the general economy, leading to potential negative effects on financial stability.
- Banking stretch: vulnerabilities related to direct losses by banks or their loss of funding due to their RRE exposures. The significance of lenders' exposures and their perceived vulnerability was considered in conjunction with measures of the lenders' resilience.

For each of these stretches, a number of key indicators are identified based on their frequent association with (the build-up of) vulnerabilities and subsequent RRE crises.

Interactions across stretches are amplifiers of RRE vulnerabilities. Vulnerabilities in merely one stretch could constitute a source of concern (particularly for household and banking stretch),¹⁹ but the existence of vulnerabilities across several dimensions is typically more problematic due to the large interdependencies and tendencies for mutual reinforcements across them (or feedback loops as discussed above). For instance, international empirical evidence suggests a strong link between RRE prices and household debt. Similarly, a fall in consumption can in turn weigh on wider economic stability, and loan performance in other sectors, thereby affecting banking stretch.²⁰ Also, decreasing RRE prices lower the value of collateral held by banks. Furthermore, it is important to stress that RRE vulnerabilities often emerge from domestic structural features and/or social and economic policies, such as tax deductibility, from cyclical developments or combinations thereof.

Collateral stretch – price levels and dynamics in RRE markets: RRE price levels and dynamics depend on several demand and supply-side factors. Per se, the level of RRE prices do not constitute vulnerabilities to financial stability or the real economy, and are for this reason typically not targets of macroprudential policy. However, large upswings in prices have often been followed by periods of financial instability and/or recessions.²¹ This relates to the dynamics between levels and expectations of prices, household wealth and credit risk. Housing is both a consumption good and an investment good. Therefore, RRE prices are not only based on fundamentals, but also have a speculative component.²² Persistent and large increases in RRE prices shape expectations of future increases, thereby inducing households to take on additional debt or increase spending, banks to issue additional credit, or construction booms.²³ Persistent and large price increases also heighten the risk of a sudden reversal in prices, which may lead to lower collateral values,

¹⁹ For instance, housing booms that are not credit-driven may still have large negative macroeconomic consequences.

²⁰ See Section 3.2 in **"The Financial Policy Committee's powers over housing tools: A Policy Statement"**, Bank of England, July 2015.

²¹ Cerutti, E., Dagher, J. and Dell'Ariccia, G., **"Housing Finance and Real-Estate Booms: A Cross-Country Perspective"**, Staff Discussion Notes No 15/12, International Monetary Fund, 2015.

²² Buiter, W. (2010) as above fn. 10; Benes, J., Laxton, D. and Mongardini, J., **"Mitigating the Deadly Embrace in Financial Cycles: Countercyclical Buffers and Loan-to-Value Limits"**, IMF Working Paper WP/16/87, 2016.

²³ Turk, R., **"Housing Price and Household Debt Interactions in Sweden"**, IMF Working Paper WP/15/276, 2015.



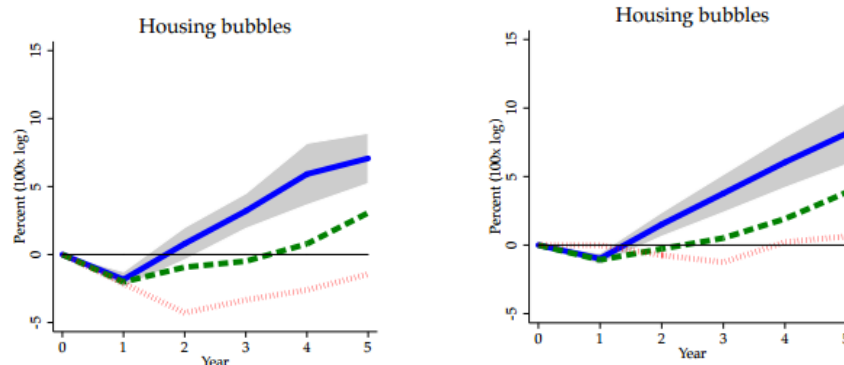
decreasing investment and oversupply.²⁴ Such a reversal may also reduce household consumption through wealth effects that vary both between households with different characteristics and across countries.²⁵ While this is particularly the case when households are indebted (which is typically the case since most households need mortgages to be able to fund home purchases), negative macroeconomic consequences from housing busts also occur when the housing boom has not been credit fuelled (see Chart 1.2).²⁶ Such corrections are also more likely when interest rates are low.²⁷ Indicators used to gauge the collateral stretch in the current horizontal risk identification and the analytical framework include the price-to-income (PTI) ratio and a model-based overvaluation measure developed by the ECB.²⁸ Further indicators are used in the so-called vertical country-specific analysis (see Section 2.2), including average LTV ratios and the share of amortising loans and average maturity.²⁹

Chart 1.2
Housing busts and recessions: the role of credit

(percent (100x log))

Full sample, 1870–2013

Post-WW2 sample, 1948–2013



Source: Jorda, Schularick and Taylor (2015).

Notes: The solid blue line traces the average no-bubble path. The grey area represents the 90% confidence region around the average path. The green dashed line is the sum of the average no-bubble path and the bubble coefficient when credit is below the mean, whereas the dotted red line is the sum of the average no-bubble path and the bubble coefficient when credit is high. Full sample: 1870-2013, excluding the World Wars and a window of five years around them. The y-axis shows the cumulative percentage change in real GDP per capita.

²⁴ Developers' price expectations, along with development lags, have been found to generate periods with significant overbuilding (see Chinloy, P., "Real estate cycles and empirical evidence", *Journal of Housing Research*, Vol. 7(2), 1996, pp. 173-190; Grenadier, S. R., "The strategic exercise of options: development cascades and overbuilding in real estate markets", *Journal of Finance*, Vol. 51(5), 1996, pp. 1653-1679; Lee, G. S., "Housing cycles and the period of production", *Applied Economics*, Vol. 31(10), 1999, pp. 1219-1230; DeCoster, G. P. and Strange, W. C., "Developers, herding, and overbuilding", *Journal of Real Estate Finance and Economics*, Vol. 44(1), 2012, pp. 7-35.

²⁵ This also occurs since lower prices make equity withdrawals more difficult (see Buiter, W., 2010 as above fn. 10).

²⁶ Jordà et al. (2015) as above fn. 10.

²⁷ Himmelberg, C., Mayer, C. and Sinai, T., "Assessing High House Prices: Bubbles, Fundamentals and Misperceptions", *Journal of Economic Perspectives*, Vol. 19(4), 2005, pp. 67-92.

²⁸ For a description of the usefulness of the price-to-income ratio as an indicator of overvaluation of real estate markets, see e.g. "Report on Residential Real Estate", ESRB Expert Group on Real Estate, 2015, Section 2.1. For a detailed description of the methodology, see Box 3 in [Financial Stability Review, ECB, November 2015](#) (hereafter "ECB 2015c").

²⁹ Included in Annex C.



Household stretch – implications of housing debt for households' wealth and consumption:

a key transmission channel from the housing market to financial or economic instability occurs through households. Empirical evidence suggests that when households have accumulated high levels of debt or when they are highly leveraged, housing busts are more likely to end in costlier and longer recessions.³⁰ When households are leveraged, RRE price drops have particularly strong effects on wealth and thereby consumption.³¹ Similarly, when debt service ratios are high, even small income shortfalls can prevent households from consumption smoothing, while large income shortfalls have been found to trigger increases in defaults and dampen the economic outlook.³² The latter is likely to be particularly pronounced following long periods of low interest rates, especially in cases where households rely extensively on variable rate mortgages.³³ The risk of sharp consumption reductions is particularly pronounced when high indebtedness interacts with sharp falls in RRE prices. This relates to large wealth effects and increased leverage (as discussed in the paragraph on collateral stretch). Some household assets (such as pension savings) are typically not liquid enough to sustain the level of consumption of highly indebted households in a housing downturn.³⁴ This also points to the importance of the distribution of assets and debt among households; in many countries, aggregate statistics mask large underlying variety in terms of distribution. This implies that some groups of households own the assets, whereas debt has been accumulated in other groups.³⁵ The horizontal risk identification uses the following commonly used indicators to analyse household stretch: households' debt-to-income (DTI) ratios, household leverage and households' debt service ratios. Household stretch is related to collateral stretch because higher RRE prices typically force households to take on additional debt to be able to finance a house purchase and because RRE price increases lead to higher perceived wealth, inducing households to borrow and consume more (see Chart 1.3).³⁶ Additional indicators are used in the vertical country-specific analysis (see Section 2.2), including the average DSTI ratio, the average DTI ratio and the share of mortgages with variable interest rates.³⁷

³⁰ See, for instance, Glick, R. and Lansing, K., "Global household leverage, house prices, and consumption", FRBSF Economic Letter, Federal Reserve Bank of San Francisco, 2010; Jordà, O., Schularick, M. and Taylor, A., "The Great Mortgaging: Housing Finance, Crises, and Business Cycles", Federal Reserve Bank of San Francisco Working Paper No 2014-23, 2014; "Dealing with household debt", World Economic Outlook: Growth Resuming, Dangers Remain, International Monetary Fund, April 2012; and Mian and Sufi (2014) as above fn. 15.

³¹ Jordà, Schularick and Taylor (2014) *ibid.* See also Bank of England (2015) as above fn. 20.

³² Drehmann, M. and Juselius, M., "Do debt service costs affect macroeconomic and financial stability?", BIS Quarterly Review, September 2012. To the extent that household debt is denominated in foreign currencies or based on variable interest rates, additional challenges emerge. See, for instance, the [Recommendation of the European Systemic Risk Board of 21 September 2011 on lending in foreign currencies \(ESRB/2011/1\)](#).

³³ Himmelberg, Mayer and Sinai (2005), as above fn. 27.

³⁴ In addition, households may not be willing to draw down on their savings to sustain consumption.

³⁵ Data on distributions are often lacking, which makes a comprehensive assessment of the role of household stretch more difficult. This is also a limitation of the horizontal method in Section 2.

³⁶ Turk (2015) as above fn. 23.

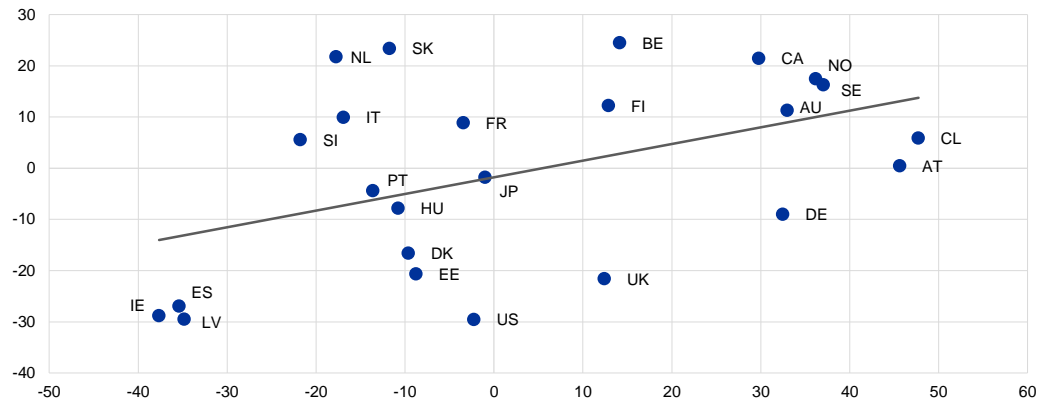
³⁷ Some of these variables are included in Annex C.



Chart 1.3

Interactions between house prices and household indebtedness

(x-axis: change in HPI (2007-2014), percentages; y-axis: change in HH debt-to-income ratio (2007-2014), percentage points)



Sources: OECD and ESRB calculations.

Banking stretch – the ability of lenders to withstand losses when risks manifest: lower collateral values resulting from RRE price drops and worsened economic conditions are associated with increasing credit risk. Indeed, following periods of strong credit growth, the risks of economic instability and financial crises are elevated. If credit risk manifests itself, lenders may not just suffer reduced profitability or face capital losses, they may also face higher funding costs or even face difficulties in obtaining sufficient funding.³⁸ Vulnerabilities can also be aggravated by potential exposure concentration in terms of the relative importance of mortgage lending in the balance sheet of lenders. Concentration in the mortgage market itself is another source of vulnerability, since it makes the market highly dependent on a few key suppliers of credit. Indicators to analyse banking stretch include bank leverage, credit for house purchase (growth, as a proportion of GDP, as a proportion of banks' CET1 capital), average risk weights on mortgages and the share of short-term funding (% of total funding).³⁹

³⁸ ESRB 2015.

³⁹ See Table 2.3 of Section 2.1.1.



Section 2

Analysing vulnerabilities in residential real estate⁴⁰

In this report, the analysis of residential real estate vulnerabilities rests on two pillars: (1) a “horizontal” cross-country risk identification covering all 28 EU Member States; and (2) a “vertical” country-specific analysis of risks and policies in eleven focus countries, organised around the collateral, household and banking stretches.

In Section 2.1, the horizontal risk identification and analysis is presented. This is the method that was used to identify the focus countries. The horizontal analysis is conducted in three steps (see Box 1 for an overview of the horizontal analysis methodology and Annex B for more details):

1. Horizontal analysis based on various key indicators and a creation of composite vulnerability scores based on selected indicators (developed in cooperation with the ECB).⁴¹
2. An analysis of risks focusing on household, collateral and banking stretches.
3. An analysis of structural and institutional factors that could potentially mitigate or aggravate the risks identified. This analysis is subsequently used in the vertical analysis (see below).

In Section 2.2, the results of the “vertical” analysis for the focus countries are presented. The assessments were conducted by the dedicated teams within the task force that were responsible for the country analysis (the Country Teams), with significant input from authorities in the focus countries and the ESRB Assessment Team on Macroprudential Measures.⁴² The vertical analysis also benefited from information from third-party assessments, in particular those from the European Commission, IMF and OECD.⁴³

⁴⁰ The current horizontal framework for analysing RRE vulnerabilities, presented in Section 2.1, was developed jointly by the ECB (the Directorate General Macroprudential Policy and Financial Stability – DG/MF) and the ESRB. The framework builds on earlier ECB (DG/MF) and ESRB approaches to RRE analysis. The ESRB in particular thanks the colleagues from the ECB, Federica Ciochetti, Marco Lo Duca, Benjamin Klaus and Giulio Nicoletti, for their contribution.

⁴¹ For a description of the methodology, including an outline and justification of the indicators and thresholds in the horizontal assessment, see Annex B. The methodology is identical to the one used by the ECB for euro area countries.

⁴² For a description of the methodology of the vertical assessment, see Section 2.2.1. See Annex A for an overview of the teams in the RRE task force including their mandates and main forms of interaction.

⁴³ Annex D contains an overview of third-party assessments for the focus countries.



2.1 Horizontal analysis of residential real estate vulnerabilities in EU countries⁴⁴

Box 1

Methodology – horizontal framework for analysing RRE vulnerabilities

The current horizontal framework for analysing RRE vulnerabilities was developed jointly by the ECB (DG/MF) and the ESRB. The framework builds on earlier ECB (DG/MF) and ESRB approaches to RRE analysis.

The analytical framework consists of three steps: (1) a preliminary screening of vulnerabilities in RRE markets (looking at, for example, RRE prices, lending conditions and household balance sheets) focusing on the detection of “exuberant” developments; (2) an analysis of the strength of the expansion in RRE markets; and (3) an analysis of banking sector resilience and potential aggravating/mitigating institutional and structural factors.

In the first step, vulnerable RRE markets are identified on the basis of indicators covering RRE prices, lending conditions and household balance sheets. The indicators used in this first step are summarised in a scoreboard table which consists of a heat map with relevant risk thresholds and summary indicators to facilitate country rankings (Table E.1). The indicators in the scoreboard capture three risk categories and are explained in detail in Table B.1. Specifically, the categories are:

- collateral stretch: indicators capture potentially “exuberant developments in RRE markets” which relate also to stretched collateral values (and can feed into lending conditions);
- lending conditions: indicators capture potentially “exuberant developments in lending conditions” which can relate to underpricing of risk and might also feed into RRE price developments;
- household stretch: indicators capture household vulnerabilities which relate to potential credit risk and its dynamics.

The scoreboard thresholds are guided by model evidence, where possible, and by the distribution of the indicators; the plausibility is checked on the basis of expert judgement. Explanations and data sources for each indicator are provided in Table B.1. The dates of the observations underlying the scoreboard are also reported in Table B.2.

Two composite indicators, summarising the level of vulnerabilities in a country, are used to facilitate an initial country ranking.

- The average rating across indicators (the penultimate column of the scoreboard) is an equally weighted average of a discrete transformation of the individual indicators. Each indicator is assigned a rating from 0 to 3 on the basis of the threshold it breaches (0 = no threshold breached, 3 = highest threshold breached indicating high risk). The summary indicator is simply the average of the ratings of individual indicators. The first threshold of the composite indicator is set at 1 (i.e. individual indicators breaking the first risk threshold on average) and corresponds to a yellow

⁴⁴ The current horizontal framework for analysing RRE vulnerabilities was developed jointly by the ECB (DG/MF) and the ESRB. The framework builds on earlier ECB (DG/MF) and ESRB approaches to RRE analysis. The horizontal analysis has been developed by colleagues from the ECB (Federica Ciocchetta, Marco Lo Duca, Benjamin Klaus and Giulio Nicoletti) and adapted for the use of the ESRB.



colouring. The second (orange colour) and third (red colour) threshold are set on the basis of the 80th percentile and 90th percentile of the distribution of the indicator across countries and over time.

- The composite indicator (the last column of the scoreboard) reports the average distance (in terms of standard deviation) of indicators from the lowest thresholds. It is calculated as an equally weighted average of the standardised indicators. Standardisation is achieved by deducting the lowest threshold from each indicator and dividing by the standard deviation of the indicator (calculated across countries and over time). The first threshold of the composite indicator is set at 0 (i.e. individual indicators breaching the first risk threshold on average) and corresponds to a yellow colouring. The second (orange colour) and third (red colour) threshold are set on the basis of the 80th percentile and 90th percentile of the distribution of the indicator across countries and over time.

As the resulting ranking of countries according to summary indicators critically depends on the thresholds, the set of indicators used and the weighting scheme used for the aggregation, a number of robustness checks are performed. These have yielded similar results.

The second step of the analysis consists in determining the position of a country in the housing cycle as suggested by the household income and collateral stretches by looking at indicators capturing the “strength” of the expansion across countries.

Finally, in a third step, the analysis of the household income and collateral stretches is complemented by an analysis of risks coming from the banking sector stretch (exposures of the banking system to risks and the consequent analysis of resilience).

In addition, the vulnerable RRE markets are analysed on the basis of institutional and structural factors that might act as amplification or mitigation mechanisms for shocks, as detailed in Section 2.1.2.

2.1.1 Horizontal analysis: indicator-based analytical framework

The indicator-based analytical framework suggests a diversity of vulnerabilities across the EU countries. An overview of the signals provided by the analytical framework (see Box 1 for a description of the methodology) developed by the ECB/ESRB is provided in Table 2.1.⁴⁵ As illustrated in this table, there is a large diversity in terms of the indicators that drive the composite vulnerability measures at the country level. On the one hand, there are many countries which display few signals of vulnerabilities in RRE. On the other hand, there are a number of countries where the framework signals vulnerabilities. This group includes countries which recently experienced a RRE-related crisis and still suffer from related legacy issues, and countries where a materialisation of (further) RRE-related risk may occur over the medium term. In the remainder of this report, the analysis focuses on the latter group.

⁴⁵ For a description of the methodology, including an outline and justification of the indicators and thresholds used in this analysis, see Annex B.



Table 2.1

Vulnerabilities in RRE across the EU: results from the indicator-based horizontal analysis

Country	Indicators										Summary measures	
	Collateral Stretch				Lending Indicators			Household Stretch			Average rating across indicators	Composite indicator
	Residential real estate price index, 12m growth, %	Residential price index relative to peak prior to 2014	RRE valuation measure, house price to income	RRE valuation measure, econometric model	Loans to HH for house purchases, 12m growth, %	Loans to HH for HP relative to peak prior to 2014	HH Loan spread	HH debt, % of GDP	HH financial assets to debt, %	Debt service to income ratio for HH, %		
AT	8.1	1.1	26.0	14.0	4.9	1.1	2.1	51.2	350.8	10.2	1.4	0.3
BE	2.3	1.0	26.0	4.0	8.1	1.2	1.8	59.6	500.2	10.7	1.5	0.2
BG		0.8	-9.0	-11.0	0.6	1.0	5.6	23.8	552.6	8.1	0.0	-0.9
CY	-1.6	0.7	-16.0	-3.0	-1.8	0.9	3.2	127.3	206.0	28.8	0.9	0.3
CZ		1.0	8.0	2.0	8.7	1.1		30.3	360.4	8.2	0.8	-0.1
DE	4.7	1.1	4.7	-2.0	3.7	1.1	1.9	53.4	338.1	9.4	0.8	0.1
DK	3.5	0.9	19.0	4.0	1.2	1.0	1.4	122.8	248.5	20.4	1.5	0.6
EE	0.8	0.9	8.0	-7.0	4.6	1.0	2.3	40.6	270.4	7.6	0.4	-0.2
ES	6.3	0.7	-6.0	5.0	-3.5	0.8	1.9	66.4	275.8	12.9	0.5	-0.1
FI	-0.1	1.0	10.0	3.0	2.6	1.0	1.4	66.7	210.9	11.4	1.4	0.2
FR	0.3	0.9	14.0	4.0	3.2	1.0	1.7	56.5	394.1	10.0	1.0	0.0
GR	-5.0	0.6	-25.0	-5.0	-3.6	0.8	2.7	61.8	218.3	21.8	0.7	-0.2
HR	-2.1	0.8	-11.0	-16.0	-4.8	0.8	4.4	36.9	302.7	8.8	0.0	-0.6
HU	4.3	0.9	-7.0	-15.0	-3.3	0.6	4.6	21.2	563.5	7.6	0.1	-0.9
IE	7.4	0.7	-3.0	-23.0	-4.2	0.6	3.4	57.8	237.3	19.9	0.7	-0.4
IT	-1.2	0.8		-5.0	0.9	1.0	1.6	42.1	581.5	11.8	0.3	-0.3
LT	10.5	0.7	-3.0	-8.0	6.6	1.0	1.9	22.3	414.2	5.1	0.6	-0.4
LU	4.5	1.1	18.0	9.0	7.0	1.2	1.7	57.4	242.1	10.8	1.8	0.4
LV	7.4	0.7	-6.0	-19.0	-2.2	0.7	3.3	24.3	430.8	5.7	0.2	-0.8
MT	10.0	1.1	10.0	-9.0	7.9	1.2	2.3	57.8	462.8	12.8	1.6	0.1
NL	4.4	0.9	-4.0	2.0	6.2	1.1	2.8	111.4	296.7	21.5	0.9	0.3
PL	1.8	0.9	-9.0	-17.0	0.7	1.1	1.4	36.2	268.6	13.4	0.5	-0.2
PT	5.0	0.9	-9.0	-3.0	-3.5	0.8	2.0	76.3	269.5	16.4	0.6	0.0
RO	3.6	0.7	-20.0	-29.0	16.5	1.3	2.8	17.2	414.6	6.5	0.6	-0.6
SE	12.9	1.3	69.0	47.0	8.7	1.1		84.7	333.4	16.0	2.2	1.2
SI	0.8	0.8	-10.0	-8.0	3.2	1.0	2.0	27.5	367.4	5.8	0.1	-0.4
SK	1.0	0.8	-6.0	-15.0	13.8	1.3	2.3	35.8	213.9	10.0	1.0	-0.1
UK	8.7	1.0	30.0	11.0	4.6	1.1		87.0	372.9	18.4	1.7	0.6
EAA	2.4	1.0	4.7	-1.0	2.1	1.0		59.3	356.1		0.5	0.0
EAM	4.5	0.9	-3.0	-3.0	3.2	1.0	2.0	57.4	296.7	10.8	0.8	0.0
EUA		1.0									1.0	0.4
EUM	4.4	0.9	-3.0	-3.0	3.2	1.0	2.1	54.9	335.8	10.8	0.7	-0.1
T1	4.0	0.9	2.5	2.5	5.0	1.0	1.5	50.0	220.0	10.0	1.0	0.0
T2	6.5	1.0	5.0	5.0	7.5	1.1	1.8	70.0	240.0	15.0	1.2	0.2
T3	9.0	1.1	7.5	7.5	10.0	1.2	2.0	90.0	260.0	20.0	1.7	0.5
TR	4.0	0.9	2.5	2.5	5.0	1.0	2.0	50.0	260.0	10.0		

Sources: ESRB and ECB (see Annex B for specific sources and detailed definitions of the indicators).

Notes: EAA is the euro area average; EAM is the euro area median; EUA is the EU average; EUM is the EU median; T1, T2, T3 and TR are risk thresholds. See Box 1 and Annex B for a description of the methodology underlying these results. In Finland, the household financial assets-to-debt indicator excludes earnings-related pension assets. Including assets held by the Finnish employment pension schemes, the ratio would be around 337%.



A set of key indicators suggest that vulnerabilities in the collateral and household stretches are elevated in Austria, Belgium, Denmark, Estonia, Finland, Luxembourg, Malta, the Netherlands, Sweden, Slovakia and the United Kingdom.⁴⁶

Several of these countries have high household indebtedness; however, Austria, Estonia and Slovakia all have a household debt-to-GDP ratio below the EU median. In Denmark and the Netherlands, this is particularly pronounced, with household debt reaching 122.8% and 111.4% of GDP, respectively. Household debt dynamics also suggest increasing vulnerabilities in many countries. In Slovakia, Belgium, Malta and Sweden, household debt as a share of GDP rose rapidly last year. The cumulative increase since 2011 is also significant in Denmark, Malta, the UK, Sweden and Luxembourg (see Chart 2.1). For all countries with high household debt levels, debt service ratios also appear elevated, despite the low interest rate environment. Low loan spreads could indicate underpricing of risks and exuberant lending policies, but the low spreads could also be due to a competitive lending market. Finland, Denmark and Luxembourg are in particular characterised by low loan spreads. Along the dimension of collateral stretch, price-to-income (PTI) ratios have increased in many countries, particularly in Austria and Sweden where the PTI ratio in the first quarter of 2016 was, respectively, 27% and 22% higher than in 2010.⁴⁷ It is difficult to measure overvaluation and undervaluation in RRE markets, since the results depend on the underlying assumptions but, compared with income, RRE prices might be overvalued in Sweden, Austria, Belgium and the UK – in these countries, prices are also at historical peak levels (see Chart 2.1).⁴⁸

Dynamics of the indicators suggest that vulnerabilities are increasing in a number of the above-mentioned countries (see Chart 2.1). Growth in RRE prices over the last 12 months characterises all the countries mentioned above, with the exception of Finland where RRE prices have remained stable.⁴⁹ In a number of countries, RRE price growth has been particularly strong in recent years. This also applies to price developments in the past year: Belgium (+7%), Austria (+8%), the UK (+9%), Malta (+10%) and Sweden (+13%). A recurrent pattern relates to the concentration of the RRE price increase and overvaluation in major cities across Europe compared with non-urban areas. For instance, in the last three years, RRE prices in London have been growing on average by 12% (vs. 7.5% for the UK), and in Amsterdam by 7.5% (whereas growth in RRE prices in the Netherlands as a whole has remained subdued in the last three years).⁵⁰ In addition, the growth rates in loans for house purchase are high in Slovakia (13.8%), Sweden (8.7%), Belgium (8.1%), Malta (7.9%), Luxembourg (7.0%) and the Netherlands (6.2%). Moreover, trends in lending for house purchases are strongly interlinked with RRE price dynamics, particularly in some countries.

⁴⁶ The list of countries does not completely correspond to the countries highlighted in Table 2.1 and Chart 2.1. This relates to the fact that the initial identification of countries was based on an earlier methodology and older data.

⁴⁷ For Malta, the analysis in the scoreboard (Table 2.1) has been replicated with Malta's official index for residential real estate prices based on transacted property prices (Eurostat series teicp270). The results show that: (i) 12-month growth in the RRE price index is 1.0%; (ii) the residential price index relative to the peak prior to 2014 is 1.03 and is marked in orange; and (iii) the average rating across indicators is 1.2 and is marked in orange. These results confirm the assessment of Malta.

⁴⁸ Figures refer to PTI ratio levels (index: 2010 = 100) and overvaluation. For a detailed description of the methodology to calculate RRE price overvaluation, see Box 3 in ECB 2015c.

⁴⁹ See footnote 47.

⁵⁰ "Hot in the City", The Economist, 2 April 2016.

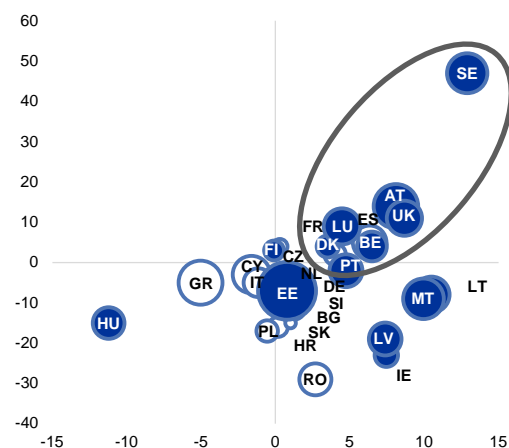


Chart 2.1

Developments in collateral and household stretch

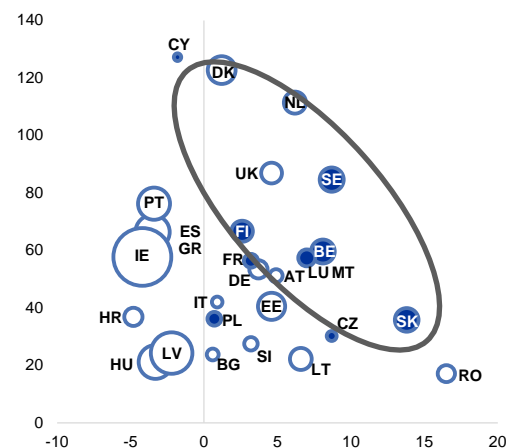
a) Developments in the collateral stretch

(x-axis: RRE annual price growth;
y-axis: RRE valuation;
bubble size: weighted by percentage change in RRE prices since Q1 2011 (empty bubbles indicate negative developments))



b) Developments in the household stretch

(x-axis: loans to households for house purchase, annual growth in %;
y-axis: household debt-to-GDP ratio, %;
bubble size: weighted by change in household debt-to-GDP ratio since Q1 2011 (empty bubbles indicate negative developments))



Sources: ECB and ECB/ESRB Secretariat calculations.

The economic outlook sheds light on potential future developments in RRE vulnerabilities.

The price dynamics together with the overall economic outlook for the focus countries (see Table 2.2) may also shed light on potential future vulnerabilities related to residential real estate. Strong economic growth rates and outlooks in Malta, Slovakia and Luxembourg (and to a lesser extent Estonia and Sweden) signal that vulnerabilities related to RRE are likely to continue to rise, unless their current macroprudential policy stances are effective in curbing further build-up. By contrast, in Finland and – to a lesser extent – Austria, Belgium and Denmark, the subdued economic outlook increases the probability of the materialisation of a reinforcing spiral of adverse dynamics in the housing market and the real economy. The outlook for the UK is surrounded by uncertainty following the UK’s referendum on EU membership on 23 June 2016.



Table 2.2
Economic outlook in EU countries

Real GDP	2015	2016	2017	Real GDP	2015	2016	2017
BE	1.4	1.2	1.6	AT	0.9	1.5	1.6
DE	1.7	1.6	1.6	PT	1.5	1.5	1.7
EE	1.1	1.9	2.4	SI	2.9	1.7	2.3
IE	7.8	4.9	3.7	SK	3.6	3.2	3.3
GR	-0.2	-0.3	2.7	FI	0.5	0.7	0.7
ES	3.2	2.6	2.5	BG	3.0	2.0	2.4
FR	1.2	1.3	1.7	CZ	4.2	2.1	2.6
IT	0.8	1.1	1.3	DK	1.2	1.2	1.9
CY	1.6	1.7	2.0	HR	1.6	1.8	2.1
LV	2.7	2.8	3.1	HU	2.9	2.5	2.8
LT	1.6	2.8	3.1	PL	3.6	3.7	3.6
LU	4.8	3.3	3.9	RO	3.8	4.2	3.7
MT	6.3	4.1	3.5	SE	4.1	3.4	2.9
NL	2.0	1.7	2.0	UK	2.3	1.8	1.9

Source: European Commission spring 2016 forecast.

Notes: Following the outcome of the UK's referendum on EU membership in June 2016, the economic outlook has changed. The forecasts in this table predate the referendum. The Bank of England projects that UK GDP will grow by 0.8% in 2017; the estimate was revised down from 2.3% after the referendum.⁵¹

There are some signs of banking stretch related to real estate in Austria, Finland, Belgium, Denmark, the Netherlands, Sweden and the United Kingdom (see Table 2.3). The mortgage stock in relation to capital exceeds 600% in Denmark⁵², the Netherlands and Sweden. In these countries, this corresponds closely to the gross domestic product. Low risk weights (Luxembourg, Finland, Belgium and the UK) imply less resilience of banks to manifestations of credit risk. Moreover, bank leverage is relatively high in Finland (19), Sweden (19), the Netherlands (18), Denmark (17) and the UK (16). At the other end of the spectrum lies Estonia with a leverage ratio of around 8, also reflected in a very high CET1 ratio (35%). Mortgages are also high in relation to capital in Finland and Belgium (421% and 413% respectively). In Estonia, Finland, Austria and Malta, the domestic banks also have significant exposures to non-financial companies engaged in real estate activities. In Austria, this is also accompanied by one of the lowest CET1 levels in the EU. For some countries, the proportion of market funding is considerable, which adds to banking stretch. This is particularly the case in Denmark (50% of total funding) and Sweden (52% of total funding). Large proportions of short-term wholesale funding also confirm the banking stretch indicated in Luxembourg (89%).

⁵¹ Inflation Report, Bank of England, August 2016.

⁵² The ratio for Denmark is significantly lower if mortgage credit institutions are included.



Table 2.3

Banking stretch related to residential real estate: key indicators

Indicators							
	Risk Weights on Residential Real Estate (IRB banks)	Total mortgage loans outstanding, as % of GDP, BSI	Total mortgage loans outstanding, as % of CET1, CBD ⁽¹⁾	Short-term market funding to total market funding (%), ANBS report	Proportion of Market Funding %, ANBS report	CET1 capital ratio, %, CBD	Leverage ratio, %, CBD ⁽²⁾
AT	24.00	27.96	165.26	54.90	19.66	12.65	13.53
BE	10.00	31.44	413.79	74.10	10.84	15.43	14.74
BG		9.89		78.10	0.65	19.47	7.68
CY		65.96	236.15	89.10	1.03	15.61	10.73
CZ		21.55	221.96	65.40	6.79	15.85	9.75
DE	16.00	35.59	87.27	58.00	19.43	14.90	18.56
DK	14.00	106.70	641.34 ⁽⁴⁾		49.7 ⁽⁵⁾	16.17	16.67
EE	15.00	30.78	183.60	83.90	0.16	34.79	7.73
ES	15.00	50.20	440.85	58.40	13.57	12.66	13.72
FI	<10.00	43.80	421.38	66.60	17.83	21.41	19.06
FR	15.00	40.56	194.26	70.70	19.80	12.57	17.26
GR		37.77	195.69	84.90	2.06	16.31	10.95
HR		15.97	102.30	83.10	0.25	17.71	7.96
HU		8.68		67.50	5.28	13.23	11.31
IE	37.00	35.87	241.74	74.40	16.90	22.30	7.82
IT	18.00	21.99	252.96	55.80	19.68	11.80	13.13
LT		16.69	274.56	58.50	0.24	24.29	9.04
LU	10.00 ⁽³⁾	47.05	50.98	89.20	9.58	20.11	13.45
LV		18.21	138.59	84.20	2.53	18.98	9.52
MT		44.15	154.13	78.60	1.10	18.02	14.07
NL	15.00	62.36	638.97	50.00	28.45	14.65	17.95
PL		20.66	244.97	56.40	4.62	14.50	9.18
PT	22.00	53.62	383.89	49.00	8.93	12.42	12.37
RO		7.31	215.33	87.10	0.81	16.38	9.79
SE	25.00	65.75	641.27	49.00	52.47	18.92	18.82
SI		14.26	93.57	64.00	3.64	17.98	8.57
SK		25.64	391.99	51.50	7.32	16.02	8.99
UK	11.00	55.28		69.20	18.16	13.76	15.63

Sources: ECB balance sheet item (BSI) statistics, ECB consolidated banking data (CBD), November 2015 Analysis of the national banking systems (ANBS) report, EBA 2015 Transparency Exercise and national authorities.

Notes:

(1) The total mortgage loans series uses consolidated banking data and therefore captures cross-border lending. However, it is necessary to use this data for consistency with the denominator, CET1 capital.

(2) Leverage ratio defined as total assets/total equity.

(3) Risk weights in Luxembourg are reported for all banking sectors for consistency purposes. Note that the (seven) banks active in real estate lending have higher risk weights (16%).

(4) The ratio for Denmark is significantly lower if mortgage credit institutions are included.

(5) Regulation does not permit specialised mortgage banks in Denmark to take deposits; they must instead fund their lending through the issuance of covered bonds.

2.1.2 Horizontal analysis: structural and institutional features

Structural and institutional features and developments in recent years vary considerably across the EU. RRE markets in the EU display considerable diversity in terms of structural and institutional features. It is difficult to provide a clear view of how these features affect probabilities and potential impacts of RRE-related crises, especially since such features interact and often have



both amplifying and mitigating effects that vary over the financial cycle.⁵³ However, developments in recent years show that even within groups of countries with similar structural characteristics, some countries were hit by RRE-related crises, whereas others were not.⁵⁴

National RRE markets are products of geographical, socio-economic, political and other factors. While geographical, demographic and cultural factors are key determinants of country-specific structural and institutional features, some features are also the result of conscious or unconscious political design. Housing is indeed one of the most regulated sectors, where a vast array of regulatory objectives interact to produce distinct national characteristics. This includes not only the availability and affordability of housing itself, but also (redistributive) tax policy, health and safety regulation, environmental regulation and spatial planning.⁵⁵ Needless to say, geographical conditions, including infrastructure, also display considerable variation across countries.

RRE vulnerabilities should be considered in the light of national specificities. Comparing structural and institutional features in the RRE markets across the EU reveals cross-country similarities, but also considerable differences (see Table 2.4). The paragraphs below use the information on structural and institutional features presented in Table 2.4 to analyse how the main structural and institutional features affect the vulnerabilities in the countries identified in the indicator-based analysis (see Section 2.1.1). However, analysing the way in which such structural and institutional features amplify or mitigate RRE-related vulnerabilities is extremely complex – not least since the effects may depend on interactions with other policies, and in particular on whether vulnerabilities are rising or already elevated.⁵⁶ One should also bear in mind that structural features and their expected developments tend to be priced in to housing market expectations and equilibria. This implies that unexpected structural changes (e.g. a comprehensive tax reform, reversed migration flows, etc.) may have large implications for RRE vulnerabilities.

High home ownership and rental market restrictions potentially amplify and interact with RRE-related vulnerabilities. Academic research has identified home ownership and rental market characteristics as factors having a bearing on real estate-related vulnerabilities. The evidence from the global financial crisis shows that EU countries with higher home-ownership rates not only experienced larger RRE price increases in the run-up to the crisis, but also saw sharper RRE price corrections in the crisis.⁵⁷ High home-ownership rates have also been found to have a strong positive effect on RRE price volatility in a global context and over time.⁵⁸ This could suggest that high home-ownership rates potentially amplify and interact with other RRE-related vulnerabilities, in

⁵³ Wheaton, W., "Real estate 'cycles': some fundamentals", *Real Estate Economics*, Vol. 27(2), 1999, pp. 209-230; Malpezzi, S. and Wachter, S., "The role of speculation in real estate cycles", *Journal of Real Estate Literature*, Vol. 13(2), 2005, pp. 143-164.

⁵⁴ See ESRB 2015 for further details on the structural and institutional features of national RRE markets, including a discussion on how such features may amplify or mitigate systemic risks.

⁵⁵ For a comprehensive discussion of these matters, see Andrews, D., Caldera Sanchez, A. and Johansson, A., "**Housing markets and structural policies in OECD countries**", OECD Economics Department Working Paper No 836, 2011; and "**House price imbalances and structural features of housing markets**", Quarterly Report on the Euro Area, Vol. 10, Issue 3, European Commission, October 2011.

⁵⁶ It is difficult to assess the precise impact of these parameters, as it typically depends on the combination of structural characteristics in place (ECB 2015a). It should also be noted that the structural and institutional features of national RRE markets are to some extent captured in the risk weights applied by IRB banks, in cases where these features impact on the probability of default and loss given default of mortgage exposures.

⁵⁷ ESRB 2015.

⁵⁸ Kappler, M., Kröncke, T.-A., Schindler, F., Schleier, F., Seymen, A. and Westerheide, P., "Housing Markets and Intra-Euro Area Macroeconomic Imbalances: Identifying Policy Instruments", European Commission – Directorate General for Economic and Financial Affairs (DG ECFIN), 2011; and ESRB 2015.



both the upturn and downturn of the housing cycle. In the former, they may cause a mutually reinforcing spiral of increasing RRE prices, credit and household indebtedness. In the latter, large price drops could aggravate the effects of negative feedback loops between falling RRE prices, reduced household consumption and losses and credit contractions among banks. Of the focus countries, Slovakia and Estonia have home-ownership rates that are significantly above the EU average. The opposite holds for Austria and Denmark, where the market is more balanced between owner-occupied and rented dwellings. Some countries (such as Denmark and Sweden) have strongly regulated rental markets; in some cases this coincides with underdeveloped rental markets. While specific research is lacking on the implications of restrictions on rental markets, underdeveloped rental markets should intuitively lead to similar amplifying effects to those seen for high home ownership.⁵⁹

Vulnerabilities can be amplified by tax breaks and subsidies.⁶⁰ A key feature of many national tax systems is direct and indirect housing subsidies – the latter typically in the form of mortgage interest deductibility. Tax deductibility reduces the net cost for households of servicing their debt, and gives households the possibility and the incentive to borrow more. Experience indicates a moderate effect of tax deductibility on RRE price volatility, possibly by increasing post-tax returns on (speculative) housing investment. Also, it tends to encourage indebtedness, which is in turn related to higher RRE prices.⁶¹ A more comprehensive way to analyse the effects of taxes on housing market dynamics is to observe the difference between the market rate and the financing cost of housing.⁶² Such a tax burden has a strong effect on price volatility in RRE markets. When the tax burden is high – due to high recurring property taxes or low subsidies/tax relief – RRE price volatility tends to be lower and vice versa.⁶³ Property tax measures can therefore have the effect of automatic stabilisers on the housing market. At the same time, distortionary effects from property taxes are usually smaller than from other taxes, e.g. taxes on labour or capital income.⁶⁴ The marginal contribution of tax to the cost of housing data shows that the focus countries generally have lower tax burdens on housing than the EU average (10.1 compared with 12.7). This is particularly pronounced for Estonia and the Netherlands, where tax systems significantly reduce households' housing expenditure. This, in turn, may amplify vulnerabilities in residential real estate. The opposite characterises Denmark, Belgium and the UK, where the marginal contribution of tax is more than twice the EU average.

Transaction costs can discourage speculation, but also reduce liquidity. Transaction costs – in the form of capital gains tax, stamp duties, legal fees, etc. – have also been found to have a

⁵⁹ These findings do not take into account the indebtedness of households or differentiate between mortgaged and non-mortgaged households.

⁶⁰ There are a number of features relating to tax and subsidies which are left out of this analysis, including social housing, rental market taxation and outright subsidies (such as the government mortgage subsidy in Slovakia).

⁶¹ Harris, B., “**The Effect of Proposed Tax Reforms on Metropolitan Housing Prices**”, Tax Policy Center, Urban Institute and Brookings Institution, April 2010; Andrews et al. (2011) as above fn. 55.

⁶² For a discussion of tax effects on housing, see Van Den Noord, P., “Tax incentives and house price volatility in the euro area: Theory and evidence”, *Économie Internationale*, Vol. 101, 2005(1), pp. 29-45; ESRB 2015; ECB 2015a; and Andrews et al. (2011) as above fn. 55.

⁶³ ECB 2015a; Harris (2010) as above fn. 61; and European Commission (2011) as above fn. 55. Please note that “taxes” in this paragraph refers to taxes, charges and fees that are recurring, and not taxes that relate to transactions or other one-off charges and fees.

⁶⁴ Ormaechea, S. A. and Yoo, J., “**Tax Composition and Growth: A Broad Cross-Country Perspective**”, IMF Working Paper WP/12/257, 2012.



negative but small effect on RRE price volatility.⁶⁵ This is probably due to disincentives for speculative house purchases. The effect is somewhat counterbalanced by a reduction in the number of houses offered for sale and the number of transactions, which may increase RRE price volatility. While the magnitude of these effects may differ across countries (due to influences from other policies and structural features), high transaction taxes – particularly in Belgium but also to a lesser extent in Luxembourg – may mitigate vulnerabilities in RRE. However, the transaction cost estimates in Table 2.4 exclude costs relating to stamp duties, legal and administrative fees, etc., which have the same directional effects as transaction costs, but for which comparable data are unavailable.

Mortgage maturities vary significantly among countries. The focus countries are characterised by relatively longer mortgage maturities than in other EU countries. Swedish housing loans, and to a lesser extent those in the Netherlands and Denmark, particularly stand out in this respect. Long maturities imply that amortisation, and thus the rate of reducing household indebtedness, are expected to be low. Of course, other features – such as the interest rate fixation period and the type of amortisation – can interact with the length of the maturity. Furthermore, mortgages with shorter maturities can be repeatedly rolled over in some cases. Longer maturities imply that there is less natural reduction in vulnerability levels related to household indebtedness. Related to this it is noteworthy that in some countries full amortisation of mortgages is not required or common.

The EU is characterised by large cross-country variations in price elasticities of housing supply. Housing supply strongly influences housing market dynamics, and is a complex function of geographical conditions (such as the supply of zoned and serviced land, urbanisation, etc.) and institutional factors (such as planning restrictions, building approval processes, etc.). Price elasticity of supply has been identified as particularly important. While housing supply generally tends to be relatively inelastic to price changes in the short run, the variation across countries is probably greater over the long run.⁶⁶ Also, elasticity is likely to be particularly low in urban areas, especially in the absence of a well-developed infrastructure for commuting or given restricted availability of land.

The responsiveness of housing supply to price changes has mixed effects on RRE vulnerabilities. When the housing supply is elastic to price changes, as is the case in the Nordic countries, real RRE price volatility tends to be lower. This may mitigate RRE vulnerabilities. However, the mitigating effect may be countered by the risk of overshooting in the construction sector. In turn, this may magnify a fall in RRE prices if demand subsequently weakens.⁶⁷ This may potentially characterise developments in Estonia, where recent investments in RRE in relation to GDP have been significantly higher than the EU average. When the responsiveness of new housing supply is low, which is the case in Austria, Belgium and the Netherlands, price effects from demand shocks can be exacerbated. This, in turn, may increase volatility and the risk of

⁶⁵ Andrews et al. (2011) as above fn. 55; ESRB 2015.

⁶⁶ European Commission (2011) as above fn. 55; Bacon, P., MacCabe, F. and Murphy, A., "An Economic Assessment of Recent House Price Developments", Government of Ireland Publications, Stationery Office, 1998.

⁶⁷ European Commission (2011) as above fn. 55; Caldera Sánchez, A. and Johansson, Å., "**The Price Responsiveness of Housing Supply in OECD Countries**", OECD Economics Department Working Paper No 837, 2011; Glaeser, E. L., Gyourko, J. and Saiz, A., "Housing supply and housing bubbles", *Journal of Urban Economics*, Vol. 64(2), 2008, pp. 198-217.



overvaluation, thereby amplifying RRE vulnerabilities.⁶⁸ Indeed, evidence suggests that countries with a low elasticity of housing supply display longer and more pronounced housing bubbles.⁶⁹ However, the risk of oversupply of housing through a construction boom is lower.

Population and household dynamics are key drivers of housing demand. In addition to increases in income and trends towards (de)urbanisation, demographic developments and changes in household structures are typically seen as key drivers of housing demand.⁷⁰ For instance, estimates show that population growth caused by population increases tends to translate into higher real RRE prices.⁷¹ Large population increases, which in the past have characterised Luxembourg and to a lesser extent Sweden and Austria, may therefore shield the housing market from significant price drops, potentially mitigating vulnerabilities. However, large population increases can also make the housing market vulnerable to subsequent population declines, such as the one experienced in Ireland recently). Evidence also suggests that household structure in combination with housing supply influences RRE price dynamics.⁷² Whereas the stock of dwellings per capita is a common measure of housing supply, it also reflects cultural differences and displays a high correlation with variables such as the share of single households. Changes in household structures may therefore be more useful in explaining housing dynamics over time.

⁶⁸ An analysis by the OECD (Andrews et al., 2011 as above fn. 55) suggests that in a country with supply responsiveness half a standard deviation below the median OECD country, the increase in RRE prices linked to a demand shock is roughly 50% larger than if the responsiveness was at the median. Thus, in rigid supply environments, increases in housing demand are much more likely to be capitalised into RRE prices than to spur increases in the quantity of housing, at least over the medium-term horizon covered by the OECD analysis. See also Caldera Sánchez and Johansson (2011) as above fn. 67.

⁶⁹ Glaeser, Gyourko and Saiz (2008); Glaeser, E., Gyourko, J. and Saks, R. E., "Why have house prices gone up?", *American Economic Review, Papers and Proceedings*, Vol. 95(2), May 2005, pp. 329-333; Grimes, A. and Aitken, A., "Housing supply, land costs and price adjustment", *Real Estate Economics*, Vol. 38(2), 2010, pp. 325-353; Paciorek, A., "Supply constraints and housing market dynamics", *Journal of Urban Economics*, Vol. 77(C), 2013, pp. 11-26.

⁷⁰ Many of the indicators in the composite vulnerability analysis are adjusted for income (price-to-income, debt-to-income and debt service ratios).

⁷¹ See for instance Conefrey, T. and Fitzgerald, J., "Managing housing bubbles in regional economies under EMU: Ireland and Spain", *National Institute Economic Review* 211, 2010; Cvijanovic, D., Favilukis, J. and Polk, C., "New in Town: Demographics, Immigration, and the Price of Real Estate", London School of Economics and Political Science, 2010; **Structural factors in the EU housing markets**, ECB, 2003.

⁷² Changes in family structure contributed to housing boom/bust cycles in Ireland, Spain and the UK as discussed in Duca, J., Muellbauer, J. and Murphy, A., "Housing Markets and the Financial Crisis of 2007-2009: Lessons for the Future", *Journal of Financial Stability*, Vol. 6(4), December 2010, pp. 203-217.



Table 2.4

Structural and institutional features of RRE markets in all EU countries

	Market characteristics				Tax & transaction			Supply-side characteristics				Demand-side characteristics		
	Dwellings per capita	Home ownership	Prevailing type of interest rate	Typical mortgage maturities (years)	Mortgage Tax Relief	Contribution of tax to marginal cost of housing	Transaction tax	Estimated longrun price elasticity of new housing supply	RRE investment/GDP (annual average 1995-2014)	RRE Investments/GDP (annual change in 2013)	Construction cost index	Net migration (per 1000 inhab.)	Single households (%)	Change in single households (%) 2004-2014
AT		57.3	Variable		None	6.9	< 5%	0.2	4.9	1.8	85.2	5.7	16.6	2.1
BE	0.35	72.3	Long term fixed	21.4	Bounded	24.0	≥ 10%	0.3	5.7	-1.4	95.5	2.5	15.0	1.2
BG		85.7		20.0	Bounded and Limited	-0.3			2.8	2.3	88.6	-0.2	9.2	
CY		74.0			None			0.2		-26.3	99.7	-13.9	7.6	
CZ		80.1	Short term fixed		Bounded and Limited	1.6	< 5%		7.9	-4.3	83.6	0.4	11.6	
DE	0.32	52.6	Medium term fixed	30.0	None	9.8	5-9%	0.4	3.4	2.7	91.9	5.3	20.2	
DK	0.42	63.0		27.2	Bounded	20.0	< 5%	1.2	6.0	-4.4	94.9	3.0	22.7	1.2
EE		81.1	Variable	22.6	Bounded and Limited	-5.3			4.6	17.0	87.9	-2.0	9.8	
ES	0.37	77.7	Variable	22.7	None	24.1	5-9%	0.5	3.6	-15.7	91.3	-5.4		
FI	0.41	73.6	Variable	21.6	Bounded	7.5	< 5%	1.0	7.4	-1.4	90.5	3.3	19.9	2.2
FR	0.39	64.3	Long term fixed	18.6	None	32.5	5-9%	0.4	8.0	-2.2	83.3	0.5	16.2	1.9
GR	0.42	75.8	Variable		None	30.2	< 5%		5.7	-33.3	88.7	-5.4	10.2	2.8
HR		88.5			None		5-9%		5.8		89.2	-1.1	8.8	
HU		89.6	Variable	15.0	None	11.0	< 5%		3.6	-30.3	88.5	0.4	8.8	
IE	0.22	69.9	Variable	26.4	None	15.8	< 5%	0.6	7.1	8.4	97.2	-5.3		
IT	0.42	73.0	Variable	21.9	Bounded and Limited	22.1	5-9%	0.3	5.1	-4.8	87.0	3.0	14.1	2.9
LT		92.2	Variable	21.0	None	8.4			2.5	15.4	93.4	-5.7	15.8	
LU	0.26	73.0	Variable	20.6	Bounded and Limited	8.0	5-9%		2.9	6.9	94.1	19.3	13.9	2.3
LV		81.2		16.2	None	14.1	< 5%		2.7	-6.1	85.0	-7.0	13.7	
MT		80.3	Variable	26.7	None	5.0	5-9%		4.9	4.8	94.2	7.7	8.9	
NL	0.36	67.1	Long term fixed	29.7	High or Unbounded	-7.2	< 5%	0.2	5.2	-11.1	94.0	1.0	16.8	
PL		83.8	Variable	26.3	None	20.5	< 5%	0.4	1.5	-5.2	91.7	-1.5	8.7	
PT	0.40	74.2	Variable	29.0	None	18.5	5-9%		5.6	-15.2	93.5	-3.5	8.4	2.5
RO		95.6	Variable	24.5	None	9.3			1.6	-3.9	77.8	-0.4	7.8	
SE	0.42	69.6		41.2	High or Unbounded	11.9	< 5%	1.4	3.1	6.1	82.6	6.8	19.6	-0.7
SI		76.6	Variable		None	10.3			3.4	-7.2	82.9	0.4	11.7	
SK		90.5			None	6.3		0.4	2.7	5.9	79.1	0.2	9.1	
UK	0.37	64.6		18.0	None	25.2	5-9%		4.6	7.6	78.7	3.3	12.5	
EU Average	0.37	76.0		23.8		12.7		0.5	4.5	-3.5	88.9	0.4	13.0	1.8

Sources: Eurostat and "Report on Residential Real Estate", ESRB Expert Group on Real Estate, 2015.



A key indicator in this analysis is the level of mortgage debt due to the risks that unsustainably high debt can pose to the economy. The accumulation of household debt has both costs and benefits. Household borrowing facilitates the purchase of investment goods, such as housing, and allows households to smooth consumption over their life cycle. Hence the option to accumulate debt improves the welfare of households and wider society. However, high indebtedness can also be associated with risks, both for individuals and the economy as a whole. At the individual level, high indebtedness can leave a household more sensitive to shocks. A shock to cash flow, due to reduced income or increased interest payments, may force a household to cut back on consumption or in more extreme circumstances renege on its debt. A simultaneous shock to RRE prices can make this more likely as it reduces the ability of struggling households to escape debt commitments by selling their property. The consumption of highly indebted households may respond more to RRE price shocks as they also tend to have higher leverage, which amplifies the impact of the RRE price fall on their net wealth.⁷³ Even if individual households are rational about the amount of debt they take on, there may be negative externalities for the whole economy particularly if the incentives to take on debt are misaligned. Households' inability to internalise these aggregate effects means that the optimal combined actions of individual households can have negative implications for wider economic and financial stability.

In assessing the risks from high household debt, one can distinguish between high debt levels reached through a long and steady build-up, and those reached through a short burst of rapid credit growth; both have been important amplifiers of economic shocks. Rapid growth in credit can exacerbate the risks associated with a high level of debt. A period of rapid credit expansion is likely to mean that a high share of debt is held by new borrowers who tend to be more vulnerable to shocks. Credit booms have often been associated with weakening underwriting standards, underestimation of risk by both lenders and borrowers, an unsustainable rise in RRE prices, and a rise in short-term wholesale funding by banks. All these factors increase the vulnerability of the balance sheets of both borrowers and lenders. In addition, a rapid credit expansion may also have been associated with unrealistic expectations about future income growth and RRE prices. The reassessment of these expectations following a shock could be associated with a sharp reduction in the availability of credit. The literature on the role of household credit focuses on credit growth as an important indicator of the probability and severity of a crisis. This literature finds strong evidence that a high rate of credit growth increases the likelihood of a crisis occurring. Moreover, recessions preceded by a sharp increase in indebtedness tend to be deeper and longer than other recessions.⁷⁴ Although there is comparatively less literature on the role of the level of indebtedness, there is convincing evidence that high aggregate debt levels go together with sharper cuts in consumption following a crisis.⁷⁵

The distribution of debt is also very important, given that the biggest risks from household indebtedness relate to the behaviour of highly indebted borrowers. A range of evidence based on micro data suggests that highly indebted borrowers cut back consumption more sharply in response to shocks, and are more likely to struggle to meet their mortgage commitments than other

⁷³ Mian and Sufi (2014) as above fn. 15 show that the sensitivity of consumption to changes in RRE prices is three times higher for households with loan-to-value ratios over 90% than for those with LTV ratios of less than 30%.

⁷⁴ See e.g. Drehmann and Juselius (2012) as above fn. 32 and Jordà et al. (2015) as above fn. 10.

⁷⁵ One such study is Flodén (2014) which shows that consumption between 2007 and 2012 fell by almost 4% more in countries which at the start of the crisis had a debt-to-income ratio of 200% than in countries that had a DTI ratio of 100%. See Flodén, M., "Should We Be Concerned by High Household Debt", 2014: [Flodén, M., "Should We Be Concerned by High Household Debt", *Ekonomistas*, February 2014](#)



borrowers.⁷⁶ Whilst the literature supports a link between the aggregate household debt level and the fall in consumption or severity of a crisis following an initial shock, there is little evidence on the extent to which aggregate debt plays a role, or whether it is just a summary measure for the share of highly indebted households. Other distributional factors may also be important when analysing the risks. These include whether the most highly indebted households hold liquid financial assets, which can be used to ease shocks to cash flow, and (un-mortgaged) housing wealth, which enables a struggling borrower to trade down.⁷⁷ It should also be considered whether highly indebted households, as measured by DTI ratios, are also the most leveraged in terms of LTV ratios. If so, this can increase the size of a wealth effect from a fall in RRE prices, magnifying the impact of a cash-flow shock on consumption.

However, just how risky a specific level of debt is to the economy may vary due to the level and evolution of certain macroeconomic variables and some of the structural factors mentioned above.

The evolution of these factors in many of the focus countries may suggest that the sustainable level of debt has increased over the past decades. Under some conditions, a declining real long-term interest rate, declining credit spreads and increased financial intermediation are factors that may indicate that the sustainable, or equilibrium, debt level has risen in many European countries. However, it should be noted that the causes of these developments may not support a higher equilibrium debt level, for example if interest rates are low due to lower growth expectations. Real RRE prices are also an important factor affecting the demand and supply of credit. Because housing accounts for a large proportion of household assets, changes in RRE prices can have a significant wealth effect affecting the demand for credit.⁷⁸ Higher RRE prices also represent more valuable collateral, which can lead to credit expansion by relaxing credit constraints.⁷⁹ But the channel can also operate in the opposite direction: increasing credit provision can lead to rising real estate prices in the short and long run (if housing demand persistently outstrips demand).

It is important to note that it is not always simple to disentangle long-term developments in the macroeconomic determinants of the debt level from cyclical developments that will revert in the medium term.

For example, there is some evidence that one of the drivers of rising household credit in Europe in the past 40 years has been rising RRE prices. The relatively fast falls in RRE prices that have occurred in some countries in recent years would suggest that a portion of the associated rise in credit had not been for sustainable reasons.⁸⁰ The amount of debt that is

⁷⁶ For evidence on the US, the UK and Denmark, respectively, see Mian and Sufi (2014) as above fn. 15; Bunn, P. and Rostom, M., "**Household debt and spending**", Bank of England Quarterly Bulletin, Q3 2014 Vol 54(3); and Andersen, A. L., Duus, C. and Jensen, T. L., "**Household debt and consumption during the financial crisis**", Monetary Review, Danmarks Nationalbank, Q1 2014. Further evidence is documented in **Financial Stability Report**, Sveriges Riksbank, 2015:2, 2015, pp. 13-14.

⁷⁷ Evidence for Denmark in the post-crisis period found that households with substantial financial assets cut back on consumption more sharply than households with limited financial assets, though this may have been because they also suffered greater losses of financial wealth (Andersen et al., 2014 as above fn. 76).

⁷⁸ Case et al. (2005) find a large housing wealth effect on consumption in a panel of countries including 11 EU countries; however, for the euro area as a whole, Sousa (2009) shows no housing wealth effect on consumption; for Italian households, Paiella and Pistaferri (2015) find a large housing wealth effect on consumption. See Case, K. E., Quigley, J. M. and Shiller, R. J., "Comparing Wealth Effects: The Stock Market versus the Housing Market", The B.E. Journal of Macroeconomics, Vol. 5(1), 2005; Sousa, R. M., "**Wealth effects on consumption: evidence from the euro area**", Working Paper Series, No 1050, ECB, 2009; and Paiella, M. and Pistaferri, L., "**Decomposing the Wealth Effect on Consumption**", September 2015.

⁷⁹ For example, see Bahaj, S. Foulis, A. and Pinter, G., "**The Residential Collateral Channel**", 2016.

⁸⁰ Forthcoming research on the drivers of structural credit; Bianchi, Trinity College Dublin and ESRB Secretariat.



considered as sustainable also depends on policymakers' tolerance of a materialisation of the associated risks (e.g. a sharper fall in consumption and an increase in defaults in a shock) and their view of the likelihood and severity of shock scenarios.

Structural and institutional features do not indicate that any focus countries should be excluded. As mentioned above, structural and institutional features are primarily considered within the vertical analyses in Section 2.2. However, based on the information illustrated in Table 2.4, one can conclude that there are both amplifying and mitigating factors relating to structural and institutional features in all the focus countries with the exception of Denmark, where the numbers in Table 2.4 suggest that most observed structural and institutional features are mitigating. However, other factors such as a highly regulated rental market and an inefficient housing tax system suggest that amplifying features are also present for Denmark and the horizontal indicator-based analysis also provides a relatively strong signal for Denmark. Based on this, while also recognising the difficulties in assessing structural and institutional features discussed above, the assessment suggests that there are no grounds for excluding any of the focus countries from further assessment based on their structural and institutional features.

Specific vulnerabilities may be rooted in any of the structural or institutional features mentioned above. This report tries to take all vulnerabilities into account in order to create a holistic understanding of the vulnerabilities in each country irrespectively of whether the vulnerabilities are due to cyclical or structural reasons. This suggests that the optimal policy response is not necessarily to be found (only) in the macroprudential toolbox; in some cases, vulnerabilities are perhaps best handled with structural reforms, e.g. changes to the regulation of the rental market or the tax system.

2.1.3 Policy measures to address RRE vulnerabilities

The ESRB has done extensive work on instruments to tackle macroprudential risks originating from the RRE sector.⁸¹ This provides a good basis for understanding and categorising policy measures.

The set of possible real estate instruments can be organised around the three “stretches” framework employed in the risk analysis section of the report. Table 2.5 shows an indicative categorisation of macroprudential policy measures by the type of RRE risks that they could directly address. This is not an exhaustive list of tools to address the different types of risk; countries may use other tools or certain tools for different purposes.

⁸¹ Chapter 3, ESRB (2014) as above fn. 4; ESRB 2015.



Table 2.5

Macroprudential policy measures, by the type of RRE risks that they could directly address

Identified RRE stretch	Household stretch	Collateral stretch	Banking stretch
Potential tools – depending on whether addressing stock or flow of lending	<p>Flow tools: LTI cap, DTI cap, DSTI cap, affordability requirements, amortisation rules</p> <p>Stock tools: Sectoral capital requirements/ increased risk weights on RRE lending, stress testing, capital buffers (incl. countercyclical)</p> <p>* Non-macroprudential policies may be useful, e.g. tax reforms or rental market reforms</p>	<p>Flow tools: LTV cap, amortisation rules, term limits</p> <p>Stock tools: Sectoral capital requirements/ increased risk weights on RRE lending, stress testing, capital buffers (incl. countercyclical)</p> <p>* Non-macroprudential policies may be useful, e.g. tax reforms or rental market reforms</p>	<p>Flow and stock tools: Sectoral capital requirements/increased risk weights on RRE lending, stress testing, capital buffers (incl. countercyclical)</p>

Household stretch instruments, such as caps on loan-to-income, debt-to-income and debt service-to-income ratios, limit the loan amount relative to the income of the borrower and may therefore be helpful in dampening credit growth. Collateral stretch instruments, such as LTV caps or amortisation limits, ensure some degree of protection before losses reach lenders' balance sheets or before consumption is scaled back, and limit the impact of risks if they materialise. Banking stretch instruments relate to regulatory capital requirements imposed on banks' RRE exposures and aim to limit the impact of risks when they materialise by enhancing the loss-absorbing capacity of banks. The ESRB Expert Group on Real Estate assessed that a combination of instruments, addressing different specific risks and channels, often seems to be the most suitable and comprehensive response to vulnerabilities originating in the real estate sector.⁸²

A carefully conceived design is crucial to the instruments' effectiveness and for reducing the risk of leakages and unintended consequences. Policy design includes aspects such as definitions used (e.g. as regards the type of income included or how the collateral is valued), exemptions granted and calibration. A wide array of methods is potentially available to help calibrate instruments. The methods vary in their degree of complexity and data intensity, ranging from simple descriptive analysis to advanced models. While such methods can usefully inform the setting of an instrument, expert judgement still remains crucial given the complexity involved in fully grasping the systemic risks and the uncertainty surrounding the likely impact of the instruments.

The role of policy more broadly than just macroprudential policy was also discussed in the 2015 report by the ESRB Expert Group on Real Estate. Policies that affect the structural features of RRE markets might positively contribute to financial stability since these features may amplify or dampen the transmission channels between the housing market, real economy and financial sector. Thus, rather than tackling emerging cyclical imbalances in markets through macroprudential intervention, policies influencing structural characteristics of RRE markets might positively contribute to financial stability. Such policies could address the tax treatment of housing/mortgage tax deductibility, the regulation of rental markets or regulatory constraints on developing new housing.

Member States' implementation of measures differs along most dimensions and, as measures in most cases have only recently been introduced, the evidence for determining "best practice" is still

⁸² ESRB 2015.



relatively scarce. In practice, a combination of instruments, even if not applied simultaneously, is the general rule, in particular for collateral and income stretch instruments.

Policies targeted at household indebtedness

As mentioned in Section 2.1.2 above, an unsustainably high debt level can pose risks to the economy and financial system. Therefore, it is useful to consider which policy measures might be useful to address the vulnerabilities that may arise from a high stock of mortgage debt.

A range of policy tools can be used to address the risks of high indebtedness. In principle, any measure that increases the cost of debt or reduces the amount of debt available to households can be used to lower the level of debt. Moreover, several tools – including macroprudential tools, tax measures and other tools – can be used to lower the riskiness of a given level of debt. It is important to note the benefits and costs of using the various policy options.

Macroprudential policies

Several macroprudential tools can be used to lower household indebtedness. These tools can be categorised into measures that are directed towards the loan contract between a lender and borrower (borrower-based measures) and measures targeted at the lender itself (lender-based measures).

Measures that set limits on certain characteristics of mortgage loans (such as LTI or LTV caps) have a direct impact on the flow of credit. As the characteristics of a loan contract cannot typically be adjusted unilaterally, these measures will normally only affect new or recontracted loans.

Tools on bank capital, such as sectoral capital requirements for residential real estate, are aimed at strengthening bank rather than household balance sheets. Higher (sectoral) capital requirements may be less effective than borrower-based tools in curbing the flow of new loans as they do not set a strict limit. Although there is some empirical evidence that borrower-based tools are most effective in reining in credit growth, most studies find that both borrower-based and lender-based instruments can impact credit growth.⁸³ However, as macroprudential capital requirements apply only to banks, these measures may be circumvented by non-bank lending.⁸⁴

Tax measures and other tools

Where high debt levels are caused by institutional and structural factors, policy measures can be directed at changing these factors. Such options should also be taken into account, even if most of these reforms are not in the toolkit of macroprudential authorities. These measures can directly affect household indebtedness, for example by increasing the cost of borrowing or the supply of housing. And they can lower the riskiness of a given level of indebtedness by reducing the volatility of RRE prices.

⁸³ See e.g. Cerutti, E., Claessens, S. and Laeven, L., “**The Use and Effectiveness of Macroprudential Policies: New Evidence**”, IMF Working Paper WP/15/61, 2015; Claessens, S., Ghosh, S. R. and Mihet, R., “**Macro-Prudential Policies to Mitigate Financial System Vulnerabilities**”, IMF Working Paper WP/14/155, 2014; and Kuttner, K. N. and Shim, I., “**Can non-interest rate policies stabilise housing markets? Evidence from a panel of 57 economies**”, BIS Working Papers No 433, 2013.

⁸⁴ For cross-country evidence on cross-sector substitution following macroprudential policies, see Cizel, J., Frost, J., Houben, A. and Wierts, P., “**Effective Macroprudential Policy: Cross-Sector Substitution from Price and Quantity Measures**”, IMF Working Paper WP/16/94, 2016.



For example, since countries with high stocks of debt are generally characterised by a preferential tax treatment of mortgage debt, such as mortgage interest deductibility (MID), reducing MID can be an effective and efficient way of reducing the level of household debt and can affect both the stock of existing debt and the flow of new loans.

Another way to reduce debt levels is by encouraging existing borrowers to amortise more. Even though binding amortisation requirements can in general only be applied to new loans, amortisation of existing loans can also be stimulated through other measures, such as tax incentives for amortising mortgages and moral suasion by banks and authorities.

Ensuring an adequate supply of housing and a well-functioning rental market may also reduce indebtedness and the volatility of RRE prices. A structural shortage in housing supply increases RRE prices and may induce households to borrow more. This may increase both the aggregate level of indebtedness and the share of highly indebted households.

The choice between different policy measures depends on the effectiveness of a measure in mitigating specific risks and the potential economic costs. In calibrating macroprudential and other tools to address (the risks from) high household debt, policymakers should be specific about the risks they want to address and the policy objective they want to achieve. For instance, lowering the aggregate level of indebtedness may call for different policy measures than those for reducing the proportion of households with excessive debt. Moreover, the effectiveness of a measure should be weighed against the possible negative economic effects in terms of restricted financial intermediation and lower growth. Measures that affect all borrowers can be more effective than measures that only affect new borrowers, but may also involve higher short-term economic costs.

Analysis produced by the IMF shows that some policies have proved to be more effective than others in reducing mortgage credit growth and RRE price inflation in advanced economies in the past two decades⁸⁵ Chart 2.2, which is taken from the IMF (2014) analysis, shows that DTI limits have constrained mortgage credit growth the most, followed by tightening mortgage tax policies and an LTV limit. Similarly, tightening mortgage tax policies can have a significant impact on RRE price inflation.

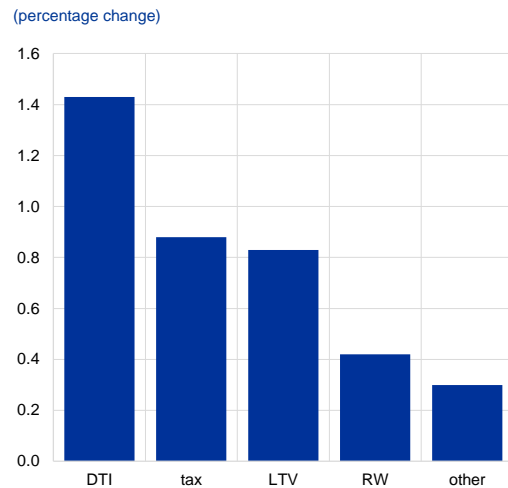
⁸⁵ See Section B of 'Macroprudential Policy: Lessons from Advanced Economies' in [IMF Country Report No 14/234](#), July 2014.



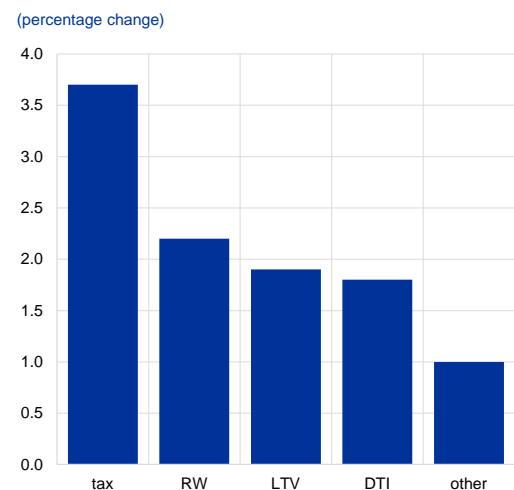
Chart 2.2

IMF event study estimates of the impact of macroprudential tools on mortgage credit and house prices⁸⁶

a) Reduction in mortgage credit growth in response to macroprudential measures



b) Reduction in house price inflation in response to macroprudential measures



Source: IMF staff calculations (2014).

In general, the macroeconomic costs associated with policy measures are lower when policies are applied gradually. However, the (short-term) economic costs may not be the same at each point in time. For instance, household deleveraging may be more costly in a period of weak economic demand, whereas reducing mortgage interest deductibility will be less costly when interest rates are low.

2.1.4 Summary: results of the horizontal analysis

As described earlier, a cross-country risk identification comprising an indicator-based scoreboard, and analysis of the cyclical position of vulnerabilities and institutional/structural features, was applied to all 28 EU Member States in order to identify a set of focus countries for further investigation. The three-step approach to horizontal risk identification was initially applied in the fourth quarter of 2015 and led to the identification of ten countries: Austria, Belgium, Denmark, Estonia, Finland, Luxembourg, the Netherlands, Slovakia, Sweden and the United Kingdom. In early 2016, during the course of the assessment, Malta was also confirmed as a focus country bringing the total to eleven.

For the purpose of this report, the scoreboard and cyclical analysis were updated with the latest available data (for August 2016) and some small methodological adjustments have also been made since the initial horizontal analysis was performed. The current scoreboard and charts may therefore suggest a slightly different set of high-risk countries than those originally identified and

⁸⁶ Figure 3, *ibid.*



analysed by the ESRB (in Section 2.2). Nevertheless, the originally identified focus countries continue to exhibit vulnerabilities in the latest data, which supports the robustness of the original identification. It is also useful to see how risks may have developed in other EU countries over the course of the assessment process.

Section 2.2 will discuss the results of the vertical analysis for the eleven focus countries in more detail.

2.2 Vertical analysis of RRE vulnerabilities

The horizontal analysis – described in Section 2.1 of this report – identified those countries with vulnerabilities that have the potential to become material risks in the medium term. This set of focus countries was then subject to in-depth, country-specific analysis in a second stage of the work (known as the “vertical analysis” stage).

This section provides the preliminary vertical analysis of vulnerabilities related to residential real estate, taking into account whether prudential policy measures as well as other relevant policies enacted are likely to address the vulnerabilities in the medium term. This analysis has been prepared jointly by the ESRB Secretariat and the members of the task force who were responsible for the country analysis (the Country Teams), with input from the ESRB Assessment Team on Macroprudential Measures and methodological advice from the ESRB Working Group on Real Estate Methodologies (the “Methodology Team”). This team-based framework was developed to ensure a fair and independent treatment of each country, so that all relevant factors are taken into account. Country representatives were heavily involved in the process and have provided input via self-assessments, via interactions with the task force and at ESRB meetings in order to ensure the accuracy and completeness of the analysis. A more comprehensive description of the organisational framework can be found in Annex A.

Section 2.2.1 briefly describes the methodology for the vertical assessment and Section 2.2.2 presents the country-specific analysis for each of the eleven focus countries.

2.2.1 Vertical analysis methodology

A qualitative approach was taken to analyse vulnerabilities and policies at the country level. The analysis was organised around the three “stretches” described in Section 1.3; each identified vulnerability was assigned to the associated stretch.⁸⁷ The overall analysis was then based on the vulnerabilities in each stretch and the interaction between them, since one type of vulnerability may amplify other types. At the country level, consideration was given to the interaction of the stretches, as well as structural features, relevant policy measures and other country specificities. Note that, in addition to prudential policies, non-prudential policy measures were also investigated if they were deemed to be potentially important for RRE markets (see Section 2.1.4). Policy measures were taken into account in the assessment if they have been implemented (including with a transitional period) or decided upon with a firm plan for implementation.

⁸⁷ This methodology was inspired by a concept put forward by the ESRB Expert Group on Residential Real Estate (ESRB 2015).



As described in Section 2.1.2, in each country there are a number of structural features that may either amplify or reduce RRE vulnerabilities; the advantage of conducting in-depth country analysis is that these features can be taken into account. Since material risks to financial stability can arise as a result of structural and cyclical factors, both are investigated in the country analysis. The assessment of whether the enacted policy in each country addresses any vulnerabilities in the three stretches has resulted in a grading of policy at the level of each stretch and overall for a country. Note that credit could be given to the same policy measure more than once if it was considered that it could address vulnerabilities in more than one stretch. Two main criteria were used to assess the policy stance:⁸⁸

- **Appropriateness:** whether or not policies are conceptually suitable given the nature and timing of risks. Appropriate measures are those which address the risks in that country, e.g. if there are risks related to a country having a high debt-to-income ratio, an appropriate measure could be a DTI or LTI limit.
- **Sufficiency:** whether or not policies are expected to or could be shown to significantly mitigate, or reduce the build-up of, risks over an appropriate time horizon with a limited unintended impact on the general economy. Factors to be considered when assessing policy sufficiency relate to the calibration of the measure, its timeliness and its scope of application. If there was evidence that the measure was having the intended effects and was mitigating or reducing the identified risk(s), and/or if it was causing any unintended negative effects, this has been taken into account.

The policy stances of the focus countries were assessed individually for each of the three stretches and then an overall assessment was made.

At the level of each stretch (household, collateral, banking), there were four possible assessment grades:

1. **Appropriate and sufficient**, where policies are conceptually suitable given the nature and timing of risks and where the level and build-up of risks can be shown to be fully addressed by the policy packages.
2. **Appropriate and expected to be sufficient**, where policies are conceptually suitable given the nature and timing of risks and where the level and build-up of risks cannot be shown, but are expected, to be addressed by the policy packages.
3. **Appropriate but not expected to be sufficient**, where policies are conceptually suitable given the nature and timing of risks, but where the level and build-up of risks are not expected to be addressed by the policy packages.
4. **Not appropriate**, for cases where no conceptually suitable measures, given the nature and timing of risks, have been taken.

The grading of an individual country's policy measures into one of the four categories followed a two-step procedure. The first step was to see whether any policies have been taken to address the risks identified. If not, the policy stance was assessed as not appropriate (option 4), but if conceptually suitable measures have been taken, the policy stance was assessed to be appropriate (options 1-3). In cases where appropriate policies have been taken, the next step was to group the

⁸⁸ The conceptual criteria and precise definitions were proposed by the RRE Methodology Team.



policy stance into categories 1-3 taking into account the calibration of the measures, the timeliness and the scope of application. If there is evidence that measures have had the intended effects and are mitigating or reducing the identified risk(s), and/or if they are causing any unintended negative effects, this was taken into account.

When an assessment had been arrived at for each of the three stretches, an overall assessment of the country's policy strategy was performed using the following aggregation rule:

- If the policy strategy was assessed to be not appropriate for any individual stretch, the overall policy strategy was assessed as not appropriate.
- If the policy strategy was assessed to be appropriate for all three stretches, the sufficiency of the overall policy strategy was determined by the lowest sufficiency grading of the individual stretches (where the highest grading is category 1, and the lowest is category 3).

2.2.2 Country analysis

Austria

Key points

Vulnerabilities for Austria are related to the robust growth, particularly recently, in RRE prices and mortgage credit and the risk of a further loosening in lending standards. The vulnerabilities in the collateral stretch are mostly due to the rapid increase in RRE prices since 2011. Until recently, RRE price dynamics were much stronger in Vienna than in the rest of the country. However, since Q3 2014, RRE prices have been rising more quickly in the rest of the country (where the annual growth rate was 8.9% in Q1 2016) than in Vienna itself (where the annual growth rate was 6.5% in Q1 2016). In general, rapid RRE price growth that surpasses household income growth, as has recently been observed in Austria, makes it more difficult for households to become homeowners, and can lead to an overall increase in household indebtedness and/or a rise in the size of the group of highly indebted households. The Oesterreichische Nationalbank (OeNB) estimated that RRE prices in Vienna were 22.8% above the price suggested by fundamentals in Q1 2016, whereas the prices in the whole country were more in line with fundamentals at 6.3% above fundamentals (see Chart AT.1). The valuation measures are partly driven by the fact that RRE prices in Austria have been growing compared with some fundamentals. For instance, the price-to-income index rose to 127% in Q1 2016 from 100% in 2010, while during the same period the average EU PTI decreased by 1 p.p. Moreover, the price-to-rent index increased to 113% in Q1 2016 from 100% in 2010, while the EU average decreased to 97%.

The strong RRE price dynamics have coincided with robust credit growth more recently. In June 2016 loans for house purchases grew by 5% annually. The OeNB gathers data on banks' lending standards via a survey. Unfortunately these data are not completely reliable since there are a number of caveats for the survey: (1) it covers only a relatively small market share (about 20-25% of housing loans collateralised by residential real estate); (2) its sample size changes over time; and (3) the variance in the data between banks is quite large, also due to different methods of calculation between banks. For this reason, the results have to be carefully interpreted. However, the first indications of the survey suggest that vulnerabilities appear to be increasing. The data suggest that the sample average median DTI ratio for new mortgages among surveyed banks increased to 490% in Q4 2015 from around 400% in Q4 2014, while the sample average median LTV ratio increased to 65% in Q4 2015 from 60% in Q4 2014 (see Chart AT.3). However, the share



of the volume of new loans with LTV ratios above 90% increased between Q1 2013 – Q2 2014 and Q3 2014 – Q4 2015. Furthermore, 67% of the volume of new loans had a DTI above 400% in Q4 2015. Given the available evidence, the DSTI ratio has been stable. For the sample average median DTI ratio, the change was in particular driven by two medium-sized banks, of which only one reported data as of Q3 2014. Excluding these banks from the sample leads to a sample average median DTI ratio of 440% instead of 490% in Q4 2015. The variance between banks is relatively large.

As a response to rising vulnerabilities related to the real estate sector, suggested in particular by the first indications of the above-mentioned OeNB survey on lending standards⁸⁹, the OeNB informally communicated expectations to the industry on lending standards at end-July and in early August. Such moral suasion aims to reduce, ex ante, the likelihood that lending standards will be loosened to an extent that would increase systemic risk. Furthermore, on 1 June 2016, the Austrian Financial Market Stability Board (FMSB) issued advice to the Federal Minister of Finance to prepare the legal foundations for imposing limits on LTV, DTI or DSTI ratios in new lending. Such an expansion of the macroprudential toolkit is meant to ensure that the FMSB can act on systemic risks arising from real estate-related vulnerabilities.

When analysing the nature of the identified vulnerabilities, one can observe both mitigating and aggravating factors. The identified aggravating factors relate to the significant shares of variable rate loans (for both new loans and in the existing stock) as well as existing foreign currency housing loans. However, the share of both variable rate loans and foreign currency loans has been declining. Also, several analyses show that particularly borrowers with foreign currency housing loans in Austria hold considerable risk buffers that mitigate related vulnerabilities. Mitigating factors include a relatively low home-ownership rate, which has been stable for decades, combined with a well-developed rental market. Moreover, most of the mortgages are amortising, while the proportion of mortgage holders among homeowners is close to the EU average (in 2014 25% of homeowners had mortgages in Austria, compared with 27% for the EU as a whole). Mortgage loans in relation to GDP as well as to Austrian banks' Tier 1 capital are low compared with other EU countries. Total household indebtedness in relation to GDP is a bit lower but close to the median for the EU and has declined slightly over the last few years. In addition, the wealthiest households tend to be the households with the highest levels of debt. The relatively high housing investment in Vienna may also be viewed as a mitigating factor.⁹⁰ Tax deductibility of mortgage interest payments is negligible. An increase in the real estate transfer and capital gains tax in 2016 may make real estate purchases for investment purposes marginally less attractive in the long run and may therefore mitigate future RRE price appreciation pressures. Finally, exposures of Austrian banks to RRE receive risk weights above the EU average, which makes the Austrian banking sector relatively better capitalised to absorb potential losses from RRE shocks. However, the overall solvency ratio of the Austrian banking sector is below the EU average.

Given RRE price dynamics and valuations (particularly in Vienna), coupled with robust growth of mortgage loans and signs of weakening lending standards, vulnerabilities in the Austrian RRE sector are building up, particularly in the collateral and household stretches. Indeed, the first

⁸⁹ Some caveats apply to the OeNB survey data: (1) it only covers a relatively small market share (about 20-25% of housing loans collateralised by residential real estate); (2) its sample size changes over time; and (3) the variance in the data between banks is quite large. For this reason, the results must be interpreted with care.

⁹⁰ The housing stimulus package for the development of subsidised rental homes in the next five years may further ease demand pressures.



indications of the recent OeNB survey⁹¹ show that for some banks a large share of the volume of new loans represent high levels of debt compared with the house values and borrower income. In these types of situations, borrower-based macroprudential tools could efficiently prevent the excessive build-up of vulnerabilities and systemic risk going forward. Even though expectations have been communicated informally and steps have been taken to make the policy instruments legally available, they are currently not available in the legislation to the Austrian authorities.⁹² Hence, the authorities would not be able to respond quickly to growing vulnerabilities by using legal borrower-based macroprudential measures if they found it to be necessary.

While the policy measures that have been taken by the Austrian authorities are appropriate given the nature of RRE vulnerabilities in Austria, they may not be sufficient to fully address them. Measures introduced by the Austrian authorities include the expectations regarding sustainable lending standards that have been communicated to banks.⁹³ In addition, the FMSB has advised the Ministry of Finance to extend the macroprudential toolkit to borrower-based macroprudential instruments in the field of real estate financing to ensure that the FMSB can act on systemic risks arising from unsustainable real estate market developments.⁹⁴ Despite the measures taken, RRE prices and mortgage credit are growing robustly, there are groups of households with elevated debt levels and there is some evidence of weakening lending standards. The measures taken for the banking stretch seem sufficient to deal with RRE vulnerabilities relating directly to the banking system. However, given the developments in RRE prices and credit, the measures taken for the collateral and housing stretches may not be sufficient. Appropriate measures have been taken for all stretches.

⁹¹ See footnote 89: some caveats apply to the OeNB survey data.

⁹² Following the ESRB's decision to issue this warning, the Austrian Financial Market Stability Board discussed sustainable lending standards in residential real estate during its meeting on 23 September 2016. See the FMSB press release: [FMSB press release](#).

⁹³ See footnote 92.

⁹⁴ The FMSB's advice is available publicly: <https://www.fmsg.at/en/publications/warnings-and-recommendations/advice-2-2016.html>.



Table AT.1

Summary assessment – Austria

Summary RRE risk assessment narrative	<p>Key vulnerabilities are related to the collateral and household stretches</p> <p>Vulnerabilities for Austria are related to robust growth, particularly recently, in RRE prices and mortgage credit and the risk of a further loosening in lending standards.</p> <p>RRE prices are increasing rapidly, in particular since 2011. In Q1 2016, RRE prices increased by 8.9% (year-on-year) in Austria outside Vienna and by 6.5% in Vienna, and are now above the pre-crisis level in Austria.</p> <p>Overall, RRE prices in Austria are broadly in line with fundamentals, but have increased quickly relative to some fundamentals (e.g. the PTI ratio increased by 27% between Q1 2010 and Q1 2016). At the same time, RRE prices in Vienna appear to be above fundamentals (by 22.8% in Q1 2016) according to OeNB models.</p> <p>Housing credit is growing robustly (loans for house purchase grew by 5% in June 2016 over the year). At the same time, the first indications, which must be interpreted with care, of an OeNB survey indicate a decline in lending standards.⁹⁵</p> <p>The related data suggest that the sample average median DTI ratio among surveyed banks increased to 490% in Q4 2015 from around 400% in Q4 2014 for new mortgages, while the sample average median LTV ratio for new mortgages increased to 65% in Q4 2015 from 60% in Q4 2014. However, the share of the volume of new loans with LTV ratios above 90% increased between Q1 2013 – Q2 2014 and Q3 2014 – Q4 2015. Furthermore, 67% of the volume of new loans had a DTI ratio above 400% in Q4 2015. Given the available evidence, the DSTI ratio has been stable.</p> <p>The share of variable rate and foreign currency mortgages in the stock of loans is still significant despite declining.</p>
Policy assessment given risks	<p>The policy stance is appropriate but not expected to be sufficient for the collateral and household stretches</p> <p>While the policy measures that have been taken by the Austrian authorities are appropriate given the nature of RRE vulnerabilities in Austria, they may not be sufficient to fully address them.</p> <p>Despite the measures taken, RRE prices and mortgage credit are growing robustly, there are groups of households with elevated debt levels and there is some evidence of weakening lending standards.</p> <p>Even though soft measures have been taken and steps have been taken to make policy instruments legally available, there is a lack of borrower-based macroprudential tools in the law. These measures could effectively prevent an excessive build-up of vulnerabilities and systemic risk.</p> <p>The measures taken for the banking stretch seem sufficient to deal with RRE vulnerabilities relating directly to the banking system. However, given the developments in RRE prices and credit, the measures taken for the collateral and housing stretches may not be sufficient. Appropriate measures have been taken for all stretches.</p>

Table AT.2

Summary of risks and policy measures – Austria

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	<p>Housing credit is growing robustly at 5%, with signs of weakening lending standards (based on the results of an OeNB survey which must be interpreted with care⁹⁵). The sample average median DTI ratio for new loans increased to 490% in Q4 2015. At the same time, 67% of the volume of new loans had a DTI ratio above 400%. A significant share of mortgage loans are in foreign currency or are with variable rates, but this share is decreasing.</p>	<p>RRE prices are increasing quickly in Austria and prices, particularly in Vienna, are estimated to be overvalued. The RRE price increase has probably not been driven by a credit boom. However, recent RRE price increases in the rest of the country, the growth in new housing loans and a possible deterioration in lending standards suggest that vulnerabilities are building up.</p>	<p>The share of mortgages on banks' balance sheets is relatively low (28% in Q1 2016), which makes banks less vulnerable to RRE shocks. Moreover, banks apply above EU average risk weights to RRE exposures (the average risk weight for Austrian IRB banks is 24% as against an EU average of 16%). However, the capitalisation of Austrian banks is lower than that of their EU peers (the CET1 ratio for Austria was 12.8% in Q1 2016 as against an EU average of 13.9%).</p>
Summary of policy measures (implemented, planned, under consideration)	<p>An information folder on the risks of foreign currency lending has been published (in 2006 and 2011) and the authorities have made recommendations on minimum standards for banks' lending addressing excessive risk concentration, maturity</p>	<p>LTV limits in certain market segments: bonds covered by mortgages (LTV max. 60%), mortgage loans granted by building societies (LTV max. 80%) and mortgages included in</p>	<p>Systemic risk buffer (SRB) of up to 2% for 12 banks (buffer of up to 1% for systemic vulnerability and up to 1% to address systemic cluster risk; in place since 1 January 2016 with a</p>

⁹⁵ See footnote 89: some caveats apply to the OeNB survey data.

⁹⁶ See footnote 89: some caveats apply to the OeNB survey data.



<p>transformation and foreign currency lending growth (implemented and reinforced in 2003, 2010 and 2013).</p> <p>The OeNB has informally communicated expectations to the industry on lending standards (July and August 2016).</p> <p>There is a lack of macroprudential instruments available to the Austrian authorities. The macroprudential toolkit does not yet include DTI and DSTI measures. On 1 June 2016 the Financial Market Stability Board issued advice to the Ministry of Finance to extend the macroprudential toolkit to borrower-based macroprudential instruments in the field of real estate financing.</p>	<p>the coverage funds in the insurance sector (LTV max. 60% to be included in the coverage fund).</p> <p>The OeNB has informally communicated expectations to the industry on lending standards (July and August 2016).</p> <p>There is a lack of macroprudential instruments available to the Austrian authorities. The macroprudential toolkit does not yet include LTV measures. On 1 June 2016 the Financial Market Stability Board issued advice to the Ministry of Finance to extend the macroprudential toolkit to borrower-based macroprudential instruments in the field of real estate financing.</p>	<p>phase-in until end-2018)</p> <p>Other systemically important institution (O-SII) buffer of between 1% and 2% (active from 1 June 2016 with a phase-in until end-2018)</p> <p>The capital conservation buffer is being gradually introduced between 2016 and 2019. When fully phased in, it will stand at 2.5%.</p>	
<p>Assessment of policy measures</p>	<p>Appropriate but not expected to be sufficient</p>	<p>Appropriate but not expected to be sufficient</p>	<p>Appropriate and sufficient</p>

Household stretch

The annual growth rate of housing loans is robust; it has increased from 1.6% in May 2013 to 5% in June 2016 (see Chart AT.2). In comparison, the growth rate for housing loans was 2% in the euro area in June 2016. In the period 2009-15, the average yearly growth rate was 3% in Austria, which is lower than the growth rate prior to the crisis (in the period 2005-8 the average yearly growth rate was 8.1%).

In general, households that are highly indebted relative to income or the value of their property could be particularly vulnerable to economic shocks such as an increase in unemployment or a fall in household incomes or RRE prices. Under such circumstances, households may find it more difficult to service their debts and the number of mortgage defaults may increase, leading to direct credit losses for banks, especially in the event of a fall in RRE prices. Moreover, if an adverse scenario for the economy does materialise, the associated negative household income and wealth effects may reinforce the initial shock, further enhancing the negative direct and indirect effects on financial stability (e.g. if households need to reduce consumption in order to service their mortgage loans).

The OeNB argues that part of the peak in the issuance of new loans for housing⁹⁷ in recent years (that has now receded) might have been caused by the restructuring of foreign currency loans as well as the refinancing of fixed rate loans (see Chart AT.2). However, there is a limited amount of fixed rate loans. Historically, a low home-ownership rate and a low share of mortgage holders among homeowners have maintained household indebtedness at a low level (51% of GDP in Q1 2016 compared with an EU average of 53%). The low home-ownership rate is combined with a well-developed rental market. Around 25% of Austrian homeowners had mortgages in 2014 compared with 27% for the EU.⁹⁸ In addition, according to the 2014 data taken from the

⁹⁷ These are purely new loans; they exclude loans that are refinanced within a bank, but for technical reasons they do not exclude loans that are refinanced across the banks.

⁹⁸ Other data from the 2014 Household Finance and Consumption Survey suggest that 34% of Austrian homeowners have a mortgage. The 25% is taken from the ECB Statistical Data Warehouse.



Eurosystem's Household Finance and Consumption Survey, household debt and wealth appear to go hand in hand, so that the most indebted households are also the wealthiest. Furthermore, most mortgage holders are amortising their loans.

The first indications of an OeNB survey⁹⁹ on lending standards, even though based on a relatively small sample of banks, indicate that vulnerabilities in the household stretch appear to be increasing. But, since the variance between banks is quite large and the sample size is small and changes over time, these results have to be interpreted with care. The data suggest that the sample average median DTI ratio among surveyed banks increased to 490% in Q4 2015 from around 400% in Q4 2014 for new mortgages (see Chart AT.3). In addition, 67% of the volume of new loans had a DTI ratio above 400% in Q4 2015 (the share of the number of loans with a DTI ratio above 400% was 49%). Given the available evidence, the DSTI ratio has been stable at around 25%. However, such analysis is subject to uncertainty and should be interpreted with care due to the short availability of the underlying data and the relatively small and changing sample size of six banks, though covering the different banking sectors.¹⁰⁰ The OeNB argues that the increase in DTI ratios and LTV ratios is partly due to an extension of the sample size.

As a response to these first indications of deteriorating lending standards¹⁰¹, the OeNB has communicated to the banking industry informal expectations regarding lending standards.¹⁰² The Austrian macroprudential toolkit does not yet include any legal borrower-based instruments. However, on 1 June 2016, the FMSB issued advice to the Ministry of Finance to extend the macroprudential toolkit to borrower-based macroprudential instruments in the field of real estate financing.¹⁰³

Another financial stability vulnerability related to the household stretch stems from a high legacy share of foreign currency loans and a high share of variable rate loans. In May 2016 the share of foreign currency loans in the stock of housing loans was 15%, particularly denominated in Swiss francs. Moreover, almost 80% of total loans are with variable interest rates (see Charts AT.4 and AT.5). Due to the high share of variable interest rate loans and foreign currency loans, most Austrian mortgagors are exposed to interest rate risk and some of them to foreign currency risk. A potential increase in interest rates may result in a reduced repayment capacity of many mortgagors, as could significant movements in the relevant currency for those with foreign currency loans. These risks are mitigated by the limited level of indebtedness of Austrian households.

As regards foreign currency loans, around 83% of foreign currency borrowers have above median wealth and income. Also, the risk of foreign currency lending to private households has been targeted by the Austrian competent authorities with several measures since 2003 and banks no longer offer foreign currency loans domestically. The measures taken range from the publication of an information folder on the risks of foreign currency lending to the implementation and reinforcement of minimum standards addressing excessive risk concentration, maturity transformation and foreign currency credit growth (minimum standards (2003, 2010, 2013), information leaflet (2006, 2011), letter from the FMA to banks (2008), moral suasion and

⁹⁹ See footnote 89: some caveats apply to the OeNB survey data.

¹⁰⁰ Unfortunately, the survey does not provide any breakdown by loans secured by property located in Vienna and the rest of the country. For the next round of the survey, this enlargement may be considered.

¹⁰¹ See footnote 89: some caveats apply to the OeNB survey data.

¹⁰² See footnote 92.

¹⁰³ See footnote 94.



regular/ongoing management talks. Regarding variable rate mortgages, banks increasingly advertise fixed rate loans according to anecdotal evidence gathered by the OeNB.

As a consequence of the policy measures taken, the share of foreign currency loans has been decreasing; in Q1 2016 the share of foreign currency loans in new lending was less than 1%. Moreover, the share of loans with an interest rate fixation period of up to one year in new lending was 63% in May 2016, which is a decrease of 8.5 p.p. over a one-year horizon and 20 p.p. over a two-year horizon. However, in Q1 2016, 25% of the foreign currency loans had a residual maturity of over 15 years according to the OeNB (down from 52% in 2007). The IMF pointed out in 2013 that the long residual maturity of these loans makes the risks connected to them limited, as the potential interest rate and foreign exchange shock can be absorbed with a low level of provisioning. Additionally, banks no longer offer foreign currency loans domestically.

Overall, the low level of aggregate household indebtedness and the fact that most mortgage holders are amortising their loans are factors that mitigate vulnerabilities related to household stretch. However, a high legacy share of foreign currency loans and the high share of variable rate loans are factors amplifying vulnerabilities. The Austrian authorities have targeted the foreign currency loans with several measures and, as a consequence, their share is decreasing, also because banks in Austria no longer offer foreign currency loans domestically.

Given the current level and dynamics of vulnerabilities in the household stretch, the measures taken are deemed appropriate, but may not be sufficient. First indications on lending standards¹⁰⁴, though based on a relatively small sample of banks, suggest a potential build-up of vulnerabilities related to the distribution of DTI ratios and DSTI ratios for new loans. This development has led the OeNB to communicate informal expectations to the banks. However, these expectations were communicated only very recently and there is no hard data available to assess whether they have been effective and complied with. Furthermore, they are merely informal and are expectations rather than recommendations. Due to the lack of available legal instruments, the Austrian authorities are unable to act efficiently with direct borrower-based macroprudential tools if needed. Legally binding limits on lending standards would be more effective in preventing a potential build-up of vulnerabilities related to loosening lending standards going forward.

Collateral stretch

Vulnerabilities in the collateral stretch are mostly due to the rapid increase in RRE prices since 2008. Until recently, RRE price dynamics were much stronger in Vienna than in the rest of the country. However, since Q3 2014, RRE prices have been rising more quickly in the rest of the country (where the annual growth rate was 8.9% in Q1 2016) than in Vienna itself (where the annual growth rate was 6.5% in Q1 2016). The OeNB has estimated that RRE prices in Vienna were overvalued by 22.8% in Q1 2016, whereas the overvaluation in the whole country was more muted at 6.3% (see Chart AT.1). The overvaluation measures are partly driven by the fact that RRE prices in Austria have been growing compared with some fundamentals. For instance, the price-to-income index rose to 127% in Q1 2016 from 100% in 2010, while during the same period the average EU PTI ratio decreased by 1 p.p. Moreover, the price-to-rent index increased to 113% in Q1 2016 from 100% in 2010, while the EU average decreased to 97%. In general, rapid RRE price

¹⁰⁴ See footnote 89: some caveats apply to the OeNB survey data.



growth that surpasses household income growth, as has recently been observed in Austria, makes it more difficult for households to become homeowners, and can lead to an overall increase in household indebtedness and/or an increase in the size of the group of households with elevated debt levels. However, according to measures calculated by the OeNB, the affordability of housing has recently been stable in Vienna and has been decreasing in the rest of the country.

Low household indebtedness suggests that there has been a limited role of credit and a quite significant role of cash buyers in the RRE price appreciation in Vienna. Furthermore, the low homeownership ratio, the positive net migration and the increasing number of households in Austria are mitigating the vulnerabilities in the collateral stretch.

The above-mentioned OeNB survey¹⁰⁵ on lending standards, even though based on a relatively small sample of banks, indicates that vulnerabilities appear to be increasing in the collateral stretch. However, since the variance between banks is quite large and the sample size is small and changes over time, these results have to be interpreted with care. According to the OeNB survey, the sample average median LTV ratio among surveyed banks for new loans increased from 60% to 65% between Q4 2014 and Q4 2015 (see Chart AT.3). Regarding the dynamics of the LTV distribution of new loans, the share of the volume of new loans with LTV ratios above 90% increased between Q1 2013 – Q2 2014 and Q3 2014 – Q4 2015. The OeNB notes that loans in the highest LTV class usually have higher additional collateral. Other data from the ECB Bank Lending Survey suggest that banks' lending standards for loans for house purchase have been unchanged or even tightened slightly over the last three months and are expected to remain stable over the following three months.

In order to counter a possible weakening of lending standards,¹⁰⁶ the OeNB communicated informal expectations regarding sustainable lending standards to the banking industry. These expectations appear to be stringent, but are merely informal and are expectations rather than actual recommendations. As for the household stretch, legally based limits would be more effective in preventing a build-up of vulnerabilities related to loosening lending standards.

Beyond the above measures, the Austrian authorities have set LTV limits in certain market segments¹⁰⁷: bonds covered by mortgages (LTV max. 60%), mortgage loans granted by building societies (LTV max. 80%), and mortgages included in the coverage funds in the insurance sector (LTV max. 60% to be included in the coverage fund). Moreover, on 1 June, the FMSB issued advice to the government to extend the macroprudential toolkit to include limits on LTV, DTI and DSTI ratios.

Rapid RRE price growth in Austria, partly driven by cash buyers, together with the existing significant overvaluation of RRE prices in Vienna, suggest that vulnerabilities in the collateral stretch are rising rapidly. The policy stance regarding the collateral stretch is assessed to be appropriate but may not be sufficient. As for the household stretch, legally based limits could be more effective in preventing a build-up of vulnerabilities related to loosening lending standards.

¹⁰⁵ See footnote 89: some caveats apply to the OeNB survey data.

¹⁰⁶ See footnote 89: some caveats apply to the OeNB survey data.

¹⁰⁷ These measures are part of the Austrian legislation. With regard to covered bonds ("Pfandbriefe"), under §10 and §11 of the Hypothekbankgesetz, only mortgages with an LTV of less than 60% may be used as collateral in covered bonds; in the case of agricultural land, the LTV limit can be up to 66%. With regard to building loans/loans under a savings and loan contract ("Bausparkredit"), under §10 of the Bausparkassengesetz, mortgages under this regime may not exceed an LTV of 80% (based on the market value). According to the FMA Directive (§ 13 Z. 3 VU-KAV), the insurance sector is bound by an LTV limit of 60% if mortgage loans are eligible for the coverage funds.



Banking stretch

Exposures of Austrian banks to RRE are relatively low: total mortgage loans as a percentage of GDP stood at 28% in Q1 2016 in Austria compared with an EU average of 36%. The average risk weights for Austrian IRB banks are 24% (the EU average is 16%). This makes the Austrian banking sector relatively less vulnerable to potential shocks related to RRE and better capitalised and thus better able to absorb potential losses. However, generally the capitalisation of Austrian banks is lower than that of their EU peers. The CET1 ratio for Austrian banks was 12.8% in Q1 2016 compared with an EU average of 13.9%. However, it has increased by 1.2 p.p. in the course of the year.

Austrian authorities have taken a range of measures to increase banking sector resilience: the capital conservation buffer (2.5% when fully phased in in 2019), the O-SII buffer (between 1 and 2%, fully phased-in by end-2018) and the systemic risk buffer (up to 2% since January 2016) (see Table AT.2).

Given the high risk weights and low exposures to RRE, as well as the prudential measures taken, the policy stance for the banking stretch is deemed appropriate and sufficient.

Table AT.3

Additional information on instruments and data available to micro and macro supervisory authorities – Austria

<p>Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?</p>	<p>Policy tools such as limits on LTV, DTI and DSTI ratios are currently unavailable to the Austrian authorities. However, the Austrian authorities have communicated informal expectations to banks.¹⁰⁸</p> <p>The Austrian Financial Market Stability Board issued advice to the Ministry of Finance to extend the macroprudential toolkit to include borrower-based macroprudential instruments in the field of real estate financing on 1 June 2016.¹⁰⁹</p>
<p>Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?</p>	<p>The OeNB has recently started collecting data on new loans and the corresponding lending standards. However, there is still a lack of reliable data on lending standards in Austria, since a number of caveats apply to these data: (1) they cover only a relatively small market share (about 20-25% of housing loans collateralised by residential real estate); (2) the sample size changes over time; and (3) the variance in the data between banks is quite large. Hence, the data need to be interpreted carefully. Unfortunately, there is no regional breakdown of these new loans (or of their stock), which makes it hard to confirm the hypotheses about the precise nature of the risks. However, if the current RRE price growth were to continue in the rest of the country (alongside the long-term growth in Vienna), this sort of information would anyway be irrelevant for policymaking.</p>

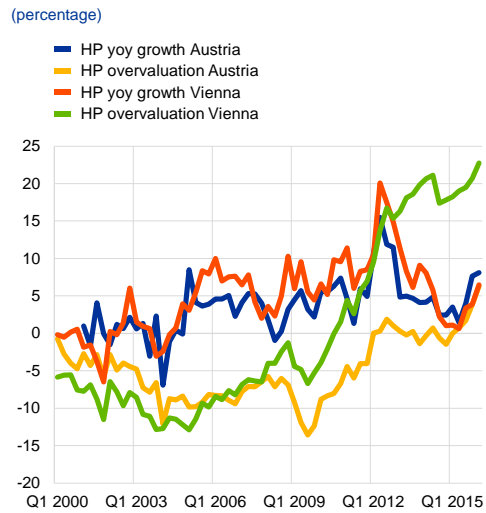
¹⁰⁸ See footnote 92.

¹⁰⁹ See footnote 94.



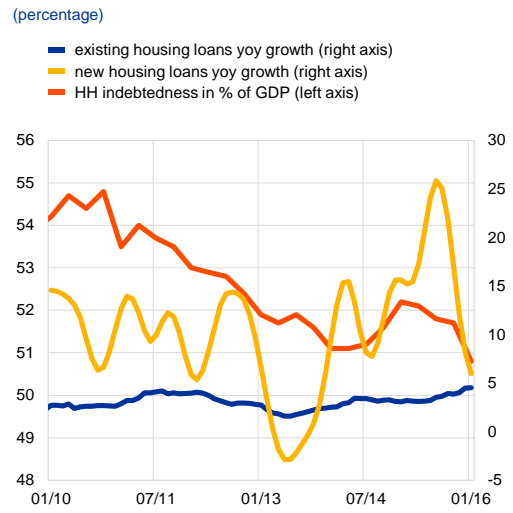
Annex with charts

**Chart AT.1
Residential real estate price dynamics and sustainability analysis**



Source: OeNB.

**Chart AT.2
Household indebtedness and housing loans**



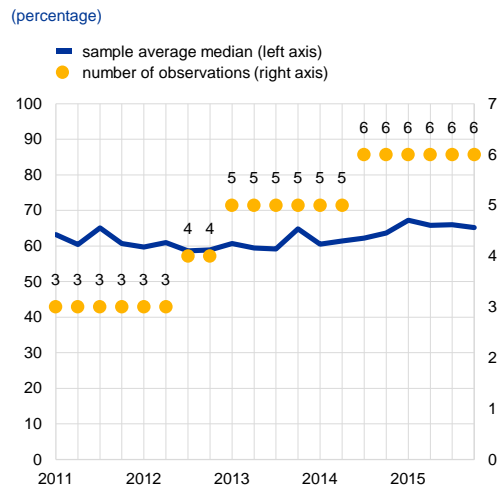
Source: OeNB.



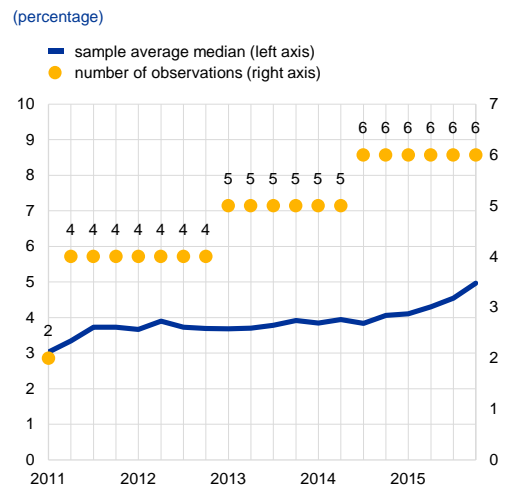
Chart AT.3

Lending standards on new loans – confidential OeNB survey

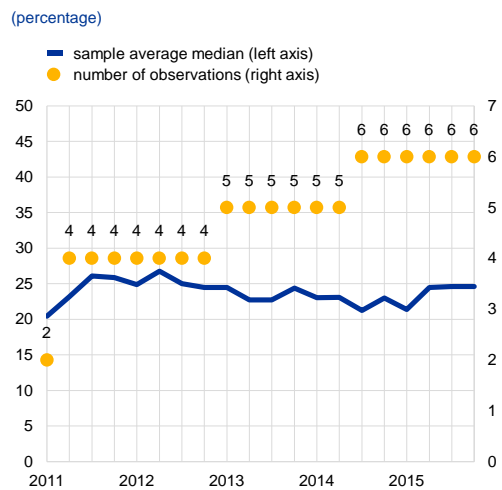
a) Loan-to-value ratio



b) Debt-to-income ratio



c) Debt service-to-income ratio



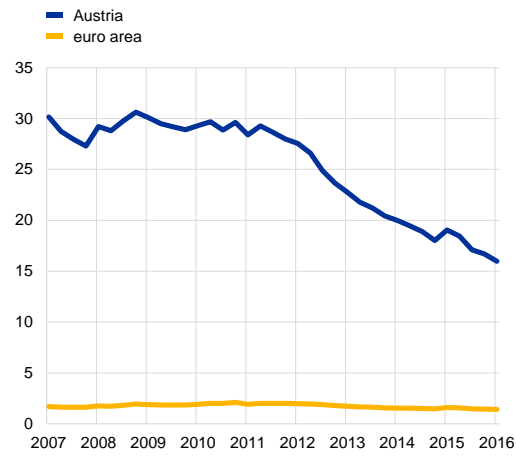
Source: OeNB.

Note: Some caveats apply to the OeNB survey data: (1) it only covers a relatively small market share (about 20-25% of housing loans collateralised by residential real estate); (2) its sample size changes over time; and (3) the variance in the data between banks is quite large. For this reason, the results must be interpreted with care (see footnote 89).



Chart AT.4
Foreign currency loans

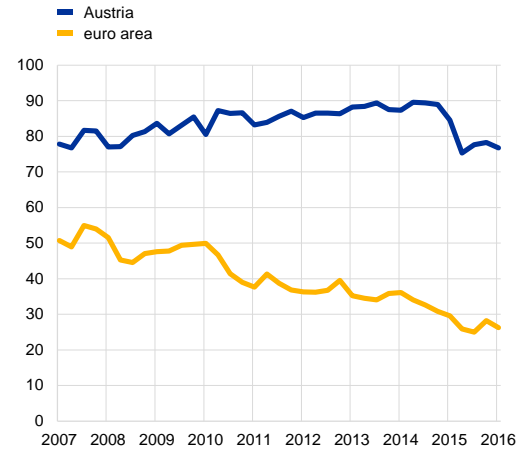
(percent of total loans)



Sources: OeNB, Statistics Austria, ECB, and Eurostat.
Note: Figures for the euro area represent only interest rate expenses on euro-denominated loans.

Chart AT.5
Variable rate loans

(percent of total loans)



Sources: OeNB, Statistics Austria, ECB and Eurostat.
Note: Figures for the euro area represent only interest rate expenses on euro-denominated loans.



Belgium

Key points

The main RRE-related vulnerability in Belgium is related to the fast increase in overall household indebtedness combined with significant groups of already highly indebted households, against the background of a significant increase in RRE prices over the past few years. The trend of rising household indebtedness that, to a large extent, has been caused by a continued rapid increase in lending for house purchases (these loans increased annually by 8.1% in June 2016 and when corrected for securitisation operations by 5.3%) (see Charts BE.1 and BE.2). Furthermore, micro-level data on the distribution of financial wealth as well as DSTI and LTV ratios suggest that there are specific groups of households that could entail financial vulnerabilities in the event of an adverse macroeconomic shock. For this reason, banks could suffer higher than expected losses if RRE prices were to decrease, interest rates increase or unemployment increase. This vulnerability could become more pronounced if the trend of rising household indebtedness continues.

The increase in household debt combined with sub-groups of households with high DSTI and LTV ratios should, however, be seen in conjunction with different mitigating factors. These include the fact that Belgian households in general have a relatively high ratio of financial assets to debt (see Chart BE.3) and that mortgage loans are typically amortised with maturities below 25 years at origination.

From 2012 until recently, lending standards appeared to have tightened (particularly through a shortening of maturities), but data for 2015 suggest that the tightening of lending standards has come to an end recently as the share of new mortgage loans with DSTI ratios above 50% and LTV ratios above 90% increased slightly for the first time since 2011. Also, the share of new mortgage loans with DSTI ratios above 50% is still around 20%. This should, however, be seen in relation to the decrease in maturities on newly issued loans. RRE prices have increased significantly over the past 30 years and have been increasing faster than incomes or rents in recent years.

Finally, banks using IRB models to estimate risk weights for mortgage lending tend to have quite low risk weights, standing at 10%, which could exacerbate the issue if there are higher than expected losses in the event of an adverse macroeconomic shock. Policy measures taken by the Nationale Bank van België/Banque Nationale de Belgique (NBB/BNB) include an add-on of 5 p.p. to mortgage loan risk weights estimated by Belgian banks using IRB models, as well as a communication calling for increased vigilance from the financial sector. The macroprudential add-on introduced in December 2013 effectively raised the average risk weight for domestic mortgage loan exposures of IRB banks from 10% to 15%. On the occasion of the publication, in June 2016, of the Belgian Financial Stability Report (FSR), which also included a thematic article on the Belgian mortgage market, the NBB/BNB announced its intention to take a new macroprudential measure with regard to the Belgian IRB mortgage loan portfolios. The measure aims to build an additional macroprudential capital buffer by increasing the LGD floors from 10% to 20% for loans with an indexed LTV (ILTV) ratio above 80% and to 30% for loans with an ILTV ratio above 90%, based on a harmonised ILTV measure. Hence, the measure aims to further increase resilience, while discouraging the production of new loans with LTV ratios higher than 80%.

Overall, the Belgian authorities have focused on ensuring banks' resilience to risks stemming from the RRE sector. The decision of the NBB/BNB in December 2013 to impose an add-on to the capital adequacy requirements for mortgage exposures of banks using internal ratings-based models, as well as public communications from the NBB/BNB calling for increased vigilance with regard to risks from residential real estate, may also serve to reduce the existing vulnerabilities. Moreover, the tax deductibility of mortgage loans is being tightened. The NBB/BNB's public



commitment to take additional capital measures to target high-risk loans (e.g. those with a high loan-to-value ratio) if they continue to constitute a significant share of the new loans issued is also expected to limit, to some extent, a further build-up of vulnerabilities in the future. However, measures directly addressing the vulnerabilities related to highly indebted households (the groups of households with high DSTI and LTV loans) or the continued increase in RRE prices have not been adopted. While the policy measures that have been implemented are appropriate given the nature of RRE vulnerabilities in Belgium, they may not be sufficient to fully address them.

Table BE.1
Summary assessment – Belgium

<p>Summary RRE risk assessment narrative</p>	<p>Key risks are related to the banking, collateral and household stretches</p> <p>The main RRE-related vulnerability in Belgium is related to the fast increase in overall household indebtedness, combined with significant groups of already highly indebted households, against the background of a significant increase in RRE prices over the past few years. Lending for house purchases has been rapidly increasing, with an annual increase of 8.1% in June 2016 (5.3% when corrected for securitisation operations).</p> <p>At the same time, groups of households are highly indebted, with high DSTI ratios including for new loans (more than 20% of loans have a DSTI ratio at origination above 50% and almost 20% of new loans have a DSTI above 50%, and one-third of loans have LTV ratios above 90%).</p> <p>RRE prices have increased significantly over the past 30 years (a 4% increase in 2015) and have been increasing faster than incomes or rents in recent years. In nominal terms, RRE prices are now close to their level prior to the financial crisis. There are some signs of price overvaluation, but alternative valuation models do not demonstrate this unequivocally.</p> <p>There are low risk weights (10%) for mortgage loans of banks using IRB models (before the 5 p.p. add-on).</p>
<p>Policy assessment given risks</p>	<p>The policy stance is appropriate but not expected to be sufficient for the collateral and household stretches</p> <p>Measures directly addressing the vulnerabilities related to highly indebted households or the continued increase in RRE prices have not been adopted.</p> <p>Furthermore, the trend of tightening lending standards appears to have ended, which – together with very high credit growth – indicates that vulnerabilities could be building up.</p> <p>The add-on of 5 p.p. to risk weights is deemed sufficient to address the banking system stretch.</p> <p>While the policy measures that have been implemented are appropriate given the nature of RRE vulnerabilities in Belgium, they may not be sufficient to fully address them.</p>



Table BE.2

Summary of risks and policy measures – Belgium

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Debt is increasing rapidly and groups of households have high debt levels (in terms of both stocks and flows).	RRE prices have increased significantly over the past 30 years (an increase of 4% in 2015). In nominal terms, RRE prices are now close to the level they had prior to the financial crisis. There are sub-groups of households with high LTV ratios (in both stocks and flows).	There are low risk weights on mortgage loans of banks using IRB models (before the risk weight add-on). The capitalisation of the Belgian banking sector is increasing and above the EU average (the average for Belgium was 14.8% in Q1 2016 against an EU average of 13.9%). There has been a considerable increase in lending for house purchases.
Summary of policy measures (implemented, planned, under consideration)	Several communications on risks starting with the 2012 FSR. The monitoring of risks led to the adoption of a microprudential measure: self-assessment of the degree of compliance with the EBA opinion on good practices by banks. A tightening of tax deductibility related to mortgage loans.	Several communications on risks starting with the 2012 FSR. The monitoring of risks led to the adoption of a microprudential measure: self-assessment of the degree of compliance with the EBA opinion on good practices by banks.	Several communications on risks starting with the 2012 FSR. The monitoring of risks led to the adoption of a microprudential measure: a horizontal assessment of the IRB models. Add-on of 5 p.p. to risk weights for mortgage loans of banks using IRB models in 2014. Phasing-in of the O-SII buffer of 0.75-1.5% from 1 January 2016 Countercyclical capital buffer at 0% from January 2016.
Assessment of policy measures	Appropriate but not expected to be sufficient	Appropriate but not expected to be sufficient	Appropriate and expected to be sufficient

Household stretch

The main vulnerabilities in the household stretch relate to a significant increase in the level of debt and the groups of highly indebted households. In June 2016 lending for house purchases increased by 8.1% year-on-year (by 5.3% when corrected for securitisation operations) (see Chart BE.1) and the DTI ratio increased to 103% in Q1 2016 (see Chart BE.2). A general increase in the DSTI ratio, as well as the share of loans with high DSTI ratios, is also worth noting. According to data from the NBB/BNB, the share of loans with a DSTI ratio at origination above 50% was around 20% in Belgium in 2015. Furthermore, one-third of outstanding loans have LTV ratios at origination above 90%. However, there are a number of mitigating factors, including limits on interest rate variability and mortgage loans typically being amortised with maturities of or below 25 years at origination.

The NBB/BNB has addressed the identified vulnerabilities by means of communication (e.g. in its 2012 FSR) as well as by requiring banks to self-assess their compliance with the EBA opinion on good practices.

Overall, these measures appear to have had an effect as credit conditions have generally tightened since 2012, particularly with respect to the maturity at origination of mortgage loans. However, as mentioned, the stock of loans with high DSTI ratios at origination is still high and new loans with a DSTI ratio above 50% still constitute a sizeable share of new mortgages (almost 20%). Moreover, data for 2015 suggest that the tightening of lending standards has come to an end recently, as the share of new mortgage loans with DSTI ratios above 50% and LTV ratios above 90% increased slightly for the first time since 2011 – despite interest rates continuing to be at low levels. However, there are some factors that should be kept in mind. First, the shortening of loan maturities, which is



a mitigating factor in this context, would tend to increase the DSTI ratios. Second, the large number of refinancings recently could bias the data, although it is not clear in which direction.

Given the continued presence of risky groups of households in both the stock and flow of lending, combined with a household debt level that has been generally increasing, rapid credit growth and the halt in the tightening of lending standards, the current policy stance may not be sufficient to contain the rising vulnerabilities in the household stretch. Measures directly addressing the vulnerabilities related to highly indebted households have not been adopted. For these reasons, the policy stance of Belgium is deemed appropriate but may not be sufficient. Furthermore, the implementation of borrower-based measures, such as DSTI and LTV ratios, is the competence of the Federal Government (but based on advice from the NBB/BNB).

Collateral stretch

Vulnerabilities in the collateral stretch are related to the significant increase in RRE prices over the last 30 years – with only a minor correction in prices during the financial crisis – combined with a considerable increase in household debt, particularly mortgage debt. In Q1 2016 RRE prices increased by 2.3% annually and at a faster pace than income (the PTI index at the same time was 127% or 13 p.p. higher than one year ago) or rental prices (the PTR index at the same time was 102% or 3 p.p. higher than one year ago). Since 2010 the PTI and PTR indices in Belgium have increased faster than the euro area average: at the end of 2015 they were, respectively, 10 p.p. and 9 p.p. higher than the euro area average. Thus, the growth of RRE prices has exceeded the growth of fundamentals, at least recently. The ECB real estate valuation methods suggest that RRE prices are overvalued in Belgium (using the income-based model overvaluation is 31%, but another model suggests an overvaluation of only 4%). However, overvaluation metrics are surrounded with some uncertainty and are quite model-dependent, so some caution should be exercised when looking at overvaluation figures. According to a model used by the NBB/BNB, RRE prices appear to be only slightly overvalued.

In addition, as highlighted for the household stretch, groups of households with high LTV ratios in the stock and flow of lending are present (one-third of outstanding and new loans have LTV ratios at origination above 90%), which could give rise to losses in the financial sector in the event of negative shocks to the economy. However, according to the slightly outdated 2010 Eurosystem Household Finance and Consumption Survey, the share of high LTV loans in Belgium was lower than in the euro area in general. Another mitigating factor is a generally high level of (liquid) financial net wealth in relation to debt (see Chart BE.3), which increases households' resilience to negative shocks to the economy in general.

The NBB/BNB has addressed the identified vulnerabilities by means of communication (e.g. in their 2012 FSR) as well as by requiring banks to self-assess their compliance with the EBA opinion on good practices. The rules for tax deductibility of mortgage loans have also been changed, which, all else equal, should have put downward pressure on prices according to the NBB/BNB.

In January 2016 a high-level expert group established on the initiative of the Belgian Minister of Finance suggested that an LTV cap should be introduced in Belgium. The group suggested that it should initially be set at 100%, but that over time it would be reduced to e.g. 85% with certain groups being allowed to breach the cap. Currently, measures in this area are the competence of the Federal Government.

Overall, given the RRE price dynamics (i.e. a significant increase in RRE prices over the last 30 years almost without any correction in prices) and a possible overvaluation of RRE prices, in



combination with increasing household debt as well as the halt in the tightening of lending standards, the current policy stance is appropriate but may not be sufficient to contain the rising vulnerabilities in the collateral stretch. Measures directly addressing the vulnerabilities related to the continued increase in RRE prices have not been adopted.

Banking stretch

Overall, the Belgian banking sector's solvency position is improving (in Q1 2016 the CET1 ratio stood at 14.8%) and exceeds the EU average (13.9%). The loan-to-deposit ratio (88%) is lower than the EU average (96%). Overall, the liquidity position of Belgian banks has improved in 2015 as they became more reliant on customer deposits and less on the interbank market. The proportion of market funding decreased and the coverage of liquid assets with short-term liabilities picked up slightly.

The Belgian banking sector has a relatively high exposure to real estate loans (mortgages and loans for construction and to real estate companies), which at the end of 2015 constituted 44% of the total loan portfolio, increasing by 1 p.p. over the year. The corresponding ratio for the euro area at the end of 2015 was 38%, decreasing by 0.4 p.p. over the year. In comparison to other EU countries, the non-performing exposures in Belgium seem to be modest and have decreased slightly.

Analyses by the NBB/BNB indicate that banks using IRB models to calculate risk weights generally apply quite low risk weights to mortgage loans. On average, their risk weights for mortgage loans (excluding the 5 p.p. add-on) are 10% compared with an EU average of 16%. One explanation for the low risk weights is the historical absence of major drops in RRE prices or episodes of high defaults on mortgage loans in Belgium; this influences banks' computation of risk weights, since they base their estimation on a sample period characterised by no major negative real estate developments. In January 2016, the NBB/BNB made an official request to extend their risk weight add-on policy measure for an additional year¹¹⁰ and on 18 February 2016 the ESRB assessed the extension of the 5 p.p. add-on to the risk weights for Belgian banks' mortgage loan exposures as justified, suitable, proportionate, effective and efficient. The add-on applies to risk weights for mortgage lending of banks using IRB models and it implies a total buffer of €2.8 billion to cover losses in the RRE market (compared with current yearly losses that oscillate around €170 million).

Since the Belgian authorities have taken measures to address the low risk weights of the IRB banks, the policy stance for the banking stretch is deemed appropriate and sufficient.

¹¹⁰ This is required since the NBB/BNB used Article 458 of the CRR to apply the risk weight add-on.



Table BE.3

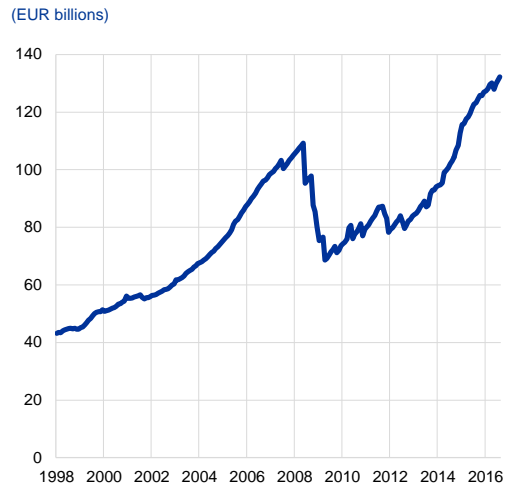
Additional information on instruments and data available to micro and macro supervisory authorities – Belgium

<p>Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?</p>	<p>The NBB/BNB has the power to exercise any prerogatives, including issuing recommendations to the credit institutions at any time, within the scope of its competences. It does not require any approval from other authorities in this respect. However, in view of shared competences with the ECB with respect to macroprudential policy, the NBB/BNB will inform the ECB about the main communications and recommendations.</p> <p>The effective implementation of quantitative measures, such as caps on the LTV ratio, the DSTI ratio, etc., is the competence of the Federal Government (but based on advice from the NBB/BNB).</p> <p>The procedure foreseen in Article 458 of the CRR (under which the risk weight add-on is implemented) is rather long and complex as e.g. the assessment of different authorities (the ESRB, the EBA and the European Commission) is needed. As a result, the NBB/BNB does not consider that it could act in a quick and effective manner if additional measures would need to be implemented under Article 458 or the current measure would need to be revised.</p> <p>The NBB/BNB as a macroprudential authority can decide at any time to increase the frequency and intensity of the monitoring of banks' lending standards. In addition, the NBB/BNB Organic Law (Article 36/33) explicitly foresees the possibility for the NBB/BNB to request any information which is relevant for the exercise of its tasks.</p>
<p>Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?</p>	<p>Currently, the NBB/BNB's Executive Board monitors the Belgian RRE market every six months on the basis of e.g.:</p> <ul style="list-style-type: none"> a) data collected on banks' lending standards at origination; b) the risk profile and the quality of portfolios. <p>In addition, the NBB/BNB can at any time decide to increase the frequency and intensity of the monitoring of banks' lending standards.</p> <p>One minor data-related issue relates to the refinancing of mortgage loans (which was quite pronounced during the second half of 2014 and in 2015) as this tends to blur the picture somewhat when monitoring lending standards.</p>



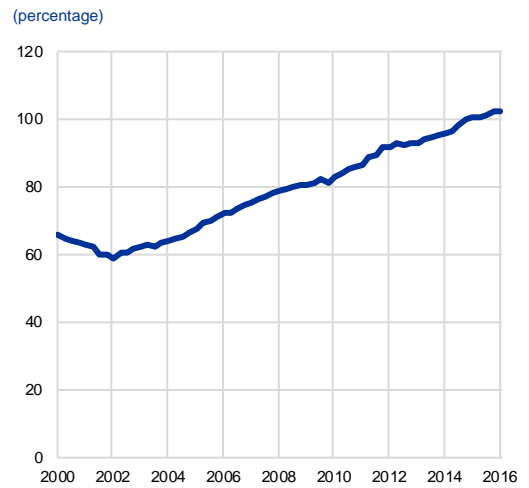
Annex with charts

Chart BE.1
Lending for house purchase in Belgium



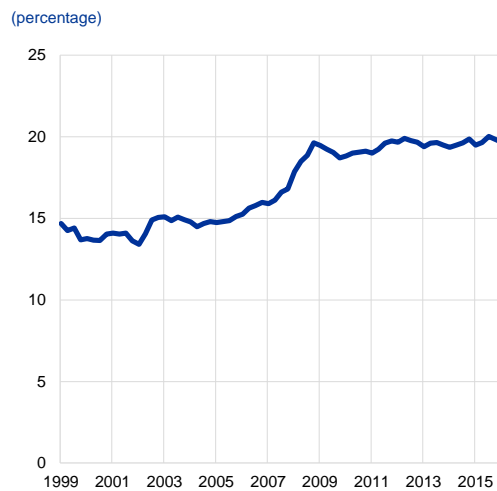
Source: ECB Statistical Data Warehouse.
Note: The chart shows Belgian banks' mortgage loans, taking into account (retained) securitisations of mortgage loans.

Chart BE.2
Household debt-to-disposable income ratio



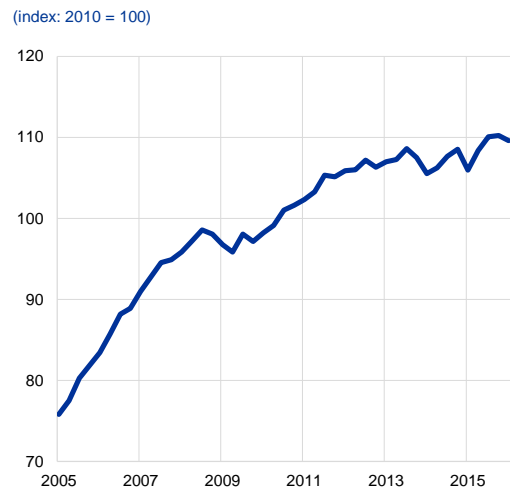
Source: ECB SDW.

Chart BE.3
Household debt-to-household total assets ratio



Source: ECB SDW.

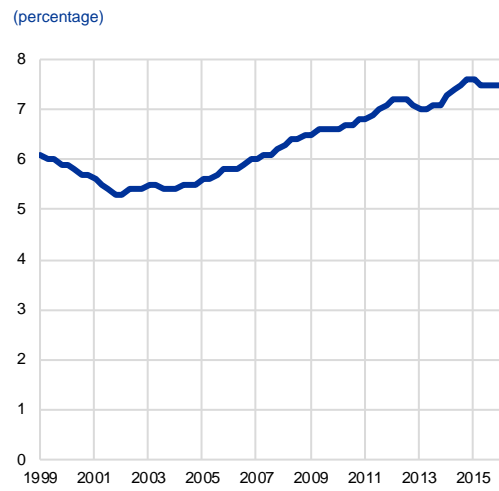
Chart BE.4
House price developments in Belgium



Source: Eurostat.



Chart BE.5
Debt service ratio



Source: Bank for International Settlements.



Denmark

Key points

Vulnerabilities for Denmark are primarily related to the robustly increasing RRE prices – in particular in the major cities – in combination with highly indebted households. Despite moderate credit developments and although some of the risk indicators are moving in the right direction, RRE prices are rising fast and are approaching pre-crisis levels (see Charts DK.7 and DK.8), in particular in the major cities. In the Copenhagen area, the rate of price increase has been very high for some time (in Q1 2016 house prices increased annually by 10.4% in Copenhagen and by 3.5% in the whole of Denmark). The developments in the real estate market are fuelled by a number of structural factors, such as a highly regulated rental market and a procyclical housing tax system. A number of these structural factors together with high RRE prices are also encouraging a high debt level. Aggregate data show that the Danish DTI ratio, at 263%, is among the highest in the world (see Chart DK.1). Micro data also show that approximately 25% of homeowners have a DTI ratio before tax above 300%, and 30% of homeowners have total debt relative to the value of their home above 100%.

Some studies estimate that the vast majority of Danish households with high debt levels are financially robust even in stressed scenarios.¹¹¹ However, studies also find a strong negative relationship between households' debt levels and changes in their consumption during stressed periods through both income and wealth effects.¹¹² So, the direct credit risk seems limited for Danish banks, but the high household indebtedness may lead to considerable negative effects for the real economy with potential negative second-round effects on the Danish financial sector in the event of an adverse scenario materialising such as a rise in interest rates, higher unemployment or a fall in RRE prices. Moreover, a high proportion of interest-only loans means that this risk will persist in the foreseeable future.

In order to address these risks, the Danish national authorities have introduced an LTV limit of 95%, published guidelines for banks and mortgage credit institutions to ensure caution in lending, introduced a “supervisory diamond” for mortgage credit institutions¹¹³ that will come into force in 2018-20, and are gradually reducing mortgage interest tax deductibility.

While the policy measures taken are appropriate given the nature of the RRE vulnerabilities in Denmark, they may not be sufficient to fully address them. Even though mortgage lenders have themselves reported a tightening in lending standards, this has not yet had a noticeable impact on the level of household indebtedness or real estate prices – on the contrary, both credit and prices are still increasing in the major cities. In the light of the RRE price increases, particularly in the main cities, there is a risk that these developments could lead to a further increase in household indebtedness. Moreover, the high level of household debt is not expected to significantly decline since it is not directly addressed by these policies.¹¹⁴ It is important to note that this assessment

¹¹¹ See, for example, Andersen, A., Christensen, A., Nielsen, N., Koob, S., Oksbjerg, M. and Kaarup, R., “**The Wealth and Debt of Danish Families**”, *Monetary Review*, Danmarks Nationalbank, Q2 2012.

¹¹² See, for example, Andersen, Duus and Jensen (2014) as above fn. 76.

¹¹³ The “supervisory diamond” sets out a number of benchmarks that the Danish FSA generally considers to indicate mortgage credit activities that have a higher risk profile. It consists of five indicators with corresponding limits: large exposures; lending growth; interest rate risk of the borrower; interest-only lending; and short-term funding.

¹¹⁴ The LTV limit only affects new loans, while the supervisory diamond and the seven best practices for lending are a mix of flow and stock measures. The change in mortgage interest tax deductibility will not be fully phased in before 2020 and the supervisory diamond will not be fully implemented before 2020.



reflects the fact that some of the measures have only been in effect for a limited period of time and are entering into force gradually, while some of them only affect new borrowers.

Table DK.1
Summary assessment – Denmark

Summary RRE risk assessment narrative	<p>Key risks are related to the collateral and household stretches</p> <p>The main vulnerabilities are considered to be the robustly increasing RRE prices – in particular in the major cities – in combination with highly indebted households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region.</p> <p>Households' debt levels are very high both relative to income (the average DTI ratio is 263%) and to GDP (123%). Debt is particularly high for some households (25% of homeowners have DTIs above 300% and 30% of homeowners have total debt of more than 100% of the value of their house).</p> <p>RRE prices are increasing, driven by fast increases in major cities where they are approaching pre-crisis levels (house prices increased annually by 3.5% in the whole of Denmark in Q1 2016 and by 10.4% in Copenhagen).</p> <p>Even though the overall credit growth does not appear to be fast, mortgage credit institutions are increasing lending in the major cities, which is coupled with rapid price increases.</p> <p>High proportion of interest-only loans (50%) and variable rate loans (60%).</p>
Policy assessment given risks	<p>The policy stance is appropriate but not expected to be sufficient for the collateral and household stretches</p> <p>While the policy measures taken are appropriate given the nature of the RRE vulnerabilities in Denmark, they may not be sufficient to fully address them. Even though mortgage lenders have themselves reported a tightening in lending standards, this has not yet had a noticeable impact on the level of household indebtedness or real estate prices – on the contrary, both credit and prices are still increasing in the major cities. In the light of the RRE price increases, particularly in the main cities, there is a risk that these developments could lead to a further increase in household indebtedness.</p> <p>Moreover, the high level of household debt is not expected to significantly decline since it is not directly addressed by these policies. It is important to note that this assessment reflects the fact that some of the measures have only been in effect for a limited period of time and are entering into force gradually, while some of them only affect new borrowers.</p> <p>Vulnerabilities related to the high proportion of interest-only loans and variable rate loans seem to be sufficiently addressed by microprudential regulation.</p>



Table DK.2

Summary of risks and policy measures – Denmark

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Elevated indirect risks to financial stability are regarded as the main risk. The debt levels are very high (the average DTI ratio is 263%), even if lending standards appear to have tightened. Around 25% of households have DTIs above 300%. Some studies estimate that the vast majority of Danish households with high debt levels are financially robust even in stressed scenarios. However, studies also find a strong negative relationship between households' debt levels and changes in their consumption during stressed periods through both income and wealth effects. A high proportion of interest-only loans means that this risk will persist in the foreseeable future.	The growth in RRE prices increases the likelihood and magnitude of any future price fall, which, combined with the high levels of indebtedness, could leave a number of households in a situation where the value of their assets is below the value of their debt. Currently, for 30% of homeowners, the debt level is above the value of their home. This means that consumption could be cut back in the event that an adverse scenario materialises. Moreover, the high debt levels may also affect mobility in the housing market if prices fall. However, RRE prices are not deemed to be overvalued at present, and the PTI ratio is not high from a historical perspective (see Chart DK.5).	Second-round effects are regarded as the main risk, but bank resilience is deemed high at present. The high household indebtedness may lead to an increase in banks' NPLs (e.g. from loans to corporates in the retail or construction sectors). Stress tests show, however, that banks would withstand a severe adverse scenario. But a potential housing market shock could have a broader impact on the financial sector beyond banks.
Summary of policy measures (implemented, planned, under consideration)	7 best practices for lending (2015) Supervisory diamond (2018 and 2020) Gradual reduction in tax deductibility (2012): reduced to 25.5% in 2019 for interest payments above DKK 50,000 per person (DKK 100,000 for couples); for payments below this limit the tax deductibility will be 33% 30-year maturity restriction on mortgages (1990)	LTV limit of 95% (2015) Supervisory diamond (2018 and 2020)	Supervisory diamond (2018 and 2020) Systemic risk buffer at 0.2-0.6% in 2015 and 1-3% in 2019 Capital conservation buffer of 0.625% in 2016 and 2.5% in 2019 Countercyclical capital buffer at 0% since January 2015
Assessment of policy measures	Appropriate but not expected to be sufficient	Appropriate but not expected to be sufficient	Appropriate and expected to be sufficient

Household stretch

In Denmark, the main risk associated with residential real estate is related to the household stretch. This is mainly due to high household indebtedness, both at the aggregate level and at the household level (the household debt-to-GDP ratio is 123% and the average DTI ratio is 263%). Looking at developments in the DTI ratio, it shows an improving trend since 2009 (the time series is volatile and the latest data point shows an increase; see Chart DK.1). In addition, groups of highly indebted households exist; approximately 25% of homeowners have a DTI ratio before tax above 300% (see Chart DK.3). Furthermore, 75% of families with high debt ratios have variable rate mortgage loans, making them vulnerable to rises in the interest rate. In the aggregate, the shares of interest-only loans (50%) and variable rate mortgages (60%) are also high. However, vulnerabilities related to interest-only loans and variable rate mortgages are expected to be sufficiently addressed by microprudential regulation. Moreover, some of the indicators are moving in the right direction. For example, credit growth is currently modest and the credit gap is negative (see Chart DK.6). The share of variable rate mortgage loans with an interest rate fixation of up to one year has also been reduced from approximately 39% to 31% from 2014 to 2015. In the same period, the share of non-amortising mortgage loans fell from approximately 55% to 51%. This development is encouraging, but indebtedness is still high in the household sector and vulnerabilities are expected to stay elevated in the years ahead.



Risks related to the household stretch are primarily of an indirect nature. Structural and institutional features in Denmark (full recourse loans, personal bankruptcy legislation, beneficial social safety nets, high pension assets and net wealth, etc.) limit credit risk for banks. Furthermore, because of a well-developed financial system, for many years Danish households have had relatively easy access to mortgage credit and it has been inexpensive to borrow against wealth, mainly due to a large covered bond market subject to a “balance principle”.¹¹⁵ At the same time, Danish households have very large pension wealth, which reduces their need to be debt-free when they retire. Some studies estimate that the vast majority of Danish households with high debt levels are financially robust even in stressed scenarios.¹¹⁶ However, studies also find a strong negative relationship between households’ debt levels and changes in their consumption during stressed periods through both income and wealth effects.¹¹⁷ So, the direct credit risk seems limited for Danish banks, but the high household indebtedness may lead to considerable negative effects for the real economy, with potential negative second-round effects on the Danish financial sector in the event of an adverse scenario materialising, e.g. a rise in interest rates, higher unemployment or a fall in RRE prices. Denmark is also one of the countries with first-hand experience that high debt levels in the household sector may reduce private consumption in the aftermath of an adverse shock.

To address risks related to household stretch, both flow and stock measures have been taken by Danish authorities. The FSA introduced in 2015 certain guidelines for mortgage banks and credit institutions for their credit assessments. Moreover, the upcoming supervisory diamond, which will be introduced in 2018 and 2020, will set numerical limits to be used in future prudential action in five different areas. Four out of five of these measures are related to the stock of lending. In addition to measures taken by the FSA, since 2012 there has also been a gradual reduction in mortgage interest tax deductibility.

In Danmarks Nationalbank’s quarterly lending survey, banks and mortgage credit institutions report that they have tightened their lending standards since Q4 2015 and that they expect to continue tightening going forward. This tightening follows the introduction of the guidelines of the FSA and the LTV limit. However, mortgage credit institutions continue to increase lending in the largest cities (Copenhagen and Aarhus), where prices have been increasing. There is a risk that households’ indebtedness will continue to increase, together with increasing RRE prices in the urban areas.

The policy measures taken are appropriate to deal with vulnerabilities related to household stretch. However, as regards the effectiveness of the measures, the evidence is mixed. On the one hand, some risk indicators are improving and lending standards are tightening. On the other hand, the overall household debt level is still very high in an international context and is not expected to significantly decline since it is not directly addressed by these policies. Furthermore, the distribution of debt shows that many households are still sensitive to adverse shocks (in particular in terms of consumption).¹¹⁸ This suggests that vulnerabilities related to household indebtedness will persist. At the same time, while overall credit developments are moderate, credit for house purchases is increasing, together with RRE prices in the largest cities. Moreover, as mentioned above, some of the measures taken are very recent, others only affect new borrowers and some of them are very

¹¹⁵ Meaning that there is matched funding between the bonds and the mortgage loans issued by mortgage credit institutions.

¹¹⁶ Andersen et al. (2012) see above fn. 111.

¹¹⁷ Andersen et al. (2014) see above fn. 76.

¹¹⁸ Stress tests carried out by Danmarks Nationalbank suggest that even indebted households are able to service their debt in times of stress; however, the stress tests also suggest that there is a strong negative relationship between households’ level of indebtedness and the change in their consumption in stressed periods (see Andersen et al., 2014 as above fn. 76).



gradual. Overall, due to these reasons, the policy stance is deemed to be appropriate but may not be sufficient in addressing the vulnerabilities in the household stretch.

Collateral stretch

Risks related to the collateral stretch are elevated in Denmark. RRE prices are rapidly increasing, particularly in the main cities, and are close to the pre-crisis peak (see Chart DK.7). The rapid increases in RRE prices in urban areas imply that it is difficult for new households to enter the housing market, and that they might be required to take on considerable mortgages to be able to purchase a home. Thus, there is a risk that these developments would lead to a further increase in household indebtedness. However, the price-to-income ratio has decreased by 0.7 p.p. between Q1 2015 and Q1 2016. When looking at the debt-to-income ratio, approximately 30% of homeowners have total debt relative to the value of their home above 100% (see Chart DK.4). High average total debt relative to home value at loan origination for the median first-time buyers (96%), in connection with the substantial fall in RRE prices in 2006-09, has left many Danish households “underwater”. While the recent rise in RRE prices has restored households’ balance sheets somewhat (see Chart DK.2), the proportion of households with high debt ratios remains at roughly the same level as in 2009 (5%). The credit risk for banks and credit institutions is, however, somewhat mitigated as households with high debt ratios also have assets other than their home to draw on in case of financial problems. Therefore, the main identified risks related to collateral stretch are of an indirect nature. For example, although RRE prices appear not to be overvalued at present, a renewed fall in RRE prices could lead to reduced private consumption affecting macroeconomic and financial stability. Falling RRE prices may also affect mobility in the housing market, as highly leveraged households are typically less mobile due to low or negative housing equity.

A number of structural factors are amplifying the vulnerabilities related to collateral stretch, e.g. a highly regulated rental market as well as property value and land taxes which work in a procyclical way. Housing tax in Denmark comprises a property value tax and a land tax. The property value tax is capped at its 2002 level and there is a cap on the year-on-year increase in the land tax. However, a number of mitigating factors are also in place, e.g. the low rate of home ownership and a price elasticity of supply that appears to be high compared with other EU countries.

To address risks related to collateral stretch, the Danish authorities introduced an LTV limit of 95% for new borrowers in November 2015. By building up buffers upfront, an LTV limit will work as a cushion before losses reach banks’ balance sheets or before private consumption is scaled back. A lower initial LTV for borrowers will also reduce the risk of households becoming underwater if RRE prices fall. As mentioned earlier, the Danish banks report that they have tightened lending standards partly due to this measure. Thus, the LTV limit is deemed to be appropriate to deal with risks related to collateral stretch. However, given RRE price increases and the fact that the LTV measure only affects new mortgages (meaning that households could finance their house purchases with other types of loans) and is still quite generous compared with LTV limits in other countries, the LTV limit may not be sufficient to address vulnerabilities in the collateral stretch. It should be noted that this policy measure has been in effect for only a short period of time, which increases the difficulty of assessing its effectiveness. Overall, the policy stance for the collateral stretch is deemed appropriate but may not be sufficient.



Banking stretch

Although the mortgage and RRE markets are systemically important for the Danish financial sector, there are not expected to be any immediate risks related to banking stretch. Stress tests indicate that Danish banks would withstand a severe decline in private consumption and a fall in RRE prices. Even if banks' loan losses from the corporate sector were to increase as a result of reduced private consumption, stress tests conducted by the IMF and national authorities show that the five systemically important banks in Denmark would all have ample capital in relation to the minimum requirements. However, it should also be noted that the interconnectedness between banks across the Nordic-Baltic region implies that there could be significant cross-border spillovers between banking systems from difficulties related to RRE stresses in any of the countries in the region. Also, since the mortgage credit institutions have sold debt on to other investors, the potential housing market shock could have a broader impact on the financial sector beyond banks.

In Q1 2016 the Danish banks had an average CET1 ratio of 15.7%, which is above the EU average of 13.9%. The capital requirements for banks will increase as the various buffers are phased in; both the capital conservation buffer and the systemic risk buffer will be fully phased in in 2019, when their levels will reach 1.25% and 0.6-0.8%, respectively. The countercyclical capital buffer is currently set at 0%. All systemic banks are already in compliance with the 2019 requirements. Thus, the microprudential measures already in place are deemed to be appropriate and expected to be sufficient to cover direct effects from RRE risks. Measures include the upcoming supervisory diamond, which has certain limits regarding lending growth and short-term funding. At present, these measures are deemed appropriate and expected to be sufficient to mitigate the risks.

Table DK.3

Additional information on instruments and data available to micro and macro supervisory authorities – Denmark

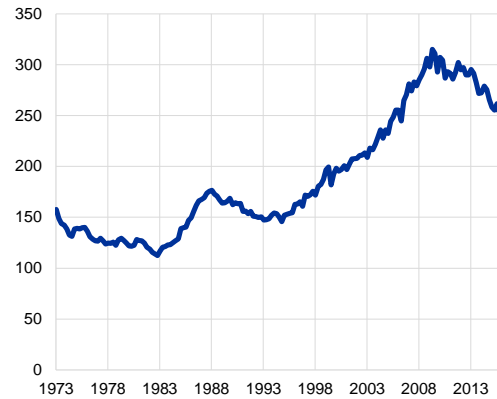
Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?	The Systemic Risk Council has been set up in the aftermath of the latest crisis in Denmark. It is composed of independent experts and representatives from various ministries, Finanstilsynet (the Danish FSA) and Danmarks Nationalbank. The purpose of the Council is to monitor and identify systemic financial risks and to issue observations, warnings and recommendations to Finanstilsynet and, if they relate to legislation, to the government on how to handle such risks. The Council has an advisory role only, hence recommendations are not compulsory. If a recommendation is not complied with, the recipient must, however, explain why within three months.
Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?	The Danish authorities have access to very good household-level data on debt and assets. However, these data are only available with some lag. For example, data for 2014 will only be available in the summer of 2016. Because of this lag, it is difficult for the Danish authorities to follow the evolution of different risk indicators at the household level (DTI ratio, LTV ratio, interest-only loans, etc.). This hinders the assessment of whether the measures taken by the Danish authorities are having the intended consequences or not. However, from 2018-19 the Danish authorities will have a credit register containing information on new lending, e.g. LTV, DTI and LTI ratios on specific mortgage loans. This will allow close to real-time monitoring of lending standards and should allow the authorities to study the impact of policy measures.



Annex with charts

**Chart DK.1
Household debt-to-income ratio**

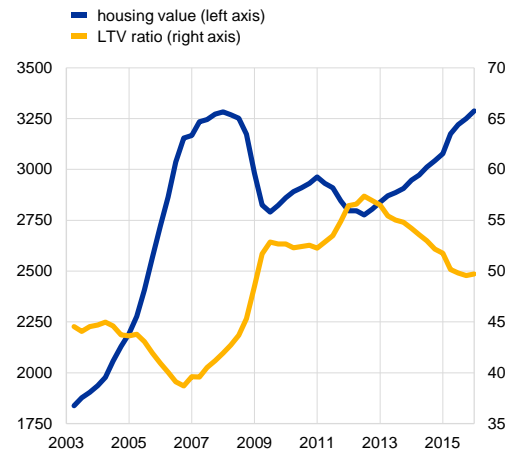
(percentage of disposable income)



Source: Danmarks Nationalbank.

**Chart DK.2
Housing wealth and household LTV ratio**

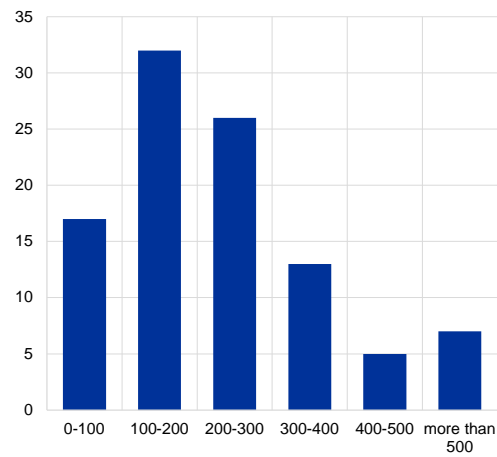
(left axis: DKK billions; right axis: %)



Source: Danmarks Nationalbank.

**Chart DK.3
Distribution of debt-to-income ratios for mortgage borrowers in 2013**

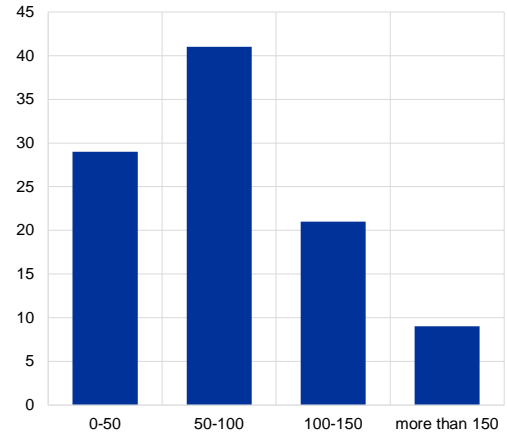
(x-axis: DTI before tax; y-axis: percentage of homeowners)



Source: Danmarks Nationalbank.

**Chart DK.4
Distribution of total debt relative to the value of the home for mortgage borrowers in 2013**

(x-axis: total debt in relation to housing value; y-axis: percentage of homeowners)

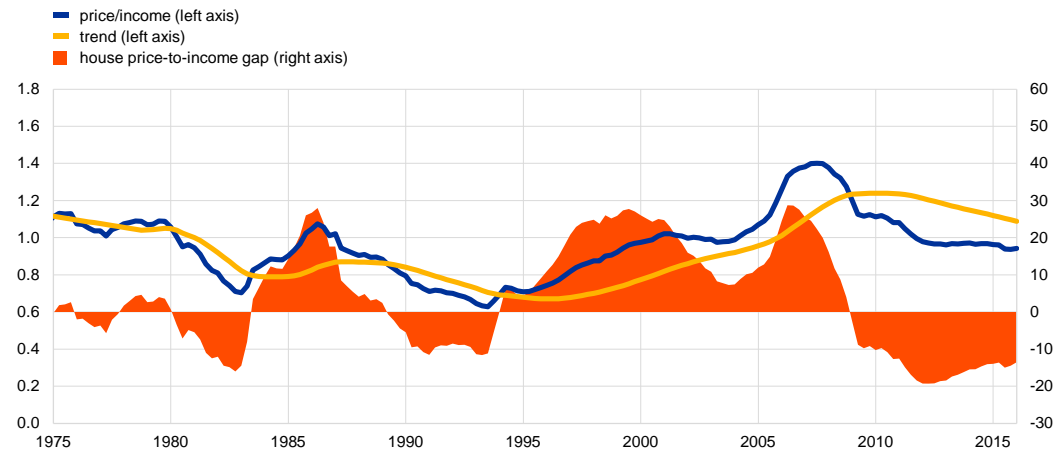


Source: Danmarks Nationalbank.



Chart DK.5 House price-to-income gap

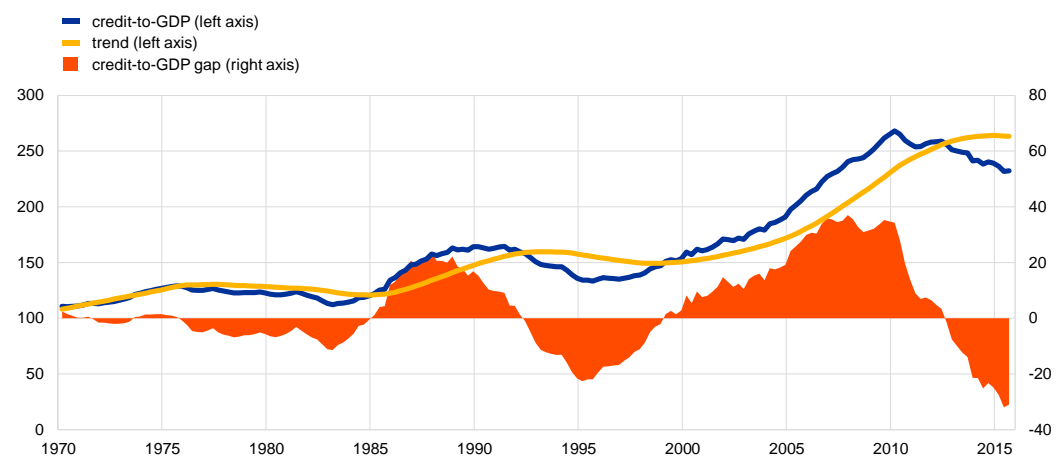
(left axis: index: 2000 = 1; right axis: percentage points)



Source: Danmarks Nationalbank.

Chart DK.6 Credit-to-GDP gap

(left axis: percentage of GDP; right axis: percentage points)

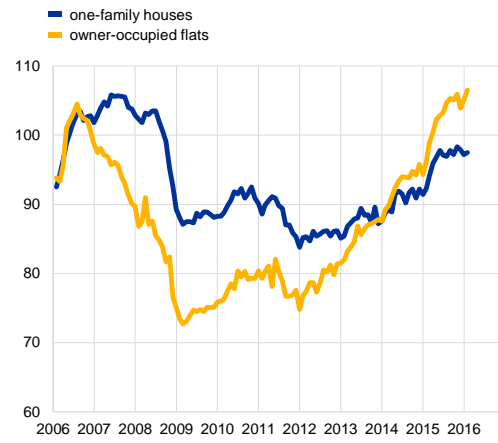


Source: Danmarks Nationalbank.



Chart DK.7
Residential real estate prices

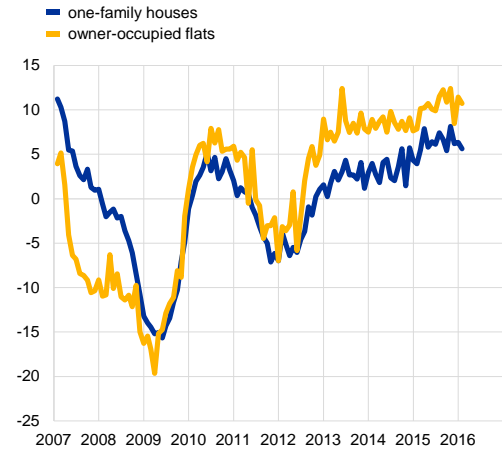
(index: January 2006 = 100)



Sources: Danmarks Nationalbank.

Chart DK.8
Residential real estate prices

(annual percentage change)



Sources: Danmarks Nationalbank.



Estonia

Key points

Vulnerabilities related to residential real estate in Estonia are concentrated in the collateral stretch. The major risk driver is increasing RRE prices, which are close to their all-time highest levels. Since Q1 2009 nominal RRE prices have increased by 50% and real prices by 27%, and prices have now reached just over 90% of pre-crisis levels. The rise in RRE prices has largely been driven by household income growth, which has exceeded expected long-run productivity growth. This could suggest that the income and RRE price growth might not be sustainable in the long run. In the short-to-medium term, the identified main risk to financial stability is that the low interest rates and continued growth in household income may increase imbalances in the RRE market. The latest data, however, show some stabilisation in both nominal and real RRE prices over the past year.

Risks and vulnerabilities in the household and banking stretch categories appear more contained, owing to relatively low indebtedness of the household sector, moderate growth in RRE lending and high capital adequacy of the banking sector. The Estonian economy is, however, exposed to risks in the global economy and the banking sector is structurally vulnerable due to its high degree of concentration and interconnectedness, in particular with the Swedish banking system. International risks could spill over to Estonia through both credit supply and trade channels.

The Estonian authorities have implemented a combination of precautionary policy measures to prevent RRE lending standards from loosening from their current level and to increase the resilience of the banking sector to structural vulnerabilities in the Estonian economy and financial sector. As intended and expected, the LTV, DSTI and maturity limits have not significantly changed the conditions on or volumes of new RRE lending over the past year. Should the risks around RRE lending increase, Eesti Pank is able to tighten the requirements.

Overall, the macroprudential policy package is comprehensive and assessed to be appropriate and expected to be sufficient in addressing the identified vulnerabilities related to RRE. Given the comprehensive set of precautionary policy measures aimed at all three stretches, including collateral stretch where the risks are assessed to be highest, the policy stance is assessed as appropriate. Measures are also expected to be sufficient given the current level of and trend in vulnerabilities: there is relatively low household indebtedness, mortgage growth is not rapid and the banking sector is well capitalised should there be any shocks from the RRE sector. Nevertheless, the policy stance is forward looking and the measures taken should reduce the misalignment of incentives that could lead banks to issue an excessive number of mortgages in future or households to take on an excessive amount of housing debt. Close monitoring of future developments relating to RRE prices and conditions on and volumes of RRE lending is, however, warranted. Furthermore, the predominance of variable rate housing loans exposes households to a higher debt service burden in the long term.



Table EE.1

Summary assessment – Estonia

<p>Summary RRE risk assessment narrative</p>	<p>Key RRE vulnerabilities are related to the collateral stretch Rapidly increasing RRE prices that are close to their pre-crisis peak levels suggest that vulnerabilities are building up in the collateral stretch (since Q1 2009 real property prices have increased by more than 50%). However, recently, there appears to be some stabilisation in RRE prices.</p> <p>Furthermore, RRE price increases have been supported by income growth which may not be sustainable in the long run since it has outpaced productivity growth.</p> <p>Risks and vulnerabilities in the household and banking stretches appear more contained, owing to relatively low indebtedness of the household sector, moderate growth in RRE lending and high capital adequacy of the banking sector.</p> <p>The Estonian economy is, however, exposed to risks in the global economy and the banking sector is structurally vulnerable due to its high degree of concentration and interconnectedness, in particular with the Swedish banking system. International risks could spill over to Estonia through both credit supply and trade channels.</p>
<p>Policy assessment given risks</p>	<p>The policy stance is appropriate and expected to be sufficient The Estonian authorities have implemented a combination of precautionary policy measures to prevent RRE lending standards from loosening from their current level and to increase the resilience of the banking sector to structural vulnerabilities in the Estonian economy and financial sector.</p> <p>Given the comprehensive set of precautionary policy measures aimed at all three stretches, the policy stance is assessed as appropriate.</p> <p>The measures are also expected to be sufficient given the current level of and trend in vulnerabilities. Nevertheless, the policy stance is forward looking and the measures taken should reduce the misalignment of incentives that could lead banks to issue an excessive number of mortgages in future or households to take on an excessive amount of housing debt.</p>



Table EE.2

Summary of risks and policy measures – Estonia

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Currently, no major risks or vulnerabilities are identified with respect to household stretch. Household debt-to-income and leverage ratios (the latter measured as debt over total financial assets) have been decreasing over the past three years and are currently significantly below their recent peaks.	Nominal and real RRE prices had been rising since 2009, driven by household income growth and partly reflecting a recovery from the preceding boom/bust cycle. The latest data, however, show some stabilisation in RRE prices over the past year. The recent rise in income and RRE prices has been accompanied by only a moderate increase in housing loans. The combination of rising RRE prices and increasing household income entail a risk of unsustainable developments in RRE prices and lending that may be further accelerated by the current low interest rate environment. In particular, the recent rapid wage growth that has been boosting RRE prices is assessed to be inconsistent with expected productivity growth in the long term.	The banking sector is highly concentrated and focused on lending. The banking sector is also highly interconnected with the Nordic banking system, with the risk of potential shocks spreading from other countries to the Estonian economy and financial system through both credit supply and trade channels. In particular, the Estonian financial system is dominated by large Swedish-owned banks that are exposed to a range of vulnerabilities, e.g. in their home RRE market and in wholesale funding markets.
Summary of policy measures (implemented, planned, under consideration)	<p>Finantsinspeksioon issued guidelines on responsible lending (December 2010)</p> <p>Requirements for new housing loans (as of 1 March 2015): at least 85% of new housing loans issued per quarter must have:</p> <p>a) a DSTI limit of 50% using either the interest rate in the loan contract plus 2 percentage points, or an annual rate of 6%, whichever is higher</p> <p>b) maturity limit of 30 years</p> <p>From 2016 the limit on deductions from taxable income was lowered from €1,920 to €1,200 per taxpayer</p>	<p>Finantsinspeksioon issued guidelines on responsible lending (December 2010)</p> <p>Requirements for new housing loans (as of 1 March 2015): at least 85% of new housing loans issued per quarter must have an LTV limit of 85% (90% if guaranteed by KredEx)</p>	<p>Finantsinspeksioon issued guidelines on responsible lending (December 2010)</p> <p>Systemic risk buffer requirement of 1% from 1 August 2016</p> <p>O-SII buffer of 2% from 1 August 2016 for the two largest banks</p> <p>Countercyclical capital buffer (CCyB) requirement to be maintained at 0%</p>
Assessment of policy measures	Appropriate and sufficient	Appropriate and expected to be sufficient	Appropriate and sufficient

Household stretch

The household stretch indicators do not signal any significant increase or a particularly high level of vulnerabilities related to household indebtedness. The household debt-to-income ratio, at 72% in Q4 2015, is significantly below its peak of 96%. In addition, the household leverage ratio (measured as debt over financial assets) – at 37% – is also below its peak (see Chart EE.1). Both indicators have been decreasing over the past three years, suggesting that vulnerabilities related to household indebtedness are decreasing.

The policy measures implemented to prevent the household stretch include the debt service-to-income (DSTI) limit of 50% and the maturity limit of 30 years for new housing loans (set by Eesti Pank as of 1 March 2015)¹¹⁹, as well as guidelines on responsible lending (issued by Finantsinspeksioon in December 2010). The DSTI ratio is calculated using either the interest rate

¹¹⁹ Up to 15% of housing loans issued each quarter are permitted to breach the requirements for new housing loans (LTV, DSTI and maturity limits).



in the loan contract (base rate plus margin) plus 2 percentage points, or an annual rate of 6%, whichever is higher.

With regard to other policy measures, the maximum amount for the tax deductibility of interest expenses on housing loans, training expenses, gifts and donations from taxable income was reduced in 2016 (through changes in the Income Tax Act) from €1,920 to €1,200.

In light of the fact that the identified vulnerabilities related to household stretch are assessed to be low and several appropriate policy measures have been taken, the policy stance is assessed to be appropriate and sufficient for the household stretch.

Collateral stretch

Vulnerabilities related to residential real estate in Estonia are concentrated in the collateral stretch category. Nominal and real RRE prices had been rising rapidly since 2009 (50% and 27% respectively since Q1 2009; see Chart EE.2), driven largely by household income growth and partly reflecting a recovery from the preceding boom/bust cycle. However, the RRE price-to-income ratio has also been increasing (+9 p.p. over the last three years; see Table C.2 in Annex C), but less than nominal and real RRE prices.

The main collateral stretch indicators signal rising vulnerabilities related to RRE prices over the past three years, while the latest data show some stabilisation in RRE prices in the last year. Moreover, both the PTI index at 109% and the PTR index at 78% have decreased considerably since their previous peaks in Q2 2007 (181%) and Q4 2006 (104%), respectively. The ECB estimations of potential overvaluation of RRE prices indicate that Estonian RRE prices are currently broadly in line with fundamentals.

In the case of Estonia, a combination of rising RRE prices and increasing household income entails a risk of unsustainable developments in RRE prices and lending that may be further accelerated by the current low interest rate environment. In particular, the rapid rise in RRE prices has largely been driven by household income growth, which has, however, exceeded expected long-run productivity growth. This could suggest that the income and RRE price growth might not be sustainable in the long run. In the short-to-medium term, the main identified risk to financial stability is that the low interest rates and continued growth in household income may increase imbalances in the RRE market. So far, the recent rise in income and RRE prices has been accompanied by only a moderate increase in lending for house purchases, which in June 2016 increased by 4.6% annually.

The policy measures implemented related to the collateral stretch include the loan-to-value (LTV) limit on new housing loans (set by Eesti Pank as of 1 March 2015) and guidelines on responsible lending (issued by Finantsinspektsioon). The LTV limit is 85% (90% for loans guaranteed by KredEx). Currently, the LTV ratio is 69% for the stock of loans and 72% for new loans (see Table C.1 in Annex C). Thus, for the average loan, this measure will be non-binding. However, it will ensure that household indebtedness will not rise too far relative to the value of the collateral.

The RRE-related measures implemented have not had any major impact on the banking sector or developments in the RRE market. The housing loan requirements were set close to the levels of bank lending standards at the time and therefore, as intended and expected, they have not significantly changed the conditions for housing loans or volumes of new housing lending (Eesti Pank Financial Stability Review 2/2015). The past increase in RRE prices and household income has also mitigated the effects of LTV and DSTI limits on borrowing.

While RRE prices were rising rapidly between 2009 and 2015 in Estonia, recovering from a significant drop during the 2008 crisis, the data show some stabilisation in both nominal and real



RRE prices over the past year. Moreover, the Estonian authorities have implemented a combination of precautionary policy measures to prevent RRE lending standards from loosening from their current level to curb the build-up of vulnerabilities going forward. Therefore, the policy stance is assessed to be appropriate and expected to be sufficient for the collateral stretch.

Banking stretch

The capital adequacy of the Estonian banking sector is high, with a CET1 ratio at 34.8% in Q1 2016, and leverage is low (the assets-to-equity ratio was approximately 8% in June 2016 in comparison with the EU average of 13%). Three banks, including the two largest, that participated in the ECB's comprehensive assessment and parent banks that participated in the 2016 EU-wide stress tests were found to be very resilient in these exercises. There are, however, some structural features that add to the vulnerability of the Estonian banking sector. These features may interact with and be an amplifying factor for other vulnerabilities related to RRE.

Firstly, the banking sector is highly concentrated overall and particularly in lending. The Estonian loan market is mostly divided between four large banks that in June 2016 covered 89% of the market. Swedbank AS had the biggest market share (39% of the total loan portfolio). It was followed by AS SEB Pank (23%), Nordea Bank AB Estonia Branch (19%) and Danske Bank A/S Estonia Branch (8%). In December 2015 Eesti Pank concluded that the two largest banks, Swedbank AS and AS SEB Pank, are to be considered as systemically important to the domestic financial system.

Secondly, the banking sector is highly interconnected with the Nordic banking system, with the risk of potential shocks spreading from other countries to the Estonian economy and financial system. In particular, the Estonian financial system is dominated by large Nordic-owned banks which are exposed to a range of risks – especially in their home RRE markets and in wholesale funding markets – that could spill over to Estonia through credit supply and trade channels.

Currently, two banks (Swedbank and SEB Pank) are applying the internal ratings-based approach in credit risk calculation within the capital adequacy framework. Based on the banking groups' public financial statements in 2015, the average risk weight for RRE loans was 17% in Swedbank and 12% in SEB Pank. All other banks use the standardised approach in which the risk weight for RRE loans is 35%.

The policy measures implemented to prevent the banking stretch include the systemic risk buffer requirement of 2% (set by Eesti Pank as of 1 August 2014), as well as guidelines on responsible lending (issued by Finantsinspektsioon). The systemic risk buffer is intended to ensure the resilience of the financial sector to structural (non-cyclical) vulnerabilities in the Estonian economy and financial sector and to related non-cyclical risks that could have a serious negative impact on the national financial system or the real economy. On 1 August 2016 the systemic risk buffer was lowered to 1% and the O-SII buffer requirement of 2% was applied to the two largest banks.

Since Estonian banks are highly capitalised, not highly leveraged, have comparatively high risk weights for RRE exposures, and have a number of capital buffers in place, the policy stance is deemed appropriate and sufficient for the banking stretch.



Table EE.3

Additional information on instruments and data available to micro and macro supervisory authorities – Estonia

Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?

The macroprudential authority in Estonia is Eesti Pank.

The currently available macroprudential policy package is comprehensive.

Eesti Pank is able to tighten requirements for new housing loans, if necessary.

Eesti Pank is also able to reduce the risks from total credit growth by raising the countercyclical capital buffer (CCyB) rate, if necessary.

Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?

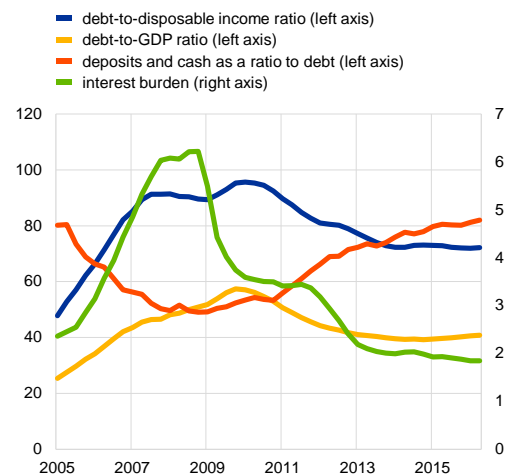
Eesti Pank has comprehensive data on conditions on new RRE lending (LTV ratio, DSTI ratio and maturity at loan origination).

Annex with charts

Chart EE.1

Household indebtedness

(percentage)

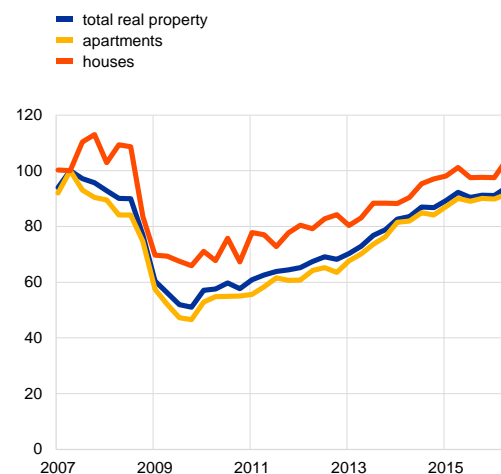


Sources: Statistics Estonia and Eesti Pank.

Chart EE.2

Real property prices

(index: Q1 2009 = 100)



Sources: Statistics Estonia and Estonian Land Board.



Finland

Key points

Finland has RRE vulnerabilities related to high and increasing household indebtedness, especially among some groups of households. Households' DTI ratio is relatively high at 112% (the EU average for the 19 available countries is 106% and Finland has the sixth highest ratio). The household debt-to-GDP ratio is relatively high at 66% (an EU average of 56%, with Finland having the seventh highest ratio). Both ratios are currently at their historical peaks. The debt is concentrated in certain households: according to the latest data, 26.5% of housing debt is borne by households whose total debt is over four times higher than their annual monetary income. In addition, 10% of households have DTI ratios above 300% and these households account for almost half of total household debt. Moreover, households appear to be exposed to interest rate risks, since more than 95% of new and existing mortgage loans have variable interest rates.

At the same time, the MFI sector has a large mortgage portfolio, coupled with high leverage. Risks linked to the collateral stretch appear to be slightly more limited, with high nominal albeit flat RRE prices. RRE price indicators, such as price-to-income and price-to-rent ratios, are close to their long-run averages (see Chart FI.6), suggesting that there is no clear evidence of overvaluation in RRE prices. Nevertheless, given the current weak economic outlook for the Finnish economy, there could be a risk of decreasing RRE prices in the event of a negative economic shock.

An economic or financial shock could lead to the crystallisation of some of the above-mentioned risks – for example, if unemployment increases and/or income growth decreases, then some highly indebted households may find it more difficult to service their debts and the number of mortgage defaults may increase, leading to direct credit losses for banks, especially if accompanied by a decrease in RRE prices. Moreover, if an adverse economic scenario does materialise, the associated negative household income and wealth effects may reinforce the initial shock, amplifying the negative direct and indirect effects on financial stability (e.g. if households need to reduce consumption in order to service their mortgage loans).

In relation to the identified vulnerabilities, a wide range of relevant macroprudential measures and other policies have been implemented in Finland. Starting with fiscal measures impacting borrowers' incentives, mortgage interest tax subsidies are being gradually reduced every year from the current 55% by 10 p.p. until they reach 25% in 2019 (until 2010, the share of mortgage interest payments subject to tax relief was 100%). The Finanssivalvonta (the Finnish Financial Supervisory Authority – FIN-FSA) has also published recommendations for banks regarding stressed loan interest rates and the maximum maturity that banks should use in their credit assessments. Targeting the adequacy of collateral, a 90% LTV limit (95% for first-time buyers) became binding through a legislative amendment from July 2016 onwards. Moreover, in order to strengthen credit institutions' capital base, the capital conservation buffer (2.5%) was introduced in January 2015. O-SII surcharge requirements (0.5-2.0%) were introduced for the most significant credit institutions as of January 2016. In June 2016 the FIN-FSA Board decided to take measures to introduce a credit institution-specific minimum level of 10% for the average risk weight on housing loans of credit institutions that have adopted the IRB approach. The minimum level is set to come into force on 1 July 2017 at the latest. The contemplated means for setting the minimum level is via Article 458 of the CRR. At the moment, the Finnish authorities do not have the legal powers to implement other relevant macroprudential measures such as LTI, DTI and DSTI limits to deal with risks linked to household stretch.

While the recently introduced LTV measure and the planned floor for IRB banks' risk weights are expected to indirectly contribute to a reduction of household stretch, macroprudential measures



such as LTI, DTI or DSTI limits would be more effective in preventing a further rise in the number of highly indebted households (it should also be noted that the introduced LTV measure will only affect new borrowing). The gradual reduction of mortgage interest tax subsidies is an important policy change impacting households' incentives and working in the right direction.

While these policy measures are appropriate given the nature of RRE vulnerabilities in Finland, they may not be sufficient to fully address them. However, it should be noted that the Finnish authorities do not have the legal powers to implement other relevant macroprudential measures such as limits on LTI, DTI or DSTI ratios, which could be used to curb further increases in household indebtedness.

Table FI.1
Summary assessment – Finland

<p>Summary RRE risk assessment narrative</p>	<p>Key risks are related to the banking, collateral and household stretches</p> <p>The main vulnerabilities are high and increasing household indebtedness, especially among some groups of households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region.</p> <p>Households' debt levels are relatively high in Finland: the DTI ratio is relatively high at 112% as is the debt-to-GDP ratio at 66%.</p> <p>More concerning are the groups of highly indebted households: 10% of households have DTI ratios above 300% and these households account for almost half of total household debt.</p> <p>In addition, households appear to be exposed to interest rate risks, since more than 95% of new and existing mortgage loans have variable interest rates.</p> <p>Price indicators suggest that prices relative to income and rents are close to their long-term average; however, given the weak economic outlook, the likelihood of a manifestation of RRE risks over the short-to-medium term is elevated.</p> <p>The banking sector is concentrated with large exposures to RRE and is very interconnected with the Nordic banking system and, to some extent, reliant on market funding. Also, the potential direct risks to the banking and financial system could be significant if they were to materialise, especially given the size of the mortgage market in relation to the banking system and the overall economy.</p>
<p>Policy assessment given risks</p>	<p>The policy stance is not expected to be sufficient for the household stretch</p> <p>While the measures taken are deemed appropriate and conceptually suitable given the nature of risks, it is not clear that they will significantly mitigate vulnerabilities related to the household stretch (in particular, the high overall indebtedness of households and the large share of highly indebted households).</p> <p>The recently introduced LTV measure and the planned floor for IRB banks' risk weights are expected to indirectly contribute to a reduction of household stretch, but macroprudential measures such as LTI, DTI or DSTI limits would be more effective in preventing a further rise in the number of highly indebted households (it should also be noted that the introduced LTV measure will only affect new borrowing).</p> <p>The situation is further complicated by the fact that the Finnish authorities lack the legal instruments to implement certain measures such as LTI, DTI and DSTI limits, preventing them from directly addressing vulnerabilities in the household stretch in the short-to-medium term.</p> <p>On the other hand, the gradual reduction of mortgage interest tax subsidies is an important policy change impacting households' incentives and going in the right direction.</p> <p>While these policy measures are expected to be sufficient for the collateral and banking stretches, they may not be sufficient for the household stretch.</p>



Table FI.2

Summary of risks and policy measures – Finland

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Finland has RRE vulnerabilities related to the high and increasing household indebtedness. Household debt seems relatively high in Finland: the DTI ratio is relatively high at 112%. The debt-to-GDP ratio is also relatively high at 66%. Some groups of households in particular would be particularly vulnerable to adverse economic conditions or developments in the RRE market. 10% of households have DTI ratios above 300% and these households account for almost half of total household debt. In addition, households appear to be exposed to interest rate risks, since more than 95% of new and existing mortgage loans have variable interest rates.	RRE price indicators, such as price-to-income and price-to-rent ratios, are close to their long-run averages, suggesting that there is no clear evidence of overvaluation in RRE prices. Nevertheless, given the current weak outlook for the Finnish economy, there could be a risk of decreasing RRE prices in the event of a negative economic shock.	The potential direct risks to the banking and financial system could be significant if they were to materialise, especially given the size of the mortgage market in relation to the banking system and the overall economy. The Finnish banking sector is characterised by large exposures of banks to residential real estate, a high concentration, a significant reliance on wholesale funding and strong connections to the Nordic banking system via foreign ownership, which increases the risk that housing market problems in other Nordic countries could spread to Finland's financial system.
Summary of policy measures (implemented, planned, under consideration)	Tax deductibility is being gradually reduced to 25% by 2019 Recommendation of the FIN-FSA (2010) related to cautious mortgage lending (ability to pay with an interest rate of 6% and a maximum maturity limit of 25 years; exercise caution in granting loans with LTV ratios higher than 90%) LTV limit of 90% (95% for first-time buyers) in effect since July 2016	LTV limit of 90% (95% for first-time buyers) in effect since July 2016	Capital conservation buffer of 2.5% since January 2015 O-SII buffer of 0.5-2% since January 2016 Process initiated to introduce an average risk weight floor of 10% for IRB banks' mortgage exposures under Article 458 of the CRR
Assessment of policy measures	Appropriate but not expected to be sufficient	Appropriate and expected to be sufficient	Appropriate and expected to be sufficient

Household stretch

Households in Finland are highly indebted. This is reflected in both the debt-to-disposable income (DTI) ratio, which is relatively high at 112%¹²⁰ (compared with an EU average of 106% for the 19 countries for which data are available, with Finland having the sixth highest ratio), and the aggregate leverage ratio (measured as household debt over financial assets), which is high at around 50%¹²¹. The household debt-to-GDP ratio is also relatively high at 66% (compared with an EU average of 56%, with Finland having the seventh highest ratio). The continued weak economic developments in Finland have led to muted growth in households' disposable income, while at the same time households have continued to accumulate debt. As a consequence, the aggregate DTI ratio has increased by 5.5 p.p. over three years and by 2.5 p.p. since last year, to 112.2% in Q1 2016.

While aggregate debt levels are high, debt is also very unevenly distributed among households. Information on the distribution of housing debt indicates that debt is concentrated in a relatively small group of the most indebted households. Moreover, households with large housing loans

¹²⁰ According to the slightly outdated Eurosystem Household Finance and Consumption Survey, at the end of 2009 over 11% of Finnish households had negative net wealth after all households' assets and liabilities were taken into account.

¹²¹ However, this measure does not include earnings-related pension assets of Finnish households (around €180 billion at end-2015). Therefore, when households' leverage is measured using debt as a percentage of total financial assets, the absence of these pension assets exaggerates Finnish indebtedness in an international comparison. Including assets held by the Finnish employment pension schemes, the ratio would be significantly lower, at around 30%.



usually also have a large debt burden in relation to their annual income. For example, according to the latest data, 26.5% of housing debt is borne by households whose total debt is over four times higher than their annual monetary income. Moreover, 10% of households have a debt-to-income ratio above 300% and they account for half of total housing debt and almost half of total household debt.

Credit dynamics in Finland are, however, less of a concern than the rise in household indebtedness: loans for house purchases grew by 2.6% annually in May 2016. At the same time, debt servicing costs for the Finnish households were the lowest among the group of focus countries, standing at 7% of their income. Over the last three years, these costs have remained more or less flat.

The low level of interest rates supports households' financial position and the overall debt servicing ability of households has remained good despite the weak economic outlook in Finland. Therefore, direct credit risks to the banking sector are seen as limited at present. However, more than 95% of new and existing mortgage loans have variable interest rates. This makes Finnish borrowers sensitive to a potential increase in interest rates. However, the fact that Finnish households typically amortise their loans on a monthly basis mitigates both the direct and indirect risks linked to the high household indebtedness in Finland.

In order to address vulnerabilities linked to household stretch, the FIN-FSA issued recommendations in 2010 for banks regarding the stress rate and amortisation rate they should use in their credit assessments (ability to pay with an interest rate of 6% and a maximum maturity limit of 25 years and to be cautious granting loans with LTV ratios higher than 90%). Moreover, the tax deductibility of housing loan interest payments is being gradually reduced from 2011 when the paid interests were fully subject to tax relief. In 2016, 55% of paid interests are subject to tax relief. The government's plan is to reduce the tax deductibility further by 10 percentage points per year for the next four years. Thus, in 2019, only 25% of interest payments will be subject to the relief.

While the recently introduced LTV measure and the planned floor for IRB banks' risk weights are expected to indirectly contribute to a reduction of household stretch, macroprudential measures such as LTI, DTI or DSTI limits would be more effective in preventing a further rise in the number of highly indebted households (it should also be noted that the introduced LTV measure will only affect new borrowing). The situation is further complicated by the fact that the Finnish authorities lack the legal instruments to implement certain measures such as LTI, DTI and DSTI limits, preventing them from directly addressing vulnerabilities in the household stretch in the short-to-medium term. However, the gradual reduction of mortgage interest tax subsidies is an important policy change impacting households' incentives and working in the right direction. While these policy measures are appropriate given the nature of RRE vulnerabilities in Finland, they may not be sufficient to fully address them.

Collateral stretch

Price indicators point to relatively stable RRE price developments in Finland. Both price-to-income and price-to-rent ratios are close to their long-term averages (see Chart FI.6). Generally, RRE prices are higher in growth centres than in the rest of the country. However, no significant overvaluation of RRE prices has been detected, even if some indicators calculated by the ECB



show that there may be slight overvaluation. Given the weak outlook for the Finnish economy (Finnish economic growth is forecast to be the second lowest or lowest among EU countries in 2016-17¹²²), there is a risk of an RRE price correction due to e.g. an economic shock despite no obvious overvaluation of RRE prices in Finland.

Furthermore, new housing loans have relatively high loan-to-value (LTV) ratios in Finland. Two surveys conducted in 2010 and 2012 by the FIN-FSA show that the self-financing share has been below 10% for a significant proportion (more than one-third) of new housing loans in the sample, i.e. the LTV ratio was over 90% at loan origination. This means that a significant portion of new borrowers are sensitive to a fall in RRE prices. The most recent survey (based on a sample covering over 90% of all new mortgages in October 2014) showed that the average LTV ratio for newly issued residential mortgages was 70.4%. However, given the amortisation of mortgages on a monthly basis, the average LTV ratio for the stock of housing loans is considerably lower than that for new housing loans (at loan origination). Based on data collected for the 2014 survey, the LTV ratio for the total stock of mortgages was 58.2%.

The analysis of institutional and structural features of the RRE market in Finland suggests that there are some factors that can mitigate negative shocks to RRE markets, such as the rather short mortgage maturities as well as a positive net migration flow and the increasing number of households supporting housing demand. However, some factors might amplify negative shocks to RRE markets, such as the high share of mortgages with variable interest rates and the large share of the construction sector in GDP.

In order to address vulnerabilities linked to the collateral stretch, a regulatory cap on the LTV ratio was introduced in July 2016 through a legislative amendment. The limit was set at 90% for buyers of real estate, while the limit for first-time buyers was set at 95%. According to the legislation, the FIN-FSA may, on certain grounds, tighten the limit by 10 p.p. (down to 80% and 85%, respectively).

Given (i) muted RRE price dynamics, (ii) no obvious signs of overvaluation in RRE prices, (iii) rather short mortgage maturities, (iv) a common practice of amortising mortgages on a monthly basis, and (v) the prevailing levels of LTV ratios on new lending and in the mortgage stock (and in particular the cap on the LTV ratio, but also the gradual removal of tax subsidies on mortgage interest payments, which is also expected to positively contribute to correcting households' incentives and thus the collateral stretch), the policy measures taken are deemed to be appropriate and expected to be sufficient to address vulnerabilities related to the collateral stretch.

Banking stretch

The Finnish banking sector is characterised by large exposures to residential real estate, a high concentration (overall and in housing, the three largest banks account for 80% of the loan stock), a significant reliance on wholesale funding and strong connections to the Nordic banking system via foreign ownership, which increase the risk that housing market problems in other Nordic countries could spread to Finland's financial system.

¹²² European Commission Spring 2016 Economic Forecast. The Finnish economy has nevertheless returned to growth after three years of contraction.



Banking stretch and resilience indicators also reveal that the Finnish MFI sector is highly leveraged (total assets were 18 times capital and reserves at the end of Q2 2016)¹²³ and dependent on RRE lending as a source of income. However, in the past years, credit institutions in Finland have been deleveraging (leverage has declined to 18 from 20 one year earlier and from 21 three years ago).

Credit for house purchases accounted for 44% of total credit to residents in Finland, which was well above the EU average of 35% and lower only than in the UK, Slovakia and Sweden, all of which are focus countries. Over the past year, the annual growth rate of the stock of housing loans stood at 2-3%. In relation to GDP, the stock of housing loans has been stable (at 43-44%) since 2013.

Overall, capital adequacy ratios are high in the Finnish banking sector (see Chart FI.4). In Q1 2016 the CET1 ratio amounted to 21.1% and increased by 4.2 p.p. compared with the level a year earlier. Banks' non-performing assets arising from loans to households have remained low relative to the loan stock. At the end of March 2016, banks' non-performing loans to households totalled around €1.1 billion, i.e. 0.9% of the stock of household loans.

In order to address vulnerabilities linked to the banking stretch, the capital conservation buffer (2.5%) and the O-SII buffer (0.5-2.0%) are in force. In addition, as a planned measure, the FIN-FSA decided to take measures to introduce a credit institution-specific minimum level of 10% for the average risk weight on housing loans of credit institutions that have adopted the IRB approach. The minimum level will come into force on 1 July 2017 at the latest. The basis for setting the minimum level is Article 458 of the CRR.

Given the overall high solvency ratios of Finnish banks, and taking into account the planned and already introduced policy measures related to RRE sector vulnerabilities, the policy stance related to banking stretch is deemed appropriate and expected to be sufficient.

Table FI.3

Additional information on instruments and data available to micro and macro supervisory authorities – Finland

<p>Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?</p>	<p>The powers conferred on macroprudential supervisory authorities allow the possible imposition of stricter national measures than those set out in the common EU regulatory framework in order to address systemic risk. The Finnish authorities are not equipped with powers to restrict the maximum size of new housing loans relative to the borrower's debt servicing capacity and loan maturities, or to impose loan amortisation requirements.</p>
<p>Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?</p>	<p>Starting in H2 2016 the FIN-FSA will start collecting new data on housing loans, their LTV ratios and the value of collateral at loan origination. In 2010 and 2012 the FIN-FSA conducted two sample surveys on LTV ratios of new housing loans.</p>

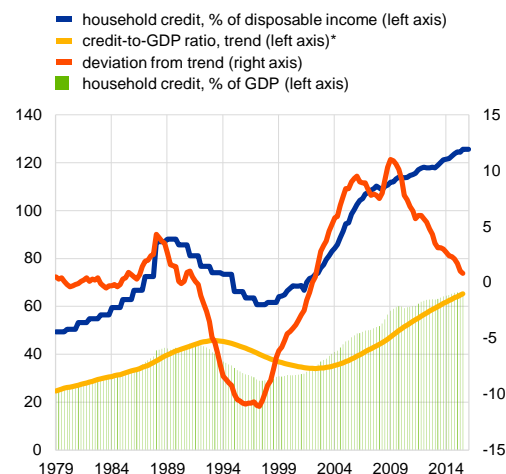
¹²³ The MFI sector also includes some leveraged credit institutions that are not engaged in household lending in Finland (e.g. branches of foreign credit institutions and a credit institution providing funding for the local public sector). The leverage ratio is also affected by the concentration of the whole derivative position of Nordea Group in the balance sheet of Nordea Bank Finland.



Annex with charts

Chart FI.1
Households' indebtedness

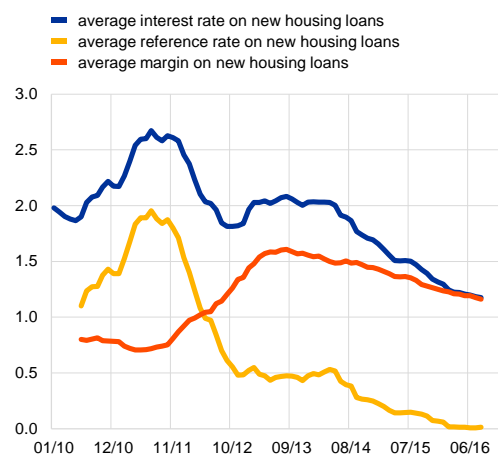
(left axis: percentage; right axis: percentage points)



Sources: BIS, Statistics Finland and Suomen Pankki – Finlands Bank.
Notes: Household loan stock including household share of housing company loans. (*) Calculated using a one-sided Hodrick-Prescott filter (lambda 400,000).

Chart FI.3
Average interest rate on new drawdowns of housing loans

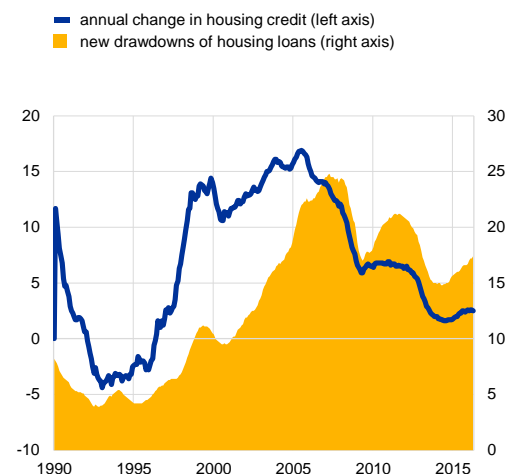
(percentage)



Source: Suomen Pankki – Finlands Bank.

Chart FI.2
Housing loans: new drawdowns and annual growth rate of the stock

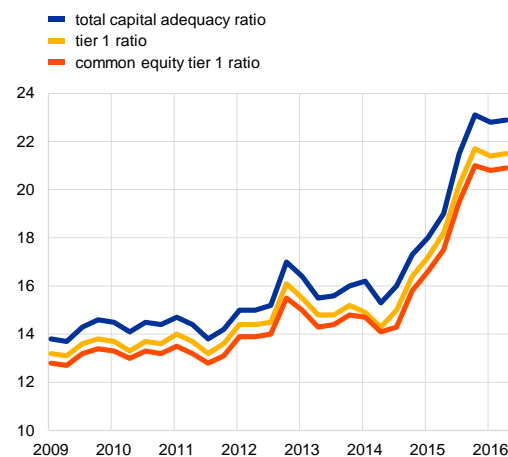
(left axis: percentage; right axis: EUR billions)



Sources: Statistics Finland and Suomen Pankki – Finlands Bank.
Notes: In real terms (at consumer prices for the most recent 12 months). New drawdowns are a 12-month moving sum.

Chart FI.4
Capital ratios for the banking sector

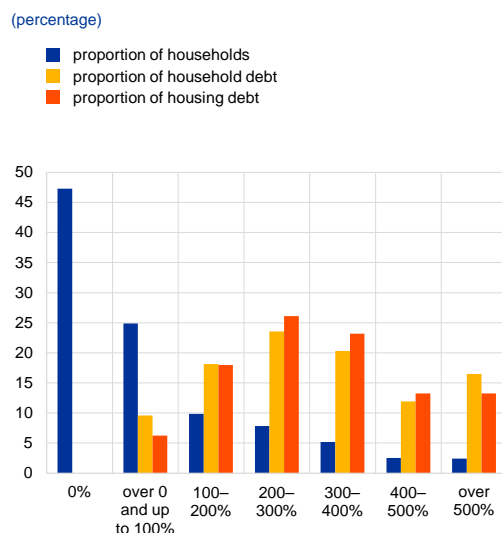
(percentage)



Source: Finnish Financial Supervisory Authority.

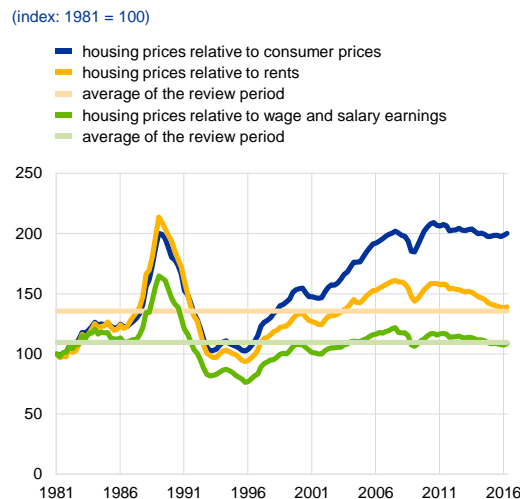


Chart FI.5
Households and their debt-to-monetary income ratio



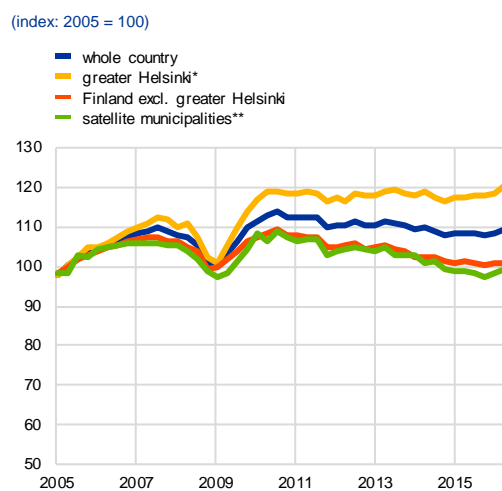
Sources: Statistics Finland and Suomen Pankki – Finlands Bank.
 Note: The figures have been published in 2016 and pertain to the situation in 2014.

Chart FI.6
House price ratios



Sources: Statistics Finland and Suomen Pankki – Finlands Bank.

Chart FI.7
Real house prices in different regions



Source: Statistics Finland.
 Note: (*) Helsinki, Espoo, Vantaa, Kauniainen; (**) Hyvinkää, Järvenpää, Kerava, Riihimäki, Kirkkonummi, Nurmijärvi, Sipoo, Tuusula, Vihti.



Luxembourg

Key points

Residential real estate-related risks in Luxembourg relate to the combination of high RRE prices and increasing household indebtedness. Prices are currently at an unprecedentedly high level (based on available data), and are increasing both in relation to income and the level of rents (in Q1 2016 nominal prices rose by 4.5% annually, the PTI index increased by 6 p.p. annually and the PTR index increased by 4 p.p. annually). These price developments have been sustained by a structural imbalance between strong housing demand fuelled, inter alia, by demographic factors and policy incentives and supply-side limitations on the availability of housing. ECB models suggest some degree of overvaluation of residential property prices, which is confirmed – though to a smaller extent – by the models of the Banque centrale du Luxembourg.

Vulnerabilities also exist for the household stretch, relating to a high and increasing level of debt. The stock of loans for house purchases increased by 6% annually in June 2016 and the debt-to-disposable income ratio appears high at 149% in Q1 2016. However, the debt-to-GDP ratio is more moderate at 57% in Q1 2016. On average, the LTV and DSTI ratios in Luxembourg's mortgage market are robust and represent a mitigating factor. However, the distribution of the LTV and DSTI ratios both for new and outstanding mortgages suggests that there is a notable share of loans with high LTV and DSTI ratios.¹²⁴ There are two different types of risks associated with this. First, while the vulnerabilities in the household stretch are already elevated given the aggregate level of household debt, there is a risk that the share of highly indebted households increases further with the ongoing robust growth in RRE prices and housing loans. Second, in the event of unexpected changes in the real estate market or the broader real economy (e.g. shocks to economic growth, income or unemployment), the associated negative household income and wealth effects (e.g. if households need to reduce consumption in order to service their mortgage loans) may reinforce the initial shock, leading to deeper economic consequences as well as negative direct and indirect effects on financial stability.

Mortgage debt is not concentrated in certain households; therefore, any income or interest rate shock would be more widely distributed across the Luxembourg economy. A potential mitigating factor is that the financial assets of Luxembourg households are also relatively high, thereby limiting the possible impact of adverse developments if households are willing and able to draw on these sources of wealth. By contrast, there is a high share of households with variable rate loans (on average between May 2015 and May 2016, 52% of new loans had variable rates), which means that even small changes in interest rate levels can have an impact on household disposable income. This may lead to larger fluctuations in private consumption and reduce macroeconomic stability. This, in turn, could lead to negative spillover effects on the banking sector through second-round effects.

Overall, the high and rising RRE prices and existing household indebtedness could interact, leading to a further increase in overall indebtedness and the proportion of vulnerable households. The policy actions by the domestic authorities addressing RRE risks have so far focused on increasing the resilience of the banking sector. Partially, this has been done by increasing risk weights on high LTV mortgages as well as by applying capital buffers both to the sector and to systemically

¹²⁴ Based on a recent survey conducted by the Commission de Surveillance du Secteur Financier (CSSF) for the main banks involved in mortgage lending.



important institutions. On 1 July 2016 a recommendation (CRS/2016/004¹²⁵) was issued by the Luxembourg Systemic Risk Committee to introduce a risk weight floor of 15% on RRE exposures for IRB banks. These measures will further increase banks' resilience and risks linked to the banking stretch seem limited at present. Given that the Luxembourg banking sector is well capitalised with limited direct exposures to residential real estate, this suggests that the policy stance for the banking stretch is both appropriate and sufficient. This is also supported by the evidence from the CSSF stress tests.

Besides taking measures to require that banks have appropriate internal governance and policies with respect to the mortgage market, no macroprudential measures have been taken to reduce vulnerabilities linked to the potential negative interaction between household indebtedness and RRE price dynamics. Borrower-based macroprudential instruments are currently not available to the Luxembourg authorities. For this reason, a further build-up of vulnerabilities and risks – especially in the light of the current RRE price and mortgage credit dynamics, the low interest rate environment and tax deductibility – could not be addressed rapidly with targeted measures. Overall, given the level and dynamics of identified vulnerabilities, the policy stance regarding the RRE sector in Luxembourg may not be appropriate to address the vulnerabilities identified for the collateral stretch. Furthermore, the policy stance for the household stretch is appropriate but not expected to be sufficient.

Table LU.1

Summary assessment – Luxembourg

<p>Summary RRE risk assessment narrative</p>	<p>Key risks are related to the collateral and household stretches The main vulnerabilities are considered to be the combination of high RRE prices and increasing household indebtedness.</p> <p>Prices are currently at an unprecedentedly high level, and are increasing both in relation to income and the level of rents (in Q1 2016 nominal prices increased 4.5% annually, the PTI index increased by 6 p.p. annually and the PTR index increased by 4 p.p. annually). These price developments have been sustained by structural factors.</p> <p>Regarding household indebtedness, the latest DTI figure suggests that debt is high (the DTI was 149% in Q1 2016), while the debt-to-GDP ratio appears to be more muted at 57% in Q1 2016.</p> <p>On average, the LTV and DSTI ratios in Luxembourg's mortgage market are robust and represent a mitigating factor. However, the distribution of the LTV and DSTI ratios both for new and outstanding mortgages suggests that there is a notable share of loans with high LTV and DSTI ratios that could lead to negative direct and indirect effects on financial stability in the event of economic or financial shocks. Moreover, household debt for house purchases is increasing rapidly (an annual growth rate of 6% in June 2016).</p> <p>The majority of mortgages are variable rate loans (on average between May 2015 and May 2016, 52% of new loans had variable rates).</p>
<p>Policy assessment given risks</p>	<p>The policy stance is not appropriate and not sufficient for the collateral stretch, and appropriate but not expected to be sufficient for the household stretch. Given the level and dynamics of identified vulnerabilities, the policy stance regarding the RRE sector in Luxembourg is deemed not appropriate, and therefore also not sufficient, due to a lack of policy measures to address collateral stretch.</p>

¹²⁵ Available here: http://www.bcl.lu/fr/stabilite_surveillance/CRS/Avis_Recommandation_CRS_00_2016_RWfloor_01_07_2016.pdf.



Table LU.2

Summary of risks and policy measures – Luxembourg

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Mortgage credit has been increasing rapidly in recent years and the level of mortgage debt is high in relation to the disposable income of Luxembourg households. Households' debt is currently 149% of their disposable income and it is still rising (mortgage credit grew by 6% annually in mid-2016), while mortgage loans are mostly with variable rates. A group of mortgage holders may be vulnerable to unexpected changes in the real estate market or the general economy. In 2015, 8% of new loans had an LTV ratio above 100% and 42% had a DSTI ratio higher than 40%.	RRE prices in Luxembourg have been increasing steadily for some time. Prices are currently at an unprecedentedly high level, and are increasing in relation to both income and the level of rents. These price developments have been sustained by structural factors. Despite LTV ratios on average being relatively moderate, their distribution shows rather high exposure to possible risks (4% of the stock of loans had an LTV ratio higher than 100% in 2015).	Mortgage growth in Luxembourg is one of the fastest in the EU; however, banks' exposure to the RRE sector is rather small. Banks in Luxembourg are well capitalised.
Summary of policy measures (implemented, planned, under consideration)	Implemented: CSSF Circular 12/552 requiring banks to have appropriate internal governance and policies, including with respect to testing mortgagors' repayment capacity and stricter stress tests for mortgage books (2012)	No measures in place or under consideration	Implemented: Institutions using the SA for credit risk need to apply a risk weight of 75% to the part of the mortgage loan exceeding 80% of the value of the real estate object Institutions using the IRB approach have to ensure that their regulatory capital adequacy is subject to a stress test which considers the effects of severe, but plausible, recession scenarios Capital conservation buffer introduced at 2.5% without phase-in starting in 2014 Pillar 2 measures are imposed on four banks operating in the RRE market The six main credit institutions in Luxembourg, of which 3 are involved in the RRE market, are subject to O-SII requirements of 0.5-1.0% Recommendation (CRS/2016/004) to introduce a risk weight floor of 15% on RRE exposures for IRB banks
Assessment of policy measures	Appropriate but not expected to be sufficient	Not appropriate and not sufficient	Appropriate and sufficient

Household stretch

The main vulnerability in the household stretch is related to the high and increasing debt of households in Luxembourg.¹²⁶ The debt-to-income ratio is relatively high at 149% in Q1 2016. Furthermore, loans for house purchases increased by 6% annually in June 2016, following similarly rapid credit growth in previous years. By contrast, developments in the debt-to-household assets ratio appear less pronounced (see Chart LU.1). In addition, vulnerabilities appear to be intensified by the low interest rate environment. Moreover, the predominance of variable interest rate mortgages makes households sensitive to a potential rise in interest rates.

¹²⁶ Based on a recent survey conducted by the CSSF for the main banks involved in mortgage lending. Due to data availability issues, no reliable LTI data could be provided.



The average LTV ratio is low for the stock of mortgages at 48% and for new loans at 67%. However, there is a notable share of loans with high LTV and DSTI ratios. In particular, for 25% of the loan stock the LTV ratio was higher than 80%, and 4% had an LTV ratio higher than 100% in 2015. As for new loans, the shares are even higher: 40% and 8%, respectively. A similar situation can be observed for the DSTI ratio, where 27% of the loan stock had a DSTI ratio higher than 40%, while the share for new loans was 42% in 2015.

There are two different types of risks associated with this. First, while the vulnerabilities in the household stretch are already elevated given the aggregate level of household debt, there is a risk that the share of highly indebted households increases further with the ongoing robust growth in RRE prices and housing loans. Second, in the event of unexpected changes in the real estate market or the broader real economy (e.g. shocks to economic growth, income or unemployment), the associated negative household income and wealth effects (e.g. if households need to reduce consumption in order to service their mortgage loans) may reinforce the initial shock, leading to deeper economic consequences as well as negative direct and indirect effects on financial stability. Mortgage debt is not concentrated in certain households, so any income or interest rate shock is likely to be more widely distributed across the Luxembourg economy.

It should be noted that households in Luxembourg have significant wealth; however, it has been decreasing with respect to debt over the last couple of years. Also, the average maturity of mortgage loans is relatively short, at about 21 years, so households in Luxembourg tend to amortise their liabilities rather quickly. Factors potentially increasing vulnerabilities through borrowers' incentives relate to the decisions by the Luxembourg authorities to reduce the taxation of capital gains derived from the sale of residential property, as well as to increase the mortgage interest deductibility limit for the principal residence. However, these tax incentives are temporary and will end in 2017.

No macroprudential measures have been adopted by the Luxembourg authorities to mitigate risks and vulnerabilities in the household stretch. However, the CSSF has introduced some other relevant measures: banks are required to test mortgagors' repayment ability and there are stricter stress-test requirements on banks' mortgage portfolios. These measures are appropriate to address vulnerabilities in the household stretch. However, they are not expected to be sufficient given that household debt levels are already high and may further increase with the ongoing robust growth in RRE prices and housing loans. Borrower-based macroprudential tools are currently not available to the Luxembourg authorities. For this reason, a further build-up of vulnerabilities – especially in the light of the current RRE price and mortgage credit dynamics, the low interest rate environment and mortgage interest tax deductibility – could not be addressed rapidly with targeted measures.

Collateral stretch

Residential real estate prices in Luxembourg have been increasing steadily for some time. Prices are currently at an unprecedentedly high level (based on available data), and are increasing both in relation to income and the level of rents. The PTI index increased by 6 p.p. annually to 118% in Q1 2016 and the PTR index increased by 4 p.p. to 119% (both with a value of 100 in 2010). Hence, prices appear to be high in comparison with fundamentals. In addition, the ECB calculations suggest that RRE prices are overvalued by 9-18% in Q1 2016. However, calculations by the BCL show a more conservative degree of overvaluation, with RRE prices more in line with fundamentals.



There are several reasons for such a strong increase in RRE prices: (i) growing domestic demand fuelled by positive demographic changes (positive net migration and an increasing number of households) and the rising volume of mortgages in the country; (ii) international demand financed by other sources than domestic banks; (iii) government policies that have further supported housing demand, for example the increase of the mortgage interest tax deductibility limit for the principal residence; and (iv) supply-side limitations on the availability of housing.

As for the housing stretch, no macroprudential policy measures are in place for the collateral stretch. However, some indirect positive effects could stem from increased risk weights on high LTV mortgages of banks using the standardised approach (SA) and representing some 20% of market share. As mentioned earlier, the average LTV ratio is low for the stock of mortgages at 48% and for new loans at 67%. However, taking into account that a relatively high share of mortgages in Luxembourg have LTV ratios that are above the limits commonly used in other countries (see above)¹²⁷, the exposure to possible vulnerabilities in the real estate market is relatively high and could lead to both direct and indirect financial stability risks. Given the identified vulnerabilities and due to the lack of policy measures, the policy stance for the collateral stretch is not appropriate.

Banking stretch

Mortgage loan growth in Luxembourg – at 6.2% in June 2016 – is currently one of the fastest in the EU, but it has shown a slowing trend over the last four years. However, the share of mortgages in total loans is relatively small. Moreover, the capitalisation of banks is relatively high in terms of the CET1 ratio (34.5% in Q1 2016). A capital conservation buffer of 2.5% has been in place since January 2014, and several mortgage banks have been identified as systemically important with additional buffers of 0.5%. According to sensitivity analysis performed by the CSSF, in the event of a severe RRE price shock, combined with a sharp rise in default rates, the main Luxembourg banks would have enough capital to absorb potential credit losses.

It is also worth mentioning that further measures are expected in order to enhance banks' resilience to real estate risks. On 1 July 2016 the Luxembourg Systemic Risk Committee issued an opinion and a recommendation to the CSSF stating that the average risk weights for IRB banks' retail (non-SME) exposures secured by residential property should not fall below 15%. Currently, banks using the SA are required to apply increased risk weights (75%) to high LTV mortgages.

Overall, evidence that Luxembourg's banks are well capitalised and have low direct exposures to residential real estate suggests that the policy stance for the banking stretch is both appropriate and sufficient. This is also supported by the evidence from the CSSF sensitivity analysis. The robustness of the banking sector to real estate risks will be further strengthened by the measures to increase the risk weight floors for the IRB banks.

¹²⁷ See for instance Table 2 in *A review of macro-prudential policy in the EU one year after the introduction of the CRD/CRR*, ESRB, June 2015.



Table LU.3

Additional information on instruments and data available to micro and macro supervisory authorities – Luxembourg

Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?

Luxembourg's macro and micro supervisory authorities do not have the power to impose LTV/LTI/DSTI limits. These powers are not established in Luxembourg law.

Microprudential decisions are taken via the JSTs or, for LSIs, directly by the CSSF (shared competence).

Macroprudential decisions are taken at the national level by the CSSF in close cooperation with the BCL, after having received recommendations from the Luxembourg Systemic Risk Board, and after engaging in the concertation mechanism with the ESCB Financial Stability Committee and the ESRB, where applicable.

Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?

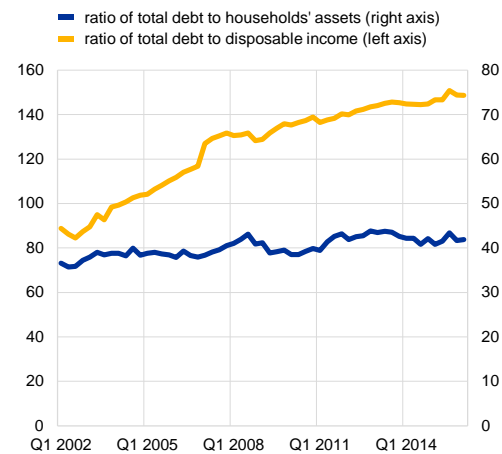
The Luxembourg authorities have at their disposal a relatively good range of data needed to assess the financial stability of the sector. However, there are some data gaps mainly in the LTV distribution and the authorities do not have information on LTI/DTI/DSTI ratios.

Annex with charts

Chart LU.1

Household indebtedness

(percentage)



Source: Banque centrale du Luxembourg.



Malta

Key points

The main vulnerabilities related to residential real estate in Malta concern the household and collateral stretches. In terms of household stretch, total debt has grown rapidly due to robust mortgage growth in recent years. The annual growth rate of mortgages started to accelerate from the beginning of 2014, and reached its peak in the second half of 2015. Over 2015 loans to households for house purchases increased by 8.5% in Malta. During the first half of 2016 mortgage growth decelerated somewhat, but has remained rapid at 6.6% on an annual basis on the back of robust economic growth in Q2 2016 (5.2% year-on-year). Aggregate debt is relatively high in relation to households' income. Total financial liabilities of households constituted approximately 70% of GDP in 2015, which is close to the euro area average. However, total financial liabilities in comparison to wages were significantly higher in Malta than in the euro area, and reached nearly 160% (the euro area average is around 140%). The latest macroeconomic forecast by the European Commission projects slowing, though still robust, growth of Malta's economy for this and next year. Thus, households' indebtedness relative to income and to GDP is expected to increase further in the medium term. The debt service-to-income ratio¹²⁸, at 13%, is relatively high in Malta compared with other EU countries, despite the prevailing low level of interest rates.

Mitigating factors include that only around 16% of Maltese households have a mortgage (relative to the EU average of 27%) and the large holdings of financial assets by Maltese households should be a buffer if risks related to residential real estate manifest themselves.¹²⁹ In addition, while the majority of mortgages are with variable rates, it is a common practice in Malta that when interest rates change, banks maintain the same annual repayment requirements but adjust the term to maturity. This means that debt servicing costs would not be expected to rise even when interest rates rise.

In terms of collateral stretch, the official transaction-based RRE price data showed 2.6% annual growth, whereas advertised prices increased by 9.9% in Q1 2016. Both price indices have passed their highest levels reached before the last financial crisis, by 1.4% and 16.7% respectively. Different RRE price valuation methods indicate that, on average, real estate prices in Malta are broadly in line with fundamentals. However, the experience of some countries shows that advertised RRE prices, which are at their all-time high level and rising rapidly in Malta, could act as a leading indicator for transaction prices. Thus, monitoring of RRE prices should continue to be a high priority for the Maltese authorities.

There are several structural and other factors that might mitigate potential RRE price declines. These include the limited amount of land available for construction and the low supply of housing. They also include a growing population, net migration and a generally high home-ownership rate (where many households do not have mortgages). However, there are also some factors that might cause misaligned incentives and/or lead to excessive housing demand. For instance, temporary tax

¹²⁸ For more details, see Drehmann, M., Illes, A., Juselius, M. and Santos, M., "**How much income is used for debt payments? A new data base for debt service ratios**", *BIS Quarterly Review*, September 2015. Note that due to comparability issues, as for the denominator, compensation of employees has been used; thus, differences may appear by using other data sources (e.g. disposable income). For example, using the Central Bank of Malta (CBM) estimates for disposable income, the DSTI ratio for the corresponding period goes down to 9.3%.

¹²⁹ Information about holdings of financial assets is from the H2, 2013 CBM Household Finance and Consumption Survey (the latest available).



advantages for first-time buyers (stamp duty relief is due to expire by the end of 2016) and the Individual Investor Programme, which seeks to incentivise people to move to and reside in Malta, may lead to excessive growth in prices and mortgages. However, the latter programme has not so far resulted in significant purchases of property.

Regarding the banking sector stretch, the banking sector in Malta is very large and concentrated, and has strong links with the real estate sector. In terms of assets, the total banking sector exceeds by five times the size of the total economy. However, when taking into account the assets of those banks that are linked with the domestic economy, the ratio of assets to GDP declines to 2.6 (core and non-core domestic banks). Mortgage loans to households, loans for construction and loans to real estate-related companies constituted 11% of total bank assets at the end of 2015 – the highest level since the start of data in 2005 – and amount to 59% of GDP. Banks and the real economy in general (in terms of value added and investment) are becoming more interlinked and are thus more exposed to risks in the real estate sector. In addition, given strong economic growth and the low level of unemployment, the NPL ratio for mortgages could be considered relatively high (3.1% in Q1 2016). However, Maltese banks are highly capitalised (CET1 ratio of 21.0% in Q1 2016), have favourable liquidity positions (market funding is low and deposits are the predominant form of funding (approx. 80%) for Maltese core domestic banks) and have comparatively high risks weights applied to real estate exposures (35-100%, with an average of approx. 39%), reflecting implemented policy measures.

The Maltese authorities have implemented both micro- and macroprudential measures to mitigate vulnerabilities regarding the banking stretch. Since 2008 they have required banks to apply higher RRE risk weights to the portion of a mortgage loan with an LTV greater than 70%. Thus, it is more expensive for banks in terms of the capital charge to issue highly leveraged mortgage loans.¹³⁰ The authorities also apply microprudential measures to ensure that banks hold sufficient reserves for the stock of non-performing exposures (a specific reserve equivalent to 2.5-5%, depending on the overdue period). The fact that the bulk of non-performing exposures in Malta are related to the construction sector indirectly acts as an incentive for banks to act prudently in this sector, hence bolstering the resilience of credit institutions further. Furthermore, the O-SII buffer and the capital conservation buffer are currently being phased in and the countercyclical capital buffer has been activated (currently set at 0%).

So far, no borrower-based macroprudential measures have been applied in Malta to directly address vulnerabilities related to household and collateral stretches. However, it is positive that there are no legal impediments that would hinder the deployment of such instruments (such as LTV or LTI limits) and thus they could be deployed rapidly if necessary. The Maltese authorities have identified that there is a lack of granular data on the distribution of household indebtedness and its evolution, and are currently undertaking a data collection exercise to improve this. These data will be important in order to make a fully comprehensive risk assessment.

Overall, the policy stance is considered to be appropriate and expected to be sufficient in Malta at the current juncture given the current level of risks from the RRE sector. While some vulnerabilities relating to the household and collateral stretches have been identified in Malta, these are mitigated by several factors and are assessed not to present systemic risks at present. The micro- and

¹³⁰ Mortgages secured by residential property are assigned a risk weight of 35% for loans not exceeding 70% of the market value of the property (rather than 80% of the market value of the property as in the CRR). For any remaining part of the loan, a risk weight of 100% is assigned, in accordance with Article 124(1) of the CRR.



macroprudential measures targeted at banking stretch are also assessed to be appropriate and expected to be sufficient, particularly given the high capitalisation of the banking system and high risks weights applied to RRE exposures. However, it is important that the Maltese authorities continue to monitor the evolution of RRE prices (particularly the potential link between advertised and transaction-based prices) and lending standards due to rapid mortgage growth, and that they ensure access to and analyse more granular data with respect to household stretch.

Table MT.1

Summary assessment – Malta

<p>Summary RRE risk assessment narrative</p>	<p>The main RRE-related vulnerabilities in Malta concern the collateral and household stretches The rapid growth of households' total debt due to robust mortgage growth, and the relatively high debt level and debt service burden in relation to households' income.</p> <p>During the first half of 2016 mortgage growth decelerated somewhat, but remained rapid at 6.6%. Total financial liabilities of households constituted approximately 70% of GDP in 2015, which is the euro area average. However, total financial liabilities in comparison to wages (compensation of employees) were significantly higher in Malta than in the euro area, and reached nearly 160% (the euro area average is around 140%). The debt service-to-income ratio is relatively high in Malta (at 13%) despite the currently prevailing low level of interest rates. However, using the Central Bank of Malta estimates for disposable income, the DSTI ratio for the corresponding period goes down to 9.3%.</p> <p>In terms of collateral stretch, the official transaction-based RRE price data showed 2.6% annual growth, whereas advertised prices rose by 9.9% in Q1 2016. Both price indices have passed their peaks reached before the last financial crisis, by 1.4% and 16.7% respectively. Different RRE price valuation methods indicate that, on average, real estate prices in Malta are broadly in line with fundamentals.</p>
<p>Policy assessment given risks</p>	<p>The policy stance is appropriate and expected to be sufficient Overall, the policy stance is considered to be appropriate and expected to be sufficient in Malta at present given the current level of risks from the RRE sector.</p> <p>While some vulnerabilities relating to the household and collateral stretches have been identified in Malta, these are mitigated by several factors and are assessed not to present systemic risks at present. There are no impediments in national law hindering a rapid deployment of borrower-based measures should vulnerabilities increase.</p> <p>A number of micro- and macroprudential measures have been taken to address direct risks to the banking sector stemming from RRE vulnerabilities. These are assessed as appropriate and expected to be sufficient, particularly given the high capitalisation of the banking system and high risks weights applied to RRE exposures.</p> <p>It is important that the Maltese authorities continue to monitor the evolution of RRE prices and lending standards due to rapid mortgage growth, and that they ensure access to and analyse more granular data with respect to household stretch.</p>



Table MT.2

Summary of risks and policy measures – Malta

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Rapidly increasing aggregate level of household indebtedness, which has, however, been slower than the increase in households' assets. Total financial liabilities in comparison to wages (compensation of employees) are significantly higher in Malta than in the euro area, and reached nearly 160% in 2015 (the euro area average is around 140%). Mortgage growth is among the most rapid in Europe, on the back of robust economic growth. Debt service ratio is relatively high historically.	The official transaction-based RRE price data showed 2.6% annual growth, whereas advertised prices rose by 9.9% in Q1 2016. Both price indices have passed their peaks reached before the last financial crisis, by 1.4% and 16.7% respectively. Different RRE price valuation methods indicate that, on average, real estate prices in Malta are broadly in line with fundamentals. However, average LTV ratios are moderate so there is a buffer against RRE price falls.	The banking sector in Malta is very large ¹³¹ compared with the size of the economy and is very concentrated, but also highly capitalised. Mortgage loans to households, loans for construction and loans to real estate-related companies constituted 11% of total bank assets at the end of 2015 – the highest level since the start of data in 2005 – and amount to 59% of GDP. Banks and the real economy in general (in terms of value added and investment) are becoming more interlinked and thus more exposed to risks in the real estate sector. However, banks apply comparatively high risks weights to real estate exposures (35-100%). The share of non-performing loans in the household sector is relatively high (but declining) despite recent robust economic growth (5.2% year-on-year growth in Q2 2016).
Summary of policy measures (implemented, planned, under consideration)	No measures in place or under consideration	No measures in place or under consideration	Risk weights depend on the LTV: 35% RW if the LTV <70% and 100% RW for the remaining part of the loan with the LTV >70% (slightly more stringent than the CRR standardised approach rules) Pillar 2: reserves for general risks due to heightened level of NPLs CCoB: 0.625% (rising to 2.5% by 2019) O-SII buffer: 0.125-0.5% (rising to 0.5-2.0% by 2019) CCyB: 0%
Assessment of policy measures	Appropriate and expected to be sufficient given that identified vulnerabilities are mitigated by several factors and, therefore, are assessed not to be material currently	Appropriate and expected to be sufficient given that there are no clear signs of overvaluation, excessive RRE price dynamics (based on the official price index) or weakening lending standards at present	Appropriate and expected to be sufficient

Household stretch

In Malta, vulnerabilities in the household stretch relate to the rapid growth of households' total debt due to rapid mortgage growth, and the generally relatively high debt level and debt service burden relative to households' income. However, only around 16% of households had mortgages, which is significantly less than the EU average (27%). In addition, aggregate information and the somewhat outdated household survey data confirm that the large holdings of financial assets by Maltese households can act as an effective buffer against the materialisation of RRE risks.

In 2015 total financial liabilities (of which more than 80% are loans) grew by 5.3%, which is relatively high in comparison to other EU countries. This was mainly driven by the growth of loans for house purchases provided by banks. In fact, loans to households for house purchases

¹³¹ For core and non-core domestic banks (with links only to the domestic economy), the ratio of assets to GDP is 2.6.



increased by 8.5% over 2015, on the back of robust economic growth. The annual growth rate of mortgages started to accelerate from the beginning of 2014, and reached its peak in the second half of 2015. During the first half of 2016 mortgage growth decelerated somewhat, but remained rapid at a 6.6% annual growth rate.

Total financial liabilities of households constituted approximately 70% of GDP in 2015, which is the euro area average. However, total financial liabilities in comparison to wages (compensation of employees) were significantly higher in Malta than in the euro area, and reached nearly 160% (the euro area average is around 140%). The latest macroeconomic forecast by the European Commission projects slowing growth of Malta's economy for this and next year (though still remaining robust); thus, households' indebtedness relative to income and to GDP is expected to increase further.

The debt service-to-income ratio is relatively high in Malta, at 13%, despite the currently prevailing low level of interest rates and the fact that the majority of mortgages are variable rate mortgages.¹³² However, according to the Maltese authorities, banks in Malta are keeping monthly mortgage payments constant by shortening loan maturities to compensate for the decrease in interest rate payments due to the low interest rate environment. The increase in the amortisation rate should positively contribute to the mitigation of vulnerabilities. Based on survey information, the weighted average maturity for new residential loans is around 26 years, while the weighted average maturity for first-time buyers is almost 31 years. The maturities are quite close to the EU averages.

At the aggregate level, the relatively large holdings of financial assets mitigate vulnerabilities related to households' indebtedness in Malta. Overall, households have nearly four times more financial assets than liabilities and, since 2009, financial assets have grown more rapidly than liabilities. Usually, the majority of households' financial assets are made up of equity, but in Malta almost half of such assets are in currencies and deposits, i.e. they are highly liquid. In fact, households' holdings in bank accounts exceeded the loan stock for house purchase at the end of 2015 by almost 50%. Furthermore, the share of household debt in financial assets has been decreasing and is below the EU figures. This suggests that, on aggregate, households are well prepared for possible shocks.

However, one needs to analyse micro-level data to better understand potential vulnerabilities facing households with mortgages. According to a 2013 household survey¹³³, almost 80% of Maltese households were owner-occupiers of their homes, with the median value of their main residence estimated at around €187,000. Furthermore, the median value of households' financial asset holdings was estimated at around €26,000. One-third of all households had some type of debt liability averaging around €36,000. According to the survey, household debt represents only 3% of the total gross wealth of households. However, from these and other results it is not clear whether mortgage holders have a financial buffer to cover at least part of their debt if economic performance were to deteriorate.

¹³² This ratio of 13% is a macro-level aggregated figure based on BIS statistics. Using the Central Bank of Malta estimates for disposable income, the DSTI ratio goes down to 9.3%. Recent preliminary survey results for Malta show that the DSTI ratio at loan origination for those households that actually have debt stood at 24.6%.

¹³³ "Household Finance and Consumption Survey in Malta", *Quarterly Review*, 2013:2, Central Bank of Malta.



As the results of the ECB household survey¹³⁴ suggest, only around 16% of households had mortgages, which is significantly less than the euro area average of around 23%. Eurostat's SILC survey provides slightly different shares (20% and 28% respectively; 27% for the EU), but the tendency is the same. The median ratio of household debt to gross household income was 52%. When this ratio is calculated solely for those households with mortgage debt as their debt liability, the ratio increases to 151%. However, two-thirds of their debt is covered by financial assets. In fact, Maltese households with mortgages would be able to cover their monthly payments from their holdings of financial assets for more than six years. Given that this information is already some years old, it would be important to be able to make the assessment of vulnerabilities related to household stretch using more up-to-date information. The Maltese authorities are currently collecting this information and it should be available around October/November 2016.

No borrower-based macroprudential measures have been implemented to address household stretch in Malta yet. However, only about 16% of Maltese households have mortgages and the aggregate information and the somewhat dated household survey data confirm the relatively large holdings of financial assets by Maltese households, which can act as an effective buffer against the materialisation of RRE risks. Given these mitigating factors, the RRE-related risks in the household stretch are assessed to be low at the moment¹³⁵ and, therefore, the policy stance of no borrower-based macroprudential measures is assessed as expected to be sufficient. However, given that the available household-level information is already some years old, it would be important to be able to make the assessment of vulnerabilities related to household stretch using more up-to-date information, particularly given the rapid mortgage credit growth and dynamics in RRE prices (particularly in the advertisement-based price index).

Collateral stretch

Residential real estate prices in Malta are increasing. Depending on the price series used, in Q1 2016 they picked up by between 2.6% and 9.9% in terms of annual growth rates, based on the Eurostat RRE price index and the Central Bank of Malta's asking price-based index, respectively. The trend in RRE price growth has accelerated since mid-2013, and the current price levels are at all-time high levels. The transaction-based RRE price index has passed the peak reached before the financial crisis by 1.4%, and the advertisement-based price index has exceeded its peak before the financial crisis by 16.7%.¹³⁶ The official assessment of RRE prices is based on transaction prices. However, experience of some countries shows that advertised prices could act as a leading indicator for transaction prices. Thus, the monitoring of RRE prices should be a high priority for the Maltese authorities.

¹³⁴ "The Eurosystem Household Finance and Consumption Survey: results from the first wave", *Statistical Paper Series*, No 2, ECB, April 2013. According to our knowledge, the survey data was collected in 2010-11.

¹³⁵ It should be noted that given a high home-ownership rate, a shock to residential real estate prices could lead to significant wealth effects and negative consumption developments.

¹³⁶ The housing price (HP) index that has been used by the Central Bank of Malta, as well as many international organisations (BIS, IMF) in their analysis of Malta, has been the HP index based on the advertised residential property price index. This differs from the property price index collected and published by Malta's National Statistical Office which is based on actual transactions covering many different housing forms (Eurostat definitions). According to the actual transaction-based HP index, RRE price growth has been more moderate compared with the advertised price-based HP index. In the Central Bank of Malta's Annual Report, the year-on-year growth in the advertised price index was 5% on average, and 3.9% for the actual transaction-based HP index (for the first three quarters of 2015). In its analysis, the ECB's DG/MF used both HP indices and found the same results for the riskiness of Malta's RRE market (medium risk).



Different RRE price valuation methods indicate that, on average, real estate prices in Malta are broadly in line with fundamentals. Changes of real estate prices in relation to household income have stayed stable since 2012 (in the previous years, RRE price growth was more rapid than income growth, suggesting some overvaluation). The dispersion among different valuation methods has widened recently and indicates both under- and overvaluation signals, which illustrates the uncertainty regarding valuations in the RRE sector. Were economic and income growth to slow down in Malta, this would be expected to be reflected in RRE price valuations. The latest macroeconomic forecast by the European Commission projects slowing, though still robust, growth of Malta's economy for this and next year.

Changes in RRE price valuations may have an impact on the economy. Value added by construction and real estate activities in Malta is lower than before the crisis. However, in 2015, its share increased somewhat to nearly 9% of GDP, which is relatively high at the European level. Investments in dwellings have increased in the past two years and the number of building permits granted resumed its rise. In 2014 the number of housing transactions was at the highest level in the last eight years. Thus, the importance and activity of the real estate market in Malta is increasing, which warrants its close monitoring.

As mentioned for the household stretch, mortgage credit growth in Malta is among the strongest in Europe. In Q2 2016 it decelerated slightly, but remained at the rather elevated level of 6.6% per year. The changes in RRE prices and in mortgages have recently become more interlinked: the statistical correlation between movements in the housing price index and the mortgage credit stock is strong in Malta; growth in the mortgage credit stock by one indexed point is associated with RRE price growth by 0.2 indexed point. In such a context, the high growth rate of mortgages may push real estate prices up in an unsustainable way.

There are several demand-side factors affecting the Maltese RRE market and RRE price growth. The population is growing quickly, immigration has exceeded emigration, the employment participation rate is increasing, and the unemployment rate is declining. In May 2016 the unemployment rate in Malta was 4.1%, which is one of the lowest in Europe and is expected to decrease further. Given relatively stable earnings in the last couple of years, the purchasing power of households has increased. Taking into account the low interest rate environment, it is not surprising to observe growth of investment in comparatively profitable real estate. Other relevant factors are the temporary fiscal incentives for first-time buyers and the Individual Investor Programme (IIP) designed to attract applicants to Malta's shores.¹³⁷ However, the amount of the programme is small: out of 143 applicants, only 27 persons have actually purchased a property in Malta, with the remaining 116 renting properties.

There are also some important supply-side factors, such as the limited amount of available construction land and the limited supply of housing, which can have an impact on the RRE market and prices. House construction volume growth has been slower than that in general economic activity. Moreover, dealing with construction permits in Malta is slightly more difficult than on average in other OECD countries based on World Bank Doing Business data. However, as the Maltese authorities point out, height restrictions in highly urbanised areas have been relaxed

¹³⁷ The IIP is the first citizenship programme in the European Union to be recognised by the European Commission. Applicants are subject to a thorough due diligence process, which guarantees that only reputable applicants acquire Maltese citizenship.



recently, which is expected to alleviate some supply constraints. Over the last five years, construction prices have increased by almost 10%.

For individual borrowers, the LTV ratio for mortgage loans is higher than the EU average of approx. 70%; the average LTV ratio for new loans to first-time homebuyers is around 77% and around 74% for non-first-time buyers. While LTV ratios are currently not far above average in Malta, there is a risk that lending standards could deteriorate in the future if the trend of rapid credit growth continues.

So far, no macroprudential measures have been taken to tackle the vulnerabilities in the collateral stretch. The official transaction-based RRE price data showed 2.6% annual growth in Q1 2016, while the price index has passed the peak reached before the financial crisis by 1.4%. Regarding the RRE price valuations, the dispersion among different valuation methods has widened recently, pointing to both under- and overvaluation, which illustrates the uncertainty regarding valuations in the RRE sector. However, mortgage credit growth in Malta is among the strongest in Europe (in Q2 2016 it was 6.6% per year).

Given the moderate RRE price developments in the official transaction-based RRE price index and no clear signs of overvaluation of RRE prices, the policy stance of no macroprudential policies is assessed as expected to be sufficient. However, experience of some countries shows that advertised prices, which increased by 9.9% in Q1 2016 and are at their all-time high level, could act as a leading indicator for transaction prices. Thus, the monitoring of RRE prices should be a high priority for the Maltese authorities.

Banking stretch

The banking sector in Malta is assessed to be resilient to RRE vulnerabilities¹³⁸, given the high risk weights applied to RRE exposures and the overall high solvency and liquidity ratios. However, its biggest vulnerabilities relate to the large size of the banking sector relative to the economy and banks' increasing exposures to the real estate and construction sectors.

Overall, the Maltese banking sector is well capitalised, and all solvency and liquidity ratios are well above the minimum requirements. Banks' CET1 capital ratio in Q1 2016 stood at 21%, which was relatively high in the European context but rather low from a Maltese historical perspective. Moreover, the risk weights on RRE exposures are very high in an international context as all banks use the standardised approach. Average risk weights on RRE exposures are around 39% for the moment. The funding structure of banks in Malta suggests that the banking sector's dependency on market funding is low: the loan-to-deposit ratio is 50% in consolidated terms. Deposits are the predominant form of funding (approx. 80%) for Maltese banks.

The banking sector in Malta is very large and concentrated and has become more interlinked with the real estate sector. In terms of assets, the banking sector exceeds the total economy by five times.¹³⁹ Mortgage loans to Maltese households, loans for construction and loans to real estate-related companies as a share of banks' total assets at the end of 2015 stood at 11.0%, which is the peak level over an 11-year period. However, in relation to GDP, real estate-related loans stood at 58.9% at the end of 2015 and were on a decelerating trend. However, the exposures of core

¹³⁸ According to the IMF (2016), **Maltese banks are well capitalised, profitable and liquid.**

¹³⁹ For core and non-core domestic banks (with links only to the domestic economy), the ratio of assets to GDP is 2.6.



domestic banks to mortgage loans are 19% of total assets and their exposures to the real estate sector are 25% of total assets.

The amount of non-performing loans (NPLs) has picked up compared with the situation at the end of 2013, although in the course of 2015 and 2016 NPLs decreased slightly. The share of banks' non-performing debt instruments in the total corresponding stock was 5.4% at the end of 2015. According to the Maltese authorities¹⁴⁰, this is mainly due to the legacy of the past crisis and is limited to sectors like construction. Banks in Malta have made larger loan loss provisions than in previous years, approaching 50% of NPLs. The low level of interest rates and high employment are supporting the repayment of loans. However, the share of non-performing mortgage loans was 3.1% of the mortgage stock in Q1 2016, down from 3.4% in December 2015.

The results of stress tests performed by the Central Bank of Malta indicate that the Maltese banking sector can withstand extreme yet plausible shocks under a number of scenarios. The loss-absorbing buffers in the banking system are sufficiently large to withstand a drop in collateral values of at least 30%. Combined with an increase in the level of non-performing loans of up to 10%, banks would remain sufficiently capitalised, with their CET1 ratios remaining above the regulatory minima given their high levels of loan loss provisions. Moreover, the published results of the ECB 2014 comprehensive assessment reveal that the participating Maltese banks could withstand even the more severe scenario with their CET1 ratios ending at levels significantly above the 5.5% stipulated threshold.

Regarding macroprudential measures, the O-SII buffer is in place (0.125-0.5% and after the transition period 0.5-2.0% in 2019). Pillar 2 measures for general banking risk are in use by all banks to mitigate risks arising from the heightened level of NPLs. The capital conservation buffer is 0.625% at present (2.5% in 2019) and the countercyclical capital buffer is 0% at present. In 2008 the Maltese authorities introduced an LTV measure, as a combination of preferential risk weights and more stringent LTVs. The measure requires that mortgages on residential property attract a risk weight of 35% on the part of the loan that does not exceed 70% of the market value of the property and the rest of the loan is assigned a risk weight of 100%.

Overall, Maltese banks are highly capitalised (CET1 ratio of 21% in Q1 2016) and have high risk weights on real estate exposures (35-100%). Moreover, the Maltese authorities have activated the O-SII and the capital conservation buffers and have taken Pillar 2 measures. At the same time, the banks' direct exposures to mortgages are low at 7.6%. However, banks' overall exposure to real estate-related activities (construction, related companies) has risen significantly and the banking sector is becoming more interlinked with the real economy. Moreover, the share of non-performing mortgage loans was 3.1% of the mortgage stock in Q1 2016, which is relatively high given the robust economic developments. Thus, taken together, given the level of RRE-related risks, the micro- and macroprudential measures taken regarding banking stretch are expected to be sufficient.

¹⁴⁰ IMF (2016), as above fn. 138.



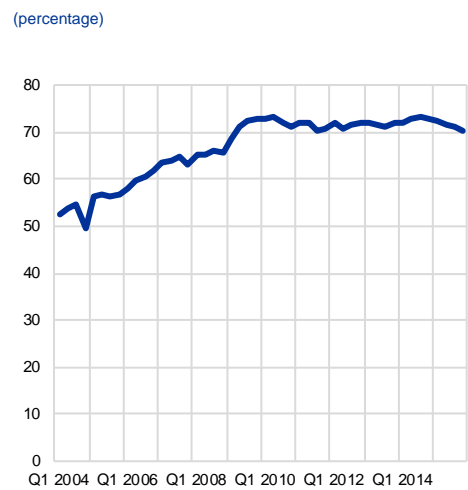
Table MT.3

Additional information on instruments and data available to micro and macro supervisory authorities – Malta

<p>Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?</p>	<p>There are no legal impediments in national law to prevent a rapid deployment of borrower-based macroprudential measures should the authorities want to deploy them.</p>
<p>Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?</p>	<p>The authorities are currently undertaking a granular data collection exercise in order to get better micro-level data on the distribution of household debt and to inform future policymaking.</p>

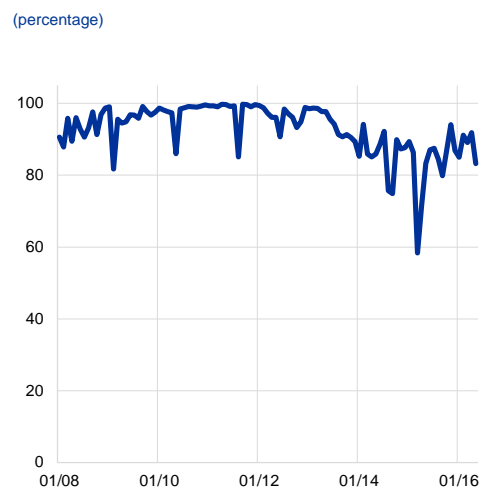
Annex with charts¹⁴¹

**Chart MT.1
Household financial liabilities-to-GDP ratio**



Sources: Eurostat and ESRB calculations.

**Chart MT.2
Share of variable rate loans in total new loans to the private sector**



Source: ECB.

¹⁴¹ All data in these charts are from publicly available sources.



Chart MT.3
Price-to-income ratio



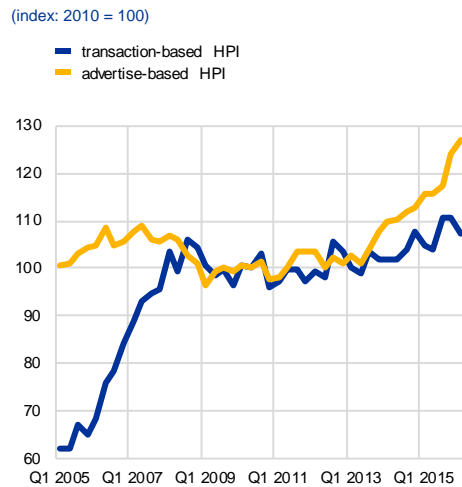
Sources: Eurostat.

Chart MT.4
Households' total financial assets-to-total liabilities ratio



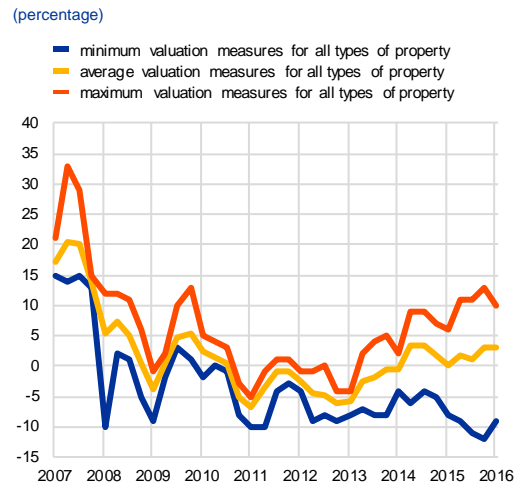
Sources: Eurostat and ESRB calculations.

Chart MT.5
House price indices



Sources: Eurostat and BIS.

Chart MT.6
Valuation of residential real estate prices

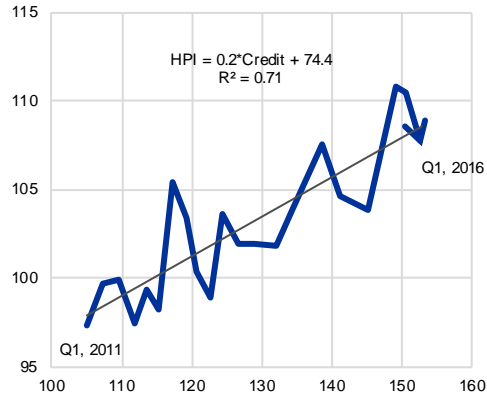


Source: ECB.



Chart MT.7
House price indices and credit for house purchase

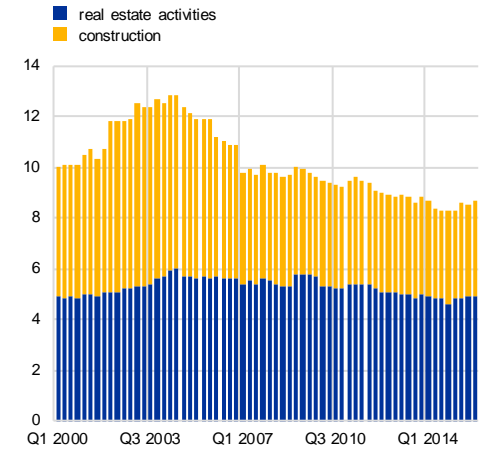
(x-axis: Credit, index: 2010 = 100; y-axis: HPI, index: 2010 = 100)



Sources: Eurostat, ECB and ESRB calculations.

Chart MT.8
Value added of real estate-related activities in comparison to GDP

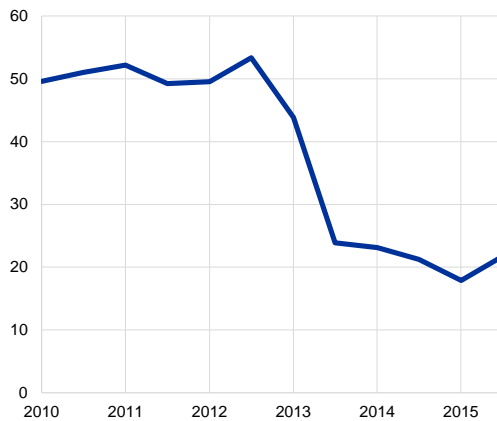
(percentage)



Source: Eurostat.

Chart MT.9
Banks' Tier 1 ratio

(percentage)



Source: ECB.

Chart MT.10
Mortgage loans-to-total bank assets ratio

(percentage)



Sources: ECB and ESRB calculations.



Chart MT.11
Banks' gross non-performing debt instruments

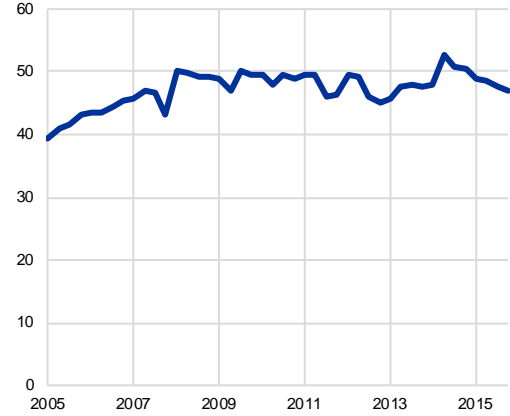
(percentage share of total gross debt instruments)



Source: ECB.

Chart MT.12
Share of mortgages and loans to construction and real estate companies in banks' total loan portfolio

(%)



Sources: ECB and ESRB calculations.



The Netherlands

Key points

The main vulnerability related to residential real estate in the Netherlands is the persistently high household debt levels combined with low mortgage collateralisation. In particular, there is a large group of households, especially younger mortgagors, which have debt levels that exceed the value of their home. While the aggregate household debt-to-income ratio has fallen somewhat over the past years, it is still high at 231% in Q1 2016 compared with most other EU and developed countries. The same goes for the household debt-to-GDP ratio, which is high at 111% in Q1 2016.¹⁴²

Regarding credit developments, total mortgage lending to households grew annually by 1.1% in Q1 2016 (including banks and all other institutions granting mortgage loans).¹⁴³ However, loans for house purchases provided by monetary financial institutions (MFIs) increased annually by 4.0% in June 2016.

Risks related to the collateral stretch are also elevated. The loan-to-value ratios, at 94% for new loans and 68% for the stock of loans, are among the highest in the EU. Approximately 25% of all mortgage holders and 50% of mortgagors under 40 years old have total debt relative to the value of the home above 100%. Due to low amortisation rates for pre-2013 mortgage debt and since new mortgage loans tend to be high in relation to the value of the purchased property, the vulnerabilities related to the high debt level and high LTV ratios are likely to persist. For new mortgage loans, however, the amortisation rates are higher, because only interest on amortising mortgages may be deducted for tax purposes, which acts as an incentive for households to amortise their loans.

RRE prices had grown by 4.4% annually in Q2 2016, and they are approaching their pre-crisis peaks in the major cities, but not in the country as a whole. A mitigating factor is that RRE prices, according to ECB estimates, do not appear to be overvalued.¹⁴⁴ Another mitigating factor is the strong recourse facilities for lenders, and strict personal bankruptcy rules may limit the direct credit risk for banks. However, high household indebtedness may lead to considerable indirect negative effects on macroeconomic and financial stability in the event of an adverse scenario such as higher unemployment, a rise in interest rates or a fall in RRE prices.

In order to address these risks, the Dutch authorities are gradually tightening the limits on the DSTI and LTV ratios for new lending and reducing the tax deductibility of mortgage interest. The DSTI limit has declined over the past years, due to slow growth in households' disposable income. In addition, new interest-only mortgages are not tax deductible, which incentivises households to amortise their loans. Stress tests of banks also indicate that they have sufficient capital in the adverse scenarios related to real estate developments.

While the policy measures taken for the Netherlands are appropriate given the nature of RRE vulnerabilities, they may not be sufficient to fully address them as most measures are only being gradually phased in and their calibration will not be very constraining even after full implementation.

¹⁴² The ratio of mortgage debt to GDP is 94.2%.

¹⁴³ Total mortgage lending started to grow in 2015, after a slight abatement in 2013-14. When corrected for securitisation operations, the growth rate of mortgage credit provided by MFIs was negative also in the first quarter of 2016.

¹⁴⁴ Overvaluation was assessed in the horizontal analysis, i.e. methods used by the ECB and the ESRB. Additionally, results of real estate price valuations could be found in the ECB Statistical Data Warehouse (RRE prices and RRE price valuation indicators).



The vulnerabilities that might not be fully addressed are related to the household and collateral stretches, while vulnerabilities related to the banking sector seem limited and the measures taken are assessed as appropriate and sufficient.

Table NL.1
Summary assessment – The Netherlands

<p>Summary RRE risk assessment narrative</p>	<p>Key risks are related to the collateral and household stretches The main vulnerabilities are considered to be the persistently high household debt levels combined with low mortgage collateralisation. In particular, there is a large group of households, especially younger mortgagors, which have debt levels that exceed the value of their home.</p> <p>Household debt levels are very high both in comparison with income (the DTI ratio is 231%), GDP (111%) and house values (the LTV ratio is 94% for new loans and 68% for the stock), despite risk indicators having improved in recent years.</p> <p>Total mortgage lending to households by banks and all other institutions granting mortgage loans has been muted at 1.1%, whereas growth in lending to households by MFIs has been higher at 4% over the last year.</p> <p>A quarter of homeowners and around 50% of first-time buyers have total debt in excess of the value of their property.</p> <p>RRE prices in the cities are approaching peak levels and overall RRE prices in mid-2016 increased by 4.4% annually.</p>
<p>Policy assessment given risks</p>	<p>The policy stance is not expected to be sufficient for the collateral and household stretches Measures are only being gradually tightened at a slow pace over a long time horizon.</p> <p>Even after full implementation, the LTV limit (100% in 2018) and tax deductibility will still be high.</p> <p>While the policy measures taken for the Netherlands are appropriate given the nature of RRE vulnerabilities, they may not be sufficient to fully address them as most measures are only being gradually phased in and their calibration will not be very constraining even after full implementation.</p>

Table NL.2
Summary of risks and policy measures – The Netherlands

	HOUSEHOLD STRETCH	COLLATERAL STRETCH	BANKING STRETCH
<p>Summary risk assessment/main risks</p>	<p>The main vulnerability is related to high household indebtedness, as the debt-to-income ratio is one of the highest in the EU. The high debt level is partly due to the tax system. The relatively low amortisation rates make the high indebtedness persistent. Adverse shocks to households could lead to lower consumption, which could harm macroeconomic and financial stability.</p>	<p>Elevated vulnerability related to the collateral stretch, as mortgage portfolios are large and loan-to-value ratios are high (in particular for certain households). Underwater households are expected to be a persistent problem. RRE prices in the cities are close to peak levels after relatively fast increases.</p>	<p>The vulnerability due to banking stretch is lower than for the other two stretches. However, leverage of Dutch banks is high and the banks rely on market funding. A drying-up of market funding could trigger risk materialisation. In addition, almost half of new loans are currently provided by non-banks, which could increase risks to financial stability.</p>
<p>Summary of policy measures (implemented, planned, under consideration)</p>	<p>DSTI/LTI limits since 2012, being gradually tightened (limits depend on income and interest rates).</p> <p>Tax deductibility eligibility: new mortgages must take an annuity or linear form in order for interest to be tax deductible from 2013.</p> <p>From 2014 the maximum tax deduction rate will be gradually reduced over 28 years.</p>	<p>Gradual lowering of the LTV limit for new mortgages from 106% in 2012 to 100% in 2018 (currently 102%).</p> <p>The Dutch Financial Stability Committee has recommended to continue the gradual reduction beyond 2018 to an LTV limit of 90%.</p>	<p>The systemic risk buffer at 3% and the O-SII buffer between 1 and 2% will be phased in between 2016 and 2019. For each bank, the higher of the two will apply.</p> <p>The countercyclical capital buffer has been 0% since 2016.</p> <p>Macroprudential tools for loans (LTV limits, etc.) apply to banks and non-banks.</p>
<p>Assessment of policy measures</p>	<p>Appropriate but not expected to be sufficient</p>	<p>Appropriate but not expected to be sufficient</p>	<p>Appropriate and sufficient</p>

Household stretch

The main RRE vulnerability in the Netherlands is related to high household indebtedness. While the aggregate household debt-to-income ratio has fallen somewhat over the past years, it is still high at 231% compared with most other EU and developed countries. The same goes for the household



debt-to-GDP ratio, which is high at 111%.¹⁴⁵ In recent years, the growth in total mortgage lending (including banks and all other institutions granting housing loans in the Netherlands) to households has been relatively muted at 1.1% in Q1 2016. When corrected for securitisation operations, the growth rate was even negative in Q1 2016. However, loans for house purchases provided by other MFIs were growing by 4.0% annually in June 2016.

The average maturity of mortgages is long (about 30 years) and interest-only loans are still common, which implies that the vulnerabilities are not likely to decrease quickly. However, there are factors (e.g. a generous tax subsidy for homeowners and strong recourse facilities for lenders) that reduce the risk of households defaulting on their debt. The main risk is that high household indebtedness may lead to negative effects for the real economy, with potential negative spillover effects on the financial sector.

The authorities have introduced measures for both new mortgages and the stock of mortgages that can mitigate risks associated with the household stretch. For new mortgages, the debt service-to-income (DSTI) limits have been gradually tightened, and from 2013 new mortgages must take an annuity or linear form in order for interest to be tax deductible. From 2014 onwards, the maximum tax-deduction rate will be gradually reduced over 28 years. This will affect the stock of mortgages, but the tax deduction will still be generous. Furthermore, new mortgages must be amortising in order for the interest payments to be tax deductible.

Some improvements in the risk characteristics of new mortgages are already visible, for example almost all new mortgages are now amortised. However, for the stock of loans, 21% are fully amortising, 45% are partly amortising and 34% are not amortising at all, hence the households' debt level is likely to be persistent for a long period of time. This is also because the measure directly affecting the stock of loans, i.e. the reduction of the maximum tax deduction, will still be generous after a long period of tightening. Moreover, in 2015 60.1% of households had bought a house with a mortgage loan, which was one of the highest ratios in the EU (only Sweden has a slightly higher ratio). The very high debt level in the Netherlands is partly explained by this very high home-ownership ratio. This ratio has been increasing gradually for years, resulting in an increase in households' exposure to risks related to the real estate market.

While the measures taken for the household stretch are appropriate, they may not be sufficient to fully address the identified vulnerabilities as they are only being gradually phased in and their calibration will not be very constraining even after full implementation.

Collateral stretch

Risks related to the collateral stretch are also elevated. The loan-to-value ratios are among the highest in the EU, both for the stock and for new mortgages (at 68% and 94% respectively). Furthermore, approximately 25% of all mortgagors and 50% of mortgagors under 40 years old have LTV ratios above 100%. As stated in the 2013 Eurosystem Household Finance and Consumption Survey (the most recent data), every tenth mortgage holder in the Netherlands has negative wealth – i.e. their debt is greater than their real and financial assets. Due to low amortisation rates, the risks associated with high LTV ratios are likely to be persistent. If RRE prices were to fall again, the LTV ratios would increase, which could lead to reduced private consumption affecting

¹⁴⁵ The ratio of mortgage debt to GDP is 94.2%.



macroeconomic and financial stability. However, a mitigating factor is that RRE prices appear not to be overvalued according to the ECB model; likewise the PTI ratio appears muted at 85% (it was 100% in 2010). However, RRE prices were increasing by 4.4% annually in Q2 2016 and they are closing the gap to the peak levels. However, this development is more pronounced in the major cities than in the rest of the country. The authorities are gradually tightening the LTV limit, which mitigates risks related to collateral stretch. By building up buffers upfront, an LTV limit will work as a cushion before losses reach banks' balance sheets or before private consumption is scaled back. A lower initial LTV will also reduce the risk of a household becoming underwater if RRE prices fall.

The LTV limit is thus deemed to be the appropriate instrument to deal with risks related to collateral stretch. However, the measure only affects new mortgages and the limit will still be high (100% in 2018) compared with other countries. There are no other measures in place for the collateral stretch, and the policy stance is not expected to be sufficient in addressing the vulnerabilities in the collateral stretch.

Banking stretch

Vulnerabilities related to the banking stretch are assessed to be more contained than for the two other stretches. Risk weights for mortgage loans are close to the EU average, while the banks' RRE exposures (mortgage loans to households, loans to construction companies and loans to real estate companies) at the end of 2015 constituted 44% of total exposures. The ratio is close to the historical average, but is above the euro area level of 38%.

Strong recourse facilities for lenders and strict personal bankruptcy rules may limit risks of direct losses on mortgages for banks. However, the risks of indirect losses may be high, if households cut consumption in order to service their high debt.

Moreover, stress tests indicate that the Dutch banks have sufficient capital in the event of strongly adverse developments. The authorities have also addressed risks in the banking sector by increasing capital buffers for the biggest banks during the period 2016-19, which should increase the resilience of the banking sector further.

Regarding the capitalisation of the Dutch banking system, the CET1 ratio started to increase slightly from mid-2015 and in Q1 2016 stood at 14.6% and was above the EU average of 13.9%. The share of non-performing debt was 2.4% at the end of 2015 and was significantly lower than in the EU (4.7%) or the euro area (5.6%). The Dutch banking sector's reliance on market funding is among the highest in the EU (in H1 2015 38% of funding came from market funding compared with a weighted EU average of 12%), which makes it vulnerable to market shocks. Moreover, liquid assets¹⁴⁶ as a share of short-term liabilities amounted to 22% in H1 2015 which was lower than the EU average of 40%.

Even though the risks in the banks may be limited, there could be increasing risks related to RRE in the non-banking sector. Currently, around half of all new mortgages are provided by non-banks (e.g. insurance companies). Selected macroprudential measures taken for loans (such as LTV

¹⁴⁶ Liquid assets are defined as the sum of cash, holdings of MMF shares/units, holdings of debt securities with a maturity below one year from euro area and domestic MFIs and the private sector, holdings of debt securities (total maturity) from euro area and domestic general government, holdings of debt securities with a maturity below one year from the rest of the world (all sectors) and inter-MFI loans (total maturity). This definition is used in the ECB report on "Analysis of the national banking systems".



limits) also apply to loans provided by the non-banking sector. However, there is limited information and analyses of the impact on financial stability of increased lending from the non-banking sector are scarce.

Overall, the risks related to the banking sector seem limited and the measures are assessed as appropriate and sufficient.

Table NL.3

Additional information on instruments and data available to micro and macro supervisory authorities – The Netherlands

<p>Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?</p>	<p>In the Netherlands, the Financial Stability Committee is the appointed macroprudential authority. The committee identifies risks to financial stability and makes recommendations with respect to these risks. Members of the committee are representatives of De Nederlandsche Bank (DNB), the Authority for the Financial Markets (AFM) and the Ministry of Finance. The Financial Stability Committee has no power to implement measures.</p> <p>Measures are taken by DNB and the government, and many measures could be implemented effectively and at short notice if required. DNB has the authority to set capital requirements for banks, like the countercyclical capital buffer and other buffer requirements. LTV and DSTI/LTI limits are set by the government in the Netherlands. The numerical value of the LTV limit is set by a ministerial decree, which can be implemented at very short notice.</p>
<p>Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?</p>	<p>No data issues that make the implementation of certain measures or the monitoring of risks difficult have been observed. However, the increasing mortgage lending by non-banks may become an issue if it is harder to monitor and collect data from these institutions.</p> <p>The effects of the measures taken have not been analysed and evaluated. However, this is assumed to be due to the short period in which the measures have been in effect, rather than a lack of data.</p>



Slovakia

Key points

The main vulnerability in the Slovakian housing market is related to the household stretch, in particular rapid credit growth leading to increasing indebtedness of Slovakian households. Since 2011 there has been double-digit mortgage credit growth, which has accelerated since 2012 and in June 2016 stood at 14% year-on-year. In 2004 credit for house purchases represented 8% of GDP, which has increased to 25.6% of GDP in March 2016. This has been coupled with a strong increase in household leverage (households' total debt over financial assets), which is now 45% compared with an EU average of 19%. By contrast, the debt-to-income ratio of Slovakian households seems relatively low (at 46.7% in Q1 2016) compared with the EU average (of 108%). However, the fast growth in household indebtedness, which is in part related to financial deepening in Slovakia, has the potential to lead to a situation of excessive household indebtedness. Should households become highly indebted, this could in turn lead to risks to the real economy related to vulnerabilities in the RRE sector, and could thereby expose banks to possible direct and indirect losses.

There are some additional factors that could amplify vulnerabilities related to household stretch. First, around 20% of new loans are "top-up" loans, where borrowers – due to the low interest rate – are able to increase the level of debt without increasing their debt servicing costs. Second, a high share of mortgages is sensitive to interest rate changes, since around 83% of new loans had an interest rate fixation period of between one and five years only. The strong economic outlook for the Slovakian economy should mitigate these vulnerabilities to some extent.

Concerning the collateral stretch, following rapid credit developments, RRE price growth has picked up since early 2015, following an earlier boom/bust cycle. However, RRE prices remain below their peak (prices of flats are approximately 20% below their peak value of 2007). A few years ago a loosening of lending standards had been observed, but they have been tightened following recommendations by Národná banka Slovenska (National Bank of Slovakia – NBS) in October 2014. For example, the share of new loans with high LTV ratios is decreasing (see Chart SK.3).

Regarding the banking stretch, some RRE-related vulnerabilities have been identified. First, a significant portion (45%) of Slovakian banks' total loans are mortgage exposures (the euro area average is 30%). Thus, if vulnerabilities were to crystallise in the RRE market (for example, an interest rate rise that increases households' debt service burden), this could potentially lead to significant credit losses for the banks. Second, given already high and rising mortgage exposures of banks, a potential cause for concern is that banks are compensating for lower mortgage interest rate margins by increasing their mortgage volumes. This development requires close monitoring despite the evidence that lending standards are now tightening.

As already mentioned, the Slovakian authorities implemented policy measures in October 2014 in response to an observed loosening of lending standards. In particular, they made a recommendation to ensure minimum lending standards including: limits on DSTI ratios, limits on LTV ratios, maturity limits and amortisation rules. Since March 2016, following the implementation of the Act on Housing Loans, the NBS has had a mandate to issue binding decrees imposing limits on DSTI ratios, LTV ratios and mortgage maturities. It is currently preparing decrees to replace the recommendations that have already been issued and will at the same time tighten some of the



limits.¹⁴⁷ The capitalisation of the banking sector in Slovakia has been increasing in recent years and in Q1 2016 the sector-wide CET1 ratio was 15.7%, which is above the EU average. Furthermore, Slovakian IRB banks have relatively high risk weights for RRE exposures, with average risk weights standing at 17.2%. Moreover, the Slovakian authorities have taken measures to mitigate risks related to banking stretch: the capital conservation buffer was set to 2.5% as of 1 October 2014; and the systemic risk buffer and O-SII buffer were activated with a combined value up to 3% from 1 January 2018 after the phase-in.

In general, the Slovakian authorities show a high awareness of the strong cyclical credit developments due to the current low interest rate environment. Consequently, the NBS decided to increase the CCoB rate to 0.5% as of 1 August 2017.

Overall, given that the identified RRE-related vulnerabilities are assessed to be low although increasing, the proactive policy stance in Slovakia is assessed as being appropriate and expected to be sufficient to curb a future build-up in vulnerabilities. There is evidence that the policy measures have already been quite effective, e.g. in stopping a decline in lending standards. In addition, the move to transpose the current recommendations into decrees and to tighten some of the limits should further increase their effectiveness. With respect to the banking stretch, the increasing capital adequacy of the Slovakian banking sector, relatively high risk weights and the active use of capital buffers including the CCyB are also considered to mitigate risks from banks' exposures to the RRE sector.

Table SK.1
Summary assessment – Slovakia

<p>Summary RRE risk assessment narrative</p>	<p>Key risks are related to the collateral and household stretches Rapid credit growth (credit for house purchases increased by 14% year-on-year in Q2 2016), albeit from low levels, in Slovakia may signal rising vulnerabilities in the household stretch.</p> <p>The credit growth is linked to financial deepening in Slovakia, but could potentially lead to a situation of excessive household indebtedness.</p> <p>There are some signs of household stretch: a high share of households is vulnerable to interest rate increases due to short interest rate fixation periods.</p> <p>Furthermore, RRE prices have been picking up since early 2015, which in combination with increasing debt suggests increasing vulnerabilities in the collateral stretch. Overall, RRE prices do not appear to be overvalued.</p> <p>There has been a tendency to relax lending standards in recent years, but this has somewhat reversed in response to policy measures that have been implemented. There is a practice of “top-up financing” where the fall in the DSTI ratio due to the low interest rates is being taken advantage of to increase the level of household debt.</p>
<p>Policy assessment given risks</p>	<p>The policy stance is appropriate and expected to be sufficient Overall, given that the identified RRE-related vulnerabilities are assessed to be low although increasing, the proactive policy stance in Slovakia is assessed as being appropriate and expected to be sufficient to curb a future build-up in vulnerabilities.</p> <p>There is evidence that the policy measures have already been quite effective, e.g. in stopping a decline in lending standards. In addition, the move to transpose the current recommendations into decrees and to tighten some of the limits should further increase their effectiveness.</p>

¹⁴⁷ The October 2014 recommendation will be transposed into law in two ways: the mortgage loans part has been transposed into the Act on housing loans (a new law); the consumer loans part is to be transposed into the Act on consumer loans (by amendment). Both Acts give the NBS the mandate to issue binding decrees in the area of LTV ratios, DSTI ratios, etc. The Acts will define the indicators (e.g. DSTI), but the level of the indicators will be specified in the decrees. The Act on housing loans has been in force since 21 March 2016. The decree is under preparation and should be issued in the near future. Additional measures will feature in this decree on housing loans. The amendment to the Act on consumer loans has been prepared, but has not yet been approved. Once it is in force, the NBS will issue the corresponding decree on consumer loans as well.



Table SK.2

Summary of risks and policy measures – Slovakia

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	Debt levels remain at intermediate levels compared with other countries, but the double-digit mortgage growth (14% year-on-year in Q2 2016) contains a risk of overheating. A high share of mortgages is sensitive to interest rate changes due to relatively short interest rate fixation periods (as of June 2016, 83% of new housing loans had a fixation between one and five years but the share of new loans with interest fixation periods shorter than one year is only 8% and has decreased over the last year). An additional amplifying factor is the widespread “topping-up” of loans.	RRE prices have started to increase of late. A number of factors could lead to further pressures on the prices: rapid credit growth, low interest rates and a positive economic outlook. Currently, there does not appear to be overvaluation in the Slovakian housing market. Prices are still below their pre-crisis peak.	Banks are compensating for lower mortgage interest rate margins by increasing volumes. Bank exposures to mortgages are increasing from already high levels (currently 45% of total loans and securities, against a euro area average of 30%). The banking sector capitalisation ratio (CET1) in Slovakia stood at 15.7% in early 2016 which is above the EU average (13.9%).
Summary of policy measures (implemented, planned, under consideration)	Implemented: Recommendation in October 2014: DSTI limit at 100%. The limit is based on net income, includes an interest rate stress element and takes into account the number of household members in determining the household's expenses. Recommendation in October 2014: 30-year maturity restriction for mortgages (specific exemptions are allowed). Loans with (partial) deferred payment of interest or principal should not be granted. Planned: Transposition of recommendations into decrees with a tightening of the limits.	Implemented: Recommendation in October 2014: LTV ratio should not exceed 100%, with a given share of loans above 90%. Planned: Transposition of recommendations into decrees with a tightening of the limits. Internal assessment of real estate appraisals should be mandatory and should meet certain minimum qualitative requirements.	Implemented: Capital conservation buffer was set to 2.5% as of 1 October 2014. Systemic risk buffer and O-SII buffer were activated with a combined value up to 3% from 1 January 2018 after phase-in. Countercyclical capital buffer is currently at 0% and will be increased to 0.5% as of August 2017.
Assessment of policy measures	Appropriate and expected to be sufficient	Appropriate and sufficient	Appropriate and sufficient

Household stretch

The main concern for the household stretch is the increasing indebtedness of Slovakian households. Since 2011 there has been double-digit mortgage credit growth, which has accelerated since 2014 (in June 2016 the year-on-year growth in credit for house purchases was 14%; see Chart SK.2). Credit for house purchases has increased from 8% of GDP in 2004 to 25.6% of GDP in March 2016. This has been coupled with a strong increase in households' leverage ratio (households' total debt over financial assets), which is now 45%, compared with an EU average of 19%. By contrast, the debt-to-income ratio of Slovakian households appears to be relatively low (at 46.7% in Q1 2016) compared with the EU average (of 108%). However, the fast growth in household indebtedness, which is in part related to financial deepening in Slovakia, has the potential to lead to a situation of excessive household indebtedness. Should households become highly indebted, this could in turn lead to risks to the real economy related to vulnerabilities in the RRE sector and could thereby expose banks to possible direct and indirect losses.

There are some additional factors that could amplify vulnerabilities related to household stretch. First, around 20% of new loans are “top-up” loans, where borrowers – due to the low interest rate – are able to increase their debt level without increasing their debt servicing costs. Second, a high share of mortgages is sensitive to interest rate changes, since around 83% of new loans have an interest rate fixation period of between one and five years only. The strong outlook for the Slovakian economy should mitigate these vulnerabilities to some extent.



The Slovakian authorities have issued a number of recommendations to address these vulnerabilities, including: a DSTI limit of 100% (verified net income after living cost deduction), which must include an interest rate stress element if the rate is not fixed until maturity; and a maturity limit of 30 years. The DSTI calculation methodology already includes a buffer for a potential interest rate increase by 2 p.p.

Furthermore, the Slovakian authorities are planning to take additional tightening measures when the current recommendations have been transposed into decrees.¹⁴⁸ The decree has been prepared in cooperation with the banking association; therefore, banks are aware of the tightening of these measures. Moreover, the plans to tighten the measures were also publicly announced in the May 2016 Financial Stability Report (without any specific details however).

Given that the identified vulnerabilities in the household stretch are assessed to be low but increasing, and that the implemented and planned measures are expected to curb the build-up of vulnerabilities in the household stretch going forward, the policy stance is deemed as appropriate and expected to be sufficient.

Collateral stretch

For the collateral stretch, some build-up of vulnerabilities has been identified. Despite strong mortgage credit growth since 2011, RRE price growth has been relatively flat over the past years. Lately, however, RRE prices have started to pick up (4.7% year-on-year growth in Q2 2016). Overall, there does not appear to be a general overvaluation of RRE prices in Slovakia (according to real estate price valuation models, they are undervalued in Slovakia for the moment). For instance, compared with income and rents, RRE price growth appears to have been relatively muted (the PTI index was 94% in Q1 2016 and has increased by 1.6 p.p. annually; meanwhile the PTR index was 105% in Q1 2016 and has increased by 4.8 p.p. annually) and remains significantly below the peak. Historically, RRE prices in Slovakia have been relatively volatile, which is mainly due to the fact that it is a relatively small market in terms of the number of properties compared with other EU countries.

There are a number of factors that may lead to a build-up of vulnerabilities in the collateral stretch. In particular, rapid mortgage credit growth, supported by a positive macroeconomic outlook and the low interest environment, which has led to a significant decline in mortgage interest rates (the largest drop in any EU country last year), are likely to lead to further pressures on RRE prices. In addition, there are signs of a potential construction boom in Bratislava, although domestic construction production contracted in real terms in the first part of 2016. According to the European Commission, RRE-related investments amounted to 6% of GDP in 2013.

As for the collateral stretch, the Slovakian authorities have taken a range of measures through recommendations. They have issued a recommendation that the LTV ratio on new loans should not exceed 100%, with a given limited share of new loans having an LTV ratio above 90%. They also advised banks to maintain a prudent approach when appraising real estate collateral: internal assessment of real estate appraisals should be mandatory and should meet high qualitative

¹⁴⁸ See above fn. 147 for further details.



requirements. The NBS is working to transform the LTV measure from a recommendation into a decree and there are plans to tighten the limit.¹⁴⁹

In the recent years there appears to have been a relaxation of lending standards. However, subsequent to the NBS recommendations in October 2014, lending standards appear to have been tightening. For example, the share of new loans with an LTV ratio above 90% has decreased, which is likely due to the LTV limit.

Given the level of identified vulnerabilities in the collateral stretch and that the taken and planned measures are expected to prevent an unsustainable build-up of vulnerabilities going forward, the measures are assessed as being appropriate and sufficient, in particular since lending standards now appear to be tightening and the share of new loans with high LTV ratios is decreasing.

Banking stretch

Regarding the banking stretch, some RRE-related vulnerabilities have been identified. First, a significant portion of Slovakian banks' total loans are mortgage exposures (45%), which is higher than the euro area average (30%). Additionally, general exposure to the real estate sector (i.e. mortgage loans and loans for real estate and construction activities) at the end of 2015 constituted 54% of all loans. Both these measures for Slovakia are among the highest in the EU. Thus, if vulnerabilities were to crystallise in the RRE market (for example, an interest rate rise that increases households' debt service burden), this could potentially lead to significant credit losses for the banks. Second, given already high and rising mortgage exposures of banks, a potential cause for concern is that banks are compensating for lower mortgage interest rate margins by increasing their mortgage volumes. This development requires close monitoring despite evidence that lending standards are now tightening.

The Slovakian authorities have taken measures to mitigate risks related to banking stretch: the capital conservation buffer was set to 2.5% as of 1 October 2014; the systemic risk buffer and O-SII buffer were activated with a combined value up to 3% from 1 January 2018 after phase-in; and the NBS decided to set the countercyclical capital buffer rate to 0.5% as of August 2017.

The banking sector capitalisation ratio (CET1) in Slovakia has been increasing in recent years and was 15.7% in Q1 2016, above the EU average of 13.9%. The liquidity position of banks in Slovakia is strong: short-term liabilities are quite well covered by liquid assets relative to banking systems in other EU countries, banks' dependence on market funding has been decreasing and customer deposits constitute a greater share of their liabilities. Furthermore, the average risk weights for Slovakian IRB banks on RRE exposures were 17.2% in June 2016, which is above the EU average of 16%. The combination of limited vulnerabilities related to the banking stretch, comparatively high capital adequacy and RRE risk weights and the banking policy measures that have been implemented suggests that the policy stance is appropriate and sufficient for the banking stretch.

¹⁴⁹ Ibid.



Table SK.3

Additional information on instruments and data available to micro and macro supervisory authorities – Slovakia

Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?

Overall, the Slovakian authorities can rely on a comprehensive set of powers:

- a) The NBS has responsibility for microprudential supervision and macroprudential supervision according to the Act on Supervision.
- b) The NBS has a mandate to set capital buffers according to the Act on Banks.
- c) The NBS has a mandate to set borrower-based measures on mortgages (e.g. LTV ratios, DSTI ratios, amortisation, etc.) according to the Act on Housing loans (together with the transposition of the EU Mortgage Credit Directive).

Borrower-based measures for housing loans are currently in the Act on Housing loans, but they are not yet available for other consumer loans. The legislation process giving the NBS the same powers in the field of consumer loans is in its final stages, but is not yet complete. For housing loans, the Recommendation on lending standards has been transformed into law and has given the NBS the mandate to issue binding decrees in the area of LTV ratios, DSTI ratios, etc. (as explained in footnote¹⁴⁷).

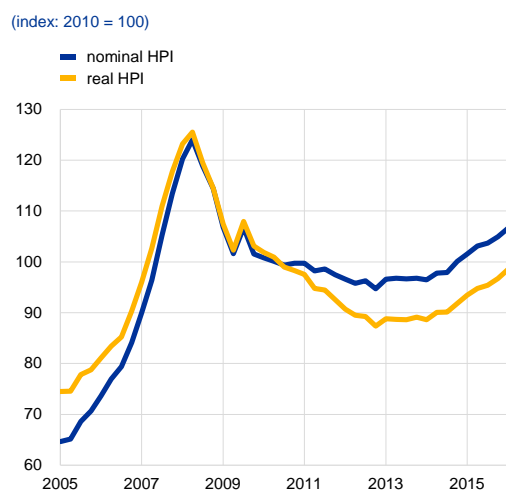
Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?

There is good data coverage on average LTV values and the LTV distribution for new loans, although long time series are not yet available. The data originate from banks and cover all loans provided in the banking sector (not just a sample). The same data are available for mortgage maturities.

A solid information base on DTI values is missing: the NBS knows banks' minimum DTI requirements but does not know the actual DTI ratio on issued loans.

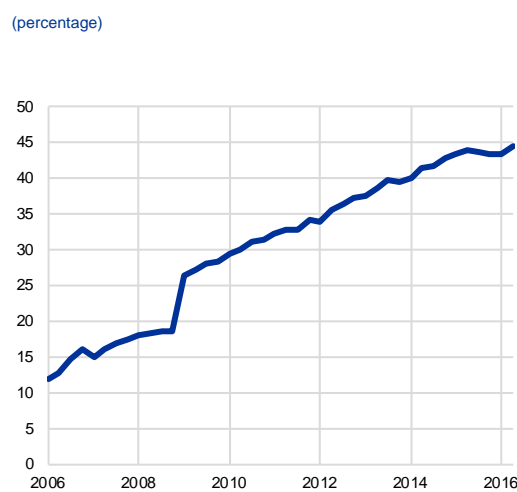
Annex with charts

**Chart SK.1
RRE price changes**



Source: OECD.

**Chart SK.2
Share of mortgage loans in the total loan portfolio**

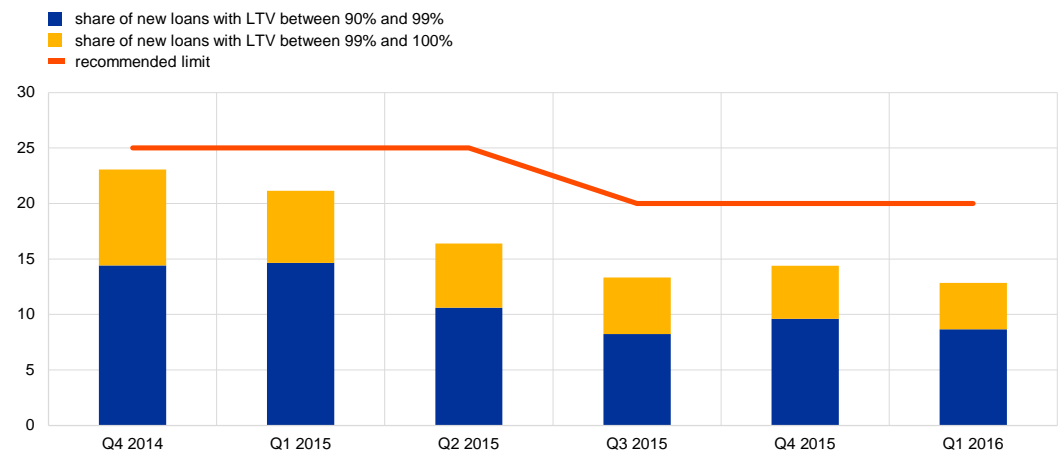


Sources: ECB SDW (money, credit and banking statistics) and ESRB calculations.



Chart SK.3

Share of new loans with a high LTV ratio



Source: NBS.
Note: 2014Q4 = November and December 2014.



Sweden

Key points

The main RRE-related vulnerabilities in Sweden are the rapidly growing RRE prices which appear to be overvalued, and high and increasing indebtedness especially among some groups of households. These are related to both the household and collateral stretches.

The rapid increase in the debt-to-income level continued. The 2016 Mortgage Survey of Finansinspektionen (the Swedish Financial Supervision Authority, hereafter referred to as FI) shows that the DTI ratio (based on disposable income) for households with new loans increased to 406% in 2015, from 387% in 2014. Furthermore, a high number of households with new loans have very high DTI levels (approximately 35% of households have a DTI level of more than 450% and about 7% has a DTI ratio above 750%).¹⁵⁰ Loans to households for house purchases grew by 8.7% annually in June 2016.

There has been a substantial and prolonged rise in RRE prices. RRE prices have been increasing since the mid-1990s, except for the period 2007-12 when house prices fell or were flat (see Chart SE.3). In the last years, RRE prices have been increasing faster than income for both apartments and houses (see Chart SE.1). However, during the last six months RRE price growth has slowed down markedly. This could be a minor correction of the prices or it could be the beginning of a downturn in the housing market. Still, RRE prices appear to be elevated: the ECB estimates the Swedish housing market to be overvalued by 24%, whereas the IMF methods suggest an overvaluation of between 5.5% and 12%.¹⁵¹ Furthermore, the price-to-income ratio is one of the highest in Europe.

As for other countries, the drivers of the rapid increase in real estate prices and high household indebtedness are demographics, urbanisation, a regulated rental market, strong income growth, low interest rates and lower taxation of home ownership. Supply-side restrictions in the form of a shortage of skilled labour and a lack of access to land in attractive areas have also contributed to these dynamics.

With a household debt-to-GDP ratio of 84%, Swedish households are among the most indebted in Europe and household indebtedness is increasing. The dynamics of LTV ratios are, however, more muted and they have fallen from 67.5% in 2009 to 61% in 2015, partly driven by the introduction of the LTV ceiling of 85% in 2010, the rise in RRE prices and increases in amortisation during the period. A rising share (currently around 65%) of households is amortising the mortgages. The number of amortising households is set to increase further due to the amortisation requirement that came into force on 1 June 2016. This is expected, to some extent, to dampen the share of households with new loans with high DTI ratios. The introduction of this measure could be responsible for the recent developments in RRE prices.

For the banking stretch, the Swedish authorities have taken several measures. These include a risk weight floor of 25% for mortgages, a 5 p.p. additional capital requirement for the four largest Swedish banks (which account for the vast majority of the mortgage market in Sweden) and a countercyclical capital buffer (currently set at 2%). The banking sector is well capitalised and profitable compared with European peers (see Chart SE.7). Still, Sveriges Riksbank recommends a

¹⁵⁰ *The Swedish Mortgage Market 2015*, Finansinspektionen, April 2015.

¹⁵¹ Turk (2015) as above fn. 23.



further tightening of capital requirements in order to strengthen the resilience of the banking system. Banks' lending standards appear to be high (in credit decisions an average interest rate of 6.5% is typically factored in). However, funding risks from high reliance on market funding, in particular in foreign currency, is a source of vulnerability for the Swedish banking system (52% of the banking system's total liabilities are market funding and 37% of the liabilities are in foreign currency¹⁵²). There is, however, an LCR requirement in place both in aggregate and separately in US dollars and euros.

Households are resilient in FI's stress tests, have high saving rates and have large asset holdings. Nevertheless, a large proportion of households' assets are tied up in pension schemes and/or residential real estate, which may hamper their use as liquidity sources and eventually amplify a shock to the real estate sector. Also, the distribution of these assets is not known. Due to the banking measures taken, and since households seem to have a sufficient margin for servicing their debt, the banking system seems to be fairly resilient to direct shocks from the mortgage market.

Due to these factors, the main identified risk is mostly related to the indirect channel and second-round effects. High indebtedness combined with large financial assets mean that households' balance sheets are large and vulnerable to correlated asset price shocks, pointing to substantial macroeconomic risks. The interaction between increases in debt-to-income ratios and RRE prices implies that a shock to the economy (e.g. a drop in incomes or RRE prices, or increasing interest rates) could force households to cut back on consumption. This could be driven either by a need of households to service their debt (despite their margin) or by general wealth effects. If many households were to be forced to reduce consumption, this would be expected to have a significant negative effect on the overall economy. This, in turn, may cause second-round effects by impacting the wider non-financial sector and may result in losses to the banks. However, the Riksbank's and FI's joint stress tests indicate that banks are resilient enough to withstand a severe macroeconomic deterioration. However, the Riksbank and FI consider that it is difficult to draw conclusions regarding the capital requirements of the Swedish banking system on the basis of a single stress test.¹⁵³

The introduction in 2010 of an 85% limit on the loan-to-value ratio for new mortgages and an amortisation requirement in 2016 are expected to address the build-up of further vulnerabilities to some extent. While the current policy measures are appropriate given the nature of RRE vulnerabilities in Sweden, they may not be sufficient to fully address them. Given that the measures apply only to new housing loans, it will take time for the vulnerabilities related to the level of household indebtedness to substantially decrease. Also, the mandate of FI with respect to some measures (e.g. an LTI cap) remains unclear, which may impair its ability to act.

¹⁵² *Analysis of the national banking systems*, ECB, 2015.

¹⁵³ See *Stability in the Financial System*, 2015:2, Finansinspektionen, and *Financial Stability Report*, 2015:2, Sveriges Riksbank.



Table SE.1

Summary assessment – Sweden

Summary RRE risk assessment narrative	<p>Key risks are related to the collateral and household stretches</p> <p>The main vulnerabilities are considered to be the rapidly increasing RRE prices which appear to be overvalued, and high and increasing indebtedness especially among some groups of households. In addition, if risks were to materialise, there could be potential spillover effects on other countries in the Nordic-Baltic region.</p> <p>High and rising debt-to-disposable income ratio for households with new loans (406% in 2015, up from 387% in 2014).</p> <p>Credit growth has been rapid (loans to households for house purchases have increased by 8.7% year-on-year in June 2016).</p> <p>A prolonged and continuing increase in RRE prices (by 12% in 2015), which has however slowed down during the last six months.</p> <p>RRE prices are, according to the ECB model, the most overvalued in Europe, though the IMF model shows less overvaluation.</p>
Policy assessment given risks	<p>The policy stance is not expected to be sufficient for the collateral and household stretches</p> <p>The current policy measures are appropriate given the nature of RRE vulnerabilities in Sweden, but they may not be sufficient to fully address them.</p> <p>Given that the measures apply only to new housing loans, it will take time for the vulnerabilities related to the level of household indebtedness to substantially decrease.</p> <p>The lack of tools is related to the fact that FI's mandate remains unclear with respect to some measures.</p> <p>Furthermore, the high and somewhat overvalued RRE prices have not been directly addressed.</p>

Table SE.2

Summary of risks and policy measures – Sweden

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	<p>Debt-to-disposable income ratios have been rising from an already high level (see Chart SE.2). In particular, DTI ratios have been rising for households with new mortgages (from 387% to 406% between 2014 and 2015). There have been some significant increases in amortisation rates in the last few years, but still 32% of new mortgages and 35% of existing mortgages are not amortised. The amortisation requirement is expected to increase the share of new mortgages being amortised.</p>	<p>RRE prices have been rising rapidly, both in absolute terms (see Chart SE.3) and relative to income (see Chart SE.1). RRE prices are estimated to be overvalued by 24% (ECB) or by between 5.5% and 12% (IMF). Therefore, the risk of a price correction is present. Mitigating factors are the decrease in the LTV ratio, which has fallen from 68% in 2009 to 61% in 2015, and the recent slowdown in RRE price growth.</p>	<p>The Swedish banking sector is well capitalised and profitable compared with European peers, and lending standards appear prudent. The Swedish banks have high risk-weighted capital ratios.</p>
Summary of policy measures (implemented, planned, under consideration)	<p>Implemented: Amortisation requirement: since 1 June 2016 all new household loans have to be amortised by 2% of the original debt burden yearly if the LTV is above 70% and by 1% if the LTV is in the 50-70% range.</p> <p>Under consideration: An LTI cap has been discussed but this measure, as well as debt service requirements, are currently not under the FI's mandate.</p>	<p>Implemented: An LTV cap at 85% since 2010</p>	<p>Implemented: 25% risk weight floor on mortgages since 2013-14</p> <p>5 p.p. additional capital requirement for systemic banks</p> <p>An LCR of 100% in aggregate and separately in USD and EUR since 2013</p> <p>A CCyB set at 2% effective as of March 2017 (The current effective CCyB rate is 1% as of September 2015 and 1.5% as of June 2016.)</p>
Assessment of policy measures	Appropriate but not expected to be sufficient	Appropriate but not expected to be sufficient	Appropriate and sufficient

Household stretch

Swedish households are highly indebted, and their indebtedness is continuing to rise; the DTI ratio for households with new loans increased to 406% in 2015 from 387% in 2014 (see Chart SE.2). With regard to RRE risks, Swedish households, banks and the overall economy are primarily exposed to indirect effects. The indirect effects are likely to be driven by decreases in consumption,



if households are forced to cut back in order to service their debt, or through general wealth effects. This has been the case during RRE-related crises in other countries (see Chart SE.4), where households in countries with high debt levels reduced their consumption the most. This risk could materialise in an adverse scenario relating to increases in interest rates or decreases in incomes.

There are several underlying drivers that have led to Swedish households' high indebtedness. One major driver is the regulated rental market, which forces some households to choose owner-occupied housing rather than renting, thus increasing the aggregated debt burden of the household sector. However, the home-ownership ratio in Sweden is still below the EU average (70% versus the EU average of 76%), even though it has risen. Other structural factors include a tax system favouring owner-occupied housing (interest expenses are tax deductible and the property tax was abolished and replaced with a low municipality fee) and the prevalence of variable rate mortgages.

The proportion of households with new loans amortising their debt has been steadily increasing from 42% in 2010 to 68% in 2015. However, 32% of households with new loans do not amortise, which in combination with the high indebtedness still constitutes a vulnerability, mainly to the real economy through possible effects on consumption. However, amortisation rates are higher for households with high LTV ratios (approximately 90% of those households with an LTV above 70% amortise their mortgages). Second-round effects affecting the banking system are a possibility, but the joint Riksbank/FI stress tests show banks to be highly resilient. Given the amortisation rate, the identified vulnerabilities are not likely to decrease quickly, even if the further growth of loans is subdued.

The situation is somewhat mitigated by the high levels of wealth and savings of households. In aggregate, households hold substantial assets. However, since a large proportion of these assets is tied up in pension schemes and/or residential real estate (see Chart SE.5), they cannot be liquidated easily and the distribution of household assets among households is not known. Swedish household leverage (debt over financial assets) is lower than the EU average and falling. This is linked to the fact that Swedish households save a considerable amount of their disposable income (16% in 2015). This is partly due to very high mandatory pension savings, but even when stripping those out, a saving rate of 8% is still high. The high saving rate could provide a cushion which would to some extent mitigate a sharp decrease in consumption.

Banks' lending standards on mortgages are high in Sweden and have tightened slightly over the last few years. For example, the banks ensure that households are able to handle higher interest rates by using high imputed rates of interest. The 2016 Mortgage Survey conducted by FI shows that the average imputed rate of interest for 2015 was around 6.5%, which can be compared with the average mortgage rate in the sample of 1.7%.

In addition, FI conducts regular stress tests of households in order to study their resilience to financial shocks. In the stress tests, FI estimates how the households' payment ability would be affected by rising interest rates, unemployment or a drop in the value of their home. The stress tests show that most households that have taken out new mortgages have a sufficient margin to handle negative scenarios such as higher interest rates, higher unemployment or declining RRE prices. Even in the event of severe stress, few households experience problems with their payments. The stress tests show that, if interest rates were to increase by 5 p.p., only 3.5% of new borrowers would no longer have a surplus, forcing them to reduce their costs (e.g. buy a more affordable home). The stress tests also show that household resilience has increased compared with earlier years. Hence, the stress tests suggest that households' need to liquidate assets even in a stressed scenario would be limited.



FI recently introduced an amortisation requirement whereby loans issued from 1 June 2016 must be amortised at a rate of 2% of the original debt burden yearly for LTV ratios above 70% and at a rate of 1% for LTV ratios in the 50-70% range. This is expected to enhance the resilience of households by increasing the share of households amortising their mortgage debt and by making households with a high LTV ratio amortise their debt more quickly. The amortisation requirement could also be expected to have some impact on the share of high DTI households. This is because an increase in amortisation will limit the size of the loan a high DTI household is eligible to borrow, as banks require their borrowers to have sufficiently high net disposable incomes (post costs and amortisation) to service the debt. The newly introduced amortisation requirement was preceded by a prolonged discussion, which led banks to gradually tighten their lending standards (e.g. reducing LTV ratios and increasing amortisation rates).

A loan-to-income (LTI) cap is also being considered by FI, but FI does not appear to have the legal powers to introduce this measure (see Table SE.3). Some banks have also started to impose voluntary LTI caps. Despite this, household credit has grown faster than disposable income over the last few years. Loans to households for house purchases grew by 8.7% annually in June 2016, a development which raises concerns.

The measures taken apply only to new housing loans, meaning that it will take time for the vulnerabilities related to the level of household indebtedness to substantially decrease. The amortisation requirement will affect new loans and is therefore an appropriate measure. Addressing the level of indebtedness is difficult for legal and practical reasons. However, vulnerabilities exist and appear to be rising, and the current policy stance is not expected to change this over the medium term. Hence, the vulnerabilities may not be sufficiently addressed by the policy stance. The lack of tools is also related to the absence of a clear mandate of FI regarding certain tools (such as LTI limits).

Collateral stretch

Swedish RRE prices appear to be high. Prices have risen steadily since the early 1990s, with the exception of the period 2007-12 when RRE prices fell or stayed level (see Chart SE.3). However, price developments have slowed down in the last six months. It is difficult to say whether this is just a minor correction or the beginning of a housing market downturn. As in many other countries, the price increases have been particularly pronounced in major urban areas. For the whole of Sweden, RRE prices have doubled since the 1990s, but in major cities (like Stockholm, Göteborg, Malmö and Uppsala) they have increased by 300-400%.¹⁵⁴ These developments have led to a situation where the price-to-income ratio is high by historical comparison (see Chart SE.1). Furthermore, a material overvaluation is suggested by the ECB (24%). However, other methods suggest only a low to moderate overvaluation (the IMF suggests an overvaluation of between 5.5% and 12%). The high and overvalued RRE prices suggest that a cooling-down of price developments is warranted, but could also suggest that a larger downturn is possible.

In addition to the drivers mentioned in the household stretch section, structurally low construction of housing has been a major driver of rising RRE prices. A shortage of skilled labour and a lack of access to land in attractive areas have caused supply to consistently fall short of demand for the

¹⁵⁴ "Sweden: Selected Issues", IMF Country Report No. 15/330, December 2015.



last decade (see Chart SE.6). At the same time, demand has been fuelled by high net immigration and rapid urbanisation. Rules largely prohibit housing speculation and there is virtually no buy-to-let market in Sweden. These factors should all support RRE prices to some extent, even in a downturn.

Swedish households are overall assessed to be highly resilient in stress tests carried out by FI. For example, if the interest rate increases by five percentage points at the same time as RRE prices decline by 20%, around 1% of households would have a deficit as the LTV ratio would exceed 100%. If prices were to fall by 40%, the corresponding figure would instead be 2.5% of households.

The LTV cap of 85%, introduced in 2010, is considered an appropriate policy measure to address this vulnerability, since it has halted the trend of rising average LTV ratios for new borrowers. However, given the high levels and possible overvaluation of RRE prices, the LTV measure may not be sufficient in neutralising the vulnerabilities in the collateral stretch.

Banking stretch

Swedish households have a high ability to service their debt and the Swedish banking system is profitable and well capitalised compared with EU peers (see Chart SE.7). Loans are of the full-recourse type and credit losses on household loans have, during previous real estate crises, been low. The risk of direct losses from a real estate-related crisis should never be completely dismissed; when assessments and stress tests are done in situations with lending booms and increasing RRE prices, they tend to generally underestimate the real size of non-performing assets. An example is the case of Spain, which is different from that of Sweden in many ways, where the average non-performing loan ratio was 0.6% for lending to the private sector at end-2006, but had increased to 14% by the end of 2013.

Funding risks from reliance on market funding (market funding in the Swedish banking system is 52% of total liabilities, against an EU average of 12%¹⁵⁵), in particular in foreign currency (37% of funding is in foreign currency, against an EU average of 12%¹⁵⁶), is a source of vulnerability for the Swedish banking system. In addition, the banking system is highly concentrated and sizeable in relation to the overall economy (in Sweden the total banking assets-to-GDP ratio is 402%, against an EU average of 284%¹⁵⁷). The interconnectedness between banks across the Nordic-Baltic region implies that there could be significant cross-border spillovers to banks from RRE-related difficulties in any of the countries in the region.

Against this background, FI has set high capital and liquidity requirements for Swedish banks in general and the four major banks in particular. The measures addressing the banking stretch are comprehensive and include both general and targeted measures (including liquidity requirements). These measures (see Table SE.2) are assessed as being sufficient in addressing the banking stretch in Sweden.

¹⁵⁵ *Analysis of the national banking systems*, ECB, 2015.

¹⁵⁶ *Ibid.*

¹⁵⁷ *Ibid.*



Table SE.3

Additional information on instruments and data available to micro and macro supervisory authorities – Sweden

Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?

Finansinspektionen (FI) is the macroprudential authority. It has a clear mandate to decide on and implement all of the macroprudential tools provided for in the CRR/CRD. FI has been using these available tools in combination with other tools falling under its microprudential and consumer protection mandates.

A judicial challenge last year regarding the planned amortisation requirement showed, however, that the mandate of the institution is unclear with regard to national measures (amortisation requirement, LTI cap, etc.) addressing risks to macroeconomic stability. Reflecting this uncertainty, the law had to be amended in order for FI to introduce the amortisation requirement. In March 2016 the Swedish Parliament approved the law amendment that enabled FI to introduce the amortisation requirement. Other measures such as the discussed LTI cap are currently not within FI's mandate. FI is therefore working towards obtaining a wider mandate, which also includes the use of national measures addressing risks to macroeconomic stability, in addition to the measures provided for in the CRR/CRD.

Furthermore, FI cannot introduce measures that target the stock of loans; only new loans can be addressed.

Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?

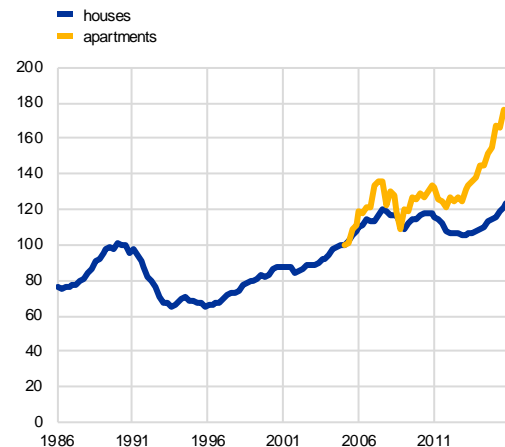
In general, data are available, but information on households' assets and savings is limited. Since the abolishment of the wealth tax in 2007, these data have only been available in aggregate form. Therefore, it is not possible to gauge whether the most indebted households are also the households with the highest savings.

Annex with charts

Chart SE.1

Swedish residential real estate prices relative to disposable income

(index: Q1 2005 = 100)

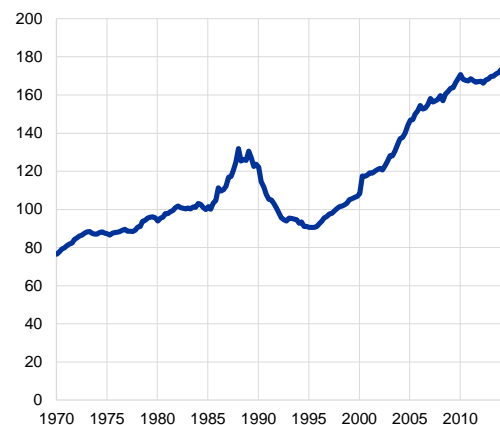


Sources: Statistics Sweden and Valueguard.

Chart SE.2

Household debt in Sweden

(percentage of disposable income)

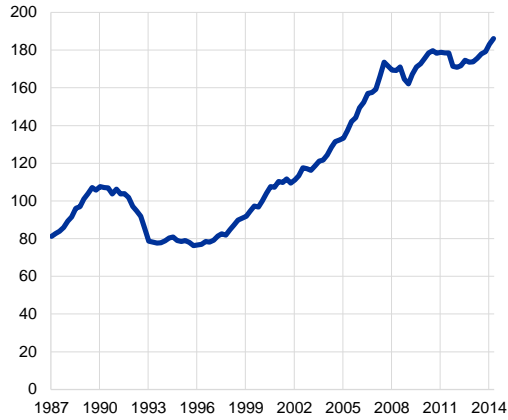


Sources: Statistics Sweden and Sveriges Riksbank.



Chart SE.3
Real property price index in Sweden

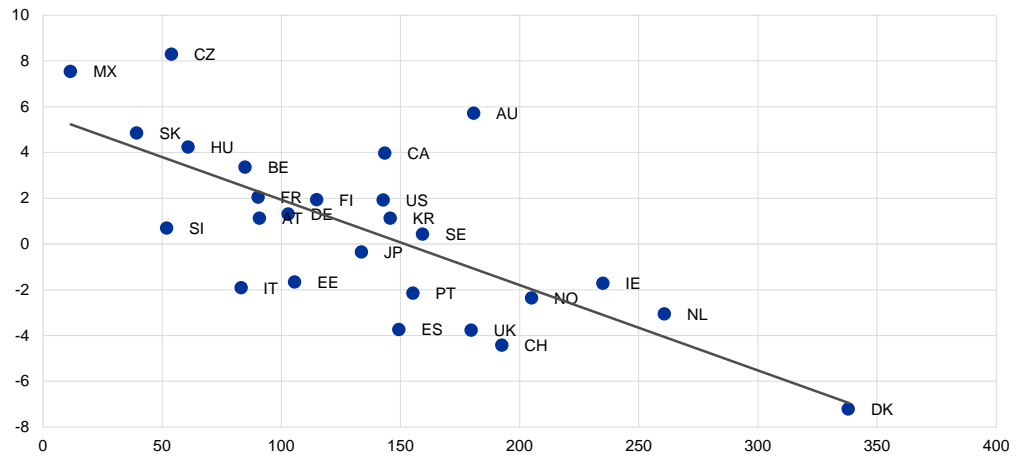
(index: Q1 2000 = 100)



Sources: Statistics Sweden and Sveriges Riksbank.
 Notes: Deflated with CPIF (consumer price index with a fixed interest rate). Refers to developments in prices of single-family houses.

Chart SE.4
The relationship between the debt-to-income ratio and consumption growth, 2007-12

(x-axis: households debt ratio 2007; y-axis: adjusted consumption, (percentage))

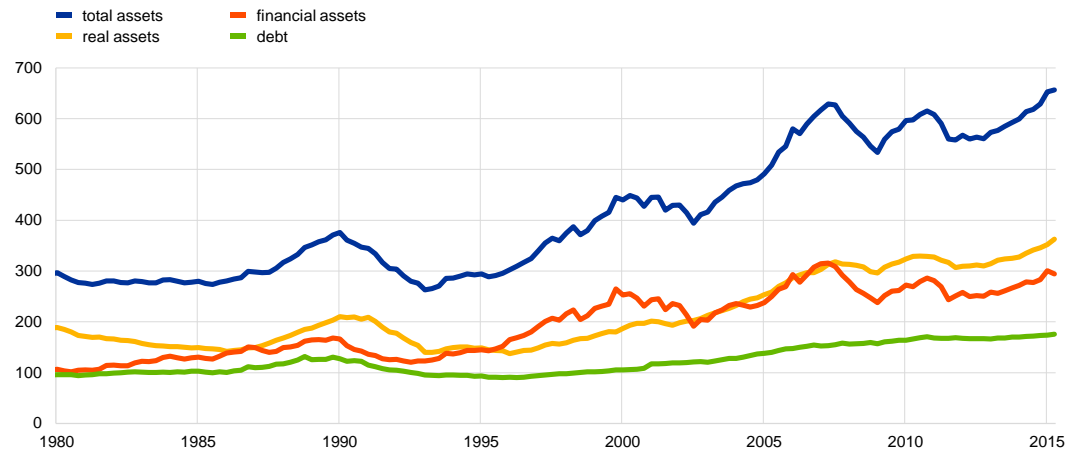


Sources: OECD and Sveriges Riksbank.
 Note: Adjusted consumption growth has been calculated as actual consumption growth minus contributions from growth in the debt ratio, the current account and consumption. For further information, see Flodén, M., "Did household debt matter in the Great Recession?", 2014.



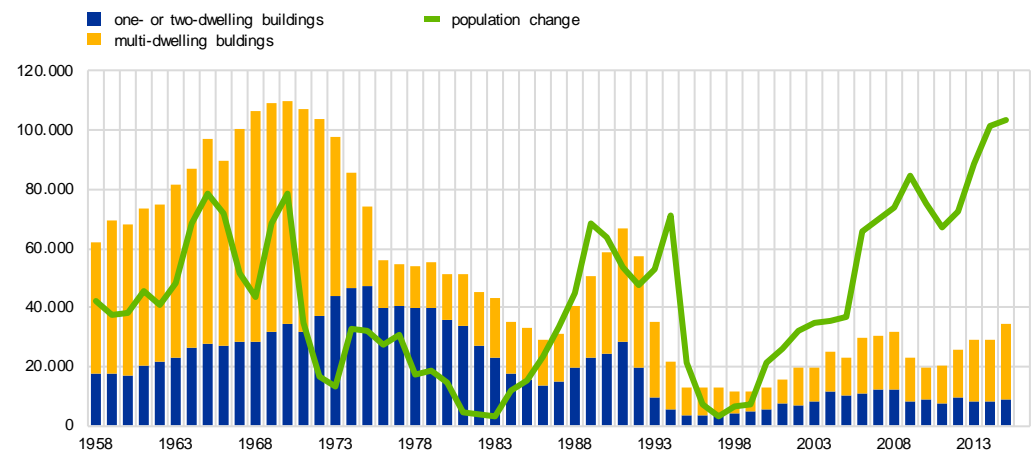
Chart SE.5
Household assets and debt

(percentage of disposable income)



Sources: Statistics Sweden and Sveriges Riksbank.

Chart SE.6
Housing construction and population changes in Sweden

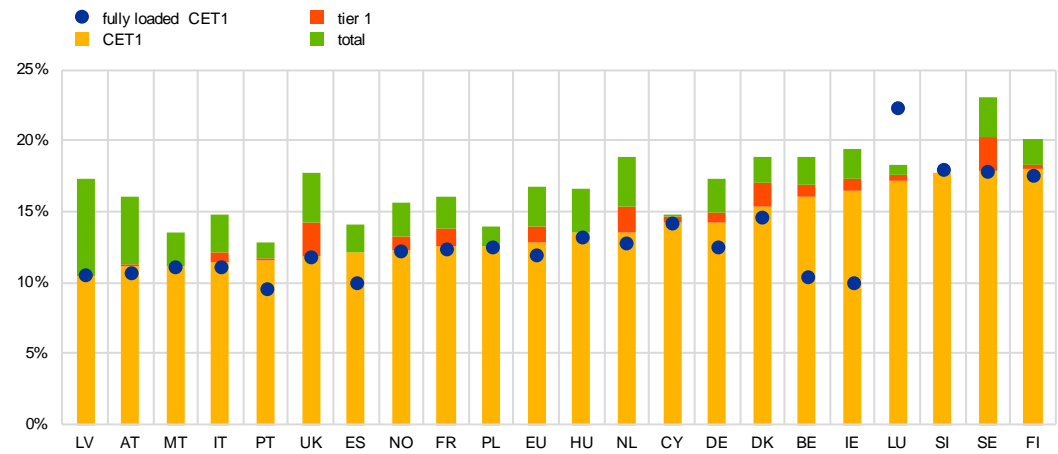


Source: Statistics Sweden.



Chart SE.7
Capital ratios by banks' home country

(June 2015)



Source: 2015 EU-wide transparency exercise: aggregate report, EBA, 2015.



The United Kingdom

Key points

There is currently a high degree of uncertainty about the medium-term outlook for the UK housing market. However, from a macroprudential perspective, there appear to be risks under different housing market scenarios – either through the crystallisation of accumulated vulnerabilities, particularly related to household indebtedness and the interaction with elevated RRE prices, or through the further build-up of vulnerabilities.

The uncertainty following the UK's referendum on European Union membership on 23 June 2016 may have caused a turning point in the UK residential real estate market. The result of the UK referendum on EU membership on 23 June 2016 initially had a significant market impact and the full implications for the UK economy are still uncertain. Before the vote, the main vulnerabilities associated with residential real estate in the UK related to the high level of household indebtedness in combination with RRE prices which had been rising for several years, and the potential for these to reinforce each other.

Following the June referendum, the Bank of England and some international institutions revised down the outlook for the UK economy and housing market. If those forecasts prove to be correct, it would slow the pace of build-up in mortgage debt and therefore reduce vulnerabilities in the medium term. However, the probability of risks through these channels materialising may have increased. If they were to materialise, the associated negative household income and wealth effects (e.g. if households need to reduce consumption in order to service their mortgage loans) may reinforce the initial shock, with negative direct and indirect effects on financial stability. Conversely, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise.

The Financial Policy Committee (FPC), the Prudential Regulation Authority (PRA) and the Financial Conduct Authority (FCA) took a number of policy measures targeted at RRE vulnerabilities before the referendum. These led to improvements in mortgagor resilience and have ensured a rising capitalisation of the banking system. On 3 August the Bank of England's Monetary Policy Committee (MPC) introduced a package of measures to support the economy (including an interest rate reduction and measures to ensure that lower rates pass through to the real economy). These measures should also support mortgagors and the housing market, and might lower the risk of crystallisation of the above-mentioned vulnerabilities.

Overall, the UK residential real estate market is potentially at a turning point. Given the uncertainty of the implications of the UK's referendum on EU membership, it is not yet possible to judge whether the vulnerabilities that had accumulated will now begin to crystallise or whether, in time, they might instead continue to grow. The appropriate policy response is likely to differ between these two scenarios. Therefore, it will be important for the UK authorities to monitor developments closely and adjust macroprudential policy in light of these. Looking ahead, it will be necessary to ensure that any adjustment in the housing market proceeds at an appropriate pace and that new imbalances do not emerge.

Situation before the UK's referendum on EU membership in June 2016

The household stretch assessment is primarily based on the relatively high debt levels in the UK household sector. However, it also takes into account the debt dynamics, distributional aspects and interactions with other stretches, in particular the collateral stretch.



The aggregate household debt-to-income ratio is historically and internationally high (130% as at Q1 2016) and the household debt-to-GDP ratio was the fifth highest in the EU in Q2 2016. However, the aggregate household debt-to-income ratio fell between 2008 and 2012-13, and has remained flat since then. And, as discussed in Section 2.1.2, there is considerable uncertainty around the sustainable level of household debt.¹⁵⁸ In the UK, around half of mortgagors are on floating rate contracts, which make them vulnerable to rises in interest rates, but can also be a mitigating factor if interest rates fall in a stress. The stock of interest-only loans to owner-occupiers fell from 31% in Q3 2013 to 23% in Q1 2016 (this also has implications for the collateral stretch). The proportion of households that own their own home and the proportion that have mortgage debt is in line with the EU averages (in 2016, 30% of households were mortgagors). Cross-country evidence indicates that homeowners, particularly those which are more highly indebted relative to their income, respond to interest rate and income shocks by reducing consumption, thus creating a potential risk channel to the economy due to household indebtedness.

Although new borrowing at high loan-to-income ratios (i.e. with a loan-to-income ratio at or above 4.5) has declined, it remained at around 9% as at Q1 2016 (7.6% as at Q2 2015). And, since the financial crisis, there has been a decrease in the share of very highly indebted households in the stock. The proportion of households with a total debt-to-income ratio greater than 5 has fallen from 3.3% in 2011 to 1.6% in H1 2016. An additional 5.5% of households have a total debt-to-income ratio of between 3 and 5, down from 6.6% in 2011. This is a positive development and should reduce the risk of vulnerabilities that may arise due to income and interest rate shocks.

Risks related to collateral stretch have been a growing vulnerability: RRE prices had been growing rapidly from already high levels and have been decoupling from rent and income growth rates. The recent IMF Article IV consultation¹⁵⁹ discussed that RRE price growth has been more than three times income growth recently and the price-to-rent ratio has risen steeply since late 2012 (the index value was 111% in Q1 2016 with a base year of 2010; see Table C.1 in Annex C). The nominal RRE price level exceeded its pre-crisis peak in 2015 – although, of course, this is in the context of much lower long-term interest rates (and, in real terms, RRE prices remain below pre-crisis peaks). RRE price growth was rapid at 6.4% year-on-year to July 2016; however, RRE price growth has been slowing recently (on a three month-on-three month annualised basis, RRE price growth has fallen from a recent peak of 9% in February to 5% in July).

Mortgages in the UK generally have somewhat high LTVs at origination relative to other countries (at present, the median LTV is around 75% for the flow of mortgages to owner-occupiers; see Table C.1 in Annex C). However, the majority of loans to owner-occupiers amortise over time and thus data on the distribution of LTVs in the stock of mortgages show that the share of mortgages with an LTV higher than 75% is only around 16%, and only 3% have an LTV greater than 90% (Q4 2015).

Buy-to-let (BTL) lending has been the biggest contributor to net mortgage lending growth, with BTL making up 17% of the flow of gross mortgage lending. Although BTL investors typically borrow at lower LTVs at origination, their mortgages tend to be on interest-only terms, meaning that the loan value can remain significant on lenders' balance sheets.

¹⁵⁸ For example, the structural fall in interest rates in recent decades suggests that a higher debt level than previously may be sustainable. And the sustainable level of indebtedness is also likely to vary between countries.

¹⁵⁹ [2016 Article IV Consultation Concluding Statement of the IMF Mission.](#)



Despite the growing vulnerabilities for a collateral stretch and the fact that mortgages account for approximately two-thirds of the total lending of UK banks to the domestic real economy, the likelihood of a related banking stretch in the future is limited as the Annual Cyclical Scenario (ACS) framework¹⁶⁰ will help the FPC and the PRA Board in the setting of capital buffers to match the risk environment and ensure resilience of the banking system.

In order to address these risks, the UK authorities have taken several measures, mainly targeting the household stretch and the banking stretch. Some of these policies also target the collateral stretch at the same time.

To increase resilience of the banking sector, stress tests with severe housing market downturns in the adverse scenarios have been used since 2014 to determine the need for additional capital additions. The stress-test scenarios in 2016 are very severe – the RRE price falls are much bigger than in the EBA 2016 stress test and in the United States Comprehensive Capital Analysis and Review. In addition, the RRE price shock in the annual stress-test scenario will increase with the size of imbalances in the housing market. This will guard against banking stretch in the future, by ensuring that the amount of capital banks hold against mortgage lending rises if policymakers judge that RRE prices are above equilibria, with elevated risks of a fall.

To target lending standards in the owner-occupier market, and thus the household stretch and to some extent the collateral and banking stretch, new rules on lending standards have been set. Key elements are a stricter affordability assessment for borrowers (including interest rate stress tests), formalised requirements for income verification and the requirement for a credible repayment strategy for borrowers receiving an interest-only loan. New interest-only loans have decreased significantly from 34% (Q1 2008) to 1.6% (Q1 2016). In addition, following a review of outstanding interest-only mortgages, the FCA has worked together with lenders to ensure that lenders contact borrowers to prompt them to check that their plan for repaying their mortgage is on track and to consider the options available to them – including switching to a repayment mortgage if it is affordable for the borrower to do so. These policies have already reduced the stock of interest-only loans from 31% to 23% between Q3 2013 and Q1 2016. This also decreases the LTV of the stock as well as household indebtedness.

In the area of buy-to-let, the authorities are ensuring prudent lending standards by clarifying their expectations regarding minimum lending standards for buy-to-let mortgage contracts. On 29 September the PRA published a Supervisory Statement on underwriting standards.¹⁶¹ This included an affordability assessment, subject to minimum stressed interest rates (of a 2 p.p. rise in interest rates or a minimum 5.5% stressed mortgage rate). Even before the referendum outcome, growth in BTL mortgage lending was expected to slow as a result of recent tax changes (to stamp duty and a reduction in mortgage interest tax relief) as well as the release of the PRA's Supervisory Statement.

Moreover, an LTI flow limit was introduced in June 2014 to prevent the risk of an increase in the tail of highly indebted households. Lenders should not extend more than 15% of their total number of new residential mortgages at LTI ratios at or greater than 4.5. This measure was intended as an insurance measure and was therefore not intended to be immediately binding in aggregate. Although the current overall share of LTIs above 4.5 is significantly lower than 15%, this measure

¹⁶⁰ For more information see: <http://www.bankofengland.co.uk/financialstability/Documents/stresstesting/2016/keyelements.pdf>.

¹⁶¹ For more information see: <http://www.bankofengland.co.uk/pradocuments/publications/ss/2016/ss1316.pdf>.



seems to already have had a direct impact on individual lenders who took action to avoid breaching the limit and an indirect impact on the market via market sentiment. The share of new mortgages extended with high LTI ratios (i.e. with an LTI ratio of above 4.5) fell from 10.1% in Q2 2014 to 7.6% in Q2 2015; however, it has since risen again to around 9% as at Q1 2016. As part of the same package of measures, in June 2014 the FPC also recommended that, when assessing affordability, mortgage lenders should apply an interest rate stress test that assesses whether borrowers could still afford their mortgages if, at any point over the first five years of the loan, the Bank of England's monetary policy rate (Bank Rate) were to be 3 percentage points higher than the prevailing rate at origination. The FPC reviews whether its macroprudential policy stance is appropriate on a regular basis, and will do this again in the second half of 2016. If it feels an adjustment is required, it has the tools to be able to change the LTI calibration, or adopt an LTV or DTI policy quickly and effectively. The FPC also has good quality loan-level data allowing it to carry out thorough analysis of the impact of its actions.

Situation after the UK's referendum on EU membership in June 2016

It is early days yet, but there is growing evidence that the outlook for the UK housing market, which showed tentative signs of weakening before the referendum, has weakened further since. The growth rate of RRE prices, on a three month-on-three month annualised basis, slowed to 5% in July, from a recent peak of 9% in February (last exceeded in September 2014).¹⁶² This slowing was more marked in London, where prices were unchanged in Q2 2016 and growth was below the UK average for the first time since 2013.

There is little hard data on the housing market since the referendum. But the evidence available suggests that the outlook for property markets has significantly deteriorated. On a month-on-month basis, RRE prices fell by 0.2% in July. In the immediate aftermath of the referendum, house builders' share prices dropped sharply (by 30% in the following week), and consumer confidence fell by its sharpest monthly move for over two decades. A number of leading indicators also suggest that the leave vote will put significant downward pressure on both activity and prices (e.g. the surveys by RICS Residential Market Survey of Chartered Surveyors for the months of June and July 2016, which are one of the best leading indicators of momentum in the housing market)¹⁶³.

In the August Inflation Report, the Bank of England's MPC revised down its near-term outlook for the UK economy and the housing market substantially. The MPC expected aggregate RRE prices to decline a little over the next year, while the level of housing transactions is expected to remain broadly flat. Staff projections consistent with the MPC's forecast pointed to a slowdown in mortgage lending growth, reflecting subdued demand. GDP was expected to grow by 2.0% in 2016 and fall to 0.8% in 2017 (the pre-referendum growth forecast for 2017 was 2.3%).

As a result of the revised macroeconomic outlook, some of the risks stemming from the household and collateral stretches may start to materialise – this could amplify the impact of the shock from the vote to leave the EU and increase the direct and indirect risks to financial stability. If prices fall in the short-to-medium term due to higher uncertainty/lower confidence, this implies that the value of banks' collateral against their mortgage lending will fall and could also imply negative wealth effects for households (however, the share of borrowers expected to fall into negative equity as a

¹⁶² Based on two RRE price indices monitored by the Bank of England (Halifax and Nationwide indices).

¹⁶³ http://www.rics.org/Global/6._WEB_%20June_2016_RICS_UK_Residential_Market_Survey_ri.pdf.



result is expected to be considerably lower than experienced in 2009).¹⁶⁴ Some households might find it more difficult to service their debts if unemployment rises and/or income growth falls, though the recent decline in Bank Rate could mitigate this to some extent.¹⁶⁵ And such households could affect broader economic activity by cutting back sharply on expenditure in order to continue to service their debts. If the number of borrowers defaulting on their mortgage rises, this could lead to losses for banks, especially if accompanied by a fall in RRE prices. The growing and sizeable buy-to-let sector in the UK has the potential to amplify a downturn in the housing market.¹⁶⁶ Buy-to-let investors are more likely to sell if RRE prices are expected to fall; however, the decline in Bank Rate, which helps protect the cash flow of the investment, should mitigate this channel.¹⁶⁷

However, the Bank of England has taken action to ensure that the UK banking system is resilient to a very large housing market shock. The Bank of England stress tests conducted in recent years assessed the resilience of the banking system to much more severe scenarios than those that are currently expected under the central projection by the Bank of England's MPC in its August Inflation Report. These stress tests ensured banks were capitalised not just to withstand the stress, but also to maintain the supply of lending throughout. The 2014 stress test, for example, incorporated a 35% fall in RRE prices and a near doubling in unemployment (to around 12%). This is considerably more severe than the August Inflation Report projections, which incorporate a small fall in RRE prices and a small increase in unemployment to around 5.6% in 2018. Given this, it seems that UK banks would be resilient enough to withstand a housing market shock if household and collateral stretch vulnerabilities were to crystallise in the near term.

However, it is important to note that there is considerable uncertainty about the impact of the vote to leave the EU. It is impossible to foresee developments in property markets with any accuracy at this juncture. Conversely, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise. It is therefore important that the FPC monitors developments closely and adjusts macroprudential policy accordingly.

Looking ahead, it will be necessary to ensure that any adjustment in the housing market proceeds at an appropriate pace and that new imbalances do not emerge, against a backdrop of uncertainty about the UK's future ties with the EU.

In summary, given that the main risks relating to RRE in the UK have changed in response to developments after the referendum and the high level of uncertainty about future developments, it is very difficult to make an assessment of the medium-term vulnerabilities relating to RRE in the UK, or of the impact of the policy measures taken to target them to date. It is not yet possible to judge whether the vulnerabilities that had accumulated will now begin to crystallise or whether, in time, they might instead continue to grow. The appropriate policy response is likely to differ between these two scenarios. Nevertheless, in the light of Bank of England analysis, it seems that the UK banking system would be resilient enough to withstand a housing market shock if household

¹⁶⁴ In the August 2016 Inflation Report, the Bank of England showed that consumption growth has been closely related to RRE price growth in the UK over the past 30 years (page 19, as above fn. 51).

¹⁶⁵ As noted by the Bank of England in its July **Financial Stability Report** (page 12).

¹⁶⁶ 17% of the stock of total secured lending is accounted for by buy-to-let mortgages, and the gross flow of buy-to let lending in 2015 was close to its pre-crisis peak (page 13, *ibid.*).

¹⁶⁷ Interest rate expectations have declined following the MPC decision to lower interest rates in August 2016.



and collateral stretch vulnerabilities were to crystallise given the steps taken by the UK authorities to ensure that the banking system is capitalised against such adverse scenarios.

Table UK.1
Summary assessment – The United Kingdom

Summary RRE risk assessment narrative	<p>There is currently a high degree of uncertainty about the medium-term outlook for the UK housing market. From a macroprudential perspective, there appear to be risks under different scenarios for the housing market – either through the crystallisation of accumulated vulnerabilities, particularly related to household indebtedness and the interaction with elevated RRE prices, or through the further build-up of vulnerabilities.</p> <p>RRE vulnerabilities had built up before the referendum – they related to the interaction of a household stretch (due to household indebtedness) and a collateral stretch (as indicated by RRE prices that were rising from already elevated levels and decoupling from rent and income growth rates).</p> <p>The UK residential real estate market is potentially at a turning point. Given the uncertainty of the implications of the UK's referendum on EU membership, it is not yet possible to judge whether the vulnerabilities that had accumulated will now begin to crystallise or whether, in time, they might instead continue to grow.</p> <p>The outlook for the UK economy and housing market has been revised down: the Bank of England expected in its August Inflation Report aggregate RRE prices to decline a little over the next year, and the level of mortgage approvals to be lower. If that forecast proves to be correct, it would slow the pace of build-up in mortgage debt and therefore reduce vulnerabilities in the medium term. However, an economic slowdown could lead to the crystallisation of some risks – for example, if unemployment rises and/or income growth falls, then some households may find it more difficult to service their debts.</p> <p>However, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise.</p>
Policy assessment given risks	<p>Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market</p> <p>But it is considered that, although the build-up of risk through the household income and collateral stretch channels appears to have abated, the probability of risks through these channels materialising has increased in the short-to-medium term, given the increased level of uncertainty and the lower economic growth projections.</p> <p>Conversely, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, vulnerabilities related to residential real estate would continue to rise.</p> <p>The appropriate policy response is likely to differ between these two scenarios.</p> <p>Therefore, it will be important for the UK authorities to monitor developments closely and adjust macroprudential policy in light of them. Looking ahead, it will be necessary to ensure that any adjustment in the housing market proceeds at an appropriate pace and that new imbalances do not emerge.</p>



Table UK.2

Summary of risks and policy measures – The United Kingdom

	Household stretch	Collateral stretch	Banking stretch
Summary risk assessment/main risks	There is uncertainty about the economic outlook for the UK economy and housing market, but the risk of vulnerabilities crystallising in the household stretch have increased. The ability of some households to service their debts could be materially affected in the event of weaker employment and income growth, though the effect of this will be partially mitigated by the recent cut in Bank Rate. In addition to increased direct credit risks to banks, this would also magnify the initial economic shock as households would need to reduce their consumption in order to continue servicing their mortgage loans. Given the overall elevated level of household indebtedness (the DTI ratio was 130% in Q1 2016), the impact of an income or interest rate shock to the UK economy may be significant. But if the slowdown in the housing market proves to be temporary, then household debt could continue to rise in the medium term.	Risks related to collateral stretch have been a growing vulnerability in recent years. It is difficult to judge whether prices are over/undervalued as various indicators send different signals. However, price-to-rent and price-to-income ratios indicate that RRE price growth has been decoupling from rent growth and income growth (although these measures do not take into account structural factors such as the fall in long-term interest rates). In 2015, nominal (but not real) RRE prices exceeded their pre-crisis peak. However, the vote to leave the EU appears to have significantly lowered the outlook for the housing market – the Bank of England expects prices to decline a little over the coming year. This would imply a fall in the value of banks' mortgage collateral and would lower household wealth, which could affect consumption. But if the slowdown in the housing market proves to be temporary, then house prices could continue to rise in the medium term.	Direct credit risk is considered to be limited. Second-round effects could be regarded as the main risk, but stress-test results indicate that the banking system is resilient enough to withstand severe shocks. If the economic outlook deteriorates following the vote to leave the EU, the probability of default on mortgages may rise. If accompanied by a fall in some property prices, this could lead to significant losses for banks.
Summary of policy measures (implemented, planned, under consideration)	<p>Implemented:</p> <p>LTI flow limit of 4.5 for 85% of owner-occupier mortgages (lender-by-lender basis)</p> <p>FPC Recommendation on interest rate stress tests to mortgage lenders when assessing affordability of borrowers</p> <p>PRA measures on BTL underwriting standards (September 2016)^[1]</p>	<p>Implemented:</p> <p>FCA Mortgage Market Review, including prescribed affordability assessment and new standards making it more difficult to qualify for an interest-only (IO) mortgage (introduced in April 2014)</p> <p>FCA review of IO mortgages in the stock of lending, and related follow-ups with firms regarding their IO borrowers (2013 onwards)</p> <p>FPC's Stress Testing Framework (see also banking stretch)</p> <p>PRA measures on BTL underwriting standards (September 2016)^[1]</p>	<p>Implemented:</p> <p>Bank of England concurrent stress-testing framework: annual stress tests of banks' capital adequacy for severe housing market shocks</p> <p>Leverage ratio requirement for major UK banks and building societies</p> <p>Currently out for consultation:</p> <p>PRA measures on BTL underwriting standards (see also collateral stretch)^[1]</p> <p>Measures to reduce the procyclicality of IRB risk weights</p>
Assessment of policy measures	Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market. But there is an increased risk that vulnerabilities related to household stretch begin to crystallise in the short-to-medium term.	Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market. But there is an increased risk that vulnerabilities related to collateral stretch begin to crystallise in the short-to-medium term.	Not directly assessed given the uncertain impact of the vote to leave the EU on the medium-term outlook for the UK housing market. But there is an increased risk that vulnerabilities relating to banking stretch increase. Nevertheless, the banking system seems to be resilient against such scenarios.

[1] This is already the basis of discussions between PRA supervisors and mortgage lenders.

Household stretch

In the UK, the main risk connected to residential real estate is related to the household stretch. The household stretch assessment is primarily based on the relatively high debt levels in the UK household sector; however, it also takes into account the debt dynamics, distributional aspects and interactions with other stretches, in particular the collateral stretch. However, the aggregate household debt-to-income ratio fell between 2008 and 2012-13, and has remained flat since then.



And, as discussed in Section 2.1.2, there is considerable uncertainty around the sustainable level of household debt.¹⁶⁸

New borrowing at high loan-to-income ratios still remains significant (around 9% as at Q1 2016) and the aggregate household debt-to-income ratio has stabilised at high levels (130% as at Q1 2016). Moreover, around half of mortgagors are on floating rate contracts, which make them vulnerable to rises in interest rates, but can also be a mitigating factor when rates fall in periods of stress. The stock of interest-only loans to owner-occupiers fell from 31% in Q3 2013 to 23% in Q1 2016 (this also has implications for the collateral stretch). Such factors create potential for indirect risks to the economy and financial system from household indebtedness, e.g. if incomes fall or interest rates rise without being accompanied by income growth. Micro data show evidence that high levels of household debt have been associated with deeper downturns and more protracted recoveries in the United Kingdom and internationally.¹⁶⁹ However, the decrease in the share of highly indebted households (i.e. with a debt-to-income ratio of above 5) indicates some decrease in the risk of vulnerabilities that may arise due to income and interest rate shocks.

Most of the increase in net lending has been in the BTL market driven by structural factors and strong competition. Mortgage lending to owner-occupiers has remained very subdued since the financial crisis. Although the BTL market is more sensitive to interest rate shocks and the impact of individual loans on lenders' balance sheets is potentially larger given higher loss given default, the risks from indebtedness stem largely from lending to owner-occupiers who cut back consumption following a shock in order to meet mortgage payments. As BTL investors do not account for a significant share of aggregate income and they can sell their properties if unable to repay their loans, they present less of a risk via the indebtedness channel. However, BTL investors have the potential to amplify housing cycles, as they are more likely to sell if RRE prices are expected to fall. However, any decline in interest rates, which protects the cash flow of the investment, should mitigate this channel. The stamp duty tax increase introduced in April 2016 (for BTL and second homes), the mortgage interest tax relief caps to be introduced in 2017 and the PRA Supervisory Statement were expected to slow growth in BTL mortgage lending, even prior to the outcome of the EU referendum.

The UK authorities have taken several initiatives to influence lending standards and thus to reduce the household stretch. Following an extensive review of lending standards (Mortgage Market Review, MMR), the FCA introduced new rules for lending standards in April 2014. Key elements are a stricter affordability assessment for borrowers, formalised requirements for income verification and the requirement for a credible repayment strategy for borrowers receiving an interest-only loan. New interest-only loans have decreased significantly from 34% (Q1 2008) to 1.6% (Q1 2016).

As a result of the 2013 review of interest-only mortgages, banks are now requested to encourage existing customers with interest-only mortgages to switch to repayment mortgages. There is evidence that this measure was successful, as the stock of interest-only loans fell by 34% between end-2012 and Q1 2016, around two-thirds of which was due to redemption of interest-only loans before their maturity date.

¹⁶⁸ For example, the structural fall in interest rates in recent decades suggests that a higher debt level than previously may be sustainable. And the sustainable level of indebtedness is also likely to vary between countries.

¹⁶⁹ See Bank of England (2014) as above fn. 76.



In June 2014 the FPC recommended the use of an interest rate stress test to assess whether borrowers could still afford their mortgage if Bank Rate were 3 p.p. higher at any point over the first five years of the loan. This is particularly important given the low level of interest rates and many variable rate contracts. This policy locked in banks' practices at the time. Since then, stressed interest rates have remained at about 7% despite actual mortgage rates at origination continuing to trend down.

A loan-to-income (LTI) flow limit became effective for loans extended from October 2014 to prevent a further rise in the share of new lending at higher LTI multiples and high household indebtedness. Mortgage lenders should not extend more than 15% of their total number of new residential mortgages at LTI ratios of 4.5 or more. The limit is applied on a lender-by-lender threshold. It does not cover buy-to-let and remortgages without increased principal. The share of new mortgages extended with high LTI ratios fell back by 1 p.p. to 7.6% over the year to Q2 2015; however, it has since risen again to around 9% as at Q1 2016. Although the current overall share of LTIs above 4.5 is significantly lower than 15%, this measure had a direct impact on individual lenders who took action to avoid breaching the limit and an indirect impact on market sentiment. Since the policy was introduced in 2014, the share of very high LTIs (i.e. more than 5) has decreased from 3% in Q2 2014 to 1% in Q1 2016.

The PRA has also looked more closely at BTL lending standards given the rapid growth in BTL mortgage lending. A review revealed that some lenders apply somewhat looser standards. As a consequence, the PRA issued supervisory guidance regarding minimum standards for BTL mortgage contracts, also including affordability tests and interest rate stress tests. Even prior to the outcome of the referendum, growth in BTL mortgage lending was expected to slow down, because of upcoming tax changes (an increase in stamp duty and a reduction in mortgage interest tax relief) as well as the release of the PRA's Supervisory Statement.

Following the UK's referendum on EU membership in June 2016, the outlook for the UK economy has been revised down – thus, the build-up of risk through the household income and collateral stretch channels may have abated, although the probability of risks through these channels materialising may have increased. If they were to materialise, the associated negative household income and wealth effects (e.g. if households need to reduce consumption in order to service their mortgage loans) may reinforce the initial shock with negative direct and indirect effects on financial stability. On 3 August the Bank of England's Monetary Policy Committee introduced a package of measures to support the economy (including an interest rate reduction and measures to ensure that lower rates pass through to the real economy). These measures should also support mortgagors and the housing market, and might lower the risk of crystallisation of household stretch vulnerabilities.

Conversely, it is also possible that the slowdown in the housing market could prove to be temporary and, after a pause, RRE prices, mortgage approvals and household debt could begin to grow again. In this scenario, household stretch vulnerabilities would continue to rise in the medium term.

Collateral stretch

Risks related to collateral stretch have been a growing vulnerability in recent years: RRE prices have been growing rapidly from already high levels and have been decoupling from rent and



income growth rates.¹⁷⁰ The recent IMF Article IV consultation¹⁷¹ discussed that RRE price growth has been more than three times income growth recently and the price-to-rent ratio has risen steeply since late 2012 (134% in Q1 2016).

The significant amount of collateralised RRE loans (approximately 69% relative to annual GDP) indicates the negative effects that difficulties in RRE could have on financial stability and the real economy. BTL lending has been the biggest contributor to net mortgage lending growth, but accounts only for 17% of the flow of gross mortgage lending.¹⁷² This is partly due to owner-occupiers paying down and redeeming their mortgages, while BTL lending is mainly on interest-only terms. While BTL investors rarely borrow at high LTVs¹⁷³, their mortgages tend to be extended on interest-only terms meaning that the loan value can remain significant on lenders' balance sheets.

Mortgages in the UK generally have somewhat high loan-to-value ratios at origination relative to other countries. The median LTV on the flow of new UK mortgage loans is around 75% at present, a small drop from the 80% level before the financial crisis. However, the majority of loans amortise over time and the share of mortgages with an LTV higher than 75% is only around 16% and the share of mortgages with an LTV higher than 90% is only around 1.3% (Q1 2016). Furthermore, despite the low risk weights (RWs) recorded for mortgages (i.e. average RWs of 11%), the FPC has imposed a minimum leverage ratio on banks of 3%, which imposes an effective minimum portfolio average risk weight of 35%. In addition, the FPC and PRA have capitalised banks against very severe nominal RRE price falls through stress testing (i.e. the stress scenarios included a 35% and 20% fall in RRE prices for 2014 and 2015, respectively).¹⁷⁴

Some of the above-mentioned policy measures also target collateral stretch. The reduction of new and existing interest-only loans for owner-occupiers will reduce the LTV ratios in the portfolio and decrease the loss given default, *ceteris paribus*. The new guidelines for BTL lending could have similar effects – anchoring affordability will help anchor LTV ratios given that a rise in LTV ratios will make loans less affordable. Given that RRE price downturns are an important feature of stress tests used to determine capital adequacy, banks might have an incentive to reduce high LTV ratios (for more details, see below under banking stretch), especially considering the very sharp falls in RRE prices embedded in the stress scenarios.

It is difficult to judge whether prices are over/undervalued as there are differing signals from different indicators. Models that take into account the current low level of interest rates, such as those used by the Bank of England, suggest that there are no signs of fundamental overvaluation. Nonetheless, standard valuation metrics, such as the price-to-rent and price-to-income ratios, indicate that RRE price growth has been decoupling from rent growth and income growth, though these measures do not take into account structural factors such as the fall in long-term interest rates. In the UK, both price-to-income and price-to-rent indicators have been rising rapidly in recent years relative to other EU countries (see Table C.1 in Annex C). And, on these metrics, London prices look more stretched relative to other regions. The nominal RRE price level exceeded its pre-

¹⁷⁰ Though these measures do not take into account structural factors such as the fall in long-term interest rates.

¹⁷¹ IMF (2016) as above fn. 159.

¹⁷² Buy-to-let amounts to around 17% of the stock of secured lending.

¹⁷³ Only 10% of the BTL is at an LTV>75%, and only 3% is at an LTV>80%.

¹⁷⁴ *Stress testing the UK banking system: 2015 results*, Bank of England, December 2015.



crisis peak in 2015, although, of course, this is in the context of much lower long-term interest rates (in real terms, RRE prices remain below pre-crisis peaks).

According to an average of lenders measure, RRE price growth slowed on a three month-on-three month annualised basis to 4.4% in June, from a peak of 8.8% in February. If there are concerns that prices are overvalued, or if RRE price increases continue, any future price correction will have a negative impact on the housing collateral value. RRE price rises have been driven by the slow response of supply (e.g. as a result of restrictive planning regulations) to the higher level of demand. Further RRE price rises may be expected in the medium term if these supply and demand imbalances continue. However, the weaker outlook for the housing market following the UK's referendum on EU membership may suggest a period of slower growth and potentially even falling prices in (some parts of) the UK. However, due to the unusual nature of the shock, there is a high degree of uncertainty about future RRE price developments at present.

Banking stretch

Given the potential for collateral stretch vulnerabilities and the fact that mortgages account for approximately two-thirds of UK banks' total lending to the real economy, there may be a related banking stretch in the future. Nevertheless, the annual stress-test programme should ensure that the UK banking system is well capitalised against adverse scenarios, including scenarios of significant RRE price falls. These stress tests ensured banks were capitalised not just to withstand the stress, but also to maintain the supply of lending throughout. The RRE price shock in the annual stress-test scenario will increase with the size of imbalances in the housing market. This will guard against banking stretch in the future, by ensuring that the amount of capital banks hold against mortgage lending rises if policymakers judge that RRE prices are above equilibria, with elevated risks of a fall.

Nevertheless, the economic outlook has deteriorated since the referendum. As a result, the probability of default on mortgages may rise somewhat (as some households may find it more challenging to service their debt if unemployment rises or income growth falls, etc.). If accompanied by a fall in some property prices, this could lead to losses for banks.

Analysis by the Bank of England suggests that any potential deterioration in unemployment as a result of the referendum decision, and any fall in the level of RRE prices, will be much less severe than the types of scenarios under which UK banks have been stress-tested in recent years. Results of the stress test were taken into account in the evaluation of capital adequacy of individual banks and led to higher capital requirements for banks with higher vulnerabilities. These stress tests ensured banks were capitalised not just to withstand the stress, but also to maintain the supply of lending throughout. The 2014 stress test, for example, incorporated a 35% fall in RRE prices and a near doubling in unemployment (to around 12%). This compares with a small fall in RRE prices in the MPC's central forecast and a small increase in unemployment to around 5.6% in 2018. The 2016 stress test will again contain a severe adverse scenario for residential and commercial real estate. Given this, it seems that UK banks would be resilient enough to withstand a housing market shock if household and collateral stretch vulnerabilities were to crystallise in the near term.



Table UK.3

Additional information on instruments and data available to micro and macro supervisory authorities – The United Kingdom

Do the macro and micro supervisory authorities have the powers necessary to implement/amend policy quickly and effectively if/when required?

The FPC regularly monitors risks to financial stability stemming from the housing market; has a range of tools at its disposal to take action to mitigate those risks, rapidly and within a clear framework; and has adequate data to assess risks and calibrate its tools. The FPC was granted powers of Direction by the Government over loan-to-value and debt-to-income limits for lending to owner-occupiers of residential property in February 2015 and the Treasury has consulted on giving powers of direction to the FPC on buy-to-let mortgage lending and will respond to that consultation in the coming months. The FPC has the power to make recommendations to the regulators – the PRA and the FCA – about the exercise of their functions, such as to adjust the rules facing banks and other regulated financial institutions. The FPC is also able to make recommendations to HM Treasury, including on additional macroprudential tools that the Committee considers that it may need, and on the “regulatory perimeter” – that is, both the boundary between regulated and non-regulated activities within the UK financial system, and the boundaries of different regulators within the regulated sector. The FPC also has a broader power to make recommendations to any other persons. For example, this power allows the FPC to make recommendations directly to the industry or to independent bodies such as the Financial Reporting Council.

The FPC and the PRA Board design stress tests annually and use those to inform the setting of capital buffers for participating firms. The PRA has the power to set firm-specific capital buffers (the PRA buffer) and the FPC has the ability to set system-wide capital buffers via the countercyclical capital buffer and a power of direction over sectoral capital requirements, which enables the FPC to change capital requirements on exposures of banks to specific sectors that are judged to pose a risk to the stability of the financial system as a whole.

The FPC also has powers of Direction over leverage ratio requirements and buffers for banks, building societies and PRA-regulated firms.

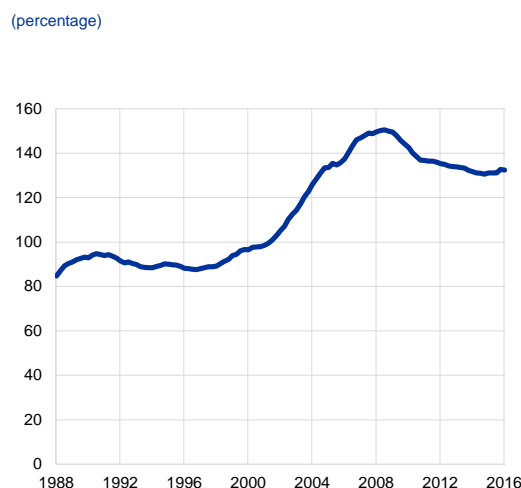
Do the macro and micro supervisory authorities have the necessary data to monitor the risks and the impact of policy measures?

There do not seem to be data issues that would hamper the implementation of certain policies. The UK authorities are collecting a wide range of data, including, amongst others, loan-level data on the flow of new mortgage lending as well as core financial and economic indicators, which they are periodically reviewing in conjunction with analysis of the drivers of movements.

Annex with charts

Chart UK.1

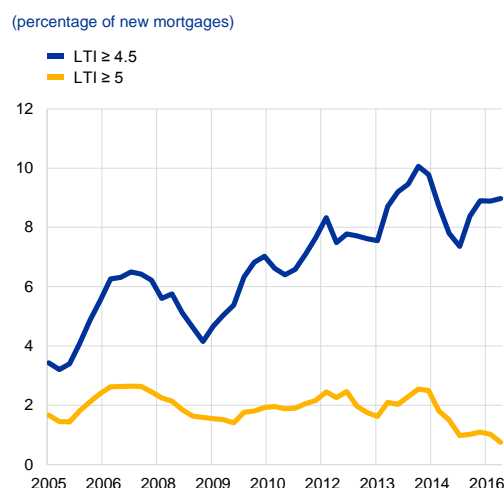
Household debt-to-income ratio



Sources: Office for National Statistics and Bank of England calculations. Notes: Gross debt as a percentage of a four-quarter moving sum of disposable income. Includes all liabilities of the household sector except for the unfunded pension liabilities and financial derivatives of the non-profit sector. The household disposable income series is adjusted for financial intermediation services indirectly measured (FISIM).

Chart UK.2

Loan-to-income multiples for new mortgages

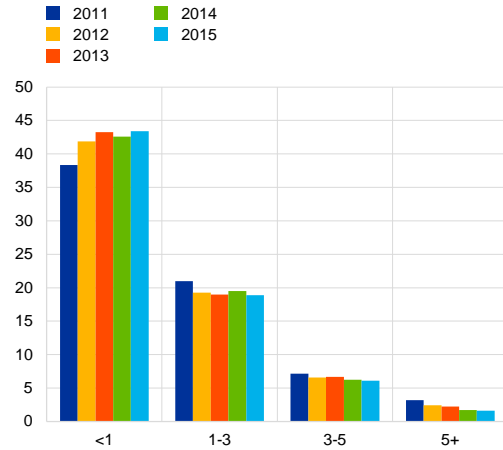


Sources: FCA Product Sales Database and Bank of England calculations. Notes: FCA Product Sales Database includes regulated mortgage contracts only. LTI ratio calculated as loan value divided by the total reported gross income for all named borrowers. Chart excludes lifetime mortgages, advances for business purposes and remortgages with no change in the amount borrowed.



Chart UK.3
Distribution of household debt-to-income ratios

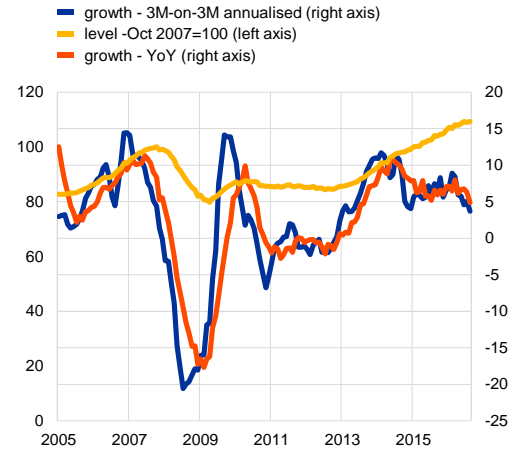
(x-axis: total household debt-to-income ratio; y-axis: percentage of households)



Sources: NMG Consulting survey and Bank of England calculations.

Chart UK.4
UK house prices

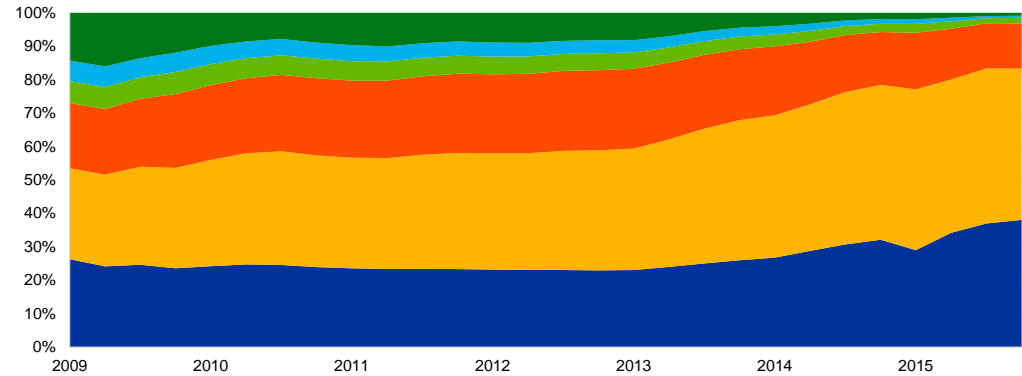
(percentage)



Sources: Halifax/Markit, Nationwide and Bank of England calculations. Notes: House prices are an average of the Halifax and Nationwide measures. Nationwide house price data have been seasonally adjusted by Bank of England staff.

Chart UK.5
Major lenders' mortgage books by indexed LTV

Legend for indexed LTV categories:
 0% < LTV <= 50% (dark blue)
 50% < LTV <= 75% (orange)
 75% < LTV <= 90% (red)
 90% < LTV <= 95% (green)
 95% < LTV <= 100% (light blue)
 100% < LTV (dark green)

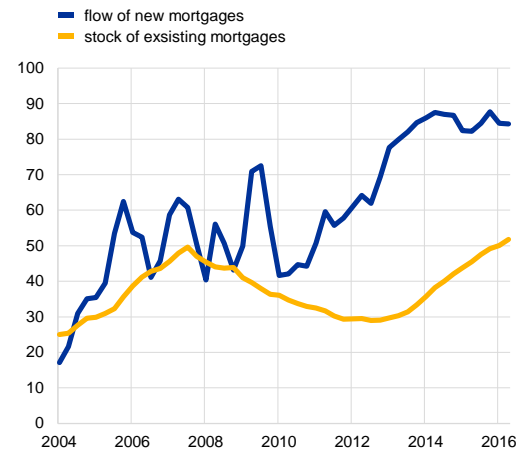


Source: Bank of England regulatory data.



Chart UK.6 Share of mortgages on fixed rates

(percentage on a fixed rate)



Source: Bank of England.



Conclusions

The analysis in this report forms the basis for the warnings issued by the ESRB on medium-term vulnerabilities in the residential real estate sectors of eight EU Member States. On 22 September, the ESRB General Board adopted warnings to eight Member States about medium-term vulnerabilities in their residential real estate sectors.¹⁷⁵ The macroprudential rationale for why developments in the RRE sector can have significant implications for financial stability and the real economy and the country-specific analysis behind these warnings are presented in this report.

Some EU Member States have been identified as having certain medium-term vulnerabilities related to RRE that are a source of systemic risk to financial stability. An EU-wide quantitative analysis identified those countries with vulnerabilities that have the potential to become material risks in the medium term. This set of focus countries was then subject to country-specific analysis, which took into account the wider institutional and structural context and relevant policy measures. Based on this analysis, the ESRB concluded that medium-term vulnerabilities relating to residential real estate which are a source of systemic risk to financial stability prevail in Austria, Belgium, Denmark, Finland, Luxembourg, the Netherlands, Sweden and the United Kingdom; the ESRB subsequently issued warnings to these Member States. In Estonia, Malta and Slovakia, the ESRB considers that there are vulnerabilities in residential real estate, but that they are mitigated by institutional factors or current prudential policies, which are expected to be sufficient in addressing them.

Work is under way to fill data gaps and improve data quality to facilitate more informed assessments of RRE-related vulnerabilities, as well as to develop the methodology for country-based assessments of real estate vulnerabilities and the effectiveness of the related prudential policies. The ESRB is aware of the shortcomings of many of the indicators used to assess vulnerabilities in RRE. To address these shortcomings, a dedicated expert group was established by the ESRB to seek to harmonise, improve and collect key indicators fit for cross-country comparisons. Based on analysis by the expert group, on 31 October 2016 the ESRB adopted a Recommendation on closing real estate data gaps (Recommendation ESRB/2016/14). With this recommendation, which covers both the residential and commercial real estate sectors, the ESRB aims to establish a more harmonised framework for monitoring developments in real estate markets in the EU. The recommendation provides a common set of indicators that national macroprudential authorities are recommended to monitor in assessing risks originating from the real estate sector along with working definitions of these indicators.¹⁷⁶ Such improvements in data quality and access are vital given the importance of RRE for financial stability and macroprudential policy. In addition, given the methodological challenges encountered during this work, in the medium term the ESRB aims to develop a more quantitative framework for country-based assessments of real estate vulnerabilities and the effectiveness of the related prudential policies.

¹⁷⁵ The eight warnings are numbered as follows: ESRB/2016/05 (Austria); ESRB/2016/06 (Belgium); ESRB/2016/07 (Denmark); ESRB/2016/08 (Finland); ESRB/2016/09 (Luxembourg); ESRB/2016/10 (the Netherlands); ESRB/2016/11 (Sweden); and ESRB/2016/12 (the United Kingdom).

¹⁷⁶ The ESRB monitors compliance with its recommendations via an "act or explain" mechanism. The deadline for implementing the recommendation on closing real estate data gaps is end-2020.



Further efforts are needed to ensure that macroprudential authorities have suitable macroprudential instruments at their disposal in order to effectively address vulnerabilities arising from RRE. A wide range of measures have been used by Member States in order to address the household, collateral and banking stretches. Commonly used macroprudential measures include LTV limits, guidelines and recommendations to tighten lending standards, and risk-weight adjustments. Beyond macroprudential instruments, policies that influence the incentives of RRE investors or borrowers, such as changes to tighten the tax treatment of property or RRE loans or amortisation requirements, have also been applied in several countries. However, there are also examples of national authorities being constrained in their ability to target RRE risks directly due to a lack of appropriate instruments within their control. This is particularly the case for borrower-based measures that are not currently included in the EU legislation, such as LTI, DTI or LTV limits. As these instruments have often proven to be efficient in addressing systemic risks, they should be available to macroprudential policymakers in all EU Member States. However, the ESRB is also of the view that such instruments – including decisions concerning their design, implementation and application – should be in the hands of national macroprudential authorities.

Going forward, the ESRB will continue exercising its mandate for macroprudential oversight of the EU financial system, including identifying risks related to RRE in the EU. The ESRB will continue to monitor risks related to residential real estate in the EU, and where needed, issue warnings and recommendations.



List of tables and charts¹⁷⁷

Table E.1	Summary assessments: focus countries
Chart 1.1	Importance of RRE for households, banks and the real economy
Table 1.1	Overview: repercussions from RRE-related crises
Chart 1.2	Housing busts and recessions: the role of credit
Chart 1.3	Interactions between house prices and household indebtedness
Table 2.1	Vulnerabilities in RRE across the EU: results from the indicator-based horizontal assessment
Chart 2.1	Developments in collateral and household stretch
Table 2.2	Economic outlook in EU countries
Table 2.3	Banking stretch related to residential real estate: key indicators
Table 2.4	Structural and institutional features in RRE markets in selected countries
Table 2.5	Macroprudential policy measures, by the type of RRE risks they may directly address
Chart 2.2	IMF event study estimates of the impact of macroprudential tools on mortgage credit and house prices
Table AT.1	Summary assessment – Austria
Table AT.2	Summary of risks and policy measures – Austria
Table AT.3	Additional information on instruments and data available to micro and macro supervisory authorities – Austria
Table BE.1	Summary assessment – Belgium
Table BE.2	Summary of risks and policy measures – Belgium
Table BE.3	Additional information on instruments and data available to micro and macro supervisory authorities – Belgium
Table DK.1	Summary assessment – Denmark
Table DK.2	Summary of risks and policy measures – Denmark
Table DK.3	Additional information on instruments and data available to micro and macro supervisory authorities – Denmark
Table EE.1	Summary assessment – Estonia

¹⁷⁷ List does not include those charts presented alongside the country-specific analysis in Section 2.2.2 of the report.



Table EE.2	Summary of risks and policy measures – Estonia
Table EE.3	Additional information on instruments and data available to micro and macro supervisory authorities – Estonia
Table FI.1	Summary assessment – Finland
Table FI.2	Summary of risks and policy measures – Finland
Table FI.3	Additional information on instruments and data available to micro and macro supervisory authorities – Finland
Table LU.1	Summary assessment – Luxembourg
Table LU.2	Summary of risks and policy measures – Luxembourg
Table LU.3	Additional information on instruments and data available to micro and macro supervisory authorities – Luxembourg
Table MT.1	Summary assessment – Malta
Table MT.2	Summary of risks and policy measures – Malta
Table MT.3	Additional information on instruments and data available to micro and macro supervisory authorities – Malta
Table NL.1	Summary assessment – The Netherlands
Table NL.2	Summary of risks and policy measures – The Netherlands
Table NL.3	Additional information on instruments and data available to micro and macro supervisory authorities – The Netherlands
Table SK.1	Summary assessment – Slovakia
Table SK.2	Summary of risks and policy measures – Slovakia
Table SK.3	Additional information on instruments and data available to micro and macro supervisory authorities – Slovakia
Table SE.1	Summary assessment – Sweden
Table SE.2	Summary of risks and policy measures – Sweden
Table SE.3	Additional information on instruments and data available to micro and macro supervisory authorities – Sweden
Table UK.1	Summary assessment – The United Kingdom
Table UK.2	Summary of risks and policy measures – The United Kingdom
Table UK.3	Additional information on instruments and data available to micro and macro supervisory authorities – The United Kingdom



Abbreviations

ASC	(ESRB) Advisory Scientific Committee	DSR	debt service ratio	FPC	Financial Policy Committee (UK)	MIR	MFI interest rates
ATC	(ESRB) Advisory Technical Committee	DSTI	debt service-to-income (ratio/limit/cap)	FSA	Financial Supervision Authority, Financial Supervisory Authority	MUFA	Monetary Union Financial Accounts
BCBS	Basel Committee on Banking Supervision	DTI	debt-to-income (ratio/limit/cap), debt-to-disposable income (ratio/limit/cap)	FSC	Financial Stability Committee	NBB/BNB	Nationale Bank van België/Banque Nationale de Belgique
BIS	Bank for International Settlements	EBA	European Banking Authority	FSR	Financial Stability Report	NBS	National Bank of Slovakia
BRRD	Bank Recovery and Resolution Directive	EC	European Commission	FX	foreign exchange	NFA	National Financial Accounts
BSI	balance sheet items	ECB	European Central Bank	GDP	gross domestic product	NPL	non-performing loan
BTL	buy-to-let	ECON	Committee on Economic and Monetary Affairs of the European Parliament	HH	household	OECD	Organisation for Economic Co-operation and Development
CBD	consolidated banking data	EEA	European Economic Area	I/O	interest-only (loan)	OeNB	Oesterreichische Nationalbank
CESEE	Central, eastern and south-eastern Europe	EIOPA	European Insurance and Occupational Pensions Authority	IAS	International Accounting Standards	O-SII	other systemically important institution
CCoB	capital conservation buffer	EMIR	European Market Infrastructure Regulation	IFRS	International Financial Reporting Standards	p.p.	percentage point(s)
CCP	central counterparty	EMU	Economic and Monetary Union	ILTV	indexed LTV	PRA	Prudential Regulation Authority (UK)
CCyB	countercyclical capital buffer	ESA 2010	European System of Accounts 2010	IMF	International Monetary Fund	PTI	price-to-income (ratio/index)
CDS	credit default swap	ESCB	European System of Central Banks	IRB	internal ratings-based (approach)	PTR	price-to-rent (ratio/index)
CET1	Common Equity Tier 1	ESRB	European Systemic Risk Board	LCR	liquidity coverage ratio	RRE	residential real estate
CRD	Capital Requirements Directive	EU	European Union	LGD	loss given default	RW	risk weight
CRD IV	Capital Requirements Directive IV	FCA	Financial Conduct Authority (UK)	LTI	loan-to-income (ratio/limit/cap)	SA	standardised approach
CRR	Capital Requirements Regulation	FI	Finansinspektionen (Swedish FSA)	LTV	loan-to-value (ratio/limit/cap)	SDW	(ECB) Statistical Data Warehouse
CSSF	Commission de Surveillance du Secteur Financier (Luxembourg)	FIN-FSA	Finanssivalvonta (Finnish FSA)	MCI	mortgage credit institution	SMEs	small and medium-sized enterprises
DNB	De Nederlandsche Bank (ECB)	FMA	Finanzmarktaufsicht (Austria)	MFI	monetary financial institution	SRB	systemic risk buffer
DG/MF	Directorate General Macroeconomic Policy and Financial Stability	FMSB	Financial Market Stability Board (Austria)	MID	mortgage interest deductibility		



Country abbreviations

AT	Austria
AU	Australia
BE	Belgium
BG	Bulgaria
CA	Canada
CH	Schweizerland
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
JP	Japan
KR	South Korea
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
MX	Mexico
NL	Netherlands
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom
US	United States



List of contributors¹⁷⁸

Banca d'Italia	Mr Francesco Zollino *
Banco de España	Mr Christian E. Castro **
Sveriges Riksbank	Mr Robert Emanuelsson **
ESRB Secretariat	Mr Tuomas Peltonen ***
* Leader of the Methodology Team	
** Leaders of the Country Teams	
*** Coordinator	
Bank of England	Ms Tracy Wheeler
Banque centrale du Luxembourg	Mr Gabriele Di Filippo
Banque de France	Mr Antoine Lalliard
Bulgarian National Bank (Българска народна банка)	Mr Mihail Mihaylov
Bulgarian National Bank (Българска народна банка)	Ms Silvia Prokopieva
Central Bank of Cyprus (Κεντρική Τράπεζα της Κύπρου)	Ms Elena Mousarri
Central Bank of Malta	Ms Alexia Pisani
Central Bank of Malta	Ms Wendy Zammit
Česká národní banka	Ms Hana Hejlova
Commission de Surveillance du Secteur Financier	Mr Bob Muller
Danmarks Nationalbank	Mr Malte Lisberg Jensen
Danmarks Nationalbank	Mr Morten Hedegaard Rasmussen
Danmarks Nationalbank	Mr Oliver Juhler Grinderslev
De Nederlandsche Bank	Mr Remco Molen
Deutsche Bundesbank	Mr Michael Richter
Deutsche Bundesbank	Ms Nataliya Barasinska
ECB	Ms Marianna Caccavaio
ECB	Ms Federica Ciocchetta
ECB	Mr Benjamin Klaus
ECB	Ms Anne Koban
ECB	Mr Marco Lo Duca
ECB	Mr Giulio Nicoletti
Eesti Pank	Mr Hanno Kase
ESRB Secretariat	Mr Sampo Tapio Alhonsuo
ESRB Secretariat	Ms Marisa Basten
ESRB Secretariat	Mr Elias Bengtsson
ESRB Secretariat	Mr Morten Niels Haastrup
ESRB Secretariat	Mr Etienne Lepers
ESRB Secretariat	Ms Katie Rismanchi

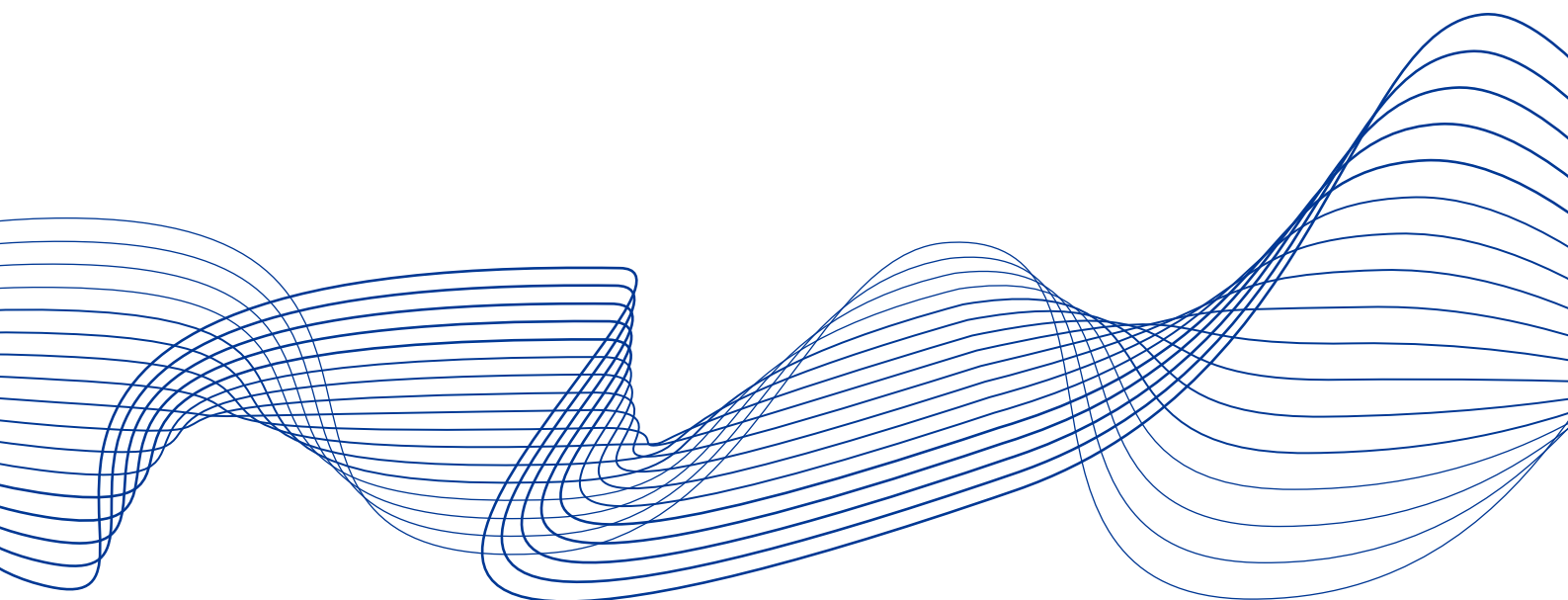
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ESRB Secretariat	Mr Virgilijus Rutkauskas
Financial Supervision Commission	Ms Kalina Hadjinedelcheva
Financial Supervision Commission	Ms Sashka Asparouhova
Finansinspektionen	Mr Johan Berg
Finansinspektionen	Mr Roland Nilsson
Finanssivalvonta (FIN-FSA)	Mr Peik Granlund
Finanstilsynet	Mr Theis Jørgensen
Finanzmarktaufsicht (FMA)	Mr Timo Broszeit
HANFA	Mr Mario Radaković
Hrvatska Narodna Banka	Ms Dragica Sitar
Hrvatska Narodna Banka	Ms Ivana Herceg
Lietuvos Bankas	Mr Vaidotas Šumskis
Magyar Nemzeti Bank	Mr Sándor Winkler
Národná banka Slovenska	Mr Pavol Latta
Narodowy Bank Polski	Ms Joanna Waszczuk
Nationale Bank van België/Banque Nationale de Belgique	Mr Thomas Schepens
Nationale Bank van België/Banque Nationale de Belgique	Ms Mara Pirovano
Norges Bank	Mr Sverre Mehlum
Oesterreichische Nationalbank	Mr Gernot Ebner
Suomen Pankki – Finlands Bank	Ms Hanna Putkuri



Annexes



Contents

Annex A – Overview of process and mandates	171
Annex B – Methodology – Horizontal method	173
Annex C – Additional key indicators for focus countries	178
Annex D – Overview of assessments by third parties	181



Annex A

Overview of process and mandates

Team-based organisational framework

In order to ensure a fair and independent treatment of each country taking into account all relevant factors, a team-based organisational framework was developed. In total, there were five teams (shown in [Table A.1](#)) comprising representatives of Member States and the ESRB Secretariat which prepared the analysis. The final assessments of the focus countries were prepared by the Country Teams and the ESRB Secretariat, which were supported by the RRE Methodology Team, the ESRB Assessment Team on Macroprudential Measures and representatives of the focus countries. The mandate and tasks of the different groups are shown in [Table A.1](#) and the list of participants is shown in the report.

In order to ensure consistency in the assessments, the Methodology Team developed a methodology to judge the appropriateness and sufficiency of policy measures given residential real estate (RRE) risks. However, the intention was not to ensure complete equivalence in the final assessments; each country was assessed individually, since all have a unique institutional, macroeconomic and policy environment. While a qualitative framework was used to supplement the quantitative approaches in the horizontal analysis (described in more detail in [Annex B](#)) and for the detailed country analysis (“vertical analysis”), data were still central to the analysis of the Country Teams. Expert judgement and interactions with country representatives were used to interpret metrics for each country. [Annex C](#) shows the values for different countries of key indicators that are mentioned in the report.



Table A.1

Mandates for the different teams of the ESRB Task Force for RRE

RRE Task Force: core participant groups	Main tasks	Additional information
Country Teams (A and B)	<p>The Country Teams made their assessment from an RRE risk perspective. For each of the vulnerabilities identified, the Country Teams assessed whether these could pose a significant risk to financial stability. They took account of the relevant policy measures in the country that could mitigate identified risks.</p> <p>The focus countries were divided between Country Teams to reduce the burden on the team members. Each Country Team had a chair; the two chairs sought to maintain the consistency of approaches across countries.</p> <p>A broad set of policies were taken into account, including prudential policies and fiscal or structural measures. Measures were taken into account if they had already been implemented or if it was confirmed that it had been decided to implement them.</p>	<p>The Country Teams interacted mainly via emails and telephone calls. A face-to-face meeting was held in April 2016 to discuss topics with country representatives.</p>
Methodology Team	<p>Assess the analytical framework used by the ESRB Secretariat and the ECB for the horizontal analysis of the vulnerabilities and provide concrete proposals on how to improve it.</p> <p>Assess the templates that were used by the Country Teams and provide concrete proposals on how to improve them.</p> <p>Propose criteria to the ESRB Assessment Team to enable it to make qualitative judgements on the effectiveness of policies (macroprudential, microprudential and other economic policies) addressing risks from residential real estate.</p>	<p>The Methodology Team interacted through several teleconference meetings and a face-to-face meeting in Frankfurt.</p> <p>A workshop to further develop the analytical framework for future use took place in July 2016.</p>
ESRB Assessment Team on Macroprudential Measures	<p>It was assessed whether the prudential policies that a country has implemented are appropriate and sufficient to address the risks identified in that country.</p> <p>The Assessment Team took account of policies of a macroprudential or microprudential nature related to residential real estate that have been implemented or are being planned by the responsible national authority/authorities. Other policies (e.g. fiscal or structural policies) were noted as mitigating or amplifying factors.</p> <p>The Assessment Team provided input to the Country Teams relating to policy assessments.</p>	<p>The assessment was guided by the framework provided by the Methodology Team.</p> <p>Individual teleconference meetings were organised to discuss each of the eleven focus countries.</p>
Representatives from national authorities in the focus countries ("Country representatives")	<p>Submitted self-assessments to the ESRB Secretariat and Country Teams, providing details on their own assessment of RRE-related vulnerabilities and policies in their respective countries.</p> <p>Interacted with the Country Teams and the ESRB Secretariat in order ensure maximum agreement, clarify data issues, provide information, etc.</p>	<p>The country representatives participated in the teleconference meetings of the ESRB Assessment Team on Macroprudential Measures and also attended the face-to-face meeting in April 2016 to discuss topics with the Country Teams.</p> <p>They interacted with the other teams and the ESRB Secretariat on multiple occasions at ESRB meetings and via emails and telephone calls.</p>



Annex B

Methodology – Horizontal method

The current RRE risk assessment framework has been developed jointly with the ECB (Directorate General Macroeconomic Policy and Financial Stability, DG/MF) in order to reach convergence of risk identification and assessment methodologies between the ECB and the ESRB. The framework builds on earlier ECB (DG/MF) and ESRB approaches to RRE analysis.

The RRE risk assessment framework consists of three steps: (1) preliminary screening of vulnerabilities in RRE markets (RRE prices, lending conditions, household balance sheets) focusing on the detection of “exuberant” developments; (2) analysis of the strength of the expansion in RRE markets; and (3) assessment of banking sector resilience and potential aggravating/mitigating institutional and structural factors.

In the first step, vulnerable RRE markets were identified on the basis of indicators covering RRE prices, lending conditions and household balance sheets. The indicators used in this first step are summarised in a scoreboard table, which consists of a heat map with relevant risk thresholds and summary indicators to facilitate country rankings (Table 2.1 in the report). The indicators in the scoreboard capture three risk categories and are explained in detail in **Table B.1**. Specifically, the categories are:

- RRE pricing: indicators capture potentially “exuberant developments in RRE markets”, which relate also to stretched collateral values (and can feed into lending conditions);
- lending conditions: indicators capture potentially “exuberant developments in lending conditions”, which can relate to underpricing of risk and might also feed into RRE price developments;
- household balance sheets: indicators capture household vulnerabilities, which relate to potential credit risk and its dynamics.

The scoreboard thresholds are guided by model evidence where possible and by the distribution of the indicators, and the plausibility is checked on the basis of expert judgement. The dates of the observations underlying the scoreboard are reported in **Table B.2**.

Two composite indicators, summarising the level of vulnerabilities in one country, are used to facilitate an initial country ranking.

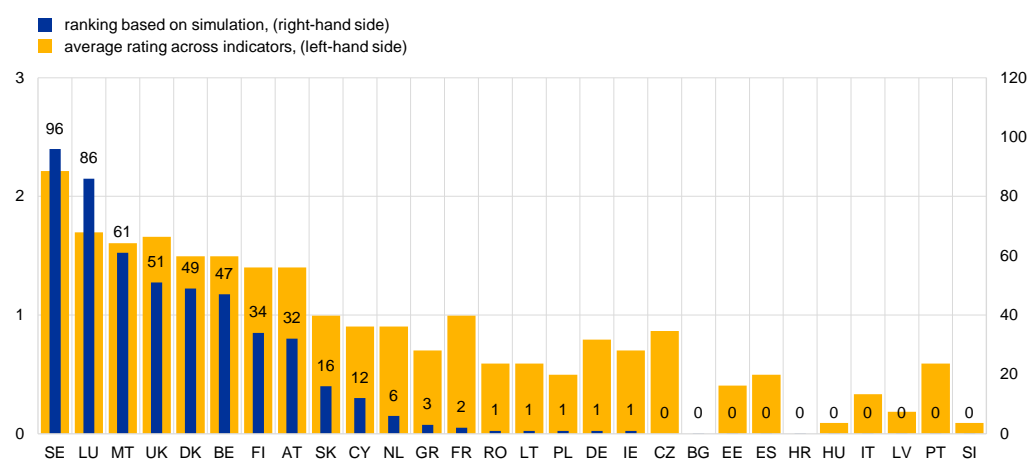
- The **average rating across indicators** (penultimate column of the scoreboard) is an equally weighted average of a discrete transformation of the individual indicators. Each indicator is assigned a rating from 0 to 3 on the basis of the threshold it breaches (0 = no threshold breached, 3 = highest threshold breached, indicating high risk). The summary indicator is simply the average of the ratings of individual indicators. The first threshold of the composite indicator is set at 1 (i.e. individual indicators breaching the first risk threshold on average) and corresponds to a yellow colouring. The 2nd (orange colour) and 3rd (red colour) thresholds are set on the basis of the 80th percentile and the 90th percentile of the distribution of the indicator across countries and over time.
- The **composite indicator** (last column of the scoreboard) reports the average distance (in terms of standard deviation) of indicators from the lowest thresholds. It is calculated as an equally weighted average of the standardised indicators. Standardisation is achieved by deducting the lowest threshold from each indicator and dividing by the standard deviation of the indicator (calculated across countries and over time). The first threshold of the composite



indicator is set at 0 (i.e. individual indicators breaching the first risk threshold on average) and corresponds to a yellow colouring. The 2nd (orange colour) and 3rd (red colour) thresholds are set on the basis of the 80th percentile and the 90th percentile of the distribution of the indicator across countries and over time.

As the resulting ranking of countries according to summary indicators critically depends on the thresholds, the set of indicators used and the weighting scheme used for the aggregation, a number of robustness checks are performed. Specifically, the robustness of the initial country rankings is assessed by: (i) using a composite indicator that does not rely on thresholds (see [Table B.3](#)); and (ii) looking at the ranking of countries stemming from a simulation where the average rating indicator is calculated by using 10,000 sets of random weights (see [Chart B.1](#)). The latter exercise ensures that the ranking is robust to the weighting scheme and does not over-rely on a specific indicator. Finally, in order to ensure that the ranking is not excessively affected by the benchmark thresholds, which in some cases are solely based on judgement, the simulation is repeated in four different settings by moving all the thresholds up by 5% and 10% and down by 5% and 10%.

Chart B.1
Robustness check: simulation using random weights



The second step of the assessment consists in determining the position of a country in the housing cycle in relation to the household and the collateral stretches by looking at indicators capturing the “strength” of the expansion. This is important in order to incorporate cyclical considerations in the policy assessment and, therefore, decide on the appropriate set of policy instruments to address risks. **The analysis on the household and collateral stretches is complemented by an assessment of risks coming from the banking sector stretch (exposures of the banking system to risks and consequent assessment of resilience).**

In a third step, the vulnerable RRE markets are assessed on the basis of institutional and structural factors that might act as amplification or mitigation mechanisms for shocks, as detailed in the relevant section of the report.



Table B.1

Definitions and sources for horizontal risk assessment indicators

Indicator	Description	Data sources
Collateral stretch		
RRE price growth	RRE price index (2007 = 100), 12-month growth, % The indicator measures dynamics of real estate prices with the goal of detecting exuberant price developments. The lower threshold for the indicator is set close to an early warning model threshold with balanced preferences between type I and type II errors.	Macroprudential database (ECB SDW)
RRE price relative to peak prior to 2014	Ratio of current house prices to peak level of house prices before 2014 The indicator is a coarse measure of RRE price overvaluation. The first threshold is arbitrarily set to 0.9 to flag when the RRE price index is close to the historical record.	Macroprudential database (ECB SDW)
RRE valuation measure, house price-to-income ratio	House price-to-disposable income ratio, deviation from long-term average, % The lower threshold for the indicator is set close to an early warning model threshold with balanced preferences between type I and type II errors.	ECB (DG Economics)
RRE valuation measure, econometric model	Deviation of actual house prices from model long-term equilibrium, % For a detailed description of the methodology, see <i>Financial Stability Review</i> , ECB, November 2015, Box 3: Financial Stability Review The lower threshold for the indicator is set close to an early warning model threshold with balanced preferences between type I and type II errors.	ECB (DG Economics)
Lending indicators		
Growth in loans to households for house purchases	Loans to domestic households for house purchases, 12-month growth, % In combination with measures of real estate price growth and price valuations, this provides early indications of the formation of a debt-fuelled housing price bubble. The lower threshold for the indicator is set close to an early warning model threshold with balanced preferences between type I and type II errors.	Balance sheet items (ECB SDW)
Loans to households for house purchases relative to peak prior to 2014	Ratio of current level of loans for house purchases to peak level of loans for house purchases before 2014 The first threshold is arbitrarily set to 1 to flag countries where the stock of mortgages reached levels above earlier peaks.	Balance sheet items (ECB SDW)
Household loan spread	Spread on the lending rate for house purchase This indicator captures the compression of lending spreads which might relate to underpricing of risks and exuberant lending policies. The first threshold is set at the 70 th percentile of the cross-country distribution. Before a weighted average is calculated using the respective loan volumes, a reference rate is subtracted from the interest rates depending on their maturities: 1 year: 3-month EURIBOR or 3-month money market rates 1 to 5 years : 3-year government bond yields if available 5 to 10 years: 7-year government bond yields if available, otherwise 10-year government bond yields 10 years: 10-year government bond yields	Macroprudential database (ECB SDW) ECB MFI interest rate database
Household stretch		
Household debt, % of GDP	This indicator captures households' leverage and relates to the ability of households to withstand shocks. The first threshold is set close to the pre-crisis average across countries.	MUFA and NFA (based on ESA 2010)
Household financial assets-to-debt ratio, %	This indicator captures the ability of households to withstand shocks by comparing the financial wealth of households to debt. The first threshold is set close to the pre-crisis average across countries.	MUFA and NFA (based on ESA 2010)
Debt service-to-income ratio for households, %	This indicator captures debt servicing costs. The lower threshold for the indicator is set close to an early warning model threshold with balanced preferences between type I and type II errors. For more details, see Drehmann, M., Illes, A., Juselius, M. and Santos, M., "How much income is used for debt payments? A new data base for debt service ratios", <i>BIS Quarterly Review</i> , September 2015 BIS Quarterly Review	ECB (DG/MF)



Table B.2

Reference period for scoreboard observations

Country	Reference period									
	Residential real estate price index, 12m growth, %	Residential price index relative to peak prior to 2014	RRE valuation measure, house price to income	RRE valuation measure, econometric model	Loans to HH for house purchases, 12m growth, %	Loans to HH for HP relative to peak prior to 2014	HH Loan spread	HH debt, % of GDP	HH financial assets to debt, %	Debt service to income ratio for HH, %
AT	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
BE	31/03/2016	30/09/2015	31/12/2015	31/12/2015	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
BG	31/12/2014	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
CY	31/03/2016	31/12/2015	31/12/2015	31/12/2015	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
CZ	31/12/2014	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016		31/03/2016	31/12/2015	31/12/2015
DE	31/03/2016	31/03/2016	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
DK	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
EE	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
ES	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
FI	30/06/2015	30/06/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
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HR	31/12/2015	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
HU	30/09/2015	30/09/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2015	31/03/2016	31/12/2015	31/12/2015
IE	31/03/2016	31/03/2016	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
IT	31/03/2016	31/12/2015		31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
LT	31/12/2015	31/12/2015	31/12/2015	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
LU	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
LV	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
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PL	31/12/2015	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/12/2015
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SE	31/03/2016	31/03/2016	31/03/2016	31/03/2016	30/06/2016	31/03/2016		31/03/2016	31/12/2015	31/12/2015
SI	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
SK	31/03/2016	31/12/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016	01/01/2016	31/03/2016	31/12/2015	31/03/2016
UK	30/09/2015	30/09/2015	31/03/2016	31/03/2016	30/06/2016	31/03/2016		31/03/2016	31/12/2015	31/12/2015



Table B.3

Robustness check: scoreboard without thresholds – the percentile rank approach

Country	Indicators										Sum
	Collateral Stretch				Lending Indicators			Household Stretch			
	Residential real estate price index, 12m growth, %	Residential price index relative to peak prior to 2014	RRE valuation measure, house price to income	RRE valuation measure, economic model	Loans to HH for house purchases, 12m growth, %	Loans to HH for HP relative to peak prior to 2014	HH Loan spread	HH debt, % of GDP	HH financial assets to debt, %	Debt service to income ratio for HH, %	
AT	0.84	1.00	1.00	0.86	0.62	1.00	0.91	0.10	0.86	0.10	0.73
BE	0.68	1.00	1.00	0.89	0.42	1.00	0.81	1.00	0.06	0.99	0.78
BG		0.73	0.52	0.40	0.35	0.58	0.76	0.13	1.00	0.05	0.50
CY	0.50	0.38	0.24	0.29	0.33	0.56	0.50	0.33	0.53	0.60	0.43
CZ		0.94	0.78	0.61	0.44	1.00		0.71	0.88	0.68	0.76
DE	0.96	1.00	0.80	0.56	1.00	1.00	0.87	0.03	0.99	0.03	0.72
DK	0.46	0.90	0.85	0.78	0.14	0.96	0.91	0.27	1.00	0.37	0.66
EE	0.27	0.85	0.71	0.46	0.93	1.00	0.93	0.46	0.77	0.25	0.66
ES	0.58	0.65	0.52	0.62	0.26	0.51	0.76	0.39	0.71	0.47	0.55
FI	0.34	0.97	0.88	0.75	0.22	1.00	0.80	0.99	0.39	0.84	0.72
FR	0.32	0.68	0.55	0.48	0.26	1.00	0.91	0.97	0.43	0.60	0.62
GR	0.30	0.24	0.06	0.28	0.26	0.64	0.94	0.13	0.47	0.77	0.41
HR	0.60	0.15	0.21	0.09	0.05	0.09	1.00	0.11	0.94	0.11	0.34
HU	0.82	0.61	0.43	0.28	0.44	0.30	0.95	0.39	0.74	0.42	0.54
IE	0.52	0.72	0.50	0.14	0.14	0.42	0.91	0.11	1.00	0.26	0.47
IT	0.23	0.61		0.42	0.38	0.86	0.74	0.11	0.89	0.58	0.53
LT	0.61	0.86	0.65	0.70	0.62	1.00	0.57	0.33	0.78	0.21	0.64
LU	0.68	0.97	1.00	0.83	0.34	1.00	0.93	1.00	0.34	0.86	0.80
LV	0.63	0.69	0.54	0.12	1.00	0.08	0.94	0.16	1.00	0.13	0.53
MT	0.84	1.00	0.76	0.20	0.24	1.00	0.60	0.48	0.62	0.40	0.61
NL	0.52	0.70	0.39	0.56	0.68	1.00	0.67	0.08	0.92	0.52	0.60
PL	0.79	0.42	0.38	0.05	0.02	0.96	0.93	0.92	0.49	0.56	0.55
PT	0.97	0.59	0.26	0.41	0.22	0.55	0.65	0.39	0.83	0.52	0.54
RO	0.88	0.50	0.33	0.15	0.60	1.00	0.84	0.13	0.84	0.05	0.53
SE	0.97	1.00	1.00	1.00	0.40	1.00		1.00	0.83	0.74	0.88
SI	0.68	0.52	0.34	0.20	0.35	1.00	0.19	0.48	0.64	0.32	0.47
SK	0.67	0.13	0.38	0.04	0.47	1.00	0.18	1.00	0.20	1.00	0.51
UK	0.74	1.00	1.00	0.74	0.45	0.94		0.54	0.71	0.47	0.73
EAA	0.51	0.88	0.65	0.49	0.31	1.00		0.55	0.70		0.64
EAM	0.51	0.88	0.65	0.49	0.31	1.00		0.55	0.70		0.64



Annex C

Additional key indicators for focus countries

Table C.1
Additional key RRE market indicators for focus countries in the vertical analysis

	Household stretch		Collateral stretch					
	DTI (%)	% variable rate mortgages: new loans	PTI: latest index value	PTR: latest index value	LTV: stock	LTV: new loans	Average mortgage maturity: stock	% amortising mortgages: stock
AT	84.7	72.2	126.9	113.8	-	65.2 (*)	-	-
BE	102.8	3.6	104.6	102.2	-	62.3	21.4	95.0
DK	235.8	- (*)	97.3	100.8	49.7	96.0	27.2	49.1
EE	<u>72.0 (*)</u>	88.9	109.4	77.8	68.9	72.3	23.0	100.0
FI	112.2	96.9	96.9	88.8	-	-	-	-
LU	<u>148.7 (*)</u>	51.9	118.2	119.2	48.2	66.5	21.0	-
MT	<u>94.4 (*)</u>	<u>73.0</u>	<u>81.4 (*)</u>	-	-	75.1	26.7 (*)	-
NL	230.8	12.7	85.4	78.3	68.0	94.0	30.0	21 (*)
SE	167.2	- (*)	121.5	129.9	61.0	69.2	41.0	66.0
SK	<u>46.7</u>	<u>4.0</u>	93.6	104.7	-	74.0	-	-
UK	129.7	<u>12.3</u>	115.5	111.3	-	76.0 (*)	18.0	77 (*)

Source notes	ECB SDW or countries' own estimates.	ECB SDW series: average of last 12 months, last data for May 2016; or countries provided own estimates	Nominal house prices to nominal gross disposable income (index: 2010 = 100); OECD	Nominal house prices to nominal rent (index: 2010 = 100); OECD	Countries provided own estimates	Countries provided own estimates	Countries provided own estimates	Countries provided own estimates where possible
	Q1 2016	May 2015-16 average for SDW data; latest available country estimates	Q1 2016	Q1 2016	Latest available	Latest available	Latest available	Latest available

Underlined data indicate a country's own estimate rather than data from a common statistical source.

Full data sources and definitions are shown in Table C.3.

AT: survey-data refer to the average median of LTV ratios for new housing loans based on an OeNB sample of six Austrian banks. Data display a relatively high degree of variance between banks.

DK: % of new loans with variable rates n/a; the % in stock 60%. LTV on new loans from "Report on Residential Real Estate", ESRB, 2015.

EE: latest DTI from country self-assessment, value as at Q4 2015.

LU: DTI has been taken from country self-assessment.

MT: the measure of disposable income used in DTI and PTI estimates is based on the Central Bank of Malta's estimates produced for the ECB's Broad Macroeconomic Projections Exercise; the PTI estimate uses the official index of transacted property prices in Malta; average maturity on new loans only.

NL: with respect to mortgage loans that are not fully amortising, 45% are partly amortising and 34% are not amortising.

SE: % of new loans with variable rates n/a; % in stock 68%.

SK: latest DTI from country self-assessment; LTV on new loans from "Report on Residential Real Estate", ESRB, 2015.

UK: 76.0% is the median LTV on new loans in Q1 2016; 98% of new loans are amortising.



Table C.2

Additional key RRE market indicators for focus countries in the vertical analysis

	DTI				PTI			
	Latest value (%)	1-year change (%)	3-year change (%)	Distance to peak (%)	Latest index value	1-year change (%)	3-year change (%)	Distance to peak (%)
AT	84.7	-1.2	0.1	-5.0	126.9	11.8	14.2	0.0
BE	102.8	1.9	10.1	0.4	104.6	2.0	0.1	-0.4
DK	235.8	-7.6	-12.9	-13.2	97.3	-0.7	3.5	-25.1
EE	<u>72.0</u>	<u>-1.4</u>	<u>-6.9</u>	<u>-24.8</u>	109.4	-5.0	9.4	-39.5
FI	112.2	2.3	5.2	-0.2	96.9	1.6	-1.3	-33.6
LU	-	-	-	-	118.2	5.2	10.7	2.5
MT	<u>94.4</u>	<u>-0.1</u>	<u>1.2</u>	<u>-1.8</u>	81.4	-2.5	-6.5	-24.2
NL	230.8	-2.2	-4.9	-6.2	85.4	2.0	1.5	-19.8
SE	167.2	2.8	8.1	0.1	121.5	8.3	25.3	-0.9
SK	<u>46.7</u>	<u>5.2</u>	<u>18.9</u>	<u>0.0</u>	93.6	1.7	2.0	-28.2
UK	129.7	-0.4	-1.9	-11.6	115.5	4.8	16.3	1.4
Source notes	ECB SDW or countries' own estimates (a country's own estimates are underlined as not directly comparable with SDW series)				Nominal house prices to nominal gross disposable income (index: 2010 = 100), OECD; or countries provided own estimates (own estimates shown in grey as not directly comparable with SDW series)			

Full data sources and definitions are shown in Table C.3.

Distance-to-peak value is measured as: (Current measure - Peak measure since start of series excluding latest quarter)/Peak measure since start of series excluding latest quarter.

The DTI series starts at the earliest in Q1 2000 (depending on the country) and ends in Q1 2016; the PTI series starts at the earliest in Q1 1970 (depending on the country) and ends in Q1 2016.



Table C.3
Sources and definitions of main indicators

Indicators	Description	Data source	Latest date
DTI	Ratio of household debt to the annual sum of household gross disposable income	MUFA and NFA (based on ESA 2010)	Q1 2016
% variable rate mortgages: new loans	12-month average share of new mortgages with up to one year interest rate fixation period as a % of total new mortgages	MFI interest rates (MIR)	May 2016
PTI	Nominal house prices to nominal gross disposable income (index: 2010 = 100)	OECD	Q1 2016
PTR	Nominal house prices to nominal rent (index: 2010 = 100)	OECD	Q1 2016
LTV: stock	Average loan-to-value ratio for mortgagors	Latest data from country self-assessment or teleconference with country Possibility of slightly different definitions for the figures provided by each country	Latest available
LTV: flow	Average loan-to-value ratio for mortgagors	Latest data from country self-assessment, from teleconference with country or from "Report on Residential Real Estate", ESRB, 2015 (collected for that report via a questionnaire) Possibility of slightly different definitions for the figures provided by each country	Latest available
Average mortgage maturity: stock	Average maturity on mortgage loans	Latest data from country self-assessment or from "Report on Residential Real Estate", ESRB, 2015.	Latest available
% amortising mortgages: stock	Share of amortising loans as a % of total loans	Latest data from country self-assessment or teleconference with country Possibility of slightly different definitions for the figures provided by each country	Latest available



Annex D

Overview of assessments by third parties¹⁷⁹

Country	Institution	Publication	Statement
Austria	OECD	OECD Economic Surveys, Austria, July 2015, Overview	The share of variable-rate loans is considerably larger in Austria than in other euro area countries and has increased further recently. This would make households more vulnerable to interest rate increases. In addition, a considerable, though declining, share of loans is still denominated in foreign currencies. (p. 17)
Austria	IMF	2016 Article IV Consultation, 10 February 2016	Corporate and household debt levels are comparatively low, but household loans in Swiss francs remain a concern . Corporate and household debt is below the euro area average. However, the share of Swiss franc loans in total household mortgage loans remains around 20 percent even after a gradual decline since 2007 . (pp. 15-16) Real estate price dynamics have moderated, although there are signs of overvaluation in Vienna . Annual price increases have dropped below 5 percent recently. On the back of strong price dynamics in previous years, the OeNB's fundamentals-based indicator still suggests an overvaluation of about 20 percent in Vienna . (p. 16)
Austria	EC	Country Report Austria 2016, 26 February 2016	Foreign-exchange denominated loans to Austrian households also continue to represent a source of vulnerability . Swiss franc denominated loans account for roughly 96% of foreign currency denominated loans and were very popular in Austria before 2008. About 70% of the total foreign currency loans granted by banks to Austrian households were bullet loans, most of them linked to repayment vehicles, i.e. an investment fund used to repay the principal of the loan at the end of the term, which are sensitive to financial market developments. (p. 15)
Belgium	OECD	OECD Economic Surveys, Belgium, February 2015, Overview	However, the large increase in house prices of the past decade, fuelled by generous tax conditions, has led to overvaluation . The rental market is small, with long waiting lists for social housing and tenants in the private market spending an increasing share of their income on housing . (p. 4) Domestic risks stem from the vulnerabilities related to high public debt and historically high house prices . (p. 11) However, the steep increase in house prices before the crisis and some increase afterwards put market access for first-time buyers under pressure. Housing affordability is also deteriorating for the poor , as demand for social housing is not met by supply and even the cheaper segment of the private rental market has become overpriced . (p. 32)
Belgium	IMF	2016 Article IV Consultation, 2 March 2016	However, staff analysis does not suggest a major overvaluation , as past price trends were broadly in line with borrowing cost, demographic and income developments. (p. 12) Recent strong household credit growth could be a cause for concern . (p. 22) Low risk - Rapid and disruptive housing price correction. (p. 41)
Denmark	OECD	OECD Economic Surveys, Denmark, May 2016, Overview	Negative interest rates are contributing to the risk of building-up a new bubble in the housing market and may be encouraging excessive risk-taking by households and the financial sector. (p. 4) Monetary conditions are very accommodative and automatic stabilisers in the housing market cannot work fully (p. 5). High household debt poses vulnerabilities . (p. 5) Private rental market is underdeveloped . (p. 5) Households are among the most indebted in the OECD , though they also hold very large pension assets. Most mortgages have variable interest rates, and interest-only periods are also common. Household exposure to rising interest rates, house-price fluctuations and losses in income are therefore of concern. (p. 15)
Denmark	IMF	Denmark: Staff Concluding Statement of the 2016 Article IV Mission, 4 May 2016	Rapid house price increases call for vigilance . Fuelled by historically-low interest rates, house prices have risen rapidly in recent periods –especially for flats and in Copenhagen.
Denmark	EC	Country Report Denmark 2016	Over the last three years the recovery of the housing market has gathered steam in certain segments of the market , but has slowed down somewhat

¹⁷⁹ The statements in the tables in this section are extracted from the cited publications. The ESRB has added the emphasis to the text in bold.



			<p>in the second half of 2015. The strongest price increase was registered in the large cities, and especially in the capital region. However, on average, Danish house prices are still significantly lower than their peak in 2006. (p. 1)</p> <p>The risks stemming from high household indebtedness seem contained and the financial sector is solid. High household debt is a structural feature of the Danish economy and is related to the specific mortgage system. Households in Denmark appear to be resilient to market shocks, i.e. their debt is backed up by a strong financial position, with assets exceeding gross debt. (p. 2)</p> <p>Property sales have picked up significantly since early 2013, and in the capital region sales of owner-occupied flats are currently close to the peak seen in 2005. (p. 6)</p> <p>Housing tax structure affects house price trends. Certain parts of the housing market, i.e. owner-occupied flats in larger towns and cities, and in particular the Copenhagen area, have recently witnessed strong and possibly unsustainable price increases. (p. 12)</p>
Estonia	OECD	OECD Economic Surveys, Estonia, January 2015, Overview	<p>Persistently low long-term interest rates could result in the re-emergence of risks in the domestic housing market. (p. 11)</p>
Estonia	IMF	Republic of Estonia: 2015 Article IV Consultation; 14 December 2015	<p>Risks from the domestic housing market are not acute, considering that recent price increases are not credit driven and price-to-income ratios remain much below previous peaks. (p. 18)</p>
Estonia	EC	Country Report Estonia 2016	<p>While house price increases have been strong they are still in line with income developments. This reflects the strong link between the housing demand and wage growth in recent years. (p. 2)</p> <p>According to different valuation gap models, house prices have increased in recent years to close to a notional 'overvaluation' estimate, but have not yet significantly passed it. [...] Should the present price increase persist, however, house prices would soon be overvalued. (p. 29)</p> <p>Estonia is characterised by two possible signs of domestic overheating: the rapidly rising unit labour costs and housing prices. Both pose risks, as they expose the country to possible competitive losses and a disorderly correction with harmful implications for the real economy. (p. 37)</p>
Finland	OECD	OECD Economic Surveys, Finland January 2016, Overview	<p>The main domestic financial vulnerability relates to high household debt, even though it is lower than in the other Nordics. High loan-to-value (LTV) mortgages are common in Finland (FIN-FSA, 2012), and most mortgages carry variable interest rates. Heavily indebted households are vulnerable to higher interest rates, losses in income or falls in housing prices. At the same time, there is no sign of a housing bubble, as housing prices have been broadly flat for more than a decade. (p. 9)</p>
Finland	IMF	Finland: 2015 Article IV Consultation; 17 November 2015	<p>Meanwhile, the housing market has cooled and standard metrics suggest that average house prices are broadly in line with fundamentals. (p. 13)</p> <p>Prolonged stagnation and higher unemployment could also conceivably cause house prices to decline and prompt deleveraging by the most highly indebted households. (p. 13)</p>
Finland	EC	Country Report Finland 2016	<p>Households could suffer from an abrupt fall in house prices, but such a scenario is unlikely as relative house prices are close to their long term averages. (p. 7)</p> <p>On aggregate, households have not started to deleverage as they have benefited from a prolonged period of favourable lending conditions, including exceptionally low interest rates and mortgage repayment holidays. (p. 22)</p>
Luxembourg	OECD	OECD Economic Surveys, Luxembourg, March 2015, Overview	<p>Luxembourg's supply of housing may be falling short of demand, as rising real house prices indicate. (p. 33)</p>
Luxembourg	IMF	Luxembourg: 2016 Article IV Consultation, 16 May 2016	<p>Banks' exposure to the real estate market is a risk to watch closely. Rising house prices largely reflect strong demand outstripping supply, partly because of supply bottlenecks and zoning regulations. (p. 10)</p> <p>On the housing market and in light of ever rising housing prices, the authorities should explore the effectiveness of recent measures in containing risk and whether further macro-prudential measures such as limits to loan-to-value ratios in addition to those already taken in 2013 would be appropriate. (p. 16)</p>
Luxembourg	EC	Country Report Luxembourg 2016	<p>House price pressures emerge from both the supply and demand side. On the supply side, land availability and administrative procedures seem to represent a bottleneck to the creation of new housing units. On the demand side, high population and employment growth, as well as, to a lesser extent, tax policies encouraging ownership push up prices. (p. 2)</p> <p>Low interest rates and easing of financial conditions have supported steady growth of mortgage loans, which represents a large part of household indebtedness (in 2014 household debt amounted to 56.7% of GDP, compared with 59.6% in the euro area). The surge in house prices is likely to have exacerbated this trend, with households having to ask for higher loans. (p. 8)</p> <p>Indeed, suboptimal administrative performance on building permit issuance may feed into market imperfections and imbalances and contribute to</p>



			house price inflation. (p. 21)
			Faced with rather rigid housing supply, a great part of the tax subsidy is likely to be capitalised into house prices. (p. 23)
Malta	IMF	Malta: 2015 Article IV Consultation, 6 January 2016	While the default rates on mortgages and household indebtedness have been low, there has been a rapid increase in mortgages, there is a relatively high overall exposure to real estate , and there has been a pick up in real estate prices – fuelled by a combination of factors, such as tax incentives for first time buyers , increase in rental demand stemming from the international investor program, increased migration, and the ECB's QE.
Netherlands	OECD	OECD Economic Surveys, Netherlands, March 2016, Overview	Core domestic banks are significantly exposed to the housing market. The private rental market falls short of rising demand. (p. 5) Indicators of potential macro-financial vulnerabilities have abated significantly since the crisis, although, at nearly 120% of GDP, gross household debt is one of the highest in Europe , owing to high mortgage debt, posing a vulnerability in the event of a financial crisis. (p. 14)
Netherlands	IMF	Netherlands: 2015 Article IV Consultation, 11 February 2016	This is an important distortion as large amounts of savings are detracted from potentially productive investments to further inflate house prices. (p. 10)
Netherlands	EC	Country Report Netherlands 2016	The housing market has contributed to a range of macroeconomic imbalances. (p. 1) The tax treatment of owner-occupied housing remains generous and encourages mortgage borrowing. (p. 3) Moreover, given the low elasticity of housing supply, strong fiscal incentives to home ownership push up house prices , thereby fuelling mortgage debt growth and worsening affordability. (p. 7) Households' financial distress has risen in the past decade. The increasingly high level of debt has led to more households finding it difficult to repay their loans. (p. 26)
Slovakia	IMF	Slovak Republic: 2015 Article IV Consultation, 14 January 2016	Recent macroprudential recommendations by the National Bank of Slovakia (NBS) have not slowed household credit growth , which is expanding by about 12 percent year-on-year, although household debt remains low compared to peers. (p. 5) On the domestic side, rapid household credit growth could lead to financial sector risks. (p. 5)
Slovakia	EC	Country Report Slovakia 2016	In the medium term, price pressures in the housing sector might pick up due to several structural factors. Potential demand for housing space is ample. (p. 7)
Sweden	OECD	OECD Economic Surveys, Sweden, March 2015, Overview	Household debt and dwelling prices have soared over the past decade. The housing price-to-income ratio is about 20% above its long-term average, suggesting moderate overvaluation. This creates risks for households and the wider economy. (p. 17) Swedes have a long history of paying only interest on home loans and a large share of households (close to 40% in 2013) do not pay down mortgage principal. (p. 17)
Sweden	IMF	Sweden: 2015 Article IV Consultation, 2 December 2015	Rapid housing price increases associated with rising household indebtedness. (p. 4) The housing market shows imbalances , with double-digit price gains as the urban population outpaces construction, pushing up household debt from already high levels. Housing supply is constrained by construction impediments and rent controls while demand is bolstered by population growth and urbanization, rising income and financial savings, and historically low interest rates. (p. 6) However, house prices could continue rising from already high levels. (p. 8) The experiences of Denmark and the Netherlands after the global financial crisis are indicative, although household debts and house price deviations appear to have been greater in these countries in 2008 than yet seen in Sweden. (p. 8)
Sweden	EC	Country Report Sweden 2016	Structural inefficiencies on the housing market not only impact investment negatively but contribute to an increase in house prices and could hamper labour market mobility. Surging house prices are further increasing private indebtedness from already record high levels making the economy more vulnerable to shocks. (p. 1) The high level of household indebtedness in Sweden has been identified as posing an ongoing risk for macroeconomic stability. (p. 2) Sweden is one of the EU countries most exposed to vulnerabilities on the housing market. Persistent overvaluation and surging house prices coupled with high and rising household indebtedness, essentially driven by credit for house purchases, increasing debt-to-income ratios and high leverage in banks reflect elevated risks in this respect. Swedish house prices are above their fundamental levels , due to supportive taxation policy and structural inefficiencies in the housing market. [...] Overvalued house prices entail risks of a disorderly and harmful correction , with a potential



			<p>impact on the banking sector and the real economy. (p. 2)</p> <p>The impact of a possible house price correction in the context of high household indebtedness is a growing concern. The regulatory capital adequacy ratios for Swedish banks are high, but the actual share of capital in banks' balance sheet remained at a relatively low level in recent years. (p. 2)</p>
UK	OECD	OECD Economic Surveys, United Kingdom, February 2015, Overview	<p>In addition, house prices have increased rapidly and may create risks to financial stability in the case of a downward adjustment. (p. 4)</p> <p>The recovery in the housing market has been marked by large house price increases, particularly in London, raising homeowners' wealth, but also reducing affordability for first-time buyers and contributing to higher household indebtedness. (p. 11)</p>
UK	IMF	United Kingdom: 2015 Article IV Consultation, 24 February 2016	<p>Housing and mortgage markets have decelerated somewhat over the last year, and lenders have become more resilient. Nonetheless, house-price growth continues to outpace income growth, and household leverage remains high by historical standards. A leverage-driven re-acceleration of the market would further increase households and banks' vulnerabilities to house-price, income, and interest-rate shocks. (p. 8)</p> <p>High house prices result in some households taking on high leverage, posing financial stability risks. (p. 20)</p> <p>A rapid rise in house price-to-income ratios driven by increased leverage would raise the vulnerability of banks and households to adverse shocks to house prices, income, and interest rates. (p. 40)</p>
UK	EC	Country Report UK 2016	<p>Developments in the housing market have posed challenges but more recently housing market indicators have varied. (p. 1)</p> <p>House price levels remain high, and affordability has deteriorated as growth in house prices exceeds that in nominal disposable income. (p. 2)</p> <p>However, over the medium term, demand continues to outstrip supply in the housing market. As a result, house prices are likely to continue to increase, as is household indebtedness. This leaves the household sector and the wider economy more exposed to risks over a longer period of time than would otherwise be the case. (p. 2)</p> <p>Activity in the housing market has risen to its highest levels since the recession. Starts and completions increased and demand has been supported by a rise in mortgage approvals. (p. 8)</p> <p>For the fifth consecutive year, high levels of private sector indebtedness have been identified as potentially posing risks to the stability of the household sector. (p. 14)</p> <p>The risks need to be assessed in the context of the recent pick up in house price growth and the high level of house prices, the high level of household indebtedness and the medium term gap between demand and supply for housing. (p. 14)</p> <p>As measured by the house price to income ratio, affordability has deteriorated markedly since 2012 as house price growth has risen and exceeded growth in household disposable income. (p. 15)</p> <p>Forward indicators of house prices are mixed but some key indicators suggest that the renewed momentum in house price increases will continue. (p. 17)</p>



Proposals made by international institutions regarding policy issues in the real estate market

Country	Institution	Document	Policy proposal
Austria	IMF	IMF Executive Board Concludes 2015 Article IV Consultation with Austria, Press Release No. 16/58, 12 February 2016	<p>Directors also underscored the need for banks to proactively mitigate risks from their cross-border exposures and domestic mortgage loans in foreign currency. They supported an expansion of the macroprudential toolkit with respect to real estate-specific instruments.</p> <p>Financial repair has advanced considerably, but needs to be completed. The focus should be on raising bank capital and addressing remaining risks stemming from exposure to some difficult CESEE markets and domestic Swiss franc loans. Expanding the macroprudential toolkit with real estate-specific instruments would limit risks to banks' asset portfolios if real estate price bubbles emerge. Wind-down units of resolved banks need to complete the asset disposal process efficiently.</p> <p>However, the macroprudential toolkit still lacks sector-specific instruments, such as caps on loan-to value (LTV), debt-to-income (DTI), and debt-service-to-income (DSTI) ratios for mortgage loans. The macroprudential toolkit should be further strengthened by introducing sector-specific caps on LTV and DTI/DSTI ratios, possibly regionally differentiated. While not binding at present, such caps would be useful if house prices pick up strongly in parts of the country. (p. 17)</p>
Belgium	OECD	OECD Economic Surveys, Belgium, 2015	<p>Housing affordability is also deteriorating for the poor, as demand for social housing has not been met while the private rental market has become expensive. As a result, access to housing is at risk of becoming less equitable if the young and poorer people are priced out. Affordability for poorer people could be improved by expanding the regional rental allowance schemes. In parallel, scaling down the disproportional support for homeownership would free up public resources and reduce the bias towards homeownership. (p. 49)</p>
Belgium	IMF	Belgium: 2016 Article IV Consultation – press release and staff report	<p>Given the strong growth in mortgage lending, Directors recommended vigilance and proactive supervision, including consideration of targeted prudential measures to limit overexposures of vulnerable borrowers. (p. 2)</p> <p>Recent strong household credit growth could be a cause for concern. Risks to bank's balance sheets are mitigated by the prevalence of owner-occupancy and of fixed-rate mortgages, as well as a default law that protects against selective default, and more generally by a relatively strong net asset position of households. In addition, recent prudential measures raising risk weights on mortgages appear to have borne fruit. However, a significant share of loans still have relatively high loan-to-value and/or debt-service-to-income ratios, suggestive of pockets of vulnerabilities, particularly in the young and low to middle income borrowers, that warrant continued vigilance. Staff thus recommended considering more targeted actions to limit overexposures of vulnerable groups (for example, additional risk weights or caps on loan-to-value ratios or limits on debt-service-to-income ratios). Staff also cautioned against banks' overreliance on the mortgage business. (p. 23)</p> <p>Following the increase in capital requirements on mortgage lending in 2014, additional macroprudential measures could be introduced while also working on the supply side of the housing market to alleviate price pressures. (p. 41)</p>
Denmark	OECD	OECD Economic Surveys, Denmark, May 2016	<p>Negative interest rates are contributing to the risk of building-up a new bubble in the housing market and may be encouraging excessive risk-taking by households and the financial sector. However, credit growth remains subdued. To mitigate future risks, macro-prudential tools should be extended across the whole country and tax policy of the property market needs to play its counter-cyclical role. Also, the debt-bias in favour of housing and credit should be lowered, in order to limit the vulnerability of households to rising interest rates. (p. 4)</p> <p>Reform property taxation, including by decreasing mortgage interest rate deductibility and regularly updating valuations in order to establish neutrality across different asset classes. Encourage mortgage institutions to strengthen the use of debt-service-to-income ratios. Give consideration to extending some of the locally targeted "Best practices" introduced by the regulator for granting a mortgage in hotspot areas to the whole country. Support a bigger private rental housing market by easing rent regulation while striking a balance between landlord and tenant protection. (p. 5)</p>
Denmark	IMF	Denmark: Staff Concluding Statement of the 2016 Article IV Mission, 4 May 2016	<p>Rapid house price increases call for vigilance. Fuelled by historically-low interest rates, house prices have risen rapidly in recent periods – especially for flats and in Copenhagen. While a recent slowdown in the volume of housing transactions might herald an impending softening, the market bears close watching since a continuation of the uptrend would soon bring real house prices in these segments back to pre-crisis levels. For the moment, risks are mitigated by the localized character of the steepest price increases and the absence of an attendant rapid build-up in household debt. However, past experience suggests that bubbles can form and spread quickly. Moreover, with high shares of "interest only" and variable rate loans, households are already exposed to substantial interest rate risk.</p> <p>Action across several policy areas would help contain the build-up of housing risks. We welcome the introduction of the DFSA's "Supervisory Diamond for Mortgage Credit Institutions (MCIs)," which addresses risks related to variable rate and interest only loans. In addition, the recent establishment of the "Seven Best Practices" should strengthen risk management practices of mortgage lenders in areas with rapid house price increases. The introduction of a five percent cash down payment requirement for house purchases is also a step in the right direction. However, more can be done and early</p>



action would help the authorities stay ahead of the curve. Adequate macroprudential tools should be developed. **The preparation of an adequate macroprudential “toolbox” is important to ensure that measures can be implemented without delay when needed. In particular, we would suggest considering limits on the debt-to-income ratio, which would help keep household debt and debt service capacity in check, especially in a context where house prices rise faster than incomes.** The authorities should also consider raising the new minimum down payment requirement to at least 10 percent to increase households' buffer in case of adverse house price shocks. These measures would complement the existing MCI supervisory diamond as they help protect households (as opposed to bank portfolios) and address risks from loans by commercial banks (as opposed to MCIs only). This would also help ensure that risks are not just shifted from the mortgage institutions to the banks. If regional market conditions continue to diverge, consideration could be given to applying policies with different stringency across regions. More fundamentally, the present would be a good time to tackle longstanding housing supply issues and reduce adverse incentives from taxation. Improving zoning regulations could help alleviate supply constraints while easing Denmark's tight rental market regulations would facilitate more efficient use of the existing housing stock. On the tax side, the procyclical valuation freezes for land and property taxes should be ended and we strongly welcome the authorities' intention to transition to a new housing valuation system, which will be discussed in the autumn.

Estonia	IMF	Republic of Estonia: 2015 Article IV Consultation – press release, staff report and informational annex	A comprehensive set of macroprudential tools is operational – maximum loan-to-value and debt-service-to-income ratios have already been set, though at currently barely binding levels. These tools also apply to foreign branches. Oversight of consumer lending companies is being strengthened through a licensing requirement from March 2016. (p. 18)
Finland	OECD	OECD Economic Surveys, Finland, January 2016	Two policy measures will reduce risks. Mortgage interest tax deductions are being cut in steps; and from June 2016 a maximum LTV ratio of 90% (95% for first-time buyers) will be imposed. Housing loans account for about 60% of bank lending and risk weights computed through banks' internal models range between 6 and 13%, compared to 35% under the standardised approach. There may be a case for introducing minimum risk weights on mortgages , as in Norway and Sweden, and to encourage harmonisation of risk-weight calculations across banks (Bank of Finland, 2015a). (p. 9)
Finland	IMF	Finland: 2015 Article IV Consultation – press release, staff report, informational annex and statement by the Executive Director for Finland	Directors commended the authorities for introducing a new macroprudential policy framework and implementing the EU's Bank Recovery and Resolution Directive. They noted that there is scope to strengthen the macroprudential framework further, including through the introduction of a systemic risk buffer. They also highlighted the importance of enhancing regional cooperation on financial stability, supervisory, and bank resolution issues. There is scope to further strengthen the macroprudential toolkit, including adding a systemic risk buffer (SRB), as recommended by an internal study group. Adding this optional CRD instrument would better align Finland with the regulatory standards that its large foreign banks face in their home jurisdictions. In view of banks' increasing reliance on wholesale funding, which creates potential funding and liquidity risks, the authorities should implement the Basel III net stable funding ratio and liquidity coverage ratio requirements as soon as is feasible. (p. 14) Full implementation of the macroprudential policy toolkit will help reduce vulnerabilities in the medium-run. Banks with potentially significant credit and funding risks should be pushed to improve buffers in the short-run. If financial market stress materializes, the ECB should provide ample liquidity. Full adoption of the macroprudential toolkit and introduction of the systemic risk buffer to bolster the largest banks' ability to absorb losses. (p. 28)
Luxembourg	IMF	Luxembourg: 2016 Article IV Consultation – press release, staff report, informational annex and statement by the Executive Director for Luxembourg	On the housing market and in light of ever rising housing prices, the authorities should explore the effectiveness of recent measures in containing risk and whether further macro-prudential measures such as limits to loan-to-value ratios in addition to those already taken in 2013 would be appropriate. (p. 16) Risks in the real estate market should continue to be closely monitored. Steadily rising house prices appear to mainly reflect supply bottlenecks against a growing demand. The authorities should explore the effectiveness of recent macro-prudential measures in containing risks and whether further measures such as limits to loan-to-value ratios are appropriate. (p. 25)
Malta	IMF	Malta: 2015 Article IV Consultation, 6 January 2016	While the default rates on mortgages and household indebtedness have been low, further consideration should be given to precautionary measures , such as loan-to-value (currently at 74 percent for residential and 69 for commercial in 2014) and debt-to-income ratios, given the rapid increase in mortgages, relatively high overall exposure to real estate , and pick up in real estate prices. (p. 13)
Netherlands	OECD	OECD Economic Surveys, Netherlands, 2016	Since 2013, amortisation of new mortgages has become a precondition for mortgage interest deductibility, which should increase amortising mortgages over time as before most of the mortgage portfolio was not amortized regularly (that is, the principal was not paid down in instalments). Also, the maximum tax rate at which mortgage interest can be deducted is being lowered, but only very gradually from 52% to 38% between 2014 and 2042. Other reforms include gradual cuts in the maximum loan-to-value ratios to 100% in 2018, reductions in loan-to-income ratios to offset higher lending capacity driven by lower interest rates, and decreases in the maximum value of a mortgage eligible to public guarantees (insuring against residual liabilities left after a sale of a property). (p. 14) Support the supply of rental housing by further limiting strict rent regulation in the private market. (p. 5)



Netherlands	IMF	Netherlands: 2015 Article IV Consultation – press release, staff report and statement by the Executive Director for the Kingdom of the Netherlands	<p>The authorities are reducing the maximum loan-to-value (LTV) ratio for mortgage loans by one percentage point per year until it reaches 100 percent in 2018, with no further plans beyond that date. The 2014 Article IV consultation urged a further and faster reduction beyond 2018. In May 2015, the Financial Stability Committee's (FSC) recommended reducing the LTV by one percentage point a year through 2028 when it would reach 90 percent. The current policies of gradually reducing the LTVs ratios on new mortgages to 100 percent by 2018 and allowing MID only for new fully amortizing loans are steps in the right direction to mitigate housing risks. The prospective reinstatement of the higher gift tax exemption is also welcome for reducing mortgage debt. (p. 15)</p> <p>Further improvement to the framework for risk management and resolution are needed. Accelerate the pace of LTV reduction to reach 80 percent and clarify [shortly] the path of LTV after 2018. (p. 38)</p>
Slovakia	OECD	OECD Economic Surveys, Slovak Republic, November 2014	<p>To develop the rental housing market, phase out support to home ownership and expand means-tested rental housing allowances. (p. 3)</p> <p>Some steps have been taken since January 2014 to promote rental housing by providing loans with subsidised interest rates to the private sector acquiring rental housing, targeted at those with low-income and in dynamic economic areas. (p. 24)</p>
Slovakia	IMF	Slovak Republic: 2015 Article IV Consultation – press release, staff report and statement by the Executive Director for the Slovak Republic	<p>The banking sector has sound capital and liquidity buffers, and household debt remains limited. Nonetheless, rapid credit growth among households calls for further strengthening of macroprudential measures and a vigilant approach should fast credit expansion continue and broaden. Recent macroprudential recommendations by the National Bank of Slovakia (NBS) have not slowed household credit growth, which is expanding by about 12 percent year-on-year, although household debt remains low compared to peers. (p. 5)</p> <p>Lowering the LTV limit: With the planned transposition of its macroprudential recommendations into law, the LTV limit should be lowered from 90 to 85 percent, thus better aligning housing loan regulation with that of peers. Introducing a debt-to-income ratio (DTI): The NBS should use authority under the planned law to issue clear guidance on a maximum ratio for overall debt-to-income of borrowers to enhance the effectiveness of the LTV limit. Applying a counter-cyclical capital buffer: If above-trend credit growth continues and broadens to the corporate sector, the adoption of a counter-cyclical capital buffer of at least 0.5 percent would be warranted. Adopt more tailored supply-side measures to address real-estate-related exposures: Raising credit risk weights and imposing stricter loss-given-default assumptions on real estate-related exposures would raise the cost of mortgage loans without affecting non-financial corporate borrowing. Implementation of the new European standards for loan classification would help, as would mandatory verification of external appraisals by lenders to avoid inflated collateral valuations. (p. 18)</p> <p>Additional macroprudential measures would help guard against risks from rapid credit growth. Although household debt is relatively low and banks enjoy sound capital and liquidity buffers, to limit financial stability risks, the LTV limit should be lowered and clear guidance should be issued on a maximum DTI ratio. If above-trend credit growth continues and broadens to the corporate sector, a counter-cyclical capital buffer of at least 0.5 percent would be warranted. In the near term, more targeted measures on real estate-related exposures should be considered. (p. 21)</p>
Sweden	OECD	OECD Economic Surveys, Sweden, March 2015	<p>Macro-prudential policy is being reinforced to prevent the build-up of financial imbalances, not least an unsustainable increase in household debt, as interest rates stay low. (p. 4)</p> <p>Continue to implement macro-prudential policies to contain the risks related to rising household debt. Consider phasing out mortgage interest deductibility. (p. 5)</p> <p>The authorities have acted to improve the resilience of the financial system by strengthening the institutional framework for financial regulation and supervision, requiring stronger capital and liquidity buffers and implementing macro-prudential measures. (p. 16)</p> <p>A cap of 85% on mortgage loan-to-value ratios was introduced in 2010. Minimum capital risk weights on mortgages were increased to 15% in 2013 and will rise to 25% in 2015. Swedes have a long history of paying only interest on home loans and a large share of households (close to 40% in 2013) do not pay down mortgage principal (Finansinspektionen, 2014b). The FSA will present a proposal to make holders of new mortgages repay capital until the outstanding loan is down to 50% of the initial value of the property, which is welcome. (p. 17)</p> <p>The impact of the measures being implemented should be monitored closely and further action should be envisaged if growth in household debt picks up. Structural measures to improve the functioning of the housing market could help moderate the increase in household debt, which is partly driven by high housing prices, although reverse causality is also at play. Such measures could include streamlining land-use planning and zoning regulations and increasing incentives for municipalities to allow building to improve supply responsiveness, limiting the tax bias in favour of home-ownership (preferably by phasing out mortgage interest deductibility) and easing rental market regulations to foster a more balanced tenure mix (Adalet McGowan, 2013). (p. 18)</p>
Sweden	IMF	Sweden: 2015 Article IV Consultation – press release, staff report, informational annex and statement by the Executive Director for Sweden	<p>The authorities are monitoring housing market and household debt developments situation closely. At this juncture, they favour assessing the impact of amortization requirements before taking further steps given uncertainty around the impacts of macroprudential measures. A DTI limit is among a number of tools that could be considered. (p. 17)</p> <p>The long process of adopting amortization regulations should be completed to cement the changes in amortization culture. But the FSA's legal mandate clearly needs to be strengthened to give it access to a range of</p>



			<p>macroprudential tools to address risks in a timely and efficient way. Although such measures cannot substitute for housing supply reforms, they can usefully moderate vulnerabilities from potential further rapid house price increases. (p. 22)</p> <p>Preventively, reduce vulnerabilities in the housing market through macroprudential measures, phasing out tax incentives, and enhancing housing supply. In the event, provide monetary stimulus and funding support to banks. (p. 23)</p>
UK	OECD	<p>OECD Economic Surveys, United Kingdom, February 2015</p>	<p>Macro-prudential regulation should act to prevent financial crises, notably by trying to head off the build-up of imbalances linked to credit cycles, which last longer and have higher amplitude than business cycles (Haldane, 2014). It is important that decision making about the size of the counter-cyclical capital buffer and the timing of its implementation be supported by a range of indicators, and such multifaceted approach is currently being developed. (p. 40)</p> <p>In June 2014, the Financial Policy Committee capped loans carrying loan-to-income ratio of above 4.5 to 15% of banks' new residential mortgages, which should ward off risks of significant rise in the number of highly indebted households. The Committee also asked the government for new powers to cap loan-to-value ratios and debt-to-income ratios for mortgages. The share of interest-only mortgages (principal repayment is postponed to the maturity of the mortgage) in new loans has been falling steadily since the crisis, and is now about 20% of new mortgages, which is welcome. Raising risk-weights would reinforce this trend and prevent a weakening of underwriting standards should the risk appetite for such loans increase. (p. 41)</p> <p>Sustainable financing of the economy and greater financial stability should be achieved by sound regulation, ensuring high capital requirements for systemically important banks, improving banks' resolvability and fine-tuning the use of countercyclical measures. Data should be collected on a wider set of financial institutions than currently done and macroprudential regulation should be gradually extended beyond the banking sector to prevent the migration of systemic risks. (p. 51)</p>
UK	IMF	<p>United Kingdom: 2016 Article IV Consultation Concluding Statement of the Mission, 13 May 2016</p>	<p>Macroprudential policy will need to tighten later this year if housing and mortgage markets remain buoyant. Housing and mortgage markets decelerated somewhat between mid-2014 and mid-2015 following macroprudential tightening. More recently, however, house price growth rose to more than three times income growth, and the share of new mortgages at high loan-to-income (LTI) ratios is again rising. The recent increased activity may partly reflect a temporary rush to buy houses before higher transaction taxes on some home purchases took effect in April. However, if current housing and mortgage market trends persist, further macroprudential tightening (e.g., tighter LTI or loan-to-value limits) will be needed later this year to avoid financial stability risks that may arise from excessive household indebtedness. The buy-to-let market has grown rapidly in recent years. It should, like the owner-occupied market, be subject to macroprudential measures to mitigate financial stability risks following the now-concluded Treasury consultation on this matter. It will also be important to continue closely monitoring potential risks in the commercial real estate market, which saw rapid price growth during 2014-15 that has recently paused. More generally, macroprudential policy should remain focused on financial stability and stand ready to act where necessary. This includes communicating the objectives and tools of the Financial Policy Committee to a broader audience, and raising the countercyclical capital buffer as warranted by credit and asset price conditions. Indeed, the countercyclical capital buffer may well need to be increased later this year. Directors stressed that the buoyant housing market requires ongoing efforts to contain macroprudential risks and address long-standing supply problems. They welcomed macroprudential measures introduced since mid-2014, but noted that further measures may be necessary if the reduction in high loan-to-income mortgages does not continue. Directors also encouraged the authorities to extend the Financial Policy Committee's powers of direction to the buy-to-let market to mirror those they currently have over the owner-occupied market. They noted that ongoing efforts to reduce housing supply constraints, such as changes to planning processes, have improved prospects for increasing supply but require continued attention to implementation.</p>



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Postal address 60640 Frankfurt am Main, Germany
Telephone +49 69 1344 0
Website www.esrb.europa.eu

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