



## Summary

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The conditions for young adults on the housing market have deteriorated over time. The supply of rental units has decreased in general, and the waiting lists for rental units have become even longer, particularly affecting young adults. Rising house prices have also raised the threshold for buying a home. This development affects young adults in particular since they are more likely to be first-time home buyers who have not benefited from previous price increases and their income has increased slower than the income in other age groups. However, because the supply of rental units has decreased, young adults have come to represent a growing percentage of all loan-financed home purchases.

A key consideration in this FI Analysis has been the significance of the amortisation requirements that FI introduced in 2016 and 2018 for this situation as a whole.

We look at actual home purchases made in 2012 and 2015 and extrapolate them to the conditions from 2018. We focus on young home buyers and study how changes in income, house prices, credit assessments and amortisation requirements would have influenced the possibilities for home buyers with the same characteristics to buy a corresponding home in 2018.

Our analysis shows that 85 per cent of the young home buyers in our sample from 2012 would have been able to buy a corresponding home in 2018. The corresponding figure for older home buyers is 89 per cent. If data is taken from a shorter period, namely between 2015 and 2018, 95 per cent of young home buyers would have been able to purchase the same home. This means that some home buyers would have needed to adapt their purchase to the altered conditions, for example by purchasing a smaller home or a home with a less central location.

The young home buyers who would have needed to adapt live in large cities, buy comparatively speaking more expensive homes and previously had a low agreed rate of amortisation. Their income is not lower than the income of other young home buyers.

The primary reason that it has become more difficult to buy a home since 2012 is the increase in house prices, although the amortisation requirements also had an impact.



## Introduction

In order to increase consumer protection on the mortgage market and counteract financial imbalances on the credit market, FI has introduced three regulations over the past ten years that have a direct impact on mortgagors. These measures were designed to find a balance between a slow-down in the build-up of risks and any costs created by the measures.<sup>1</sup>

The LTV cap from 2010 specified that households may not borrow more than 85 per cent of the value of the home when using the home as collateral.<sup>2</sup> FI introduced the first amortisation requirement in 2016. Under this requirement, households borrowing more than 50 per cent of the value of the home are required to amortise at least 1 per cent of the original loan each year. Households borrowing more than 70 per cent of the value of the home are required to amortise at least 2 per cent a year. FI then tightened the amortisation requirement in 2018. Under the stricter requirement, households taking out a mortgage larger than 4.5 times their pre-tax income are required to amortise one percentage point more than what they already amortise under the first amortisation requirement.

FI's evaluations show that all three regulations slowed the growth in the size of the mortgages taken out by new mortgagors and also to some extent helped slow growth in house prices.<sup>3</sup> In addition to pinpointing the effect on mortgages, it is also important to understand and evaluate how the regulations have impacted the housing market – particularly if they have affected households' ability to enter the housing market.

One group that is clearly dependent on entering the housing market is young adults.<sup>4</sup> This FI Analysis looks more closely at how the housing market (both rental housing and owned housing) has changed in recent decades and the impact this change has had on young adults. We focus in particular on how FI's regulations have affected the possibility of households with young adults to buy a home compared to other households.

The housing market is complex, and it is difficult to draw clear conclusions about how the conditions for younger individuals have changed. The possibility of being granted a loan is an important part of the home buying process. This possibility varies given each household's income and wealth. Assuming certain financial circumstances,

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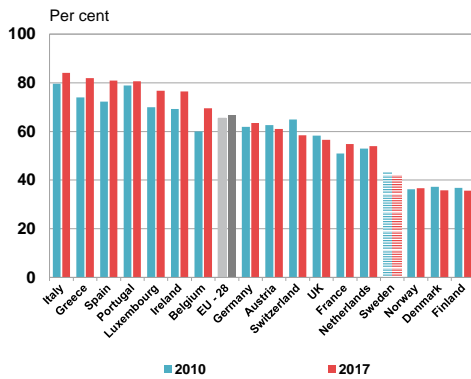
1 See FI's decision memorandums in conjunction with the introduction of the LTV cap and the amortisation requirements (Finansinspektionen; 2010a, 2016 and 2017b, in Swedish). International organisations also pointed out the risks; see, for example, ESRB (2019).

2 Prior to the introduction of the LTV cap, a cash deposit of 10 per cent was usually required. The mortgage was then divided into a bottom loan, up to a loan-to-value ratio of 75 per cent, and a top loan, for the remainder of the loan. The top loan also had a shorter maturity (it was amortised) and a higher interest rate. See Finansinspektionen (2010b).

3 See Finansinspektionen (2017a), Andersson et al. (2018) and Andersson and Aranki (2019).

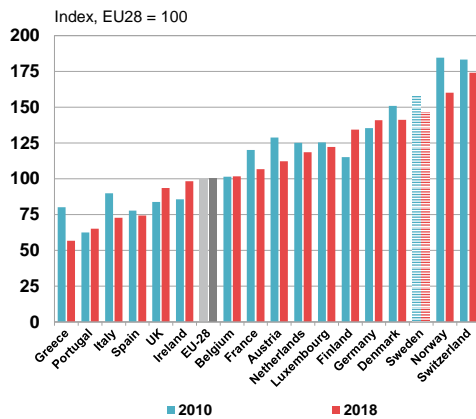
4 Young adults are defined as persons between the ages 18 and 30. For some data, i.e. data from public sources, this range is not applied exactly due to data availability restrictions. This FI Analysis refers to this group as both "young" and "young adults".

Diagram 1. Share of young adults living with their parents



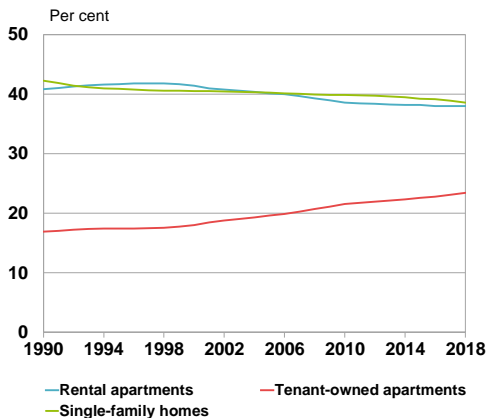
Source: Eurostat.  
Note: Refers to young adults between the ages 16–29 in various European countries who live with their parents.

Diagram 2. Cost of housing construction



Source: Eurostat.  
Note: The bars refer to the cost of housing construction relative to the European average.

Diagram 3. Homes in Sweden



Source: Statistics Sweden.  
Note: Refers to each form of tenure's percentage of the total housing stock. Freehold refers to the following forms of tenure: freehold apartment, single-family home, and detached home.

the possibility of being granted a loan for a certain home is also influenced by its price, the banks' assessment of the household's repayment ability, and the regulations on the credit market.

This analysis begins by describing how the supply on the housing market has changed over the past 30 years. We then describe how young adults' financial conditions have changed and how their establishment in the housing market, via owned housing or primary rental contracts, has changed in relation to other age groups. We focus on relative circumstances because the total supply of homes is relatively stable from one year to the next.<sup>5</sup> As a result, an increase in the aggregate demand for homes primarily places upward pressure on prices. The possibility for different age groups to enter the housing market thus depends on how their relative circumstances and purchasing power change.

Finally, using FI's mortgage survey, we analyse how changes in house prices, amortisation rules and credit assessments have affected the possibility for young adults to buy a home.

## Decrease in rental apartments

The Swedish housing market deviates from the European average in several respects. In Sweden, young adults move away from home earlier than in other European countries, but to a somewhat lesser extent than in other Nordic countries. Forty-two per cent of young adults in Sweden between the ages of 16 and 29 lived with their parents in 2017 (Diagram 1). This was a decrease of around one percentage point since 2010.<sup>6</sup> It is also less common in Sweden for households to own their homes compared to most other European countries. However, a larger percentage of those who own their home in Sweden have a mortgage compared to the EU average.<sup>7</sup> The possibility for a household to acquire a home in Sweden is therefore dependent on functioning rental and mortgage markets.

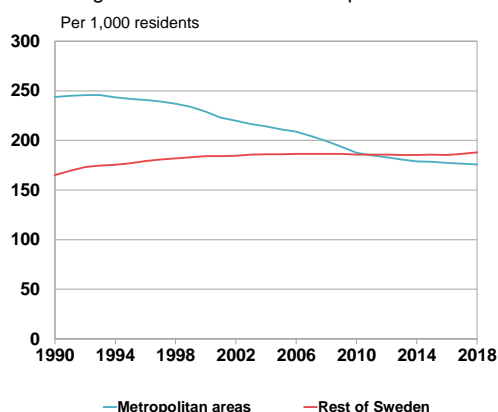
Since 1990, the number of homes and the population have followed a similar trajectory. The number of homes per 1,000 residents has thus been at approximately the same level since 1990 and is today just above 480. Relatively high costs for housing construction in Sweden have probably contributed to slow growth in the supply (Diagram 2). At the same time, there has been shift to different forms of tenure since 1990. Forms of tenure where households are owners, such as

5 New production of homes between 1990 and 2018 corresponded on average to 0.6 per cent of the housing stock per year. Research indicates that the total supply is relatively insensitive to price changes even if housing investments are more sensitive to prices in Sweden than what is the case in other countries. See, for example, Caldera Sánchez and Johansson (2011).

6 According to the Swedish Union of Tenant's surveys, just over 24 per cent of young adults (ages 20–27) lived at home in 2017. This was an increase of around four percentage points since 2009.

7 According to data from Eurostat, approximately 80 per cent of households in Sweden that own their home have a loan, which can be compared to the average in other EU countries of approximately 38 per cent. Within the EU, only the Netherlands has a higher share than in Sweden.

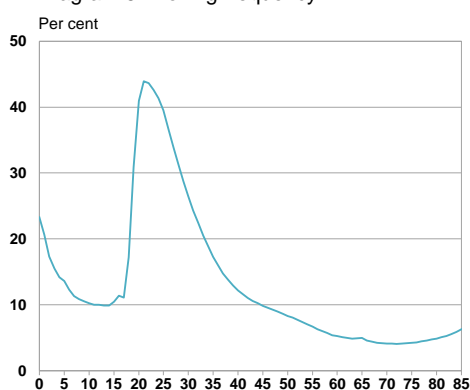
Diagram 4. Number of rental apartments



Source: Statistics Sweden.

Note: Refers to the number of rental apartments per 1,000 residents in each region. The metropolitan areas refer to Greater Stockholm, Greater Gothenburg and Greater Malmö.

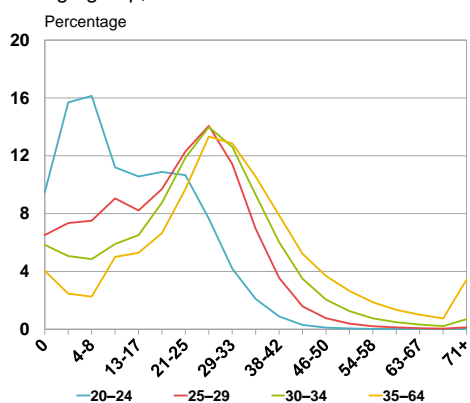
Diagram 5. Moving frequency



Source: Statistics Sweden.

Note: Refers to the average percentage that move within each age group in relation to the population of the age group between 2000 and 2017. One person can have moved more than once during the year.

Diagram 6. Distribution of earned income, by age group, Sweden



Source: Statistics Sweden.

Note: The horizontal axis refers to monthly earned income in 2017. Earned income is the sum of income from employment, a business, pension, sick leave, parental leave, sickness or disability benefits, and unemployment benefits.

single-family homes and tenant-owned apartments<sup>8</sup>, have become more prevalent (Diagram 3).<sup>9</sup> In the metropolitan areas, and in Stockholm in particular, the number of tenant-owned apartments increased approximately three times more than in the rest of the country.<sup>10</sup> Conversions<sup>11</sup> have also contributed to the decrease in the share of rental apartments in the metropolitan areas.<sup>12</sup> Together with Sweden's population growth and urbanisation, this has contributed to a decrease in the number of rental apartments per 1,000 residents in the metropolitan areas, from 244 to 176 (Diagram 4).<sup>13</sup> The decrease has been largest in Stockholm.<sup>14</sup> This means it has become more difficult to find alternatives to owned housing and that competition for rental apartments has increased.

## CONDITIONS FOR YOUNG ADULTS

On a well-functioning housing market, households can choose from different types of homes based on their preferences and financial situation. The solution for each household is unique. Some factors that influence preferences are how much of their income households are willing to dedicate to their accommodation and how much changes in housing prices or rents could affect their personal finances. However, there are also general relationships, for example the advantages of buying a home decrease if accommodation is needed for a shorter period of time since the transaction costs per year become high. On average, young adults live in the same home for a shorter period of time than older age groups (Diagram 5).<sup>15</sup> This is because, for example, the household composition and work or studying arrangements of young adults change more often.

### House prices have increased faster than income

Young adults on average have lower income and savings than other age groups. In 2017, the average income after tax for young adults in the age groups 20–24, 25–29 and 30–34 was, respectively, approximately 53, 35, and 21 per cent lower than the income of older adults (ages 35–64) (Diagram 6). Since 2000, house prices in Sweden have increased on average by 236 per cent (Diagram 7). During the same period, the income of young adults increased by between 60 and 68

8 In Sweden the most common form of ownership of apartments is through a tenant-owned association or housing co-operative association. The association usually owns the property and households can own the right to an apartment in the property.

9 Going forward, we refer jointly to these forms of tenure as *owned housing*.

10 For the population as a whole, the number of tenant-owned apartments per 1,000 residents increased from 105 to 161 in the metropolitan areas during the period 1990–2018, compared to an increase from 66 to 80 in the rest of the country.

11 Conversions means that the group of renters create a tenant-owned association and jointly buy the property from the landlord.

12 See, for example, Swedish Fiscal Policy Council (2019) for a detailed discussion about the rental market.

13 In 1990, just over 34 per cent of the population lived in the metropolitan areas. In 2018, this figure had increased to just over 40 per cent.

14 Between 1990 and 2018, the population in Stockholm increased by 43 per cent (more than 700,000 people) and the number of rental apartments decreased by more than 12 per cent (53,000 rental apartments). As a result, the number of rental apartments per 1,000 residents has decreased from 266 to 164.

15 The frequency with which young adults moved decreased between 2000 and 2010. During the same period, the frequency with which the age group 31–39 moved slowly increased.

Diagram 7. House prices

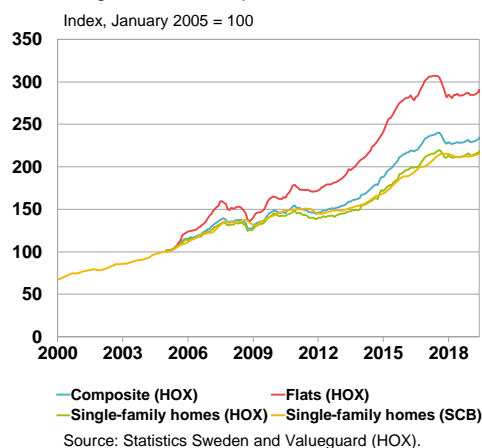


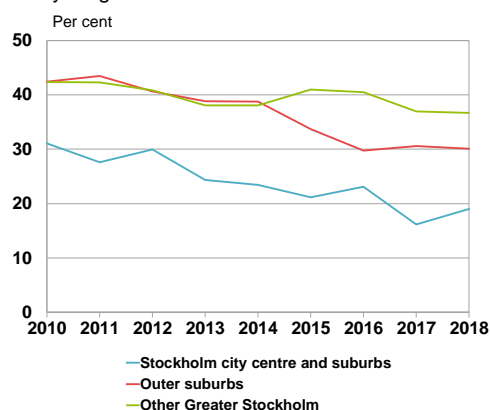
Table 1. Lowest earned income for a rental apartment with average rent

SEK		
Total rental market (stock)	Studio	2 rooms & kitchen
All of Sweden	11 763	16 356
Stockholm	13 905	18 414
Gothenburg	12 321	16 839
Malmö	12 723	18 246
Municipalities with > 75000 pop.	11 274	16 470
Municipalities with < 75000 pop.	10 068	14 715
New production		
	Studio	2 rooms & kitchen
All of Sweden	18 159	24 387
Stockholm	22 908	28 296
Gothenburg	22 236	26 793
Malmö	16 620	22 809
Municipalities with > 75000 pop.	17 568	24 387
Municipalities with < 75000 pop.	14 472	21 252

Source: Statistics Sweden.

Note: Based on average rent for a rental apartment. Lowest earned income is defined as earned income that is three times higher than the annual rent.

Diagram 8. Rental apartments that went to young adults



Source: Stockholm Housing Agency.

Note: Refers to both old and newly produced rental apartments.

per cent.<sup>16</sup> The income of older age groups increased by 91 per cent. In other words, for young adults, the financial conditions on the housing market have deteriorated compared to older adults. This is because both a larger downpayment and a higher income are required to be able to take out a larger loan.<sup>17</sup>

### Difficult to find inexpensive rental apartments

Households that cannot or do not want to own their home are confronted with a two-tiered rental market. Many property owners often have some form of income requirement.<sup>18</sup> The income requirement for an average rental apartment (studio) in Sweden requires a relatively low income, which most young adults and other groups have. However, the queue time is often long, and it has increased. For example, the average queue time in central Stockholm was around 14.5 years in 2018, compared to 8.5 years in 2010.<sup>19</sup> Since young adults often have been in the queue for a shorter period of time, it is common for them to turn to the subletting market, which means more expensive contracts or apartments in less attractive locations.

Newly produced rental apartments often have shorter queue times, but their rents are higher than older rental apartments (Table 1).<sup>20</sup> A large percentage of young adults do not earn enough income to be able to rent a newly produced rental apartment given the income requirements. In the age groups 20–24, 25–29 and 30–34, the number of households that cannot meet the average income requirement is 46, 21, and 10 percentage points higher, respectively, than for the age group 35–64. Sweden's metropolitan areas require a higher income than other areas of the country, and the metropolitan areas also have a lower percentage of young adults who earn enough to qualify for a newly produced rental apartment.<sup>21</sup> Since 2010, the percentage of rental apartments in Greater Stockholm that went to young adults has gradually decreased (Diagram 8).<sup>22</sup> The increase in the queue time is

16 During the period 2000–2017, young adults' net income increased on average 67, 60 and 68 per cent, respectively, for the age groups 20–24, 25–29, and 30–34.

17 Statistics Sweden did not publish data broken down by age group prior to 2000. According to the Swedish National Housing Credit Guarantee Board (2005), the financial circumstances of young adults also deteriorated between 1990 and 2001 since their income did not increase as much as the income of older age groups. The average disposable income of older age groups increased by 18 per cent, while the average disposable income for the age group 21–24 decreased by 13 per cent. For the age group 25–30, income increased by 4 per cent.

18 Normally, rental tenants are required to have an earned income that is either 3–4 times higher than the annual rent or a specific amount of their income left after paying the rent.

19 Based on data from the Stockholm Housing Agency. The average queue time in 2018 was 5 years in Gothenburg and 3 years in Malmö, based on Boplats Göteborg and Boplats Syd, respectively. These figures include newly produced housing, which generally has a shorter queue time. This means that the queue time is significantly longer for older, less expensive rental apartment.

20 In Sweden there has been a rent-control system in place since 1969. The aim of the regulation is to make sure that similar apartments have similar rents. Similarity is assessed with key characteristics such as living area, room planning, general location and distance to communications. Newly constructed rental apartments have their own rent-control system, presumption rent, which often are closer to the market rent.

21 In the age groups 20–24, 25–29, and 30–34 in Greater Stockholm, approximately 82, 51, and 38 per cent, respectively, do not earn enough income to rent an average newly produced rental apartment in Greater Stockholm. In the age group 35–64, this figure was 31 per cent.

22 There is a large difference between newly produced rental apartments and older rental apartments. The share of older rental apartments that went to young adults decreased by 15 percentage points in all Stockholm regions between 2010 and 2018. At the same time, the



Table 2. Years of saving for a downpayment

Year	Monthly savings (SEK)	Annual return on savings	
		0 per cent	6 per cent
2010	1 000	11,8	9,5
	1 500	7,9	6,8
	2 500	4,7	4,3
2014	1 000	15,8	11,9
	1 500	10,5	8,6
	2 500	6,3	5,6
2018	1 000	19,2	13,8
	1 500	12,8	10,1
	2 500	7,7	6,6

Source: FI.

Note: Refers to return after the capital gains tax of 30 per cent. Calculations refer to an average home purchased by a young, single adult in 2018. The average value of the home is estimated backward in time using Valueguard's housing price index. The calculation assumes a downpayment of 15 per cent of the value of the home.

probably the primary reason for why young adults find it harder to find a rental apartment.

### Larger downpayment required

For young adults, the establishment threshold also went up on the market for owned housing. Higher house prices combined with the LTV cap mean that, compared to before, home buyers need a larger downpayment. Young adults find it more difficult, relative to older age groups, to afford a larger downpayment since they often have less wealth. Since young adults are more likely to be first-time buyers, they have also not been able to benefit to the same extent from previous price increases. Homeowners often have high loan-to-value ratios, which creates a leverage effect. When prices are increasing, a higher loan-to-value ratio with the same downpayment leads to a greater increase in invested equity in the home compared to lower leveraged investments with the same price increases.<sup>23</sup> During periods of rising house prices, the difference in equity further increases between those who own their housing and those who do not.<sup>24</sup> Young adults who want to enter the owned housing market are thus negatively affected by rising prices.

Higher house prices also mean that households financing the downpayment themselves must save more per month or over a longer period of time than they needed to before to be able to buy a home (Table 2). In addition to the larger downpayment due to higher house prices, the type of housing during the savings period can also complicate the situation. Subletting contracts or newly produced rental apartments often require larger monthly payments than a tenant-owned apartment requires.<sup>25</sup> This is due in part to the compensation to landlords for taking on the responsibility of maintenance costs, renovation and financial risk, but home owners are also currently benefiting from today's low interest rates and the interest rate deduction. As a whole, this means that households with a subletting contract or that live in a newly produced rental apartment often find it more difficult to save as much of their income as households that own their home and, for example, would like to buy a new, larger home.

## CREDIT ASSESSMENT

When a household buys a home, the purchase is often largely financed by a mortgage. Before a bank approves a mortgage, as a part of its credit assessment, it assesses the borrower's ability to service its debt by conducting a debt service stress test, which consists of deducting the household's estimated monthly expenses from household income after tax. These expenses include subsistence costs (standardised

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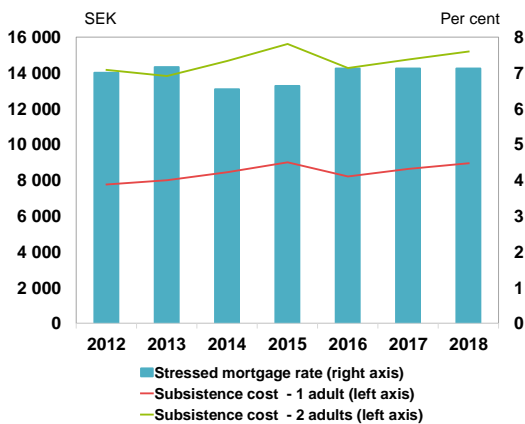
share of newly produced rental apartments that went to young adults increased by 7 percentage points during the same period. Diagram 8 shows the aggregate share.

23 In the same way, leveraged investments also decrease more if asset prices fall.

24 This has also benefited those who have access to a co-borrower who already owns a home and thus experienced this increase in equity.

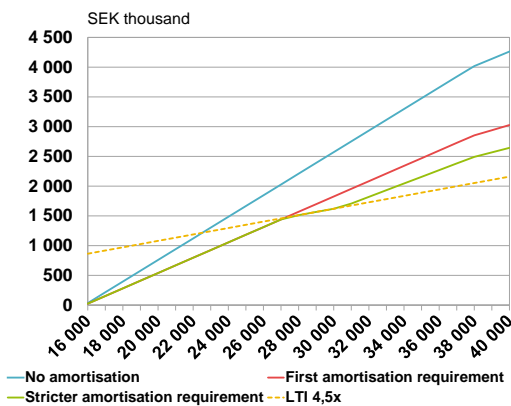
25 Cash outflows for an average newly produced rental apartment (studio) in Sweden are approximately 61 per cent higher than for owned housing given today's interest rates. This calculation disregards maintenance costs and assumes a mortgage of SEK 1.33 million (the average for single young adults in FI's mortgage survey in 2017) with an interest rate of 2 per cent and a monthly association fee of SEK 2,200. This generates a cash outflow of SEK 3,756. The rent for a newly produced studio apartment in Sweden was approximately SEK 6,060 in 2017.

Diagram 9. Banks' average standardised subsistence costs and the stressed mortgage rate



Source: FI's mortgage surveys.

Diagram 10. Possible mortgage for single-person household



Source: FI and Statistics Sweden.

Note: Refers to potential mortgage with and without the current amortisation regulations. Monthly income before tax is on the x-axis. The potential mortgage is calculated using a monthly fee of SEK 2,200, a stressed mortgage rate of 7 per cent following the interest rate deduction, a loan-to-value ratio of 85 per cent, and standardised subsistence costs of SEK 9,500.

amounts), housing-related operational expenses, interest rate expenses and amortisation payments.<sup>26</sup> The interest rate expense is calculated using a stressed mortgage rate, which is higher than the current rate. The banks' debt service stress test takes into account the LTV cap and the amortisation requirements. In order for a bank to grant a mortgage, the borrower normally may not have a deficit in the stress test.<sup>27</sup>

According to FI's mortgage survey, the banks often use a stressed mortgage rate of around 7 per cent (Diagram 9).<sup>28</sup> After the interest rate deduction of 30 per cent, the stressed mortgage rate is 4.9 per cent. In conjunction with the first amortisation requirement, some banks made marginal changes to both the stressed mortgage rate and the standardised subsistence costs in their debt service stress test. The lower average standardised costs compensated for the average increase in the stressed mortgage rate in 2016 for loans up to SEK 2.1 million and SEK 3.5 million for single-person households and households with several adults, respectively. These loans are larger than what young adults often borrow.<sup>29</sup> How strict the credit assessment is depends on the banks' internal guidelines, i.e. the combination of the stressed mortgage rate and the standardised subsistence costs but also how the banks handle loan applications from households that have a deficit in the debt service stress test.

#### Impact of amortisation requirements on credit assessment

Given the banks' average standardised subsistence costs and stressed mortgage rates, we can illustrate how large of a mortgage a single borrower theoretically could be granted (Diagram 10). Following the introduction of the amortisation requirements, households with new large mortgages in relation to their income and the value of the home must amortise 1, 2 or 3 per cent.<sup>30</sup> This means that these groups must have a higher income, all else being equal, to be able to borrow as much as before. Compared to mortgages without amortisation, the first amortisation requirement affected the size of a potential mortgage more than twice as much as the stricter amortisation requirement. The difference between the amortisation requirements is that home buyers are not subject to the stricter amortisation requirement if their income is lower than approximately SEK 28,000/month.<sup>31</sup> These home buyers are limited by the banks' credit assessment and often cannot get a mortgage that is larger than 4.5 per cent of their annual income before tax. Thus, they do not come up to a loan-to-income ratio that becomes subject to the stricter amortisation requirement. Since most mortgage

26 Subsistence costs consist of a standardised amount that is considered to be the minimum required for necessary expenses. This amount can vary between banks.

27 A deficit in the debt service stress test could lead to the denial of a mortgage application or further review before the bank makes a decision. In FI's mortgage surveys between 2012 and 2018, approximately 5 per cent of the mortgagors would have had a deficit in the stress test using the banks' average standardised subsistence costs. The percentage does not differ between younger and older age groups.

28 The volume-weighted stressed mortgage rate has varied between 6.8 and 7.2 per cent during the same period. In 2014 and 2015, some of the banks used a lower stressed mortgage rate. As a result, the average stressed mortgage rate was lower than 7 per cent those years.

29 The average mortgage for single-person households was SEK 1.1 in 2016, and the corresponding figure for households with several adults was SEK 1.8 million. In 2016, 90 per cent of single-person households with young adults had a loan that was less than SEK 2.1 million, and 94 per cent of households with several adults had a loan that was less than SEK 3.5 million.

30 See Finansinspektionen (2016) and Finansinspektionen (2017b).

31 Assuming a loan-to-value ratio of 85 per cent.

contracts required amortisation already before the amortisation requirements were introduced, the theoretical maximum effect (an increase of the rate of amortisation from 0 to 3 per cent) is higher than the realised impact on most mortgagors.

## Establishment in the housing market

There are several different housing forms that are available for young adults when they move away from home and need to enter the housing market. There are types of housing that are primarily intended for short-term use, such as student housing and subletting or sub subletting. Establishment in the housing market is more associated with long-term types of housing such as owned housing and primary rental contracts. The share of young adults who owned a home decreased already in the 1990s, primarily in the metropolitan areas. Between 1990 and 2001, the share of young adults that became established in the housing market in the Greater Stockholm area via a primary rental contract or owned housing decreased by 20 percentage points (Swedish National Housing Credit Guarantee Board, 2005). According to the Swedish National Housing Credit Guarantee Board, this lower rate of establishment was primarily due to the difficulty in getting a rental contract, but ownership rates also decreased.<sup>32</sup> In other words, young adults have been experiencing obstacles to becoming established the housing market for a long time.

There have been no public statistics since 2000 for studying the establishment in the housing market via owned housing or a primary rental contract. Today, young adults are starting to work later, and they have experienced slower income growth compared to other age groups. At the same time, the share of rental apartments in the large cities has decreased and house prices have increased. This implies that the rate of establishment may have decreased in the 2000s, but there is also no data for studying how borrowing possibilities given house prices and income changed during the 2000s. For example, if the banks lent more relative to the value of the home or relative to the household income during the 2000s, it may have facilitated establishment in the owned housing market.<sup>33</sup>

Young adults represent an increasing share of new mortgages FI introduced the LTV cap in 2010. The following year, the share of young adults that took out a new mortgage decreased.<sup>34</sup> However, since 2012 this share has gradually increased. For the period 2012–2018, we can use FI's mortgage surveys to study changes in the young

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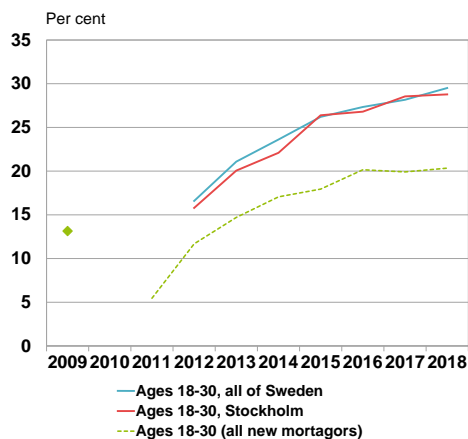
32 Between 1990 and 2001, the establishment rate for the age group 21–24 fell from approximately 50 to 30 per cent and for the age group 25–30 from 70 to 50 per cent. For establishment in tenant-owned apartments, the age group 21–24 (25–30) fell from 15 (22) to 9 (15) per cent. For establishment in primary rental contracts, the age group 21–24 (25–30) fell from 35 (48) to 21 (35) per cent.

33 For example, aggregate data of the banks' new loans during the period 2002–2010 shows that the average loan-to-value ratio increased from 59 to 71 per cent. See Finansinspektionen (2019), Diagram 8.

34 Due to discrepancies in the data in 2009 compared to 2011–2018, comparisons should be made with a certain degree of caution. For example, we cannot identify which mortgages in 2009 were issued to buy a home.

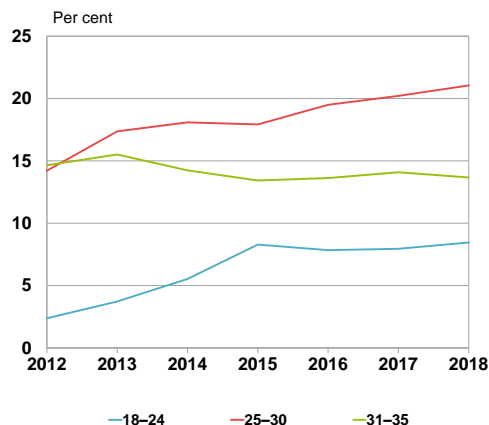


Diagram 11. Young home buyers in Sweden and Stockholm



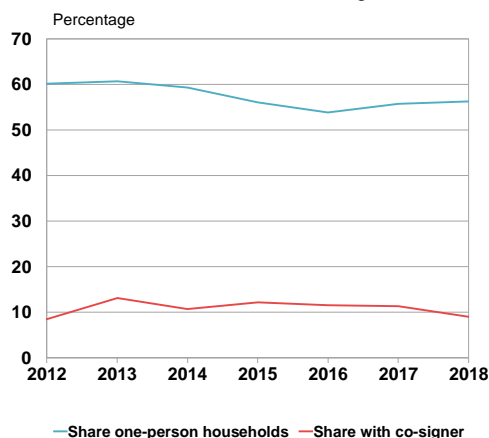
Source: FI's mortgage surveys.  
Note: Refers to new loan agreements for home purchases from FI's annual mortgage survey. This excludes households that withdraw home equity or have a new mortgage agreement following a bank switch. The dashed line refers to the new mortgages, including home equity withdrawals and bank switches, granted to young adults.

Diagram 12. Young home buyers by age group, Sweden



Source: FI's mortgage surveys.  
Note: Refers to new loan agreements for home purchases. This excludes households that withdraw home equity or have a new mortgage agreement following a bank switch.

Diagram 13. Share of single-person households and households with co-signers



Source: FI's mortgage surveys.  
Note: Refers to new loan agreements for home purchases. This excludes households that withdraw home equity or have a new mortgage agreement following a bank switch.

adults' share of home purchases financed by new loans.<sup>35</sup> Since 2012, the share of homes in Sweden that were bought by young adults between the ages of 18 and 30 increased from 16.6 to 29.5 per cent. After 2016, this growth slowed. In Stockholm, the growth has followed basically the same trajectory (Diagram 11).

At the same time, the young adults' represented a relatively stable share of the population during the period 2012–2018, even if the share of other age groups varied. For example, the share of the population that is older than 70 increased, and this group is less likely to move. As a result, the share of young adults and other age groups may have increased. The share of households that bought a new home where the primary borrower is in the age group 25–30 has slowly increased since 2012. This growth has been slightly weaker for the youngest age group. For those just over 30, the share has decreased slightly (Diagram 12). Even if the share of young adults has gradually increased, this is not the same thing as increased establishment in the owned housing market, but it is an indication that this group has not been shut out of the owned housing market.<sup>36</sup> We will come back later to how higher prices and new amortisation rules have led this group to adapt their behaviour.

The percentage of young new mortgagors that are single-person households has decreased slightly since 2012 (Diagram 13). This could be due to the stricter requirements on income and capital for individual borrowers, and young adults therefore are adapting by living together more frequently. Almost one out of ten young adults taking out a new mortgage in 2018 had a co-signer who does not live in the home. This is somewhat lower than before.<sup>37</sup> Co-signers are most common among the youngest borrowers.

### LOAN-TO-INCOME RATIO OF YOUNG ADULTS INCREASED MORE THAN THAT OF OLDER AGE GROUPS

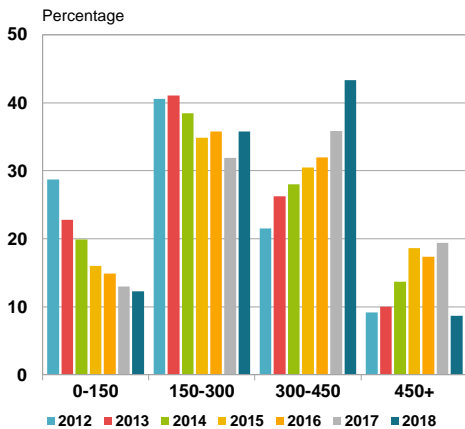
Single-person households without co-signers find it more difficult than households with several adults to meet the increasing requirements on income. In 2018, single-person households with young adults borrowed on average just over SEK 1.1 million. This is approximately SEK 400,000 more than in 2012. The average loan-to-value ratio in 2018 for these mortgagors was 76 per cent, and their loan-to-income ratio was 305 per cent (Table B1 in Appendix B). Since 2012, the loan-to-value ratio for this group has increased slightly. The loan-to-income ratio has increased by 45 percentage points despite having decreased by 31 percentage points following the stricter amortisation requirement (Diagram 14). The loan-to-income ratio of single-person

35 We cannot identify households that buy a home for the first time. The mortgage surveys contain a sample that is surveyed every year, and the results are presented in more detail in FI's report *The Swedish Mortgage Market*. See, for example, Finansinspektionen (2019) and Appendix A for a discussion about the data.

36 We cannot identify which are first-time buyers. This means, for example, that households already in the market might be buying new homes more often. This affects the share of new home purchases for young adults but not their establishment in the market.

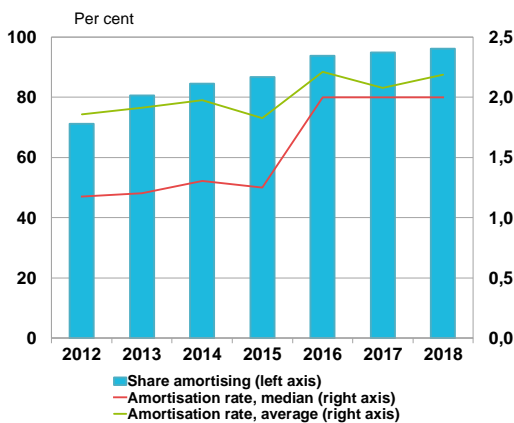
37 It is not clear what caused the decrease. It may be due to the implementation of the stricter amortisation requirement. Unlike the first amortisation requirement, the stricter amortisation requirement focuses more on the household underlying the mortgage and not the home. As a result, the amortisation rules have more of a direct impact on co-signers. The decrease can also be due to a decrease in the wealth of potential co-signers, given the negative price development on homes between the mortgage surveys in 2017 and 2018.

Diagram 14. Loan-to-income ratios of young adults increased sharply



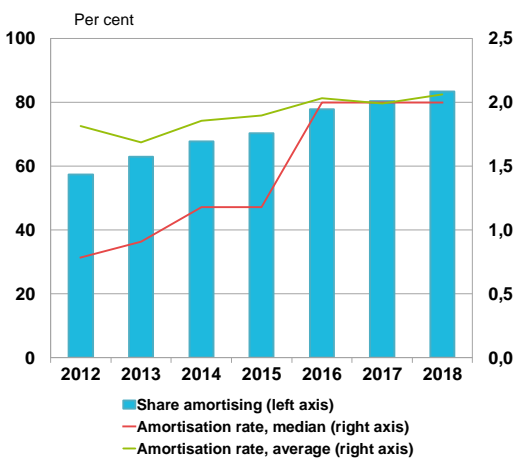
Source: FI's mortgage surveys.  
Note: Refers to new loan agreements for loan-financed home purchases.

Diagram 15. Amortisation by young adults



Source: FI's mortgage surveys.  
Note: Refers to young adults' loan-financed home purchases.

Diagram 16. Amortisation among older age groups



Source: FI's mortgage surveys.  
Note: Refers to loan-based home purchases by older age groups.

households with young adults increased by 18 percentage points more than for other borrowers.<sup>38</sup> However the share of single, young-adult borrowers with a loan-to-income ratio of more than 450 per cent was lower in 2018 than it was in 2012. This is because of the sharp decrease in this share in 2018 following the implementation of the stricter amortisation requirement.

The percentage of young adults who take an unsecured loan from the same bank in conjunction with their mortgage has decreased since 2012, and in 2018 it was approximately 6 per cent.<sup>39</sup> However, among those that took an unsecured loan in 2018, the loan was on average larger than in 2012. Approximately the same change occurred for young adults in households with several adults. These households had larger debt and higher loan-to-value ratios but lower loan-to-income ratios. Altogether, this indicates that young adults have been forced to take larger financial risks compared to other groups to purchase a home.

### YOUNG-ADULT BORROWERS ALREADY AMORTISED BEFORE THE REQUIREMENTS

The share of young adults that amortise has increased since 2012. In 2012, approximately two out of three young adults who were new mortgagors and bought a home amortised.<sup>40</sup> This is high compared to other age groups. Among older home buyers, 55 per cent amortised in 2012. In 2015 – before the implementation of the first amortisation requirement – the share of young adults that amortized had increased to 86 per cent. Following the amortisation requirements, even more young home buyers amortise.<sup>41</sup> Ninety-six per cent of young adults amortised in 2018 (Diagram 15).<sup>42</sup> Between 2012 and 2018, the percentage of older home buyers that amortise increased to 81 per cent. The percentage of young adults that amortise has varied over time throughout the country. For example, between the years 2012 and 2015, 9 percentage points fewer young adults in Stockholm amortised compared to young adults in the rest of the country.

Young adults also amortised a larger share of their mortgage than older age groups before the implementation of the amortisation requirements. The agreed annual amortisation for the median borrower among young adults was 1.2 per cent of the mortgage in 2012 (Diagram 15). The median borrower among older age groups amortised 0.8 per cent of the mortgage in 2012 (Diagram 16). The median amortisation rate increased slightly up to the implementation of the first amortisation requirement in 2016. Then the rate of amortisation for

38 If we look at all young-adult home buyers, their average loan-to-income ratio has gone from being 10 percentage points lower than that of older age groups in 2018 to being 15 percentage points higher.

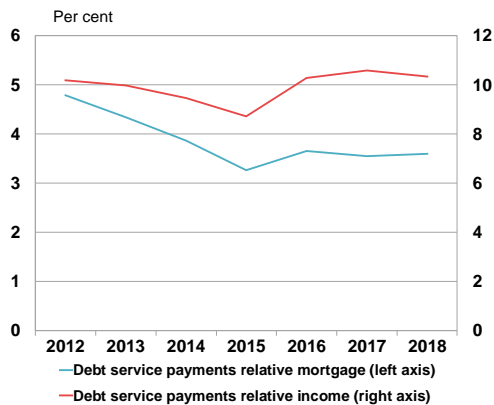
39 Unsecured loans here include unsecured loans raised by the borrower from the bank that granted the new mortgage and in conjunction with the new mortgage. Unsecured loans taken from a bank other than that which granted the mortgage with the aim of financing the property are not included in FI's data.

40 For amortisation payments, FI measures what the mortgage agreement says about amortisation payments, i.e. the terms of the agreement. This figure does not include households that amortise in addition to what has been agreed with the bank at the time the mortgage is issued.

41 Finansinspektionen (2017a) and Andersson and Aranki (2019).

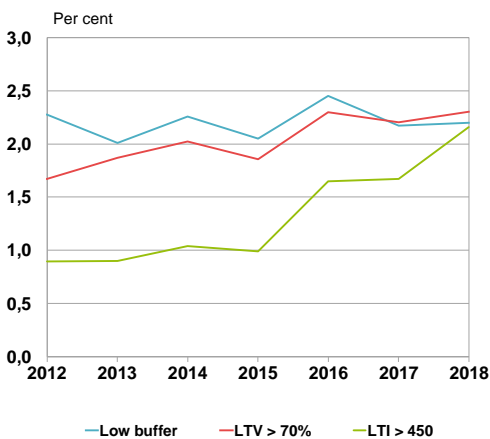
42 For the age group 31–35, the percentage that has amortised has been approximately the same as for the age group 18–30.

Diagram 17. Debt service payments by young adults



Source: FI's mortgage surveys.  
Note: Debt service payments refer to debt service payments before tax over a period of one year. Income is also before tax.

Diagram 18. The rate of amortisation among different groups of young borrowers, average



Source: FI's mortgage surveys.  
Note: Refers to households with young adults as new home buyers. LTV refers to loan-to-value ratio and LTI to loan-to-income ratio.

the median borrower increased to 2 per cent for both young adults and older age groups. The average rate of amortisation has been higher than the median. The stricter amortisation requirement in 2018 had a marginal impact on young adults' average rate of amortisation. Debt service payments (i.e. both interest and amortisation payments) have decreased slightly in relation to the mortgage since 2012 (Diagram 17). However, debt service payments increased slightly in relation to income. Given that interest rates have fallen, the difference between 2012 and 2018 in the various debt service payment ratios is smaller than the difference in the amortisation rate during the same period.

### Borrowers with small surpluses amortise a lot

The rate of amortisation was different for different groups of young households before the implementation of the amortisation requirements. Households that took out a new mortgage and that had a lower buffer in their debt service stress test between 2012 and 2015 have generally had a high rate of amortisation (Diagram 18).<sup>43</sup> New young home buyers in the lowest quintile<sup>44</sup> in the debt service stress tests had on average an annual amortisation rate of 2.2 per cent.

Households with young adults with large loans in relation to the value of the home have on average also amortised a lot. This group amortised on average 1.6 per cent in 2012, which increased to 2.3 per cent in 2018. However, young-adult home buyers with high debt in relation to their income had a relatively low average amortisation rate before the implementation of the amortisation requirements. This group increased its amortisation rate the most after the requirements; before the requirements, the group amortised approximately 1 per cent of its mortgages each year. After the amortisation requirements, this figure increased to on average 2.2 per cent in 2018.

Even if the average level of amortisation among young borrowers has historically been high, their rate of amortisation has varied significantly. Some young adults did not amortise at all before the requirements, while others amortised more than what is now required. The rate of amortisation also differs between different areas. Young home buyers in Stockholm have had a lower average rate of amortisation compared to other regions. Before the amortisation requirements in 2016, their average rate of amortisation was approximately 1.1 per cent of their mortgage. In 2018, this had increased to 2.0 per cent. This indicates that the change for young home buyers in Stockholm has been larger than for young adults in the rest of Sweden.<sup>45</sup>

43 To improve comparability over time, we use the quintile with the lowest buffers in the debt service stress test when using the actual interest rate and no amortisation. There is no clear delineation for what constitutes a low buffer in the debt service stress test. The average amortisation rate is even higher in the quintile with the lowest buffers in the debt service stress test when including amortisation payments.

44 Quintiles are created by dividing the data into five equally large groups. The lowest quintile thus contains the households with the 20 per cent lowest buffers in the debt service stress test.

45 Andersson and Aranki (2019) shows in an analysis of the stricter amortisation requirement that single young adults in Stockholm reduced their mortgages to a greater extent than other groups. However, it is more difficult to quantify how the opportunity to buy a home has been impacted by the amortisation requirements.

## YOUNG BORROWERS' OPPORTUNITIES FOR BUYING A HOME

FI's mortgage surveys enable us to analyse how different types of households changed their borrowing behaviour, given that they took out a loan. That is, the borrowing behaviour on what is called the intensive margin. It is more difficult, however, to analyse how the opportunity and willingness to take out a loan in general to buy a home has changed, which is called the extensive margin. This type of analysis would have benefited from data on assets or mortgage applications. Because we do not have this kind of data, the analysis to some extent needs to rely more on calculations and assumptions.

In a counterfactual analysis, we study how the ability of young borrowers to buy a home has changed in recent years.<sup>46</sup> We start with young adults' observed purchases of homes in FI's mortgage survey in 2012 and calculate the lowest income they needed for each home that was bought (we call this income *required income*, i.e. the lowest income (after tax) required for a borrower to not have a deficit in the debt service stress test).<sup>47</sup> We start with the actual agreed amortisation payments for the homes that were bought. We then extrapolate house prices and amortisation requirements, as well as standardised subsistence costs and the stressed mortgage rate, in the credit assessment to 2018 levels to show how the required income has changed. This analysis also enables us to describe how different components have affected the required income: changed standardised costs, stressed mortgage rates, amortisation requirements, prices and a combined amortisation and price effect.<sup>48</sup> We then compare the change with the level of income in 2018 (see Appendix C for a detailed description of the calculation).

In order to understand how the change has affected households that previously were able to buy a home, we also compare the development with borrowers' *actual income* and their *debt service stress test buffers*. This provides an indication of how a borrower's situation would have been today given the same borrowing behaviour and housing preference as before the increase in house prices and the implementation of the amortisation requirements.<sup>49</sup> The analysis shows how the *possibility* to take out a loan has changed. Changes in house prices, income and amortisation requirements can also affect the *willingness* of a household to take out a loan. We cannot take this into account in our calculations.

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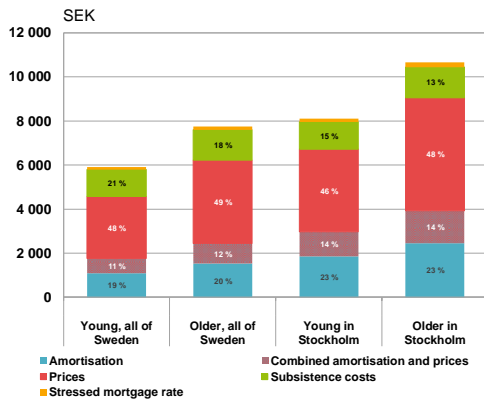
46 Borrowers in the calculations refer to both single-person households and households with several adults but excludes households that have a co-signer outside the household.

47 A similar calculation was used in the DN opinion column on 18 November 2018. In the simplified version, everything started with the average borrower's rate of amortisation and only included the first amortisation requirement. Here, we use the entire distribution of young adult households and take in account both amortisation requirements.

48 See Appendix C for an estimation of the distribution of the effects.

49 Since we do not have data on wealth, we assume here that households would have been able to pay the downpayment of house prices in 2018. Households' total financial net wealth, adjusted for pensions savings and housing assets, grew by approximately 160 per cent between 2012 and 2018. However, the financial wealth is not distributed evenly.

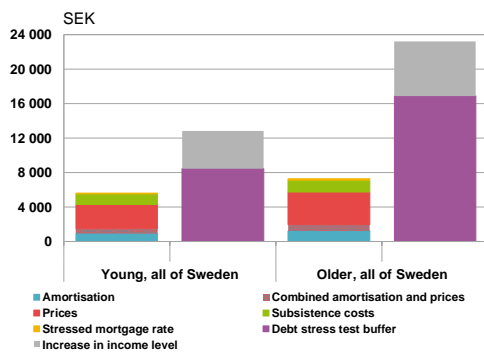
Diagram 19. Increase in required income between 2012 and 2018



Source: FI's 2012 mortgage survey.

Note: Refers to the average change. The percentages in the bars refer to the component's share of the total average change.

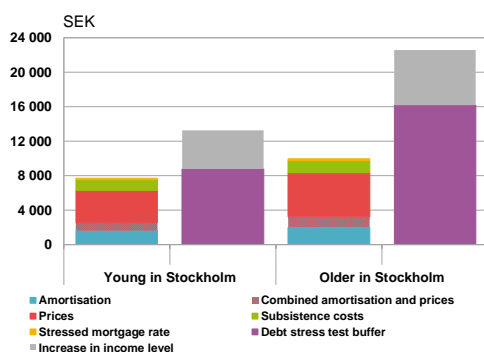
Diagram 20. Mortgagors have had large buffers, all of Sweden



Source: FI's 2012 mortgage survey.

Note: Refers to the average change. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2018.

Diagram 21. Mortgagors have had large buffers, Stockholm



Source: FI's 2012 mortgage survey.

Note: Refers to the average change. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2018.

## HIGHER THRESHOLD FOR HOME BUYING

In 2012, the required monthly income after tax for homes bought by young adults was on average approximately SEK 18,500.<sup>50</sup> This corresponds to SEK 21,450 with 2018 salary levels.<sup>51</sup> When we take into account rising house prices and amortisation requirements, the required income to buy the same home in 2018 rose on average to SEK 24,350. Thus, the average required income increased by almost SEK 6,000; in other words, more than the average change in the salary level. Higher house prices represent just under half – SEK 2,800 – of the increase (Diagram 19). The effect from higher amortisation payments is SEK 1,100, or 19 per cent. The combined amortisation and price effect is SEK 650 (11 per cent). Higher standardised costs also meant an increase of SEK 1,200 (21 per cent), while a higher stressed mortgage rate contributed SEK 100 (2 per cent) to the increase.<sup>52</sup> Of the increase that derives from the amortisation requirements, the first amortisation requirement represents approximately two-thirds. Our assumption of a constant loan-to-value ratio has an impact on the results. If we had instead assumed a constant downpayment, the effect from the upswing in prices would have been greater.<sup>53</sup> The effect that is attributed to the amortisation requirements disregards that the requirements are considered to have slightly slowed the growth in house prices, which would help decrease the impact on the thresholds.

The income of young mortgagors in 2012 was on average approximately SEK 8,500 higher than the required income. With the general increase in salaries between 2012 and 2018, their income would have been SEK 4,400 higher in 2018. This means that the actual income of young adults, together with their debt service stress test buffer, on average is higher than the required income in 2018 (Diagram 20).<sup>54</sup> However, the distribution of both the debt service stress test buffer and the effects on required income are disperse. Since some young adults had a low debt service stress test buffer at the same as the required income has increased more than the actual income, some of the homes bought in 2012 could not have been financed in 2018 by households with a similar financial situation. Given the changes in the salary level and required income, approximately 85 per cent of the young

50 This refers to homes purchased by both single-person households and households with several adults. For single-person households, the required income was on average SEK 14,750. For households with several adults, the required income per person was on average SEK 11,750.

51 We use the development in the average gross income between 2012 and 2018 to express this using the 2018 salary level. We deduct tax from the income using Tax Table 30. We assume that income is evenly distributed within the household. See Appendix C for more information.

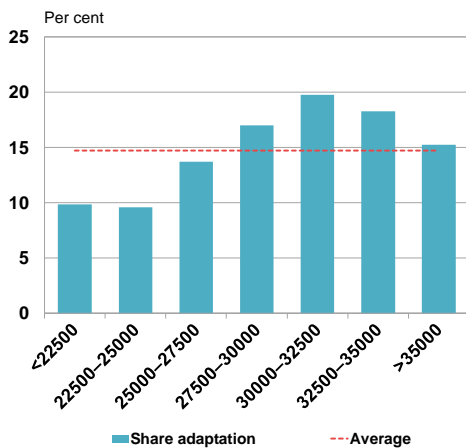
52 Our calculations are in nominal terms. If we instead calculate the payments for 2018 and convert them to the 2012 price level, the level of the payments in 2012 will be important. This would mean that the standardised costs' share of the increase in required income would be reduced by half and distributed relatively evenly among other components. See Appendix C for such a calculation.

53 We assume a constant loan-to-value ratio given the lack of information on wealth and to more easily be able to follow the effects of different components. With a constant cash downpayment, both the price effect and the combined price and amortisation effect would have been larger since the loan-to-value ratio in 2018 would have been higher. This also means that some would have needed to supplement their mortgage with an unsecured loan to be able to buy a home, which leads to more assumptions and a more complex analysis.

54 This also means that there are fewer households that need to amortise under the stricter amortisation requirement than according to the calculations for Diagram 19.

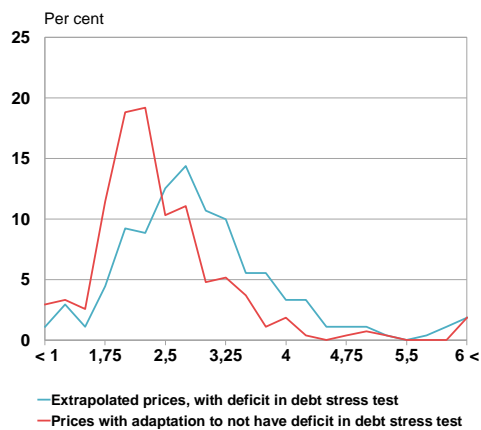


Diagram 22. The share that would need to adapt, by income group



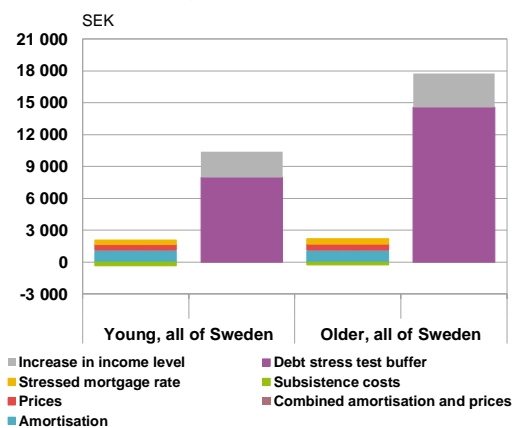
Source: FI's 2012 mortgage survey.  
Note: The bars refer to the percentage of the observed purchases from 2012 that cannot be made in 2018 in different income groups. The income groups refer to the 2018 salary level expressed as post-tax income per person.

Diagram 23. Adaptation in prices to pass debt stress test



Source: FI's 2012 mortgage survey.  
Note: The X axis refers to house prices in SEK million for young mortgagors who need to adapt. Extrapolated prices show the price level for the same mortgagors. Adapted prices show the price level where the household would not have had a deficit in the debt service stress test.

Diagram 24. Change in required income, 2015–2018, all of Sweden



Source: FI's 2015 mortgage survey.  
Note: Refers to the average change. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2015–2018.

adults could buy the same home in 2018 as in 2012.<sup>55</sup> Among older borrowers, the corresponding figure for the country as a whole is 89 per cent. For the older borrowers, the average change is larger measured in SEK. The percentage is still higher because they also on average had larger debt service stress test buffers at the start to absorb the change.<sup>56</sup>

Because house prices were higher and the rate of amortisation among young adults were lower in Stockholm in 2012, the effects for young adults in Stockholm differ from those for young adults in the rest of the country (Diagram 21). This means that, in Stockholm, 67 per cent of the observed home purchases could have been made by young adults with similar characteristics in 2018. For other home buyers, the same figure was 81 per cent.

In summary, taking price and income increases as given, the conditions for buying a home deteriorated for both young adults and older age groups during the period 2012–2018, but somewhat more for young adults. The deterioration is also clearer in Stockholm. The single most important reason is the increase in house prices, but amortisation requirements and higher standardised costs also factored in. This means that some households would have needed to adapt to buy a home, for example by buying smaller homes or homes with a less central location.

In the calculations, the group of young home buyers that would have needed to adapt their loans experience a deficit of on average SEK 3,000. Since they would not have been able to buy a similar home in 2018, they would have needed to adapt their purchase in order to pass the banks' credit assessment and be able to buy a home. These mortgagors are from the metropolitan areas, and 87 per cent of them are single-person households. The share that would have needed to adapt varies between income groups. The highest is for borrowers with a pre-tax income between SEK 27,500 and 35,000 per month (Diagram 22). The share is lowest among home buyers with lower income.

For the single-person households that would have needed to adapt, the extrapolated average price of a home was approximately SEK 2.86 million in 2018.<sup>57</sup> In order for this type of borrower to have a buffer in their debt service stress test, they would have needed on average to borrow 17 per cent less (Diagram 23). With a constant loan-to-value ratio, this corresponds to a price of SEK 2.35 million, which is a decrease on average of SEK 510,000.<sup>58</sup> Calculated using the average

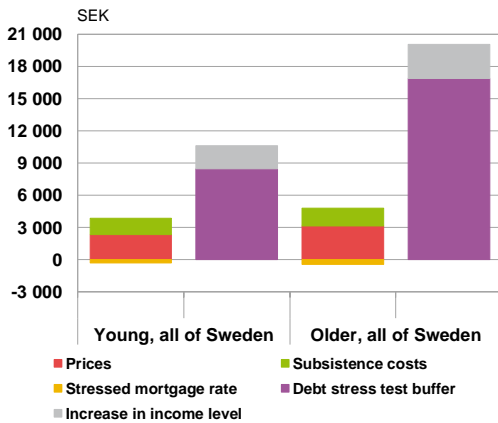
55 We look at those with a debt service stress test buffer in 2012. Approximately 6 per cent of young mortgagors had debt service stress test deficit in 2012.

56 The larger buffers on average and the resulting higher percentage for older age groups is partially explained by the greater prevalence of homes being bought by households with several adults, which in general have larger buffers. The share of homes that could have been bought in 2018 by young households with several adults is slightly higher than the figure for older households with several adults.

57 We focus on single-person households since they needed to adapt more and the homes purchased by this group are more similar.

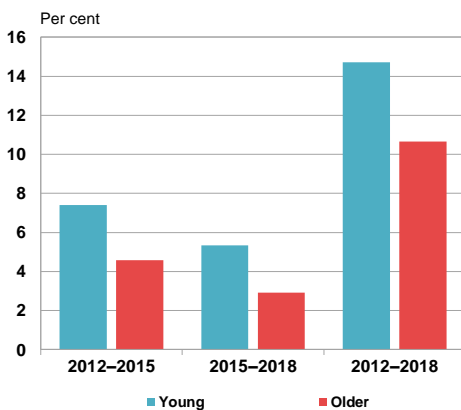
58 Given the lack of detailed price statistics, we cannot study what this corresponds to in the distribution of house prices. Instead, we need to use average prices.

Diagram 25. Change in required income, 2012–2015, all of Sweden



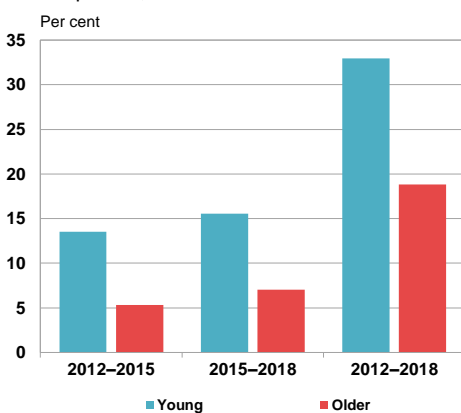
Source: FI's 2015 mortgage survey.  
Note: Refers to the average change. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2015.

Diagram 26. Share of purchases that required adaptation, all of Sweden



Source: FI's mortgage surveys for 2012 and 2015.  
Note: The bars refer to the share of observed home purchases that could not have been financed in the final year of the period.

Diagram 27. Share of purchases that required adaptation, Stockholm



Source: FI's mortgage surveys for 2012 and 2015.  
Note: The bars refer to the share of observed home purchases that could not have been financed in the final year of the period.

price of an apartment in central Stockholm in 2018, this can be compared to buying an apartment that is 27 m<sup>2</sup> instead of 33 m<sup>2</sup>.<sup>59</sup> A decrease in price from SEK 2.86 million to SEK 2.35 million also corresponded to the difference in price for a 30 m<sup>2</sup> apartment on Södermalm, a district in central Stockholm, and the price of a 32 m<sup>2</sup> apartment in Stockholm's southern suburbs.<sup>60</sup>

### HIGHER HOUSE PRICES LEAD TO ADAPTATION

The starting year we choose in the calculations affects the change in required income and how it develops in relation to salaries. If we choose a shorter perspective and start from mortgagors' situations in 2015, the year before the implementation of the first amortisation requirement, the required income increases slower than salaries for both young and older home buyers. This means that the possibilities for buying a home on average improved during the period 2015–2018.<sup>61</sup> The most important explanation for this is that house prices only increased by approximately 7 per cent during the period 2015–2018, which makes the price effect small (Diagram 24).<sup>62</sup>

The amortisation requirements represent the largest share of the increase in required income during this period. Banks also lowered their assumptions for the standardised costs during this period, which countered the upswing in required income. A marginally higher average stressed mortgage rate also contributed to the increase in required income. Ninety-five per cent of young adults in Sweden, and 84 per cent in Stockholm, would have been able to buy the same home in 2018 as in 2015 according to the extrapolated rules and prices. For other home buyers, the corresponding figures are 97 per cent in Sweden and 93 per cent in Stockholm.

House prices rose sharply between 2012 and 2015, a period during which there were no amortisation requirements. The price increases affect the average required income more during this period than between 2015 and 2018 (Diagram 25). If we extrapolate the observed purchases from 2012 to 2015, 93 per cent could have been made by young households with similar characteristics (Diagram 26). This was a slightly lower percentage than if we analyse the situation in 2018 using homebuyers in 2015. For other age groups, the corresponding figure is 95 per cent. However, the calculation shows that in Stockholm fewer homes could have been bought in the 2015–2018 example than in the 2012–2015 example (Diagram 27). Between 2012 and 2015, 86 per cent of the homes could have been bought by young households with similar characteristics in Stockholm. For other home buyers, the corresponding figure was 95 per cent. The effect of the price increase during the early period is offset by a marginal decrease in the stressed mortgage rate. It has a greater impact in Stockholm, where prices and thus loans are larger compared to the rest of the country. Home buyers

59 According to Valueguard's price per square meter for August 2018.

60 Calculated using the price per square meter for studio apartments in each area in August 2018.

61 Young adults who bought a home in 2015 had approximately the downpayment that was needed for house prices in 2018. Therefore, the calculation is impacted less by the assumption of a constant loan-to-value ratio than when the analysis is started in 2012.

62 Refers to Valueguard's HOX Flats Sweden from August 2015 to August 2018. See also Finansinspektionen (2018) for a discussion on the impact of the stricter amortisation requirement and new production on house prices during the period.

in 2015 also had smaller margins to withstand higher increases in requirements on income compared to home buyers in 2012.

If we compare the counterfactual calculations with the actual outcome in FI's mortgage surveys, we can also see that young adults have gradually adapted their home purchasing behaviour. For example, the average price for a home bought by a single-person household in the 2015 mortgage survey was 36 per cent higher than in 2012, while the price index for apartments grew by 50 per cent during the same period. In the 2018 mortgage survey, 10 per cent of the single-person households had a loan-to-income ratio of more than 4.5 (it was 25 per cent in 2017, before the stricter amortisation requirement). In the counterfactual calculation, 27 per cent of the young, single-person household homebuyers had a loan-to-income ratio of more than 4.5. Their adaptations may have contributed to the increase in the percentage of home purchased by young home buyers, which rose from 16 per cent in 2012 to 28 per cent in 2018.

As a whole, the conditions for young adults on the owned housing market deteriorated, primarily during the period when prices rose rapidly. This illustrates a more general principle that slower growth in prices combined with good income growth benefits households that want to enter the housing market.<sup>63</sup> This also means that, to the extent the amortisation requirements contributed to the slow-down in prices, the price effect on required income would have been larger without the amortisation requirements.

## Conditions for young adults have deteriorated

Due to lower income, less wealth, and shorter queue times, young adults on the housing market are facing worse conditions than other groups of the population. These conditions have also deteriorated over a long period of time. It has become more difficult to enter the rental market since the supply of rental housing in metropolitan areas has shrunk and queues are longer. The salaries of young adults have also increased slower than that of older age groups, and young adults have not benefited from the sharp upswing in prices. Prices have also increased more than income. The combination of rising house prices and the LTV cap, which was introduced in 2010, also contributed to the increase in the need for a downpayment. Higher prices, higher standardised costs in banks' stress tests, and amortisation requirements also have meant that the income young adults need to buy a home has increased.

Despite the deterioration in these conditions, the share of homes bought by young adults using loan financing increased between 2012 and 2018. However, this does not mean it has become easier for young adults to buy a home. One of the reasons the share of young mortgagors is increasing is probably because the rental market has become less accessible. It could also be that it is considered less attractive given the high rents for newly produced apartments. This means that there are fewer alternatives to owned housing, which increases demand for owned housing. In order to be able to buy a home, many

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<sup>63</sup> This also benefits households that already own a home but plan to buy a larger and more expensive home in the future.

young adults have therefore chosen to take out larger mortgages in relation to the value of the home and their income compared to other groups. This indicates that young adults have taken larger financial risks to enter the housing market.

Another explanation for the increase in the share of young home buyers could be that young adults, compared to older age groups, bought more homes that were smaller or had a less central location. Finally, the increase in the share of young mortgagors could be a result of them receiving different types of financial support when buying a home. According to FI's mortgage survey, the number of young adults with a co-signer outside the households is not higher today than it was before. It is possible that gifts or loans from close relations may have increased, but this cannot be determined from FI's data.<sup>64</sup>

In order to gain a better overview of how the conditions for young adults on the housing market have changed, we study how the possibility of buying a home has changed in recent years. Between 2012 and 2018, the average possibility of buying a home decreased for both young adults and older age groups. This is primarily because house prices increased sharply, but rising standardised costs and the amortisation requirements also played a role. The possibility decreased more for young home buyers than for older home buyers. Despite this decrease, calculations show that 85 per cent of the homes bought by young adults in FI's mortgage survey in 2012 could have been financed by households with similar financial circumstances in 2018. This also means that 15 per cent would have needed to adapt their purchase to the changed conditions, for example by buying a less expensive home. Among other home buyers, 89 per cent could have been financed by households with a similar financial situation in 2018.

For the period 2015–2018, the required income increased more slowly than salaries. The effect of the amortisation requirements is approximately the same for this period as for the period 2012–2018. The total required income increased more slowly primarily because growth in house prices was significantly slower. In relation to the change in wages, the average possibility of buying a home in Sweden has improved marginally during the period 2015–2018. However, there are regional differences, for example in Stockholm where the possibility for home buyers on average has deteriorated during the period. When starting the analysis in 2015, just under 95 per cent of the young adults in the country could have bought the same home. For older groups in the country, the corresponding figure is approximately 97 per cent. Thus, just over 5 per cent of young adults would have needed to adapt their home purchase, and 3 per cent of older age groups. However, there were more who would have needed to adapt the home that they bought between 2012 and 2015 when house prices were rising sharply.

Among households affected the most between the years 2012 and 2018, a larger share live in the metropolitan areas and had previously lower agreed rates of amortisation. Their income is not lower. Even if most young adults in the calculation would have been able to finance a similar home today, there is no guarantee that they would have wanted

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<sup>64</sup> If it has become more prevalent with co-financing outside of the mortgage agreement, this affects not only the interpretation of the percentage who are able to buy but also who are able to buy. For example, it is possible that young adults who enter the owned housing market are more dependent on the financial circumstances of close relatives than they were before.

to. To finance a similar home today, they would have needed to borrow and pay more for their accommodation in relation to income and thus taken larger risks. One alternative to this is to buy a relatively less expensive home by adapting the size and location of the home that they buy.



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## Appendix A

The data in this FI Analysis comes from FI's mortgage surveys for 2012–2018. A detailed description of the surveys is found in FI's reports on the mortgage market from 2013–2019.

The reports on the mortgage market focus primarily on mortgages. This FI analysis focuses primarily on the homes that the mortgages finance. Therefore, our sample definition differs. The mortgage market reports investigate all types of new mortgages to analyse how debt linked to homes has changed. In this analysis, we disregard the following three types of mortgage contracts that are included in the mortgage market reports:

- Bank switches. If a bank switch is not made in conjunction with the financing of a new home, it is not included in our sample.
- Home equity withdrawal. Equity withdrawn using a previously acquired home as collateral. Home equity withdrawals do not refer to the purchase of a new home and therefore are not included in our sample, either.
- Loans to buy a new home where the household already has another pledged home that will not be sold, for example a holiday home, overnight accommodation, etc. Since the analysis focuses on the purchase of primary homes, this type of mortgage is not included in our sample.

All observations in the mortgage survey have a main borrower. The definition of young adults we use in the analysis is determined by the age of the main borrower. In households with several borrowers (households with several adults), we take the total income for the household and assume that it is evenly distributed between the borrowers. We can also identify cases where there is a co-signer outside the household. On average, these borrowers look like other borrowers, but cases with a co-signers also contain, for example, more observations where the income per person is very low or very high. In order to increase comparability and reduce the influence of extreme observations, the analysis only considers mortgagors that do not have a co-signer outside of the household.

## Appendix B

Table B1. Young adults' average debt

Year	Mortgage	LTI average	LTV	Share with <i>LTV</i> ≥80 <i>LTI</i> ≥450	
Single-person households					
2012	769 377	260	75	43	12
2013	877 924	279	77	59	14
2014	958 317	293	77	57	17
2015	1 101 302	323	78	59	23
2016	1 140 580	319	76	58	22
2017	1 248 703	336	74	55	25
2018	1 166 778	305	76	59	10
Households with several adults					
2012	1 048 888	225	77	50	5
2013	1 235 506	246	79	70	5
2014	1 464 564	270	80	68	9
2015	1 725 631	304	80	66	14
2016	1 804 708	297	79	69	13
2017	1 978 056	309	80	70	14
2018	1 999 289	301	81	75	8
Total					
2012	889 828	245	75	46	9
2013	1 034 593	265	78	64	10
2014	1 183 299	283	78	62	14
2015	1 403 446	314	79	63	19
2016	1 479 297	308	78	64	17
2017	1 606 895	323	77	62	19
2018	1 559 750	303	78	66	9

Source: FI's mortgage surveys 2012-2018.

Note: Refers to new mortgages to buy a new home. LTV refers to loan-to-value, and LTI refers to loan-to-income. Both are expressed as per cent.

Table B2. Young adults' income and debt service stress test buffers

Year	Gross income per person			Debt stress test buffer		
	median	p25	p75	median	p25	p75
Single-person households						
2012	25 000	22 000	28 467	4 796	2 958	6 933
2013	26 000	23 000	30 000	3 736	1 728	6 134
2014	27 000	24 000	30 700	4 415	2 367	6 722
2015	27 500	24 000	32 000	3 700	1 678	6 008
2016	28 500	25 000	33 000	3 861	1 968	6 328
2017	30 000	26 000	34 525	3 958	2 087	6 302
2018	30 000	26 800	35 417	4 487	2 470	7 071
Households with several adults						
2012	22 500	19 500	25 500	11 991	7 495	16 360
2013	23 750	20 625	26 750	11 280	7 347	16 088
2014	25 000	21 750	28 542	12 487	7 792	17 353
2015	25 575	22 400	29 199	10 739	6 190	15 802
2016	26 750	23 500	30 500	11 559	6 757	16 822
2017	28 025	24 750	31 875	12 367	8 248	17 666
2018	28 796	25 525	32 750	12 819	8 439	17 723
Total						
2012	24 000	20 834	27 083	6 539	3 695	11 714
2013	25 000	22 000	28 500	6 050	2 785	10 997
2014	26 000	22 917	30 000	6 728	3 466	12 379
2015	26 575	23 167	30 500	5 961	2 748	11 361
2016	27 500	24 350	31 800	6 639	3 142	12 470
2017	29 000	25 166	33 000	7 021	3 489	12 809
2018	29 700	26 000	34 000	7 325	3 787	13 255

Source: FI's mortgage surveys 2012-2018.

Note: Refers to households without co-signers with new mortgages to buy a new home. The debt service stress test is calculated using the actual amortisation with the banks' average standardised subsistence costs and stressed interest rates.

## Appendix C

The calculations in the section “Young borrowers’ possibilities for buying a home” are a counterfactual exercise that use all households in FI’s mortgage surveys for 2012 and 2015. We use their loan-to-value ratio, agreed rate of amortisation and house price.

We start by calculating the income at which the household’s income after the debt service stress test would have been 0 in 2012. We call this the *required income*, i.e. the income (after tax) required for the borrower(s) to have a buffer in the debt service stress test. Based on the price of the home in 2012, we calculate what the price would have been in 2018. We do this using the change in prices according to Valueguard’s price index HOX Flats. It rose 60 per cent between August 2012 and August 2018.

Given the loan-to-value rate of 2012 and the estimated price, we then calculate the size of the mortgage in 2018 if a household with similar characteristics had wanted to buy the same home. With the new mortgage, we can calculate the interest rate after tax. In some cases, the stressed mortgage rate after tax is higher than 4.9 per cent.<sup>65</sup>

We then calculate the new rate of amortisation for each household. We do this in two steps. First, we calculate the rate of amortisation according to the first amortisation requirement that depends on the loan-to-value ratio. If the household had a higher rate of amortisation in 2012 than the amortisation requirement, we keep the agreed rate of amortisation. Second, we calculate the new required income for 2018. Using the 2018 income tax table for Stockholm, the income is converted from post-tax (required income is after tax) to pre-tax. In this calculation, we assume that the income is evenly distributed within households with several adults. If the mortgage is 4.5 times larger than the required gross income, we calculate what the new rate of amortisation would be under the stricter amortisation requirement.

We use the standardised costs the banks report in FI’s mortgage surveys to calculate how standardised costs have changed during the period.

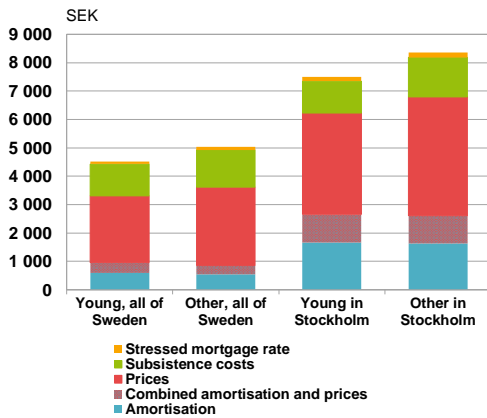
From the change in prices, amortisation rate and standardised subsistence costs, we can calculate what the required income would have been to buy such a home in 2018. We then decompose (calculate each of the component’s contribution to the change) the change in required income. If we hold the loan-to-value (LTV) ratio constant, it is possible to deduct the original situation from the new situation (denoted with \*). First, we note that LTV multiplied by price (P) equals the loan (L). Then, it is possible to rewrite the equation to follow which part of the change in required income (RI) is dependent on each factor. The stressed mortgage rate is denoted with  $r$  and the rate of amortisation with  $\alpha$ .

$$\Delta RI = \Delta_{\text{subsistence}} + \frac{LTV \cdot 0,7(P^*r^* - Pr)}{12} + \frac{LTV(P^*\alpha^* - P\alpha)}{12}$$

<sup>65</sup> Given an interest rate deduction of 30 per cent and a stressed mortgage rate of 7 per cent. The stressed mortgage rate is sometimes higher because some households make interest rate payments of more than SEK 100,000 a year. This is the threshold for when the interest rate deduction decreases to 21 per cent.

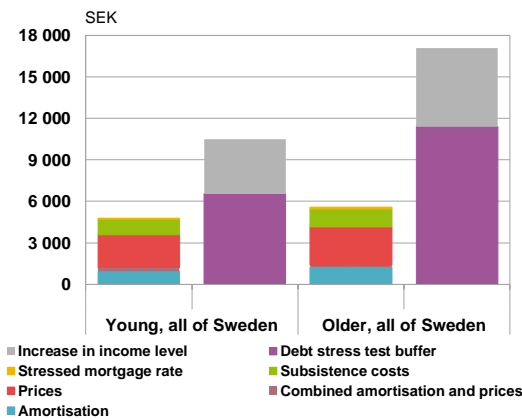


Diagram C1. Increase in required income between 2012 and 2018, median



Source: FI's 2012 mortgage survey.

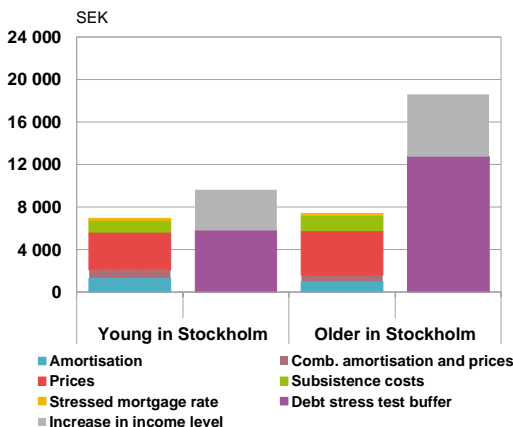
Diagram C2. Change in required income, 2012–2018, median for Sweden



Source: FI's 2012 mortgage survey.

Note: Refers to the median for each component. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2018.

Diagram C3. Change in required income, 2012–2018, median in Stockholm



Source: FI's 2012 mortgage survey.

Note: Refers to the median for each component. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2018.

$$\Delta RI = \Delta_{\text{subsistence}} + 0,7 \cdot \left( \frac{L^*r^* - Lr + Lr - Lr + L^*r - L^*r}{12} \right) + \left( \frac{L^*\alpha^* - L\alpha + L\alpha - L\alpha + L^*\alpha - L^*\alpha}{12} \right)$$

$$\Delta RI = \Delta_{\text{subsistence}} + \Delta L \cdot \frac{r \cdot 0,7 + \alpha}{12} + \frac{L^*\alpha^* - L^*\alpha}{12} + \frac{0,7 \cdot (L^*r^* - L^*r)}{12}$$

$$\Delta RI = \Delta_{\text{subsistence}} + \Delta L \cdot \frac{r \cdot 0,7 + \alpha}{12} + \frac{L^*\alpha^* - L^*\alpha + L\alpha^* - L\alpha^* + L\alpha - L\alpha}{12} + \frac{0,7 \cdot (L^*r^* - L^*r + Lr^* - Lr^* + Lr - Lr)}{12}$$

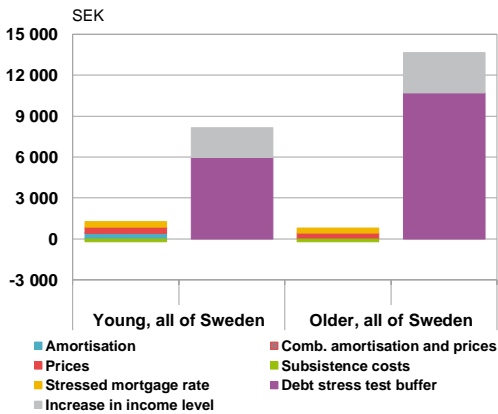
$$\Delta RI = \Delta_{\text{subsistence}} + LTV \cdot \Delta P \cdot \frac{r \cdot 0,7 + \alpha}{12} + \left( \frac{L\Delta\alpha}{12} \right) + LTV \left( \frac{\Delta P \Delta\alpha}{12} \right) + 0,7 \cdot \left( \frac{L\Delta r + LTV \cdot \Delta P \Delta r}{12} \right)$$

The first term is the change in the standardised subsistence costs. The second term is the price effect – the change in debt multiplied by the original stressed mortgage rate and the original agreed rate of amortisation. The third term is the amortisation effect – the original debt multiplied by the change in the rate of amortisation. The fourth term is the combined price and amortisation effect – the change in debt times the change in the rates of amortisation. The fifth term is the effect of changes to the stressed mortgage rate. Since the effect on average is small, we simplify by adding the effect from changes to the stressed mortgage rate to the effect of the combined effect of higher prices and changes in the stressed mortgage rate. For the two effects that are related to amortisations, we can also identify if they are due to the first amortisation requirement or the stricter requirement (see the description in the steps above).

We then compare the estimated increase in required income to wages in 2018. We do this by writing up the required income from 2012 by 16.1 per cent. This was the size of the increase in average gross income between 2012 and 2018. We can then compare the change in required income to the change in wages. In order for the components' contributions to sum to the total change, we use the average in Diagram 19. Diagram C1 shows the same exercise using the median for each component.

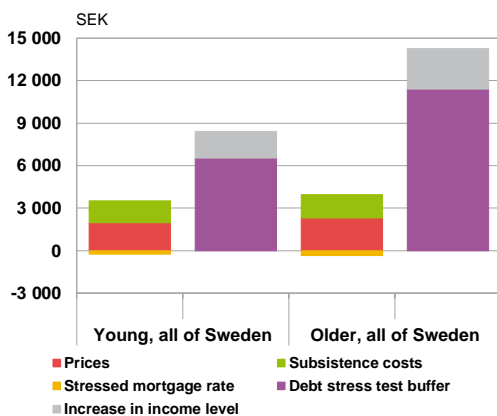
The calculations above do not take into account that mortgagors in 2012 had buffers to the required income. To analyse how the change affected households that historically have bought homes, we redo parts of the calculations to reflect their financial situation. This means, for example, that fewer need to amortise under the stricter amortisation requirement than if we assume that households have the exact income needed to buy the home. First, we recalculate the wages using the households' actual income instead of the income where the debt service stress test is equal to zero. In other words, we multiply 1.161 with the actual income from 2012 instead of the required income. We then recalculate Step 2 in the calculation of the rate of amortisation above and compare the size of the loan with the income in order to es-

Diagram C4. Change in required income, 2015–2018, median for Sweden



Source: FI's 2015 mortgage survey.  
Note: Refers to the median for each component. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2015–2018.

Diagram C5. Change in required income, 2012–2015, median in Sweden



Source: FI's 2012 mortgage survey.  
Note: Refers to the median for each component. Increase in the salary level refers to the mortgagors' income adjusted upward using the average growth in income for the period 2012–2015.

estimate whether the mortgagor would have needed to amortise in accordance with the stricter amortisation requirement. We then compare the new change in required income with their buffer in the debt service stress test from 2012 and the change in wages after tax with the actual income instead of the required income as the basis (see Diagrams 20, 21, 24, and 25). Diagrams C2–C5 show the median for the variables instead of the average.

The next step is to calculate how many mortgagors would have needed to adapt their loan to be able to buy a home. To do this, we conduct a debt service stress test on their wages for 2018 with extrapolated prices and wages and new amortisation regulations. We then compare the number that went from a buffer in 2012 to a deficit in 2018 with the number that had a buffer in 2012 (See Diagrams 26 and 27).

For those with a deficit, we then calculate how much smaller their loan would have needed to be for them to not have a deficit. The formulation of the stricter amortisation requirement means that we cannot directly infer the loan that would have given a buffer. For households that do not amortise under the stricter amortisation requirement and households that can handle a loan in accordance with the stricter amortisation requirement but not the estimated loan, we calculate the adaptation by dividing the deficit by the debt service ratio. For households not able to amortise one extra percentage point but can handle a loan-to-income ratio of 4.5, we estimate the adaptation needed to come down to 4.5. For households with a loan-to-income ratio greater than 4.5 but that already have a deficit in their debt service stress test under the first amortisation requirement, we estimate where they would have a buffer without amortisation under the stricter amortisation requirement.

Finally, we recalculate the steps above for the periods 2012–2015 and 2015–2018. We do this in the same manner as described above but use instead a price increase of 50 per cent and 7 per cent, respectively, which is the change in HOX Flats between August 2012 and August 2015 and August 2015 and August 2018, respectively. When calculating the change in wages, we use 7.4 and 8 per cent, respectively, which corresponds to the change in average gross income for the years 2012–2015 and 2015–2018, respectively.

All calculations above are in nominal terms. We can also do the calculations in real terms using the prices from 2012. To calculate the real increase in standardised subsistence costs, we take the part of the required income for 2018 that comes from standardised subsistence costs and divide this number by one plus the inflation rate between 2012 and 2018. We then subtract the standardised subsistence costs for 2012. For the part that is related to the amortisation requirements, we divide only by one plus the inflation since there was no payment due to the requirement in 2012. For the price effect, we do the same as for the standardised subsistence costs, but we start with what the *price* would have been in 2018 with higher prices and the same rate of amortisation as in 2012. To keep it simple, we assume a constant stressed mortgage rate. We divide this by one plus inflation and then subtract the debt service payments from 2012.

$$\Delta RI^{real} = \frac{subsistence^*}{1 + inf} - subsistence + \left( \frac{L\Delta\alpha/12}{1 + inf} \right) + LTV \left( \frac{\Delta P\Delta\alpha/12}{1 + inf} \right) + LTV \cdot P^* \cdot \frac{r \cdot 0,7 + \alpha}{12} - LTV \cdot P \cdot \frac{r \cdot 0,7 + \alpha}{12}$$

Using the above calculation, the increase in standardised subsistence costs represents 11 per cent, the increase in prices 52 per cent, the amortisation requirement 23 per cent, and the combined amortisation and price effect 14 per cent.