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The Dutch mortgage market in a European perspective

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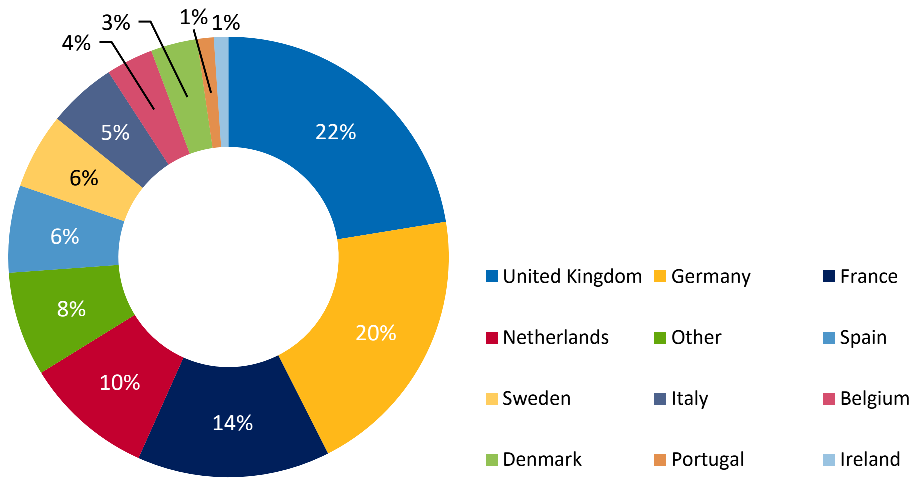
Executive summary

International mortgage markets differ widely due to regulations and the dynamics of supply and demand, among other factors. In this paper, the mortgage markets of various European countries are compared. The Dutch mortgage market, with its relatively low historical losses and arrears and relatively high interest rates, remains interesting for Dutch institutional investors compared to alternatives abroad (e.g., Belgium, Germany or Denmark). In addition, the NHG guarantee by the Dutch central government offers additional protection for investors.

Global market overview

Figure 1 provides an overview of the European countries that we examine in more detail. They are ranked according to the share of the relevant mortgage markets. Note that we focus on the owner-occupied residential mortgage market in this paper (so, not buy-to-let).

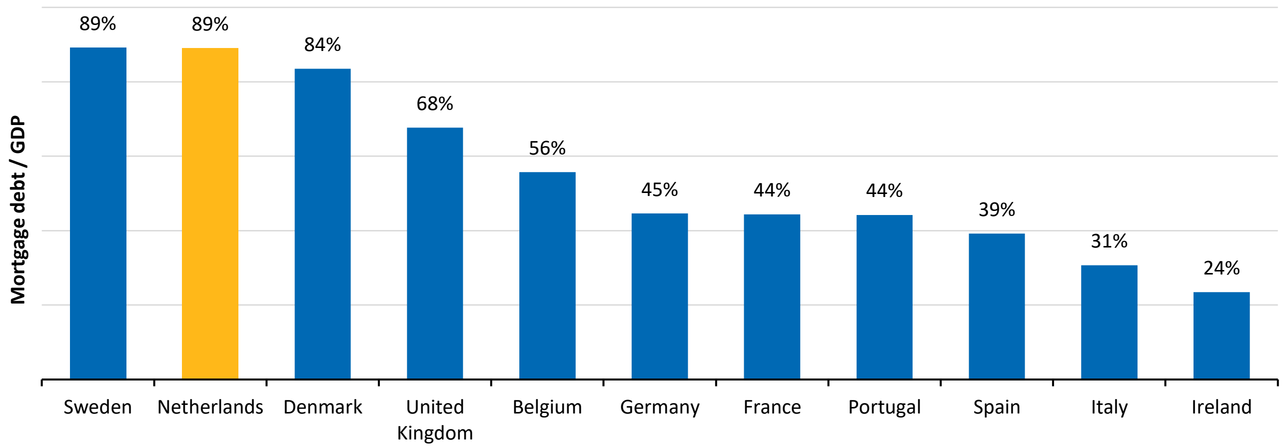
Figure 1: Total outstanding residential mortgage loans



Source: EMF (2020, Statistical Table 1), as of December 31, 2019 (EU 27 countries plus the United Kingdom).

The size of the mortgage market is (logically) related to the size of the economy. Hence, the United Kingdom, Germany and France together already account for 56% of the European market. The Netherlands, Sweden and Denmark have a relatively large mortgage market compared to the size of their economy as well. This becomes apparent in Figure 2, where we compare the mortgage market with the country's gross domestic product (GDP).

Figure 2: Residential mortgage debt vs. GDP

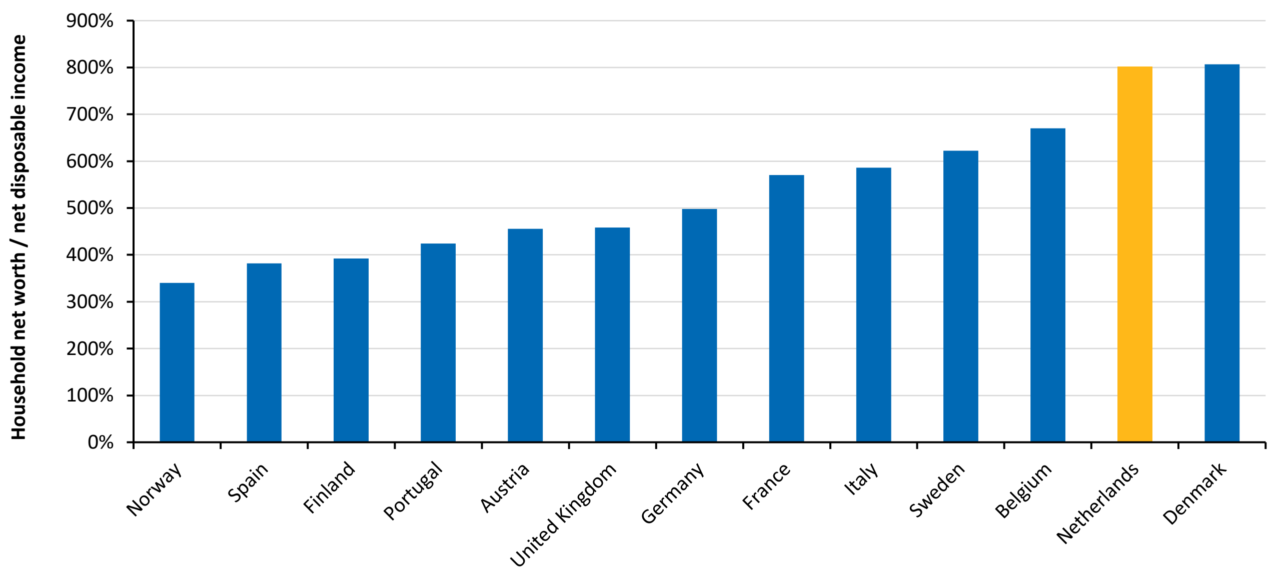


Source: EMF (2020, Statistical Table 8), as of December 31, 2019.

Note that the above figure does not show all items on a consumer's personal balance sheet. For example, in the Netherlands consumers typically have low levels of consumer debt (apart from mortgage debt). In addition, future pension assets are also much higher in the Netherlands compared to countries with pay-as-you go pension plans. For the Netherlands, total financial assets consist approximately of 15% cash and deposits, 15% equity and investment fund shares and 70% of pension and insurance assets. Financial assets in the Netherlands make up approximately 63% of the total assets (i.e., the sum of financial assets and housing wealth).[1] This provides households with a cushion when the disposable income falls in adverse economic circumstances.

Figure 3, where we display the net wealth of households as a percentage of net disposable income, shows this in more detail. The Netherlands thus has a large and well-developed mortgage market, which is supported by households with, on average, a high net worth.

Figure 3: Household net worth

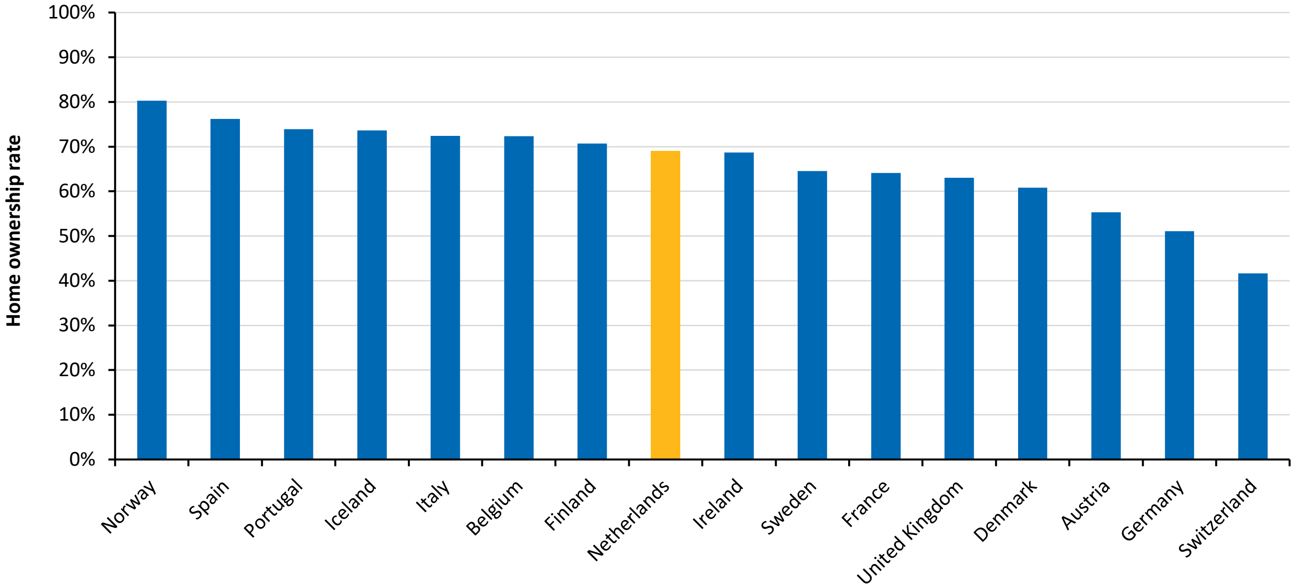


Source: OECD as of December, 2020 (or latest available). Household net worth as a percentage of total net disposable income.

[1] See ESRB (2022, Figure A and B) for more information.

Figure 4 shows the homeownership rate for various countries.

Figure 4: Homeownership rate

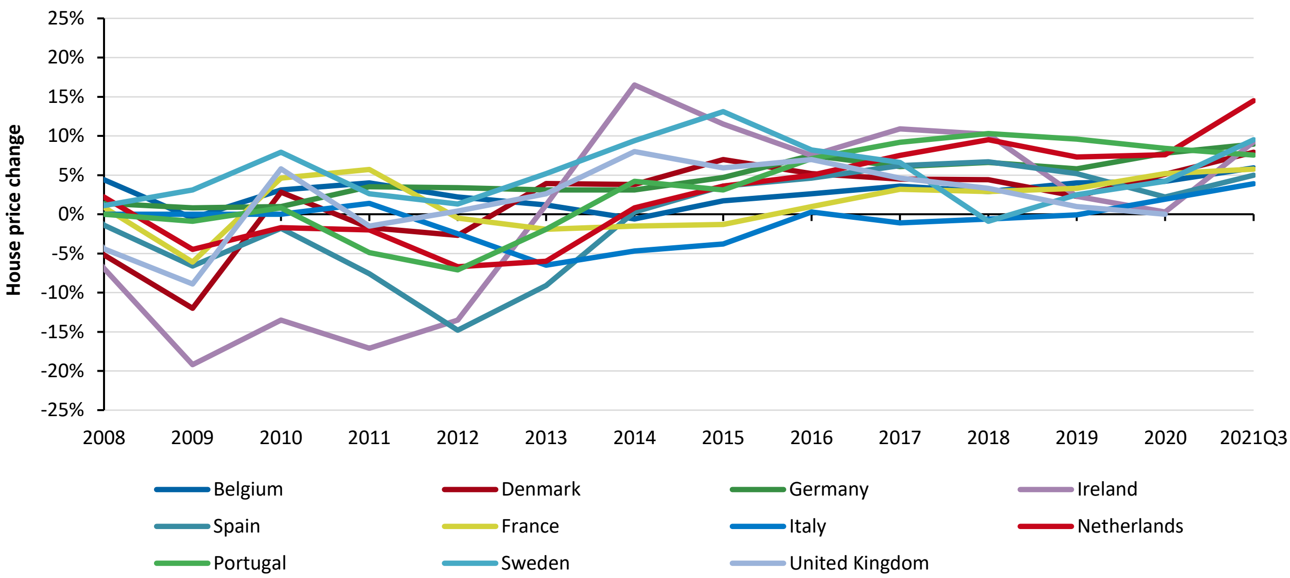


Source: https://en.wikipedia.org/wiki/List_of_countries_by_home_ownership_rate, as of February, 2022.

The Netherlands has an average home ownership percentage (around 69%), despite having a large market for residential property. This percentage is not higher due to the large number of social housing corporations which provide affordable rental housing for the lower incomes.

Figure 5 shows the house price developments for different countries.

Figure 5: House price developments

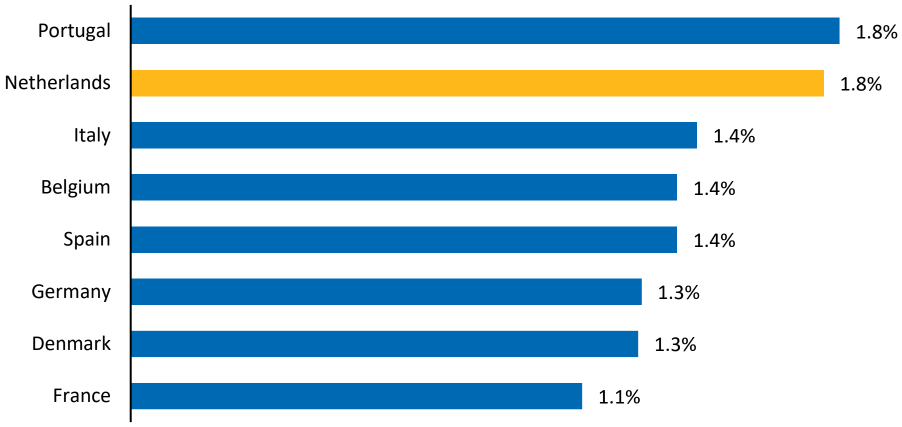


Source: Eurostat, https://ec.europa.eu/eurostat/web/housing-price-statistics, as of September 30, 2021. House price changes for different countries (from 2008 Q4 to 2021 Q3). We here shows price changes during the full calendar year, apart from 2020, where we show the price change until Q3 2020. For the UK, no data is available after 2021 in this dataset.

Note the decreasing house prices in many countries after the financial crisis of 2008. Ireland has experienced the largest swings in house prices, both downwards (from 2008-2012) and upwards (2013-2019). More recently, house prices have strongly increased in many countries, with Italy being an exception. The Netherlands has seen a large house price increase in the last years, for example 14.5% from 2020 Q4 to 2021 Q3. This has caused steadily decreasing loan-to-value ratios in Dutch residential mortgage portfolios in recent years.

Figure 6 compares interest rates for new mortgage loans (with a fixed-rate term of more than 10 years) in different European countries. For Denmark we show the yield on callable mortgage bonds.[2] The yield on Dutch mortgage loans is relatively high, especially compared to neighboring countries like Belgium and Germany. Note that the different characteristics of the underlying mortgages (such as the loan-to-value ratio, prepayment options, government guarantees, etc.) make a precise comparison difficult.

Figure 6: Mortgage yields for a fixed-rate term over 10 years



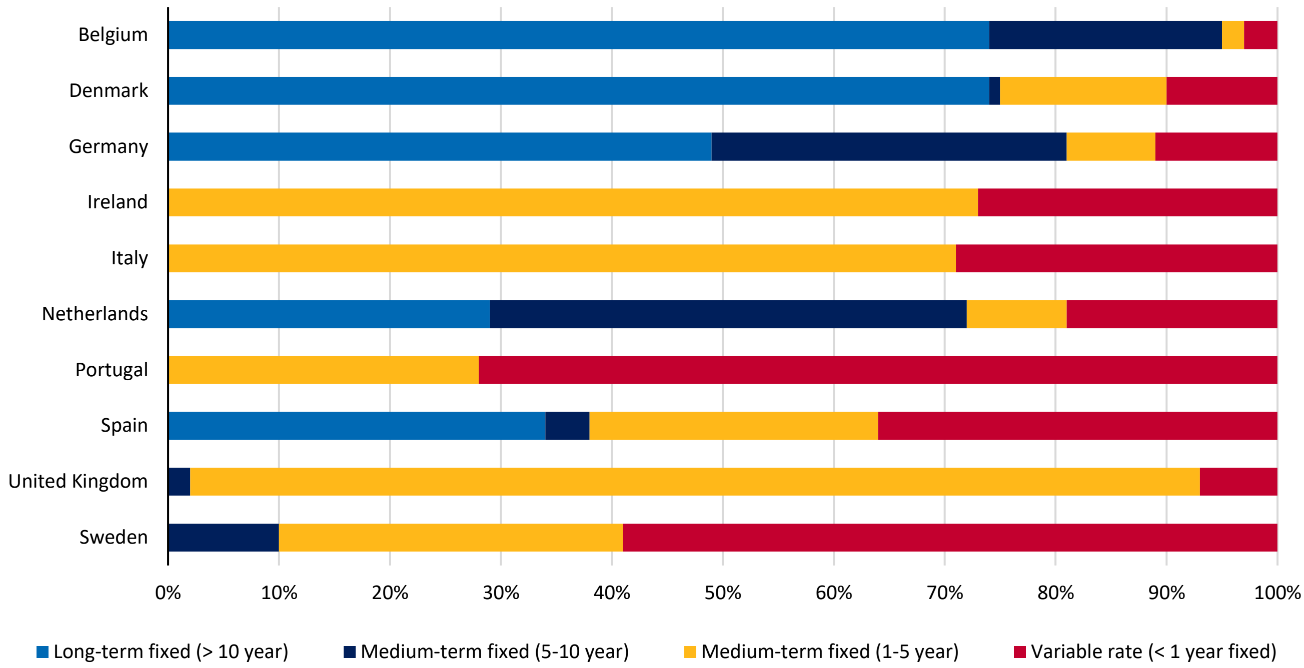
Source: ECB Statistical Data Warehouse and Danske Bank (for the Danish mortgage bond yields), as of October 31, 2021. For Denmark we show the yield on callable mortgage bonds.

Differences in fixed-rate maturities and financing

Figure 7 shows the breakdown of new mortgages in 2019 into four different buckets of fixed-rate terms. It should be noted that in most countries mortgages are mainly provided with a short-term fixed rate (less than five years) or a variable interest rate (less than one year). In Sweden and Portugal, for example, respectively 59% and 72% of all new mortgages have a variable interest rate. In Ireland, Italy and Portugal, almost no new mortgages with a fixed-rate term of more than five years were issued. Belgium, Germany and the Netherlands (and Spain to a lesser extent) are exceptions to this. For example, in the Netherlands the majority (72%) of the mortgages issued in 2019 have a fixed-rate term of 5 years or longer. This makes Belgian, German and Dutch mortgages more suitable as an investment category for the interest rate hedging portfolio of pension funds and insurers with long-term liabilities.

[2] We here use the average yield for maturities of 15, 20 and 30 years. The yield in Danish Kroner is converted to an equivalent euro yield (assuming a currency hedge based on cross-currency swap contracts).

Figure 7: Mortgage market issuance in 2019 - breakdown by interest rate type



Source: EMF (2020, Chart 25), as of December 31, 2019. N.B. No data is available for France.

Danish mortgages also typically have long maturities (74% more than 10 years). These mortgages provide a less effective interest rate hedge, however, because prepayment is possible without a penalty for callable Danish mortgages. This can cause significant fluctuations of the duration of these bonds. For example, in case of decreasing interest rate levels prepayment rates can increase rapidly. This in turn leads to a lower duration of the callable bonds and a lower hedge effectiveness, precisely when the interest rate hedge is most needed from a risk management perspective.

Mortgages are mainly provided by banks, but the market share of (life) insurers, specialized credit institutions and other parties (such as pension funds) is gradually increasing. We here distinguish three forms of financing:

- Direct financing (balance sheet/loan)
- Mortgage bonds / covered bonds
- Residential mortgage backed securities

The most common form is *direct financing*, e.g., using deposits of a bank or the premium income of an insurer. In this case, the mortgage loan remains on the balance sheet of the issuer. Mortgage lenders may also choose to use a mutual fund (or another vehicle, like an IFRS-friendly special purpose vehicle) to finance the issuance of a mortgage. In this case, the credit risk of the mortgage is transferred to the party investing in the fund. These direct loans are privately traded (without a public market) and therefore typically have a low liquidity (the risk exists that the loan cannot be sold at a reasonable price in the foreseeable future).

A mortgage loan can also serve as collateral for a *mortgage bond or covered bond*. In Denmark, mortgage bonds are publicly traded and offer the investor the benefit of a much higher liquidity. Danish mortgage bonds are mainly issued by specialized mortgage credit institutions: Nordea Kredit, Realkredit Danmark (a Danske Bank subsidiary), BRF Kredit, Nykredit, DLR Kredit, etc. These institutions retain the credit risk, but pass the interest rate and prepayment risk to the bond holders. Ratings for Danish mortgage bonds are typically high (most have an AAA rating) and a liquid secondary market exists (providing daily liquidity in practice).

Danish mortgage bonds have a number of characteristics in common with covered bonds, the main one being that they are bonds issued by a credit institution, listed and often eligible for UCITS funds. In reality, however, they differ from eurozone covered bonds for the following reasons:

- Pass-through principle: the cash flows of Danish mortgage bonds match those of the underlying mortgages so there is a "balance principle" between the mortgage bonds and the underlying mortgages;
- Like mortgages or mortgage-backed securities, callable Danish mortgage bonds bear a prepayment risk. In case of covered bonds the issuer and not the investor bears this risk;
- Over-collateralization rules are not the same: the security is generally greater when it comes to covered bonds.

More information about the Danish mortgage market, and a comparison with the Dutch mortgage market, can be found in Van Bragt and Caplain (2018).

A third form of financing packages mortgages in a so-called *residential mortgage backed security* (RMBS). These are listed instruments backed by a pool of mortgage loans. The proceeds of this pool are then divided using different risk tranches (with different credit ratings). Investors in an RMBS can select a risk tranche of their choice, in line with the investor's objective and risk tolerance.

Table 1 shows the differences between these three forms of financing. Note that differences may exist for a specific loan, covered bond or RMBS in a particular country. To analyze the differences between countries, we look at portfolios of multiple mortgages, mortgage bonds and RMBSs. Bonds and highly-rated RMBSs have a lower yield than the underlying direct loans, due to their higher liquidity. On the other hand, these forms of financing generally have a lower maturity, credit risk, prepayment risk and liquidity risk. It is important, however, to note that for a European insurer the Solvency II capital requirement for an RMBS is typically much higher than for direct mortgages (or mortgages in a special purpose vehicle) or mortgage bonds.

Table 1: Forms of mortgage financing

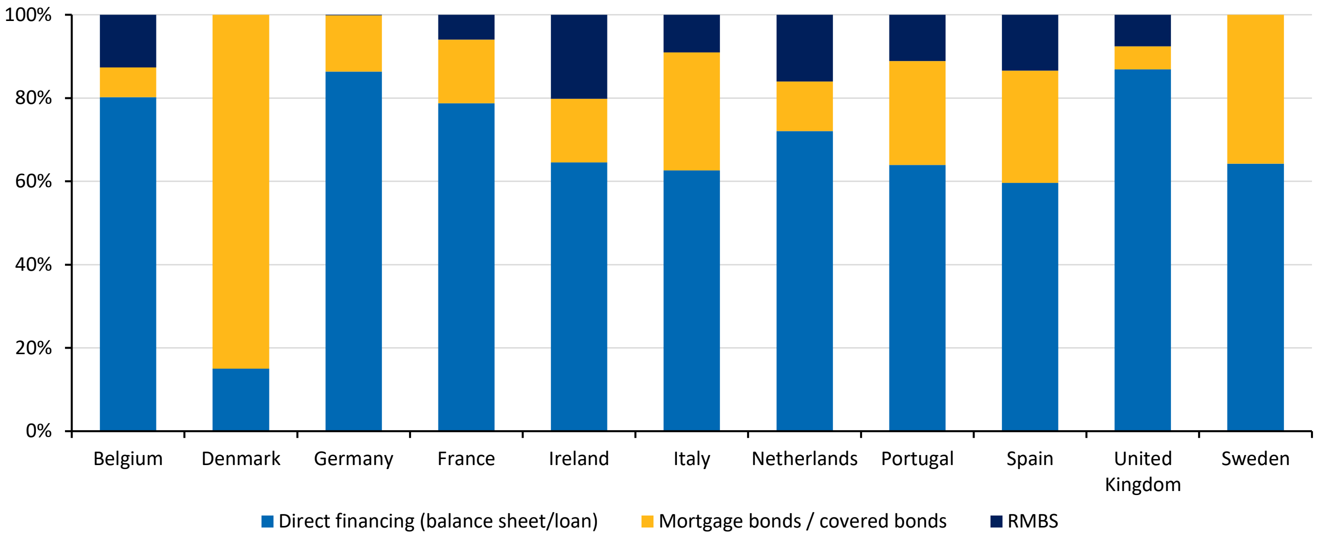
Characteristic	Mortgage loan	Mortgage bond	RMBS (senior)
Yield	+	+/-	+/-
Duration (interest rate risk)	5-20 yr.	5-20 yr.	0-5 yr.
Credit risk	Low[3]	Low	Low[4]
Prepayment risk	Average[5]	Zero or high[6]	Low
Liquidity risk	High	Low	Low
Capital charge Solvency II	Very low[7]	Low	Low or high[8]

Source: Aegon Asset Management, as of December 31, 2021.

Figure 8 shows the breakdown for different countries of the total amount of outstanding mortgages according to the three financing forms mentioned above. In Belgium, Germany, France, the United Kingdom and the Netherlands mortgages are often financed directly. Denmark has a very large market for mortgage bonds. RMBSs are not a large source of mortgage financing in most countries, except in Ireland (with 20% of the market share).

[3] An individual mortgage loan has no external credit rating. For a portfolio of several mortgages, an estimate can however be made of the creditworthiness on the basis of historical losses.
[4] This refers to a senior tranche of an RMBS with a high credit rating. It is also possible to invest in RMBS tranches with a lower creditworthiness.
[5] See Table 3 for an overview of the options and limitations for early prepayment per country.
[6] An exception to this are the callable mortgages that are for example issued in Denmark. The risk of early redemption is, of course, high for such bonds. For more information see Van Bragt and Caplain (2018).
[7] For mortgages, the Solvency II capital requirement is based on the so-called counterparty default risk category, provided that a number of conditions are met. This risk category has a low correlation with the other risk categories, which means that the contribution to the total capital requirement is very small. For more information. Mortgage bonds and (especially) RMBS are typically treated as higher risk categories (under the spread risk module), meaning that these categories lead to a higher Solvency II capital requirement.
[8] For a senior tranche of RMBS that can be classified as STS ("Simple, Transparent & Standard"), the Solvency II capital requirement is low. However, the Solvency II capital requirement is high for non-STS and non-senior securitisations.

Figure 8: Breakdown of outstanding mortgages by financing type



Source: EMF (2020, Statistical Table 1, 22 and 25), as of December 31, 2019.

Differences in risk

For more insight into the risk profile of the different mortgage markets, we look at the following five variables: loan-to-value ratio, debt service-to-income, historical losses and arrears (in RMBSs) and foreclosure period.

Table 2: Risk measures for mortgage market

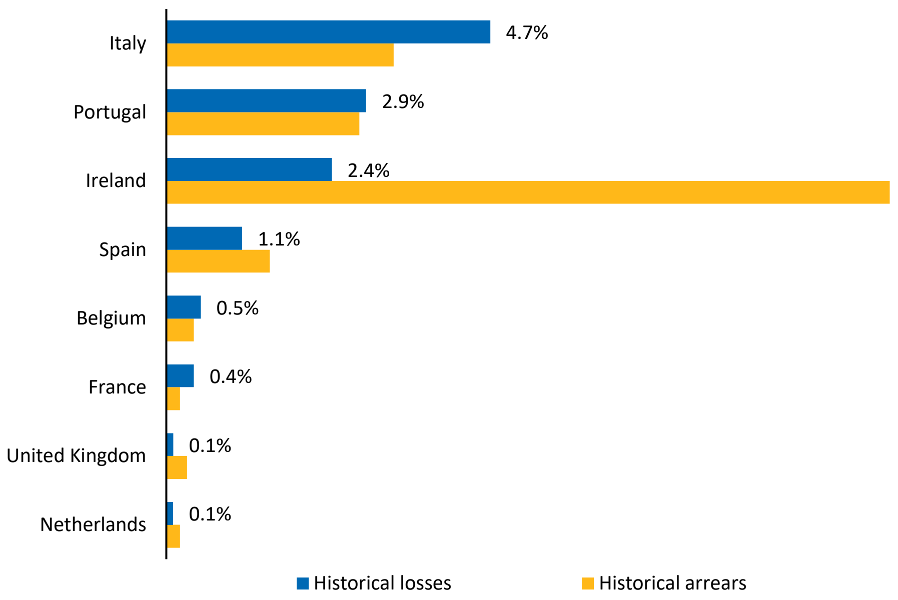
Country	Loan-to-value	Debt service-to-income	Historical losses (in RMBSs)	Historical arrears (in RMBSs)	Foreclosure period (years)
Belgium	65%	11.4%	0.5%	0.4%	1.6
Denmark	60-80%	17.3%			
Germany	81%	9.3%			0.8
France	86%	11.4%	0.4%	0.2%	1.8
Ireland	68-81%	12.5%	2.4%	10.5%	
Italy	71%	11.1%	4.7%	3.3%	4.8
Netherlands	(max. 100%)	17.8%	0.1%	0.2%	0.6
Portugal	(max. 90%)	12.1%	2.9%	2.8%	
Spain	64-80%	11.0%	1.1%	1.5%	0.8
United Kingdom	72%		0.1%	0.3%	
Sweden	66%	18.8%			

Sources: Loan-to-value: EMF (2020, Country Reports); Debt service-to-income: ESRB (2022, Table 1); Historical losses and arrears: European Datawarehouse (February 2018); Foreclosure periods: Lea (2010). If no data is available for a country in the mentioned sources, the field is left blank.

The loan-to-value ratio is the ratio between the notional amount of the mortgage loan and the value of the underlying home. From a risk perspective, a low ratio is of course preferable. For the Dutch and Portuguese mortgage markets, the loan-to-home value ratio for new mortgages is capped at 100% and 90%, respectively. The debt service-to-income ratio (i.e., total debt payments divided by the gross disposable income) provides additional information about the affordability of household debt (including mortgage debt).

Figure 9 shows historical percentages of losses and arrears for the different mortgage markets. Note that the Netherlands historically had low losses and arrears where, for example, Italy had high losses and arrears. Note that Figure 9 is based on data for RMBSs which represents only part of the total mortgage market. Based on this data, Italian mortgages appear to be much riskier than Dutch mortgages. In addition, Table 2 shows that Italy has a long lead time in settling foreclosures, with an average of 4.8 years before a forced sale is fully completed.[9] In the Netherlands, the execution of a mortgage typically takes less than a year. The Dutch mortgage market is therefore less risky for an investor than the Italian market. For Ireland, the extremely high historical arrears (10.5%) are also striking. This is mainly caused by the financial crisis in 2008. The Irish economy struggled in that period, leaving many Irish people behind with their mortgage payments (see Baudino et al., 2020).

Figure 9: Historical losses and arrears in RMBS loans



Source: European Datawarehouse, Stratification Tables & Comparisons, as of February 2018. For Denmark, Germany and Sweden no data is available.

Table 3 shows which forms of government support exist. Dutch mortgages can be secured by the central Dutch government via the NHG guarantee structure (although a 10% own risk clause exists in this case). Denmark has such a guarantee as well, but only for social housing mortgages. The Danish state provides a 100% guarantee on the loans and mortgage bonds in this case. In Germany, the government-owned KfW bank (Kreditanstalt für Wiedeaufbau) provides several loans and subsidies to those who want to enter the German housing market, as well as homeowners who want to make their properties more energy efficient. KfW loans and subsidies can usually be combined with each other, and sometimes with other mortgages as well. In the UK, a new 95% government-backed mortgage scheme started in 2021. This scheme enables first time buyers or current homeowners to secure a mortgage with only a 5% deposit to buy a house of up to £600,000. The UK government offers lenders the guarantee they need to provide mortgages that cover the other 95%, with the usual affordability checks. Ireland offers the “Rebuilding Ireland Home Loan” since 2018. This is a government-backed mortgage for first-time home buyers (for up to 90% of the market value of the property).

Table 3 also provides more information about prepayment policies in the different countries. For most countries a prepayment penalty applies. However, prepayment is sometimes possible without a fee up to 10% per year and in case

[9] This estimate may be on the high side at the moment, since legislative reforms in Italy in 2015 aimed to simplify the process of selling foreclosed properties.

of special circumstances (e.g., sale, death or unemployment). An exception are callable Danish mortgages, which can be prepaid without a penalty by the customer (as has been discussed before).

Table 3: Government guarantees and prepayment policies

Country	Government support	Prepayment policies
Belgium	No	A penalty typically applies in case of prepayment[10]
Denmark	Yes, for social housing[11]	For callable bonds prepayment is possible (penalty free)
Germany	Yes, via KfW bank[12]	Maximum of 10% prepayment per year without penalty. Prepayment in case of a sale is also possible without penalty.
France	No	100% penalty free prepayment in case of death, unemployment or changing jobs
Ireland	Yes, for first-time buyers[13]	A penalty typically applies in case of prepayment
Netherlands	Yes, via NHG[14]	Maximum of 10% prepayment per year without penalty. Prepayment in case of a sale is also possible without penalty.
Spain	No	Maximum of 10% prepayment per year without penalty
United Kingdom	Yes, with 95% guarantee[15]	A penalty typically applies in case of prepayment

Sources: Government guarantees: Aegon Asset Management; Prepayment options: Lea (2010), IMF (2011, Table 3.2) and Beltratti et al. (2017, Table 8).

Summary

The table below summarizes some important characteristics for investors of different European mortgage markets on a relative scale.

Table 4: Characteristics of mortgages markets

Country	Yield	Debt service-to-income	Defaults and arrears	Government support	Prepayment w/o penalty	Matching portfolio
Belgium	+/-	+/-	+	-	+/-	+
Denmark	-	-		+	-	-
Germany	-	+		+	+/-	+
France	-	+/-	+	+	+/-	
Ireland		+/-	-	+	+	-
Italy	+/-	+	-			-
Netherlands	+	-	+	+	+/-	+
Portugal	+	+/-	-			-
Spain	+/-	+/-	+/-	-	+/-	-
UK			+	+	+	-
Sweden		-				-

Source: Aegon Asset Management. Overview of the characteristics of different mortgage markets for a Dutch institutional investor. (+) and (-) indicate an relatively high and low score in the sample of countries considered here; (+/-) indicates a neutral assessment. For some criteria no data is available for a country.

[10] The penalty is limited by law to three months' interest on the repaid amount.
[11] See https://www.globenewswire.com/news-release/2017/11/23/1205547/0/en/New-agreement-on-social-housing-financing.html.
[12] See https://www.iamexpat.de/housing/buy-house-germany/allowances-loans-subsidies.
[13] See https://www.citizensinformation.ie/en/housing/owning_a_home/help_with_buying_a_home/local_authority_mortgages.html.
[14] See https://www.nhg.nl/english-summary. In addition, the mortgage interest deduction in the Netherlands can also be seen as a form of government support for the mortgage market.
[15] See https://www.gov.uk/government/news/new-95-mortgage-scheme-launches.

The extent to which a criterion is relevant depends on the objective, risk tolerance and other constraints of an institutional investor. This table therefore merely serves as an aid to make a trade-off between the different countries based on one's own preferences. But given this information, and from the viewpoint of a Dutch institutional investor, which of the above countries may be considered as an alternative for the Dutch mortgage market?

- **Belgium** has a lower debt service-to-income ratio than the Netherlands. The historical losses and arrears are also low and comparable to the Netherlands. But the mortgage interest rate is on average lower than for a Dutch mortgage with a long-term fixed-rate. A central government guarantee structure (like NHG in the Netherlands) does not exist.
- In **Denmark**, the majority of the mortgage market consists of mortgage bonds. These mortgage bonds currently offer a lower yield than direct Dutch mortgage loans, with a higher prepayment risk. However, an advantage of Danish mortgage bonds is their high liquidity and the availability of high, external ratings.
- **Germany** has a low debt service-to-income ratio and low historical losses and arrears. However, mortgage rates are also significantly lower than in the Netherlands.
- Mortgages from **Ireland** can offer an attractive yield, but mainly have shorter maturities. A point of attention for Irish mortgages are the arrears and historical losses, which are considerably higher than for Dutch mortgages. Also, due to slow legal procedures, a foreclosure sale in Ireland can take a very long time.

The Dutch mortgage market, with its relatively low historical losses and arrears and relatively high interest rates, thus remains interesting for institutional investors compared to alternatives abroad (e.g., Belgium, Germany, Denmark or Ireland). In addition the NHG guarantee can offer additional protection for investors.

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