

April 2005



Risk and Funding in European Residential Mortgages

Responding to changes in mortgage demand

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Foreword

In November last year Wim Kok prepared a report to assess the progress towards the implementation of the Lisbon agenda which seeks to transform the EU 'to become the most dynamic and competitive knowledge-based economy in the world'. He wrote that the "FSAP...should be supplemented by measures...to facilitate the integration of retail financial markets, in particular by reducing restrictions to more flexible mortgage financing in a number of Member States". Mortgages are likely to be one of the key areas of focus of the European financial integration efforts and later this year, the European Commission will propose a Green Paper as to what measures it believes are necessary to help the further integration of European mortgage markets.

It is clear, from the 2003 European Mortgage Federation/Mercer Oliver Wyman (EMF/MOW) study and other work that the core European mortgage borrower is already well served in most markets – the challenge is how to expand the breadth of the market to create a more flexible lending environment across Europe. In this call for more flexible lending, the topic of risk and funding in mortgages has been, too often, overlooked but it will become increasingly central for European lenders over the coming years:

- Basel II is going to transform the regulatory environment, from a prudential to a risk-aligned approach leading to a greater focus on capital efficiency and consequent changes in lending approach.
- Funding instruments are converging and competing as never before – witness the growth of the covered bond over the past two years – and this is leading to changes in the competitive positions of some lenders as their well-established institutional arrangements shift.
- Competitors are increasingly crowding the market and competing vigorously, as they build their capital positions. This competition has given rise to the need for and development of more sophistication in the risk management of mortgage portfolios and to the increased reliance on innovative funding techniques for winners, who find they can originate more volume than they can easily fund.

The MITA/Mercer Oliver Wyman study is one of the first reports I have read that starts with a demand-led approach making it clear that the flexible lending challenge is a huge opportunity for the industry as a whole. According to the report, there is a real unmet demand and commercial potential on the frontier of the core mortgage lending business – perhaps as much as 15% across Europe. Add to this the equity release and new products meeting latent consumer demand and we can easily see how the industry can sustain healthy growth rates even in a context of slowing property markets.

I, for one, welcome this timely and opportune contribution to the European debate.



Judith Hardt
Secretary General
European Mortgage Federation

¹ 'Facing the challenge – The Lisbon strategy for growth and employment', report from the high level group chaired by Wim Kok, November 2004 (www.europa.eu.int)

1 Executive summary

The European mortgage industry is at a turning point. The past decade has for most lenders been characterised by excellent asset growth rates, driven by rising house prices and falling interest rates, low credit losses, good profitability and generally a relatively benign economic environment. Future demand growth is likely to be in higher risk segments of the market and will require more innovative funding and risk management approaches.

Many mortgage markets still appear to be credit constrained, with a large population of under-served borrowers. We have identified a 15% market expansion opportunity, equivalent to around €500BN of lending, which will require a combination of greater risk taking by lenders and some modest regulatory changes to facilitate the taking of greater risks. We have identified growth opportunities across all types of lending, but over 80% of the total opportunity lies in three risk segments:

- **Low equity**, defined as borrowers who typically have equity of around 10%;
- **Stretched**, defined as borrowers with a high debt service coverage ratio; and
- **Risky**, defined as borrowers with a previous credit problem, or an unconventional history (e.g. recent immigrants): effectively the sub-prime market.

These opportunities offer the highest margins for lenders, often up to double those of traditional mortgage lending. The largest opportunities are in bigger markets that either have less developed specialist sectors (such as Germany) or less developed mortgage markets (such as Italy). The transition countries in our study (Poland, Hungary and the Czech Republic) represent medium to long term opportunities – they are currently too small to represent big lending opportunities in the near term (although the same could have been said of Spain and Portugal on entry into the EU in 1986). Countries such as Denmark and the UK, with relatively deep, mature markets, have relatively limited opportunities for additional lending growth.

Mortgage lenders currently have some key issues to address around risk appetite and management and the use of efficient funding mechanisms. We expect the winners to include universal banks with strong debt ratings pushing up into the growing higher-risk sectors, and lower-rated specialists. Where broad and deep capital markets exist, the benefits of a strong lender rating decline since capital market funding can be effectively used to manage lender funding costs. In fact, the market for higher risk lending in established markets such as the US and the UK has become dominated by players using the capital markets with lower ratings. Given that the capital markets are growing and deepening across Europe, this suggests that there will be limited natural advantage for the existing universal bank lenders in the higher risk segments. Correspondingly we expect these markets to be fiercely contested, with the possibility of cross-border or non-bank entry.

We see the winners as having three key characteristics:

- **Superior underwriting management;**
- **Superior risk management** once the risks are acquired, including use of risk mitigation and risk transfer mechanisms; and

- **Superior funding approaches**, including a deep understanding of how different funding mechanisms and techniques can be used to lower the overall cost of funding.

From a regulatory perspective, the growth of these markets poses new challenges. At present, regulations tend to impede access to certain borrower segments (e.g. low equity) and as a result, changes will be needed to foster prudent growth. Lenders will be taking on high risk levels with potentially unfamiliar client bases and regulators may prefer to see risks isolated with other market participants who are better able to mitigate and manage them. This may mean loosening some regulations (e.g. interest rate risk may provide a natural hedge to credit risk) and tightening others (e.g. they may wish to see cyclical risk concentrated on international balance sheets that are best able to handle the volatility); or it may mean encouraging the shift of risk to the capital markets or third-party specialists such as mortgage insurers.

2 Introduction

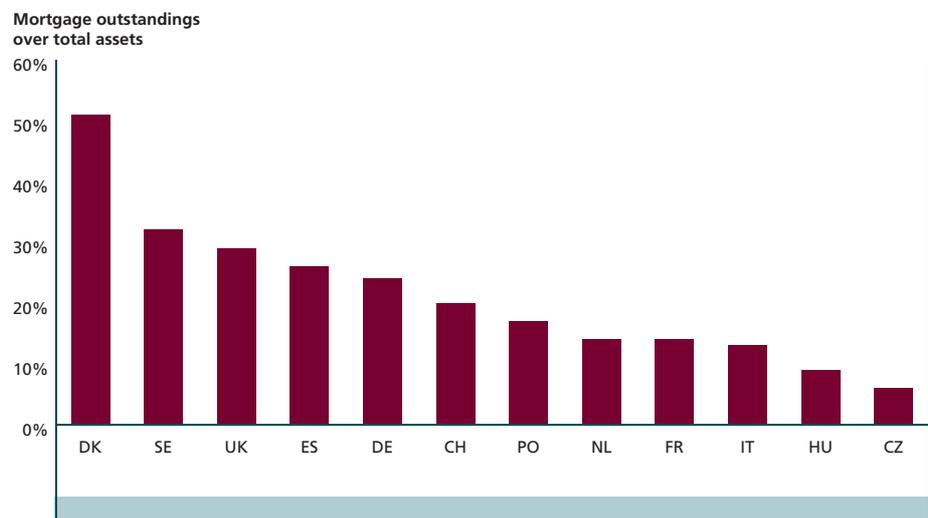
2.1 Overview

Mortgages are a critical part of the economy of most European countries. Home ownership in many European countries is a sign of position in society and is therefore important to an individual's feeling about the well-being of the economy. For most people home ownership comes via the mortgage market; hence its importance.

Because of this, many studies and papers have been written on the mortgage market and its health, particularly recently on a cross-European basis. For example, in 2003 the European Mortgage Federation and Mercer Oliver Wyman co-authored a study² discussing the financial integration of the European mortgage markets, the main findings of which were that (a) differences in mortgage prices between countries are largely due to product differences; and (b) significant benefits could be realised through greater integration of mortgage markets. In addition, the UK's Council of Mortgage Lenders has recently published a study looking at the trends in types of home ownership (owner-occupied vs. rental) across a number of countries³.

On the supplier side, the size of the market is significant. Many providers are banks, and mortgage outstandings represent over 20% of total bank assets in many markets, as shown in Figure 2.1 below:

Figure 2.1 Mortgage outstandings as a % of total bank assets



Source: CML, other national sources, Bankscope

Within the banking sector, mortgage providers include specialists (savings banks or building societies), niche players and universal banks. All share the need to fund mortgages and manage risks in the mortgage business, although the context varies somewhat according to the broader business portfolio, including, for example, access to retail deposits.

² Study on the Financial Integration of European Mortgage Markets, Mercer Oliver Wyman and the EMF, October 2003

³ International trends in housing tenure and mortgage finance, CML Research, November 2004

However, the topic of risk and funding in mortgages has largely been overlooked in the public domain. How banks fund their mortgage books and how they manage the internal and external risks inherent in the product are vital to the health of the sector, and by implication to that of the economy as a whole. As a result, risk management and funding are becoming increasingly important to all involved in the European mortgage industry for many reasons, including:

- The need to respond to the funding and risk management requirements associated with the biggest growth opportunities, which lie in higher risk segments;
- The pace and extent of regulatory change, which is leading lenders to reassess how they do business in relation to funding and capital usage;
- Funding and risk management practices differ widely across European markets, and there are significant differences in best practice, leaving a broad scope for development in some countries. Greater financial integration will mean that an increasing importance is attached to the concept of ‘best practice’;
- Mortgages are likely to be one of the key areas of focus for European financial integration efforts (including FSAP and European Commission).

Mercer Oliver Wyman, a management consultancy dedicated to the financial services industry with a wealth of experience in risk management, was commissioned by the Mortgage Insurance Trade Association (MITA) to produce a cross-European risk and funding report on residential mortgages. This work has been supported by the real-estate finance specialist Hans-Joachim Dübel.

2.2 Purpose of the report

The study aims to identify current and potential business models in relation to risk and funding requirements. The study covers:

- An analysis of the current state of the market (demand, supply and regulation) across risk segments;
- An assessment of how demand, supply and regulation may evolve and how this might impact risk and funding; and
- A review of how future business models might best exploit market opportunities, particularly in terms of risk and funding.

This study is designed to act as a starting point for discussion and establish a broad information base for further analysis and debate.

2.3 Scope of the report

This study looks at the residential mortgage market across twelve European countries, which together represent a large proportion of current and future demand:

UK	Spain	Switzerland	Hungary
France	Italy	Denmark	Czech Republic
Germany	Holland	Sweden	Poland

We have drawn on a wide range of information sources, including published reports, official national data agencies, central banks and our own primary research. We developed a detailed questionnaire that was completed by around 30 lenders in the 12 mortgage markets, and conducted interviews with a selected group of country experts and participants to broaden our understanding of the subjects at hand.

However, data varied widely across the twelve countries, constraining the depth of analysis and the conclusions we could draw. For example, detailed information on lender risk management and mitigation techniques is not publicly available and so estimates provided by lenders and estimates from pricing and funding structures have been used as the main source for evaluating this aspect of mortgage markets.

2.4 Report format

The remainder of the report is divided into seven further chapters:

Chapter	Content
Context and framework	Outline of our approach and framework
Consumer demand	Overview of current and future demand by market and risk segment
Current risk and funding approaches	Overview of the competitive landscape and current supplier economics
Meeting future demand	Analysis of how the market potential might be captured by suppliers and how this might be affected by future regulatory changes
Business models	Overview of potential business models to exploit the market opportunity in the medium term
Policy issues	An overview of potential public policy changes to encourage fulfilment of latent demand
Conclusion	Summary of the implications

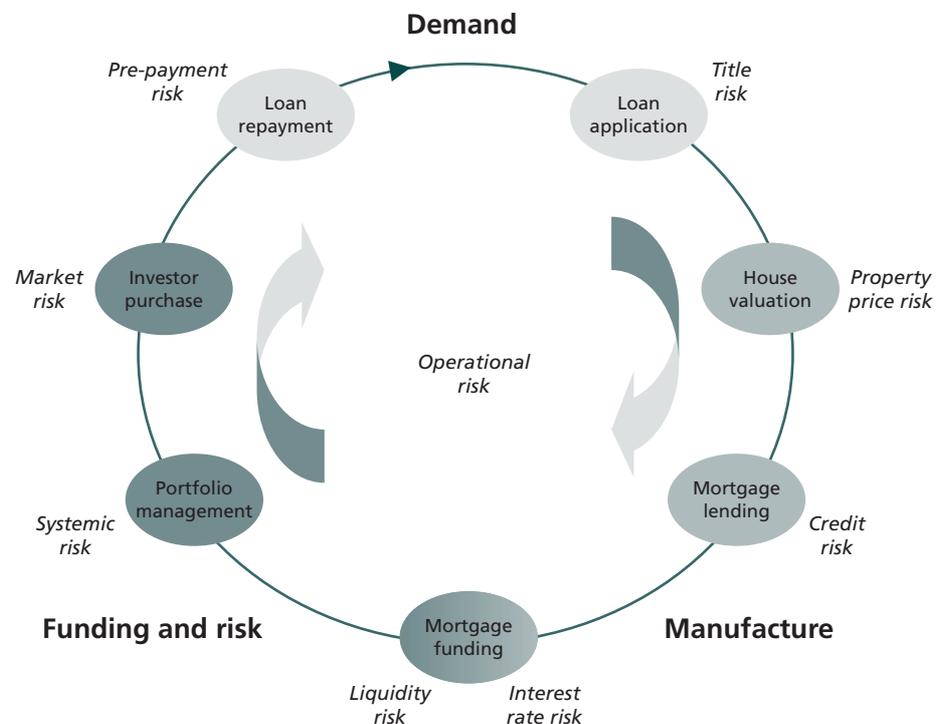
3 Context and framework

3.1 Context

We have taken a demand-led approach to this analysis, focusing on current and potential demand for consumer mortgages in each market, and then asking how lenders can best manage the risks inherent in the demand and meet the necessary funding requirements. We believe that this is the most intuitive way to approach the issues and identify the business models that are most likely to dominate demand.

Throughout the mortgage value chain, from origination to redemption, there are a large number of different risks, as set out below:

Figure 3.1 Inherent risks in the mortgage value chain



Interest rate and credit risk are the most important of these risks, and are addressed under the concepts of risk and funding. Operational risk is increasingly an area of concern and is also covered in this report. Other risks are addressed in passing, but form a modest part of the total mortgage risk. As a matter of scope, we do not address issues of operational efficiency in this report.

3.2 Framework

The study looks at the four drivers of value in the mortgage market:

■ Drivers of the market:

- **Demand:** borrower needs and products available to meet those needs, across a range of borrower risk profiles;
- **Supply:** the products and capital available to meet this demand, and associated funding and risk management approaches.

■ Drivers of the business environment:

- **Regulation:** local and pan-European regulatory frameworks and restrictions, and their impact on demand and supply;
- **Business models:** business models and how they enable individual firms to compete in the market, with particular focus on risk mitigation and funding.

Another important aspect we have considered is how risk is managed within banks themselves, looking at three main aspects:

- **Risk identification:** how the firm recognises the range of risks;
- **Risk mitigation:** how the firm then manages those risks internally;
- **Risk transfer:** how the firm transfers risks to third party providers.

All of these components are interdependent, which is what makes the mortgage market dynamic. Interestingly, there are huge differentials that make it difficult to draw general conclusions across all twelve markets.

3.2.1 Segmentation of the market

We have created six risk segments that enable us to compare and contrast countries across Europe in terms of customer risk. These profiles serve to differentiate customers by risk and then to consider size and growth potential of each segment. The risk profiles have been defined across four characteristics:

- **Age:** 15-30; 30-55; and 55+.
- **Credit quality:** Impaired and unimpaired.
- **Income Multiple:** Unemployed (or dependent on social benefits); high debt-to-income; low debt-to-income; and rental.
- **Equity⁴:** None (100% or more loan-to-value); low (requires higher LTV than the country's standard maximum); and high (able to meet or surpass standard LTV criteria).

The combination of these characteristics creates 72 permutations, but by grouping these characteristics, we have generated six different profiles which cover the market. Table 3.2 below defines these six profiles:

⁴ Note that we mean equity at the point of mortgage sale or origination

Table 3.2 Risk profiles

Name	Characteristics				
	Age	Credit quality	Equity	Loan to income	Comments
Standard	<55	Not impaired	High	Low	Standard prime borrower
Stretched	<55	Not impaired	High	High	Prime borrower with stretched mortgage
Elderly	55+	All	All	All	All borrowers within elderly segment
Low equity	<55	Not impaired	None and low	All	Standard borrower but low equity
Risky	<55	Impaired	All	All	Sub-prime sector
Investment	All	Not impaired	Not low	Rental	Investment sector

This segmentation allows us to differentiate between borrowers on the basis of asset risk (which is cyclical and driven by LTV) and income risk (which is driven by previous credit impairment or stretched income). The Elderly and Standard are low-risk segments; the Stretched and Risky bear income risk; Low equity bears asset risk; and Investment bears income risk with strongly connected asset risk. These profiles appropriately reflect the risks in the business and provide good coverage of the universe of borrowers.

3.2.2 Analytical models

We built two major analytical models for this study:

- **The demand model** extrapolates from current demand for residential mortgages across our six risk profiles and twelve countries to the potential demand for mortgages, based on certain key macroeconomic criteria. This future demand gap is then modified by building scenarios to evaluate the opportunity in each market.
- **The pricing and funding model** looks at the opportunity for economic improvement in each country to enable existing suppliers to meet current and future demand, and at how that might change across the different risk profiles.

These models, taken together, enable us to assess the opportunities to maximise the potential at each stage of the value chain through business model design, with particular emphasis on risk management and funding.

3.2.3 Survey

We also conducted our own primary research in the form of a survey sent to lenders, both to further populate our research and also to corroborate other analysis. This survey was completed by approximately 30 participants across the twelve countries.

3.3 Data sources

Information and data gathering was an important component of this study, due to its broad scope and particularly due to the inclusion of certain countries where it is difficult to gather reliable historical information. As a result, we have gathered a comprehensive database of materials covering official data sources (e.g. ECB, OECD, central banks, EMF, CML, national statistics, etc.), third party data (e.g. Datastream, Euromonitor, NOP/FRS, etc.) and publicly available reports (e.g. the Miles review). Further information was collected through discussions with central bank officials, local bank representatives, 'mystery' shopping and web-based research.

A list of main sources for the study is at the end of this paper.

4 Consumer demand

4.1 Introduction

Our working assumption is that demand for new and existing housing is the main driver of the mortgage market across Europe and will continue to be so in future. We have therefore based our analysis on the drivers of consumer housing demand. While we do expect mortgages used to finance other purchases (such as annuities for income in retirement, or consumption) to increase in importance over the next few years, we have not considered these within the scope of this study. The focus is on the demand for mortgages to fund residential house purchases.

We have analysed the potential market in two steps:

- The market today examines the current size and structure of the residential mortgage market across our twelve European countries.
- The market tomorrow presents an analysis of how demand might grow over the next five to ten years.

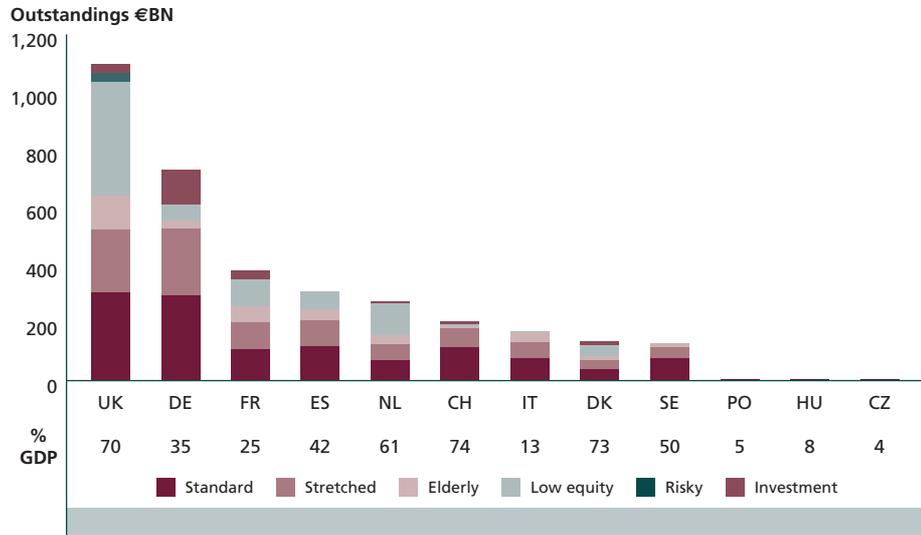
4.2 The market today

4.2.1 Current market size

Inevitably, there is a huge difference in sophistication and current demand across the twelve countries. There is a huge gulf between the UK and Denmark, at one end of the spectrum, and the accession countries of Eastern Europe at the other. These differences occur in almost all areas: basic market structures, risk segments served, levels of service available, and even the levels of home ownership that drive mortgage borrowing. Nonetheless, regardless of the sophistication of the market, mortgages are a very important part of the financial markets of most of the countries surveyed. The news is often dominated by stories of house price inflation, growing consumer demand, housing supply restriction and so forth. In four of the twelve countries, mortgage outstandings amount to more than half of total GDP.

Current mortgage outstandings vary both in aggregate and across our spectrum of risk profiles, as illustrated in Figure 4.1 below:

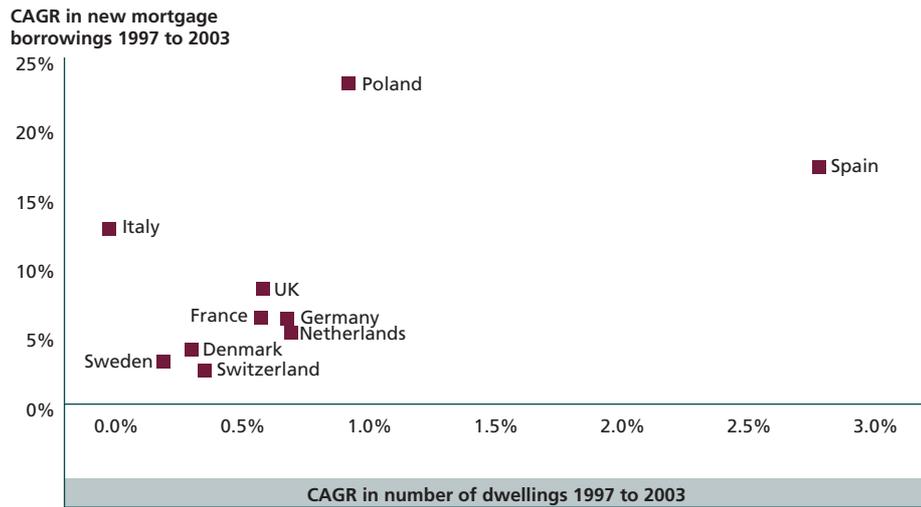
Figure 4.1 Estimated outstandings⁵ (stock) by risk character⁶, 2003



Source: EMF Hypostat, Merrill Lynch International Guide to Mortgage Markets and MBS, CML, German Nat Stats, Bundesbank, Banque de France, Insee, GEMI report, Spintab, DNB, SNB

Housing demand has historically fuelled mortgage lending across Europe. Figure 4.2 shows the recent relationship between the rise in new mortgages and the number of new houses being built. Housing continues to provide a background of steady supply for the market. This supply, assisted by declining interest rates, has fuelled a steady growth in the mortgage markets of most of the countries studied. In fact, growth in the mortgage market has outstripped any increase in housing stock in this benign macroeconomic context.

Figure 4.2 Housing stock and mortgage outstandings



Source: Euromonitor, Datastream, EMF, national statistics bureaus, national mortgage organisations and local research
 Note: No data was available for Hungary or the Czech Republic

⁵ We consider this split to be accurate to within +/-10% for each country

⁶ Switzerland does not include small private businesses that are used to purchase residential letting housing. Low equity is defined as borrowers who require high LTV mortgages (higher than 'standard' products of typically 80% LTV in most countries)

In a well-regulated, large and competitive market, mortgage outstandings reflect housing needs and the consumer desire to own. Less developed markets tend to be more supply-constrained, with the pace of growth more dependent on mortgage providers (in other words, consumers take what they are given). As markets mature, growth drivers shift from the lenders to the consumers, as better information and better segmentation take hold. The following factors are critical drivers of mortgage demand:

- Macroeconomic factors
 - Interest rates
 - Inflation
 - Other
- Supply factors
 - Pricing
 - Product availability
 - Risk availability
 - Presence of non-banks
- Policy and regulation
 - Government subsidy, taxation and social housing policy
 - Mortgage market regulation

Each of these factors is examined in detail below, with a view to understanding both why the current levels of mortgage outstandings are as they are today and how market potential (as measured in our latent demand model) might develop. Each of these factors is a key component of latent demand.

4.2.2 Macroeconomic factors

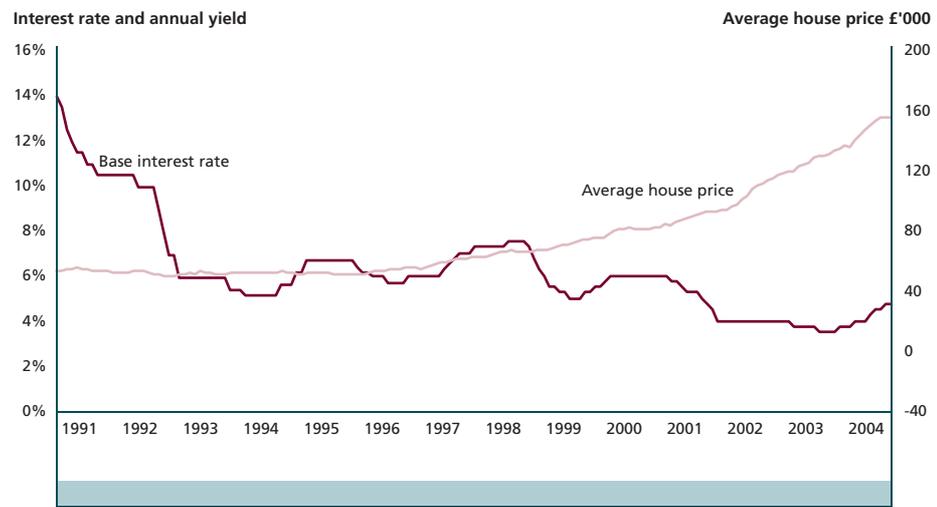
4.2.2.1 Interest rates

The base interest rate is one of the biggest drivers of demand, since it dominates the cost of a mortgage. Falling interest rates over the past few years have fuelled demand for mortgage lending, since the price for consumers has dropped significantly. This growth in demand has been greatest in markets with the highest sensitivity to short-term rates, such as Spain and the UK, but has been seen across much of Europe.

4.2.2.2 Inflation

Across Europe, house price inflation has outpaced consumer price inflation in recent years, although this may well correct itself over the medium term. In the meantime, this anomaly has made property ownership appear to be a good capital investment even though property yields have fallen, increasing demand for housing and, in turn, demand for mortgages.

Figure 4.3 UK house price yield, interest rates and house prices



Source: Bank of England, ODPM, Nationwide Building Society and IPD

The scale and rapidity of both the rise in house prices and the fall in interest rates imply the threat of a potential correction that would bring asset price inflation into line with broader consumer inflation. The recent levels of house price rises have been fuelled to some extent by the drop in interest rates; given where rates are now, that is likely to be unsustainable going forward. This could well put pressure on the markets of several countries in our study. This report does not look into the causes and effects of a potential housing crash in any detail, but we do recognise that it is a risk that could have implications both on near-term demand and on the economics of the mortgage providers.

4.2.2.3 Other

Besides interest rates and inflation, borrowing is affected by historical macroeconomic trends. For example, if unemployment is low and growth rates high, purchasers will be more likely to take on relatively large mortgage debts. This study does not examine in detail the impact of macro-economic drivers on the mortgage industry, but we acknowledge that they have a key role to play. In particular, without a high degree of macroeconomic stability, mortgage lending rarely gets off the ground as an industry.

4.2.3 Supply factors

4.2.3.1 Pricing

The price paid for a mortgage is a factor in determining demand at the margin. Customers may want to buy their own home, but be unable to afford it. Clearly the dominant driver of pricing is the underlying interest rate, as discussed above, but the margin over cost of funds also impacts the 'all-in' price to consumers. Margins reflect both supply costs (of money, delivery and risk) and the competitive landscape.

Comparing mortgage prices is difficult, due to the individual factors at play in different countries. In the recent EMF/Mercer Oliver Wyman study, the main point of note was the comparatively narrow range of standard mortgage prices across the

countries, driven by the wide use of the Euro and the macroeconomic stability of Western Europe in general, resulting in low inflation and associated interest rates.

The 2003 EMF/MOW study also found margin differences to be driven more by differences in supply costs than by differences in profits. Price seems to make little difference to overall returns, since the range of returns achieved on equity across the countries is relatively narrow (of the order of 8-22%).

However, there is greater variation between countries for higher-risk products. This could be due to lack of scale or to different revenue structures (upfront fees, redemption penalties, holding periods, and so on), or other market-specific reasons. There is also a difference between countries where primary mortgages cover higher levels of LTV (which tends to affect the price paid for the whole loan) and countries where primary mortgages are capped at lower LTV levels. In these latter cases, there is typically a much higher margin for a secondary or other type of additional mortgage.

In Italy, for example, banks tend to charge between 25 and 40 basis points more on the whole loan for a fifteen-year variable-rate loan that is over 80% LTV than for one that is below 80%. In Switzerland, secondary and tertiary mortgages are typically 75 to 100 basis points more expensive than the primary mortgage for five-year fixed-rate loans. In the Czech Republic, loans of over 80% LTV are around 20 basis points more expensive for the majority of terms.

Because of these differences (and others such as term or fixed- vs. floating-rate products), it is very hard to compare prices across the different countries in our study and so compare the relative marginal 'price' of higher risk lending.

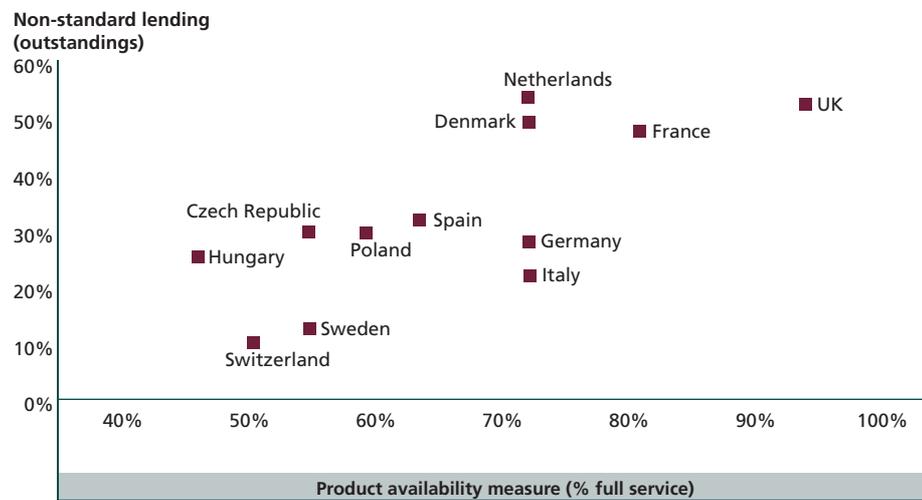
What is clear from our research is that prices do vary and the use of risk-based pricing for higher LTV loans is not consistent across countries and lenders. There often seems to be little link between the increased credit and other risks associated with non-standard lending and the prices charged by the majority of banks.

4.2.3.2 Product availability⁷

Product availability is a critical driver of current outstandings in some markets. The lack of availability of a mortgage product to a customer clearly limits actual demand and means that certain risk profiles are unable to access mortgage credit. The link between low levels of mortgage outstandings and lack of product availability is demonstrated for non-standard products in Figure 4.4 below:

⁷ Product availability and servicing by country were looked at in some detail in the 2003 EMF/Mercer Oliver Wyman study. The analysis there, however, did not split out the availability by risk profile; we have therefore extended and broadened the analysis in this study

Figure 4.4 Product availability vs. non-standard lending (outstandings 2003)



Source: EMF Hypostat, Merrill Lynch International Guide to Mortgage Markets and MBS, CML, German Nat Stats, Bundesbank, Banque de France, Insee, GEMI report, Spintab, DNB, SNB, lender websites, local research

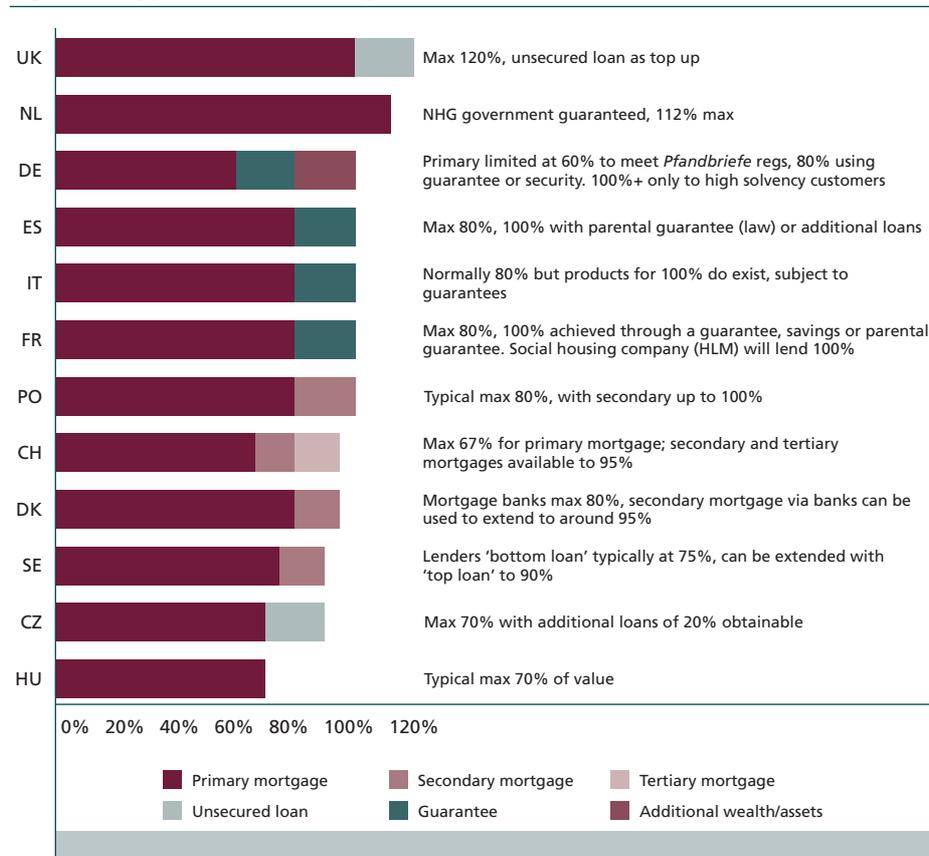
Our analysis suggests that latent demand by higher risk segments is currently unsatisfied due to lack of supply, a point we will pick up later in the report.

4.2.3.3 Risk availability

Mortgage volume is also restricted by the availability of credit to low equity borrowers and to borrowers with uncertain cash flows. In certain countries, mortgage credit is restricted by LTV regulations, which are created by governments in an attempt both to prevent excess credit risk in the banking system and to regulate house prices and demand (and also, indirectly, to mitigate house price cyclicality). This affects particular consumer segments; for example, young people typically lack substantial equity, which makes it difficult or expensive for them to buy property.

Countries have very different regulations as to how LTV is calculated, how much of that value a lender can advance and how borrowers can go beyond that limit to extend their borrowing. Figure 4.5 below shows the typical LTV structure by country and the associated products required to obtain the maximum LTV. Again, comparison is not easy because countries use different definitions of loan-to-value (and differ in the rigour with which these regulations are enforced), so we have used the theoretical regulatory limits to lending. In practice, many countries do not offer products up to this level; in Spain and Italy, for example, the usual limit on LTV is 95%, despite regulation that allows it to reach 100%.

Figure 4.5 Typical LTV structuring



Note: Mortgage insurance is currently available in the UK, Spain, Italy and Sweden
 Source: Regulator websites and research, lender websites, information hotlines and local research

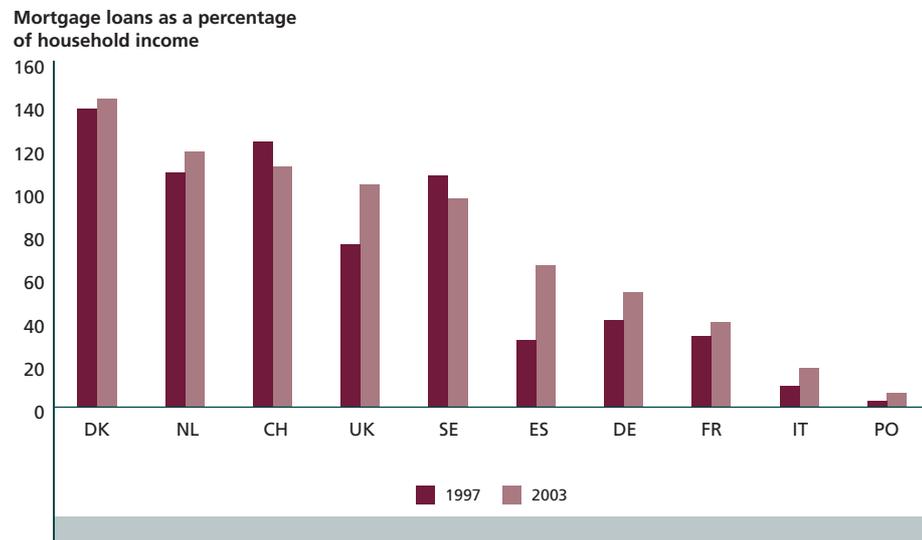
In countries where high LTV lending is either restricted or expensive, such as Hungary, the Czech Republic and Italy, consumers must look to other products to make up the difference. An analysis of mortgage borrowing as a percentage of household debt shows a higher level of other types of borrowing in these countries. In Italy, mortgage debt is only 45% of total household debt, meaning that higher-risk consumers are probably using other types of loan to extend their mortgage borrowing. In countries with very competitive low-equity markets, such as the UK and Denmark, the percentage is much higher, at over 80%. In the Netherlands, the tax advantages of a large mortgage lead to the highest level of mortgage debt as a percentage of overall debt of any country studied, at nearly 90%.

Basel II recognises that risk is a continuum and as a result allows lenders to assess the level of risk and associated capital requirements. As they currently work, LTV restrictions tend to create boundaries which restrict demand. Under Basel II, LTV levels will be less important for IRB-qualified lenders, but will still have a role to play in creating a framework. It is arguable whether or not current LTV rules should continue to exist in such a way so as to restrict demand.

LTV is not the only measure of risk – cash flow/affordability risk is also an important driver, through the safety margin of debt service coverage. Higher interest rate levels lead to the so-called 'tilt effect' where lenders have to reduce

LTV ratios to assure manageable debt service coverage ratios. It is therefore sensible to compare loan-to-income ratios, as shown in Figure 4.6 below.

Figure 4.6 Changes in leverage



Source: OECD

Note: No data was available for Hungary or the Czech Republic

Looking at Figure 4.6, we can see that leverage has risen across Europe as a whole. However, due to falling interest rates, debt service ratios have remained flat – for example, in France and Spain the debt service ratios have stayed at around 4% of household disposable income. Nonetheless, if interest rates were to rise, there would be substantial risk in many countries of borrowers failing to make their mortgage payments. Forced sales of repossessed houses would depress house prices, putting further strain on the market.

It is our view that the recent benign environment may mask higher levels of embedded risk that will lead, over time, to new approaches to managing risk.

4.2.3.4 Presence of non-banks and credit risk takers

Certain countries have seen the presence of non-bank players in the mortgage market influence the demand for credit. Innovative non-bank players have opened up access to mortgage credit for certain risk profiles in the UK. Mortgage insurers have also entered the market, often providing credit without the need for depositor safeguards. These players have recognised an opportunity in terms of both market sophistication and unsatisfied demand. The likelihood is that the presence of these players will continue to increase over the medium term, enabling demand to be served more widely and more efficiently.

These players have a three-fold impact:

- They increase price competition, forcing incumbent players to look at their pricing strategies.
- They introduce new products, achieving a competitive advantage and taking market share away from existing lenders. They use alternative distribution

channels to shake up the market. Both the new products and the new channels are usually picked up quickly by existing lenders, resulting in a more competitive market generally.

- They influence regulation to reward 'best practice', leading to a more efficient market with lower barriers to competition and/or market segments. In particular they are innovative: where regulation limits demand from being satisfied, they look for other ways to meet it.

The overall effect of non-banks and other credit risk takers such as mortgage insurers is to foster competition. Those countries with limited non-bank presence should examine carefully whether their market is fully exploiting the range of opportunities, as innovation is typically lower in the regulated banking sector.

4.2.4 Policy and regulation

4.2.4.1 Subsidy, taxation and social housing policy

Subsidies, taxation and social housing policy – as distinct from regulation – influence whether it is desirable to own a house, and therefore take out a mortgage loan, or to opt for a social or subsidised rental alternative. This is especially important for the riskier segments. Home ownership and rental effectively compete in a number of segments, and the nature of the competition (and its outcome) is determined by government policy in these three areas.

Table 4.7 below outlines a summary of these influences across our countries and we look below at some examples of each:

Table 4.7 Comparison of subsidy, taxation and social housing levels by country

Country	Interest rate or Income Tax relief on mortgage payments	Charge to Capital Gains Tax on house sale	Renter subsidies	Public loan guarantees	Overall impact on ownership
Czech Republic	Yes	No	Low	Low	Medium
Denmark	Yes	No	Medium	Low	Medium
France	Yes	No	High	High	High
Germany	Yes	Yes if owned for less than 10 years	High	Low	High
Hungary	Yes	No	Medium	Low	High
Italy	Yes	No	Low	Low	High
Netherlands	Yes	Yes but deferrable	Low	High	Low
Poland	Yes	No	Medium	Low	Medium
Spain	Yes	Yes	Medium	Low	Medium
Sweden	Yes	Yes but deferrable	Low	High	Low
Switzerland	Yes	Yes	Low	Low	High
UK	No	No if primary residence; yes if not	Medium	Low	Low

Subsidies

Subsidies exist in many different forms across Europe. Governments use them to stimulate demand at various points along the value chain, but mainly to stimulate end-user demand. Subsidies generally have a large effect on the propensity of lower-income, lower-equity and higher-risk segments to purchase, while the wealthier segments already have the financial means to purchase and limited access to subsidies.

A common form of subsidy is in the property rental market. In Denmark, the government regulates the level of rent payments; in Germany, rental prices are 'softly' regulated and owners given incentives to rent out their homes and build rental properties.

Another common target for subsidy is the low-income population. In France, multiple subsidies exist for low-income segments to purchase: there is a 0% interest rate on a portion of the mortgage loan if a borrower's income is below a certain level, while the government guarantees certain portions of the loan. In Hungary, the government subsidises the mortgage market by guaranteeing the interest rates that consumers pay and making up the difference between that and the actual market rate.

These subsidies can be expensive: Hungary's interest-rate subsidy costs the government a huge amount. At some point in time there often needs to be a mechanism that allows the government to step away from such obligations. A good recent example comes from Portugal, where the government closed its interest rate subsidisation programme and is now running off its costs with few adverse effects.

Taxation

Governments can also stimulate demand by introducing tax breaks. For example, all mortgage interest-rate payments attract tax relief in Italy, while low-income segments pay a reduced sales tax in Spain. Many other countries offer tax breaks to home-owners – for example, tax is typically not charged on capital gains made through house sales.

Conversely, governments can use taxation to restrict demand. Consumers look at the all-in cost of owning a house, so taxes on house purchases will influence their decisions to rent or buy. The relative tax treatment of rental vs. ownership is critical in this regard. For example, in Germany, the system is biased towards rental, through the depreciation allowances for rental properties. Rental losses can be netted with positive income from other sources. One study conducted last year concluded that rents would have to rise by 20 to 30% to create a breakeven with the ownership cost of capital.

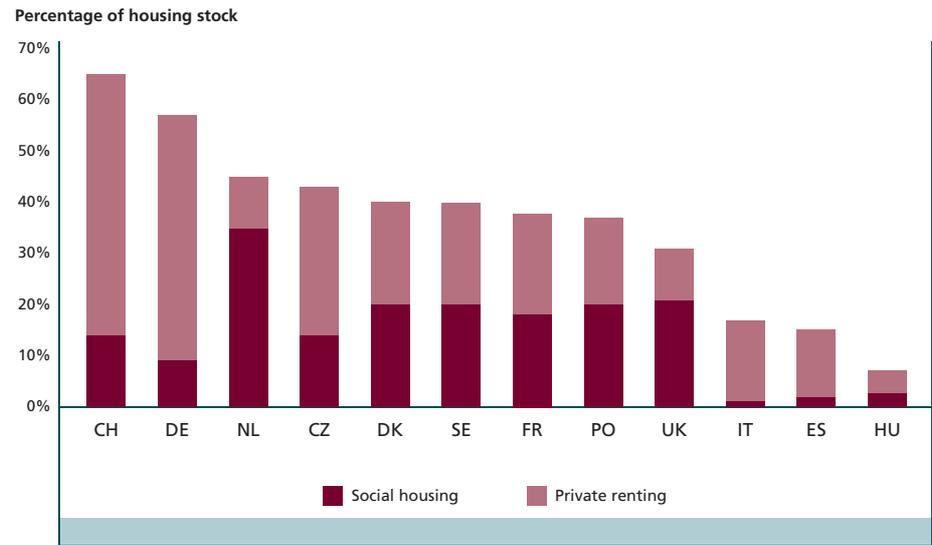
House-purchasing does not exist in a vacuum. People not only consider the tax implications of housing relative to renting, but also to other asset classes such as stocks, bonds and cash. In almost all countries (as can be seen in Table 4.7) the consumption income stream is untaxed⁸, as is the capital gain on the asset. As a result, housing investment is typically favoured over any competing investment where the owner is the occupier. However, the taxation regime is usually substantially harsher for investment properties, as in the UK, where tax is payable on capital gains made through property investment.

⁸ Imputed owner tax is charged in some markets. For example, both Denmark and Switzerland charge owner occupiers the rental value of their property as an annual tax

Social housing policy

The final influence is the level of social housing. In countries where social housing is comparatively low (e.g. Italy and Spain) the population is forced either to rent privately, which is more likely to be at higher cost than social housing, or to purchase. Again, in theory the level of social housing has a larger impact on the propensity of lower-income, low-equity and high-risk segments to purchase. For example, a change in government policy allowing social housing to be purchased by tenants at favourable rates fuelled huge demand for mortgages in the UK during the 1980s.

Figure 4.8 Level of social housing by country as a proportion of housing stock



Source: RICS European Housing review 2004
 Note: Data on private rentals not available for the Czech Republic

The level of social housing is not a universal driver of the size of the mortgage market. For example, the Netherlands has a very high level of social housing and a high level of mortgage outstandings but does not, however, have a particularly high level of home ownership. The tax benefits of taking out large mortgages mean that the high mortgage outstandings are driven by larger mortgages rather than a larger proportion of the population having mortgages. The NHG supports the mortgage market by reducing the price paid for the mortgage for lower income borrowers, but given the high levels of social housing, there is less incentive to own than in other countries.

Poland has a different model of social housing, which effectively crowds out the private market from large parts of the higher risk market. After 20 years of renting the property from the government, the renter owns the property outright. This government mortgage scheme effectively reduces the attractiveness of this part of the market to lenders, thereby limiting the opportunities to this segment in Poland.

4.2.4.2 Mortgage market regulation

The level of consumer demand for mortgages is also determined by government or central bank regulations. We have touched upon this already in the form of LTV levels, government subsidies and taxation, but the overall impact of regulation is also very important. In a deregulated market, a consumer who wishes to borrow

would simply need to persuade a lender of the economic benefits to both parties of executing the loan. But the mortgage market's size and economic importance typically attracts considerable regulatory attention, mainly focused on consumer protection. The main thrusts of mortgage market regulation are as follows:

- **Secured lending:** the legal requirements for buying and selling houses are far more onerous than buying or selling other types of goods. Since house purchases are usually the single largest purchase in most consumers' lives, and since much of that purchase is funded via a mortgage guaranteed on the property, a myriad of regulations have grown up to try to ensure that the process is transparent and fair.
- **Price/fee limits:** consumers are protected by regulation from excessive fee charging on their mortgage product. Again, this is to ensure that lenders do not abuse such a vital product and that the pricing of fees is transparent.
- **Product restrictions:** certain types of product are restricted in terms of who they can be sold to and how they can be sold.
- **Capital adequacy:** banks are required to hold capital against their mortgage lending by both non-country specific regulations and local government requirements. This will influence demand as it impacts the products and services that banks can offer. The Basel capital regulations are the main example, and are considered in depth later in this report.
- **LTV restrictions:** as discussed above, governments have tried to manage the riskiness of mortgage portfolios by imposing restrictions on the amount of money that can be lent to a borrower.

Some jurisdictions encourage risk transfer to insurers through capital and LTV rules, including the US, Israel, Hong Kong, Australia and Canada. To date, this has not been common practice in Europe.

4.2.5 Summary

The mortgage markets are driven by a combination of demand for housing and home ownership and availability of product and risk appetite, but also limited by other factors. There is a huge range of market sophistication and size across the countries surveyed. At one end of the spectrum, the mature economies of UK and Denmark possess developed mortgage markets serving a broad range of risk profiles. At the other, the Eastern European countries possess much less developed markets and a very narrow range of products. In the middle, there is a wide array of demand and practice: in Germany, for example, there is less owner-occupation and more intermediation through the rental sector, which is also financed by mortgages. Meanwhile, Italy has a significantly under-developed mortgage market, despite the size of its economy.

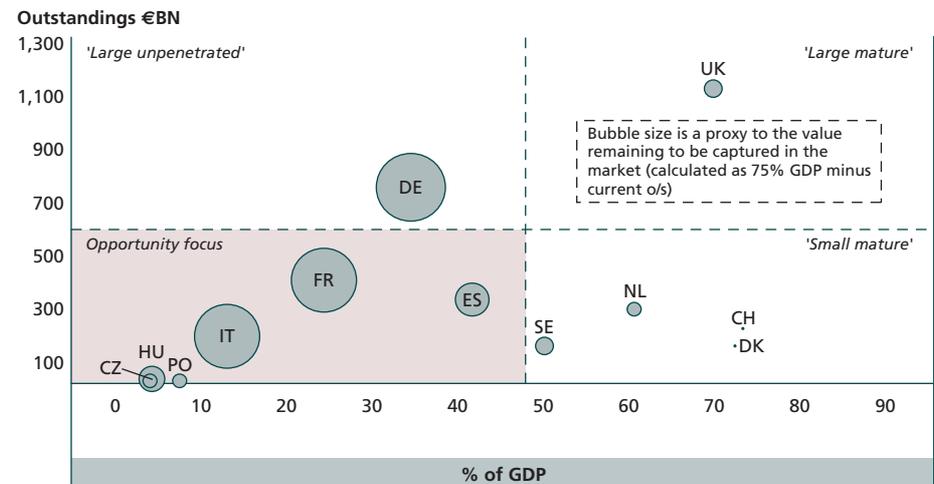
From a supply perspective, a developed market is characterised by profitable and stable providers, niche players, availability of a broad product range and effective risk transfer mechanisms (in particular well-managed credit risk techniques).

4.3 The market tomorrow

4.3.1 Introduction

One way of predicting future mortgage demand is to look at broad structural features, such as current market size and GDP, as shown in Figure 4.9 below. This analysis shows that the large range in mortgage outstandings by country is somewhat linked to GDP size, but also depends on other factors, such as the development of the housing market. The analysis points to some interesting market opportunities, which the report explores in more detail.

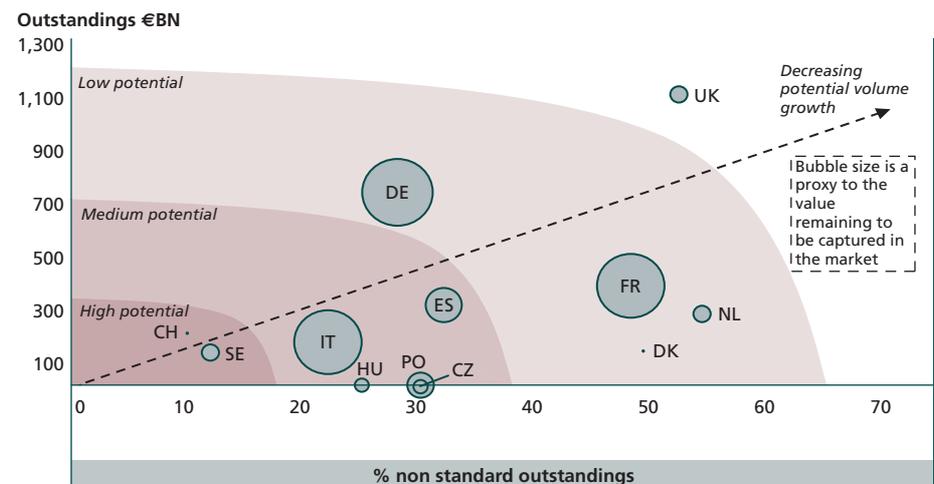
Figure 4.9 Comparative stages of development



Source: ECRI, EMF, Central Banks

Analysis of non-standard borrowing against GDP, shown below in Figure 4.10, also provides some pointers as to potential future growth.

Figure 4.10 Relationship between level of outstandings and non-standard borrowing



Source: EMF Hypostat, Merrill Lynch International Guide to Mortgage Markets and MBS, CML, Datamonitor, German Nat Stats, Banque de France, Insee, GEMI report, Spintab

The question then arises as to whether the structural conditions in each market facilitate or limit growth opportunities. The answer depends on the impact of the other market drivers identified in the previous section. We have therefore taken these drivers and modelled the underlying drivers of medium-term demand, meaning a time horizon of five to ten years.

It could be argued that the outlook for demand is bleak in those countries where interest rates have already fallen substantially and house prices have typically risen, due to a potential market levelling to compensate for recent growth. We have attempted to reflect this through our structural conditions for these markets, but are not attempting to second-guess any cyclical in the market.

The objectives of the demand model are:

1. To predict the relative 'propensity to own' across our different risk profiles and countries. Certain segments in certain countries will have greater 'capacity' or willingness to own than others. The model focuses on structural effects, since these are the most significant.
2. Given the predicted propensity to own, to estimate the maximum mortgage outstandings in each country, assuming an unrestricted market and use of a mortgage to finance house purchase. This puts an upper bound on potential demand (assuming a 100% penetration rate).
3. To build a number of 'scenarios' to provide a best estimate of the potential future demand within this upper bound of demand derived in 2.

We believe the model provides a good indication of future levels of demand. It provides a useful starting point for an assessment of the opportunity in each market and the business models that might be best suited to the funding and risk management of this demand. The results of the model are discussed below, together with a brief description of the methodology.

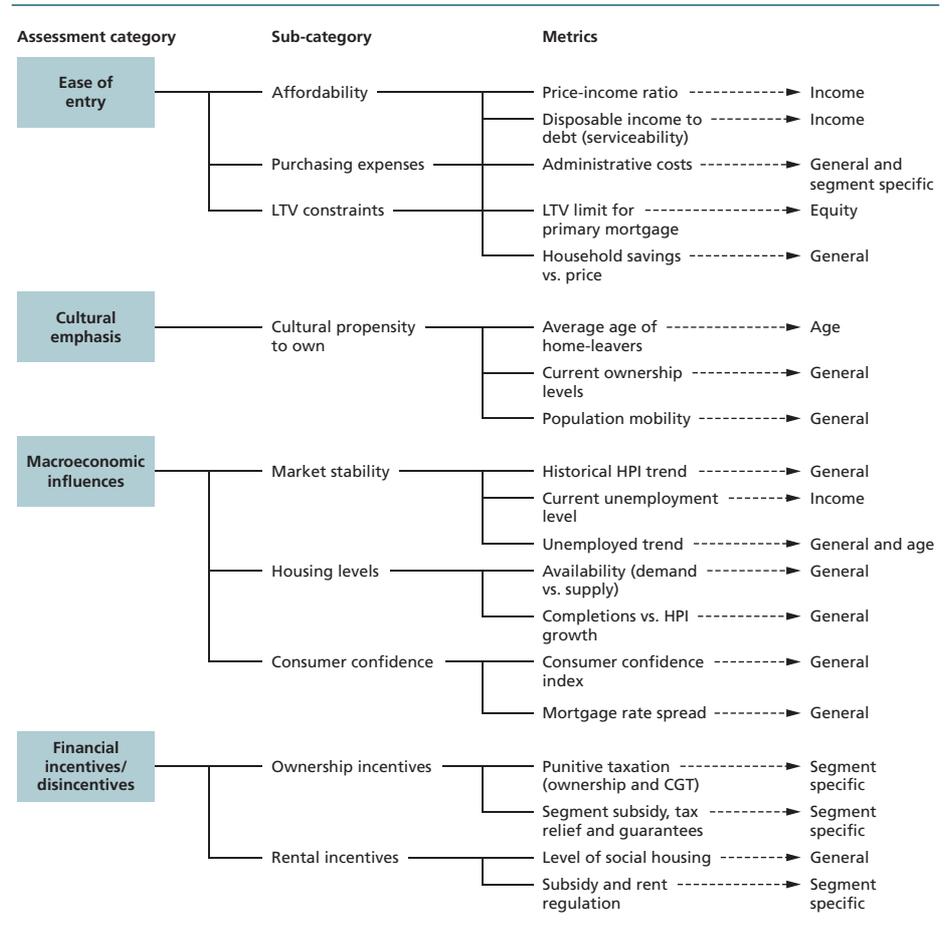
4.3.2 Methodological overview

In order to estimate the total potential demand, we have taken each of the risk segments identified above and modelled the likely impact of four drivers of demand:

1. **Financial incentives/disincentives:** Ownership/rental incentives
Financially, which is better for me? Weighting of 35%
2. **Ease of entry:** Affordability and purchasing finance constraints
What is stopping me? Do I have the means to enter? Weighting of 25%
3. **Cultural emphasis:** Non-financial factors
Do I feel as if I need to, or should, buy? Weighting of 20%
4. **Macroeconomic:** Market trends, housing/consumer confidence
Should I purchase now, or wait? Weighting of 20%

Each of these drivers incorporates multiple sub-drivers that are for the most part quantifiable. These factors allow differentiation not only between countries, but also between risk segments. Each driver is scored over a range of 1 to 5 (where 5 is a very high propensity to own and 1 is a very low propensity to own). The scores are allocated on a relative basis within each country.

Figure 4.11 Demand model framework

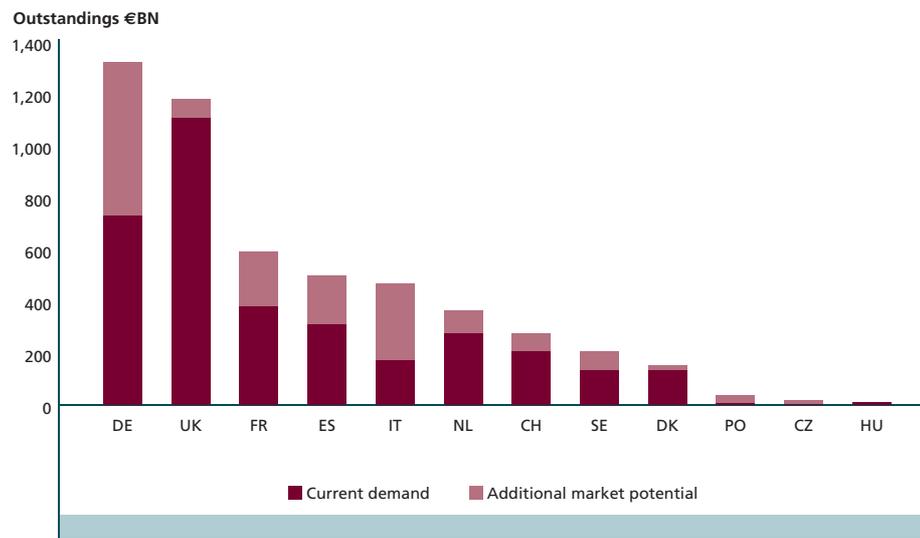


Once the propensity to own has been calculated, it can be used to estimate the maximum potential mortgage outstandings. To do this, we have multiplied the average levels of mortgage and house value by the size of each risk segment, to estimate the maximum mortgage market size for each risk segment. Consistent ownership levels, house values, population sizes, occupancy rates, average LTV and levels of outright ownership have been assumed across the countries.

4.3.3 Maximum mortgage demand

Figure 4.12 shows our estimates of the maximum mortgage market size in each country, based on our calculated 'propensity-to-own' rates for each risk segment.

Figure 4.12 Current and maximum potential mortgage demand by country



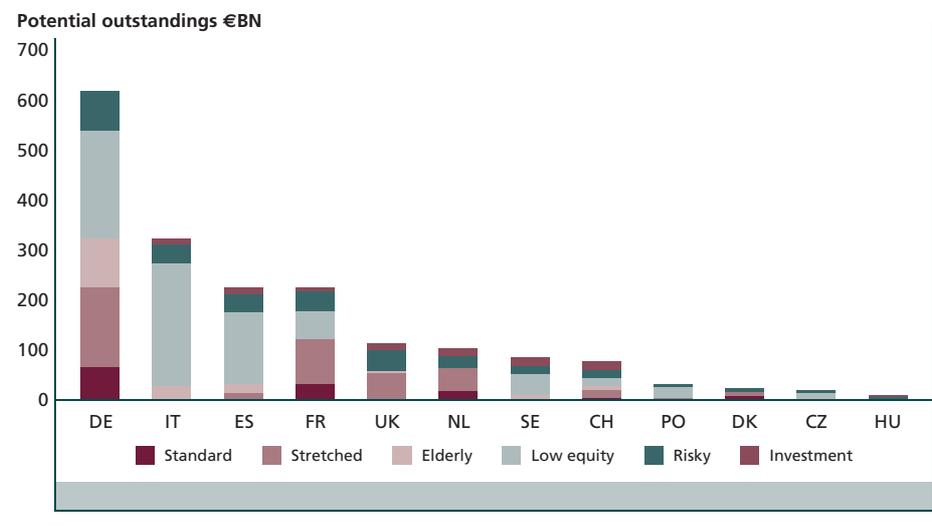
Source: EMF Hypostat, Merrill Lynch International Guide to Mortgage Markets and MBS, CML, German Nat Stats, Bundesbank, Banque de France, Insee, GEMI report, Spintab, DNB, SNB, Mercer Oliver Wyman analysis and Mercer Oliver Wyman European Mortgage Latent Demand Model

The potential for growth is significant, especially in those countries whose economies are large but where the mortgage markets are less sophisticated. The model predicts many features of the potential market demand that we would expect:

- Germany has the largest absolute potential because of its current low rates of owner-occupancy and expense of accessing LTVs above 60%. However, for this potential growth to be realised, many limiting factors will need to be overcome, such as the ownership structure of the large stock of apartments. Much of the demand here (as in the EU accession countries) may come from replacement of poor quality apartments in East Germany.
- Italy and Spain offer the highest potential growth in percentage terms, although actual growth will depend on changes in such cultural factors as living at home until marriage, low levels of social housing and currently limited low equity segments.
- The UK and Denmark have the lowest percentage potential growth due, respectively, to the highly developed state of the UK market across risk segments and the efficiency and clear structure of the Danish market.
- There is potential growth in the Eastern European countries, but given their current market characteristics, this is likely to be at lower levels than in Western Europe. These countries currently have very small mortgage markets that are set to grow but are likely to remain small in absolute terms in the medium term by comparison with Western Europe. The pace of growth will depend on such factors as economic stability, interest rate levels and the timing of entry into the Euro. Parallels exist in Spain and Portugal, which have taken ten years to grow to significant markets.

Market potential varies further across risk segments, with the Low equity and the Stretched segments showing most potential, as illustrated in Figure 4.13.

Figure 4.13 Maximum demand potential by risk segment by country



The main points we can take from this are:

- Germany's potential growth across all risk segments except Investment reflects the current state of development of this market.
- In more developed mortgage markets, such as Spain, the structural opportunity sits at the less standard end of the spectrum in Risky and Low equity segments, and providers will be sensitive to cyclical factors in accessing this growth opportunity.
- The same is true of France, although there is scope here to extend the product offering to the Standard and Stretched segments.
- There is also some opportunity left in the otherwise well-developed UK market, which appears to be in the Risky, Investment and Stretched segments. This seems intuitively realistic, since the sub-prime and Investment markets are relatively new and the Stretched segment has found it more difficult to enter the market in times of high house prices and rising interest rates.
- Italy seems to offer a huge opportunity in Low equity, indicating that the current laws and lending customs are not serving the market well, but legal difficulties with loan recovery are likely to deter providers from developing this opportunity.
- For Switzerland, the Investment segment seems to present the greatest opportunity, which is not surprising given the beneficial tax treatment of investment mortgages there.

4.3.4 Realistic demand assessment

The model output for maximum demand potential seems intuitive, but the key question remains: how much of this potential can be exploited? The maximum demand potential of €1,600 BN assumes a 100% penetration rate and full take-up but there will be factors that limit the accessible market potential. A 100% penetration rate is unrealistic; there are regulatory constraints (such as Sweden's credit quality laws); and the implied rate of change in ownership levels would require a huge cultural and economic incentive shift in some countries.

The final step in our analysis is therefore to apply some scenarios to the estimates of maximum demand in order to arrive at a more realistic estimate of potential mortgage outstandings. We have developed three progressive scenarios for this purpose:

- **Scenario 1:** Improved customer delivery through competition and extension of product offerings, but without changes to regulations or expansion into new risk segments.
- **Scenario 2:** As in Scenario 1, plus access to untapped risk segments using effective risk management and/or risk mitigation products, but with limited changes to regulation.
- **Scenario 3:** As in Scenario 2, plus full service to most risk segments with minimal regulatory barriers.

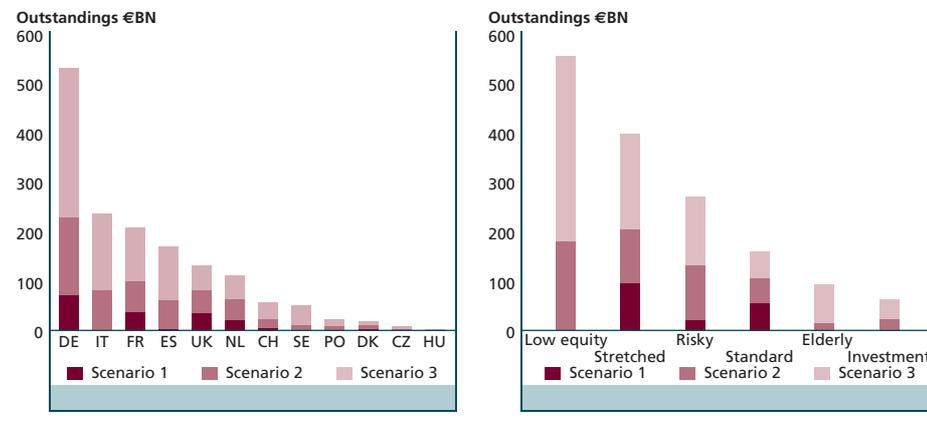
Each scenario includes assumptions regarding penetration of offering to risk segments. We have assumed that these scenarios will translate into the specific changes detailed in Table 4.14 below:

Table 4.14 Detailed assumptions for realistic demand scenarios

	Customer and delivery	Penetration	Regulatory reform	Product	Elasticity
Scenario 1	Only those risk profiles currently served	50% (25% for Stretched)	None	Improved lender processes	None
Scenario 2	Improved offering to all profiles and improved distribution	25%, 50% and 75% depending on profile	Some but not wholesale	Substantial product innovation	Yes – adjusts for speed of reaction
Scenario 3	All profiles served via all channels	50% for all	Major shift in policy reform	Substantial product innovation	All assumed to react at the same speed

The level of modelled demand varies under each of these scenarios – not just in the aggregate, but also by risk segment:

Figure 4.15 Realistic untapped mortgage demand by country and by risk profile



The scenario analysis shows Germany as still representing the biggest overall opportunity, followed by Italy and France. Much of Italy's potential relies on regulatory and legal change and may therefore be more of a long-term opportunity.

With regard to risk segments, it is notable that the well-served Standard segment shows limited growth potential under Scenarios 1 and 2, relative to Low equity and Stretched. The Elderly segment also has low potential but this is more due to its inherent characteristics, since these borrowers are the least likely to actually take out a mortgage. Investment has the lowest potential under any scenario, mainly due to the unpredictability of the market and the fact that the market's main driver is the purchase of houses as primary residences.

So, which is the most likely scenario and therefore provides the best estimate of market opportunity? Scenario 3 is not far off the total market capacity and we doubt that enough will change in terms of regulation and culture to allow this scenario in most markets, even over ten years. On the other hand, Scenario 1 is a cautious view of the market and only reflects development potential in those countries where benign regulatory and cultural factors already exist.

We have therefore identified Scenario 2 as the most likely and have used it for the purposes of the remaining analysis and chapters. Under Scenario 2, the level of demand is based on an extended offering to all segments, with conservative variations of consumer penetration based on modest changes in regulation. We have assumed that there will be no major regulatory change in each country. For example, Sweden's strict laws on lending to low-credit quality borrowers are likely to change only over a longer timeframe. As a result, the realistic estimate of potential demand for such lending is zero under Scenario 2. Another example would be the 10% penetration rate used for Investment in countries with rent regulations, due to the lack of incentive and slow change in the government subsidy structure. Generally, countries will develop their opportunities at different speeds and we have factored these differences into Scenario 2.

Under Scenario 2, the largest potential demand opportunities are in Germany and Italy. Opportunities here would include the Low equity segment in both countries, but further opportunities exist in Germany across the risk segments due to (a) the current difficulty of obtaining mortgages when borrowers are credit-impaired or low-income, (b) the lack of attractive offerings in the low-equity space and (c) a lack of growth in certain urban market areas. At the other extreme, little demand growth is expected in Denmark, due to its relatively small market size, broad product offering, efficient market and ease of acquiring comparatively cheap top-up loans.

Many of the countries in our study have experienced a fairly sustained period of house price rises, mortgage lending increases and generally benign conditions, despite the fact that many European economies have not performed well in recent times. Falling interest rates have helped to drive consumer mortgage demand.

The outlook for the medium term is less certain. The sustainability of the house price rises is very questionable, and unless the property market has a very soft landing, any crash could lead to much higher levels of default. Our analysis suggests that even well-capitalised institutions might suffer some threat to their capital buffer in the event of a fall in house prices. It is again hard to see base interest rates returning to the levels seen 12 years ago, but the trend recently has been for them to rise. In the UK, there have been a number of rises in 2004 alone.

Since this is such a key driver of mortgage demand (as consumers are price sensitive at this level), there is again a risk that further rises will dampen our latent demand predictions.

As already noted, there remains a risk that the recent house price rises have created a bubble that might burst at some point in the future in some European countries. At the very least, house prices cannot continue to rise in the way that they have. This study does not look into this in detail, but any such crash would have a severe impact on the lender (via capital issues, as discussed above) and on borrower demand, as well as on the longer-term health of the financial sector. The benefits of international diversification are therefore of prime importance to prevent any such crash having as serious an impact as the one in the early 1990s in the UK.

The other major macro factors in the medium term are any change to European regulations and any cross-border mortgage integration, which could potentially have a very beneficial effect on the mortgage market. We take a detailed look at current EU-level discussions (and their shortcomings) in Chapter 7, but in essence, we believe that thorough reform of domestic regulation would be needed to realise the full market potential expressed in Scenario 3. The reason is that the institutional constraints of the EU simply prevent such change at a supranational level. The two pivotal areas are the housing sector and the liberalisation of financial regulations: for example, the removal of rent subsidies in Germany which are currently considered to depress housing costs by between 20 and 30% relative to the (essentially market-based) cost incurred by the standard mortgagor owning his house.

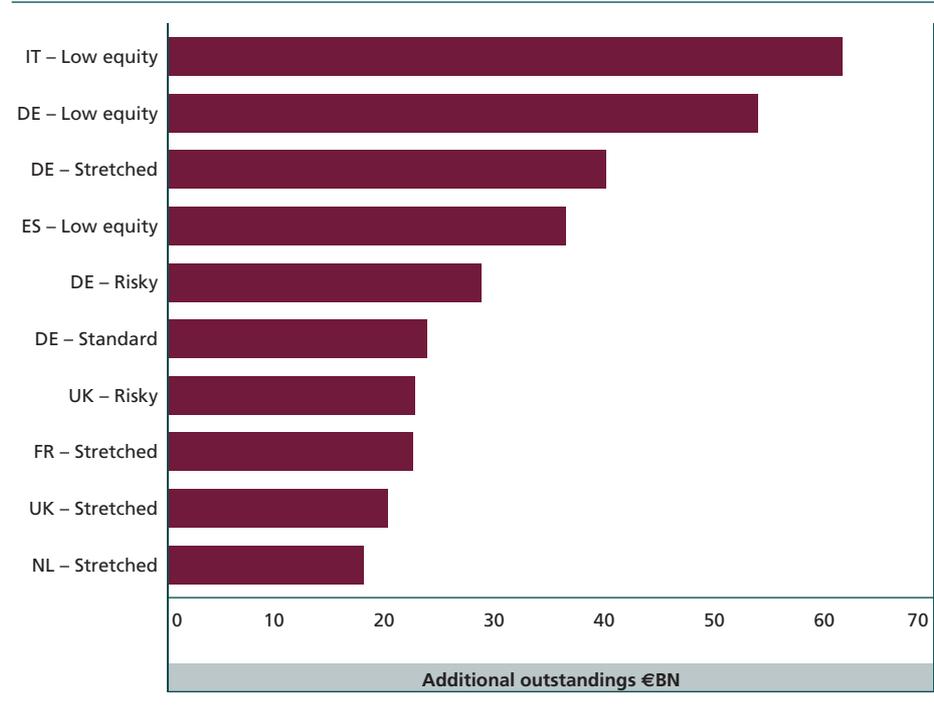
4.3.5 Implications of demand analysis

Taking Scenario 2 as an indication of medium-term demand growth, it is worth considering the potential opportunity in more detail at risk segment level. First, we review some of the reasons that demand is currently constrained:

- **Product:** lack of propositions tailored to meet the requirements of certain risk characters;
- **Pricing:** high pricing due to risk-aversion or lack of competition e.g. in the high LTV area;
- **Availability:** poor servicing levels (distribution channels, product awareness, etc.) for non-core risk segments;
- **Subsidies/Taxation:** creating significant market distortions;
- **Regulation:** for example, capped interest rates preventing lenders from acceptable returns on higher risk segments;

The top ten opportunities as outlined by our model are as follows:

Figure 4.16 Top ten demand opportunities by country and risk segment



However, not all of these opportunities are equally achievable and not all are equally attractive. Macroeconomic conditions and house price trends are important cyclical components of demand and hence drivers of the speed at which potential demand can be realised. Price and interest rate cycles will limit the growth of higher-risk segments, while deregulation might facilitate growth in others. Indeed, we would expect any housing market crisis to trigger some degree of re-regulation. Regulation may limit supply (e.g. due to unattractive returns due to capped interest rates), which will also constrain realisation of potential demand.

4.3.6 Conclusions

As we have shown, there is significant potential demand across the twelve countries covered by our report. This chapter has shown how demand is generated today and has estimated future realistic demand growth. There are clearly limitations on the pace of demand growth, but we have identified that the higher risk segments are most likely to offer demand growth. This has significant implications for how mortgage providers meet that demand.

5 Current risk and funding approaches

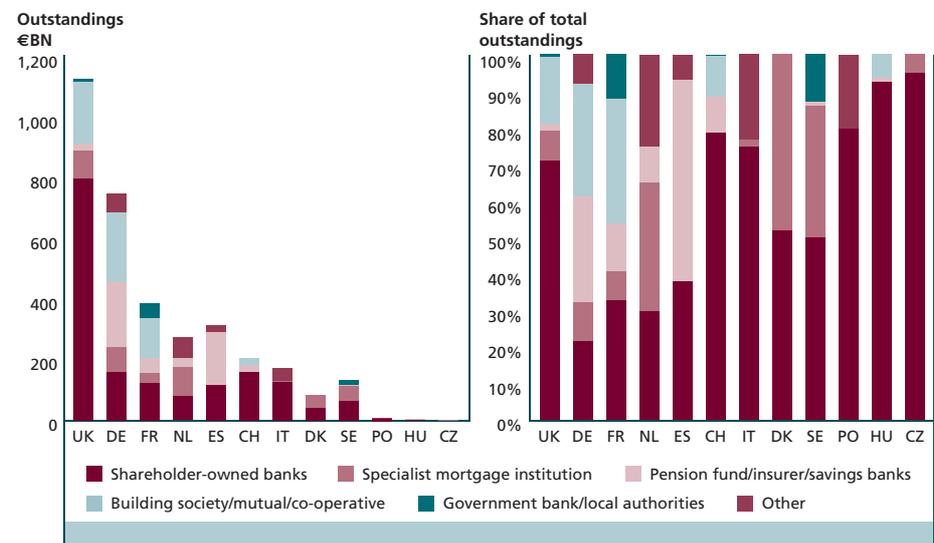
5.1 Overview of current supplier context

5.1.1 Types of lender

Mortgage lending is a scale business, in the main. The top five lenders by country typically represent greater than 50% of outstanding balances (note that for Germany, we have treated the savings banks and co-operative banks as single institutions, as there is limited competition between the individual banks).

The mix of providers varies across countries as shown in Figure 5.1 below and looks at those institutions that originate mortgage loan assets (and hence the associated credit risk). The institutions holding the interest rate risk will be different, as much of it is passed through to the capital markets. The variation is driven by a number of different factors. For example, some countries only allow specific institutions to advance mortgage loans to individuals (e.g. in Denmark); in others, historic market development has meant that mutual or governmental institutions have a high share of lending. Overall, around 50% of the market is in the hands of shareholder-run banks.

Figure 5.1 Outstandings (stock) by institution type, 2003



Source: CML, EMF/MOW report, Bundesbank, AHE, SNB, Merrill Lynch International Guide to Mortgage Markets and MBS
 Note that 'Other' represents all other lender institutions (for example foreign banks)

It is worth looking in more detail at why, how and to whom these different types of lenders cater. Because of the differences between them, they will all have different reasons, funding mechanisms and risk-management approaches to lending.

5.1.1.1 Mortgage banks

Mortgage banks aim to make money from mortgages. This may sound obvious but it is not the case for all types of lending institutions. Mortgage banks are able to take advantage of regulatory protection and large balance sheets to trim costs down to the minimum and as a result are very competitive. Many so-called 'universal' banks are in effect mortgage banks, since the economics of their business is so heavily driven by mortgages; the Basel I regulations actually encouraged a shift to a more universal model since pure mortgage players were forced to be highly-capitalised. These institutions dominate the competitive landscape in countries such as Denmark and Sweden, while they have a very small presence in others. The rationale behind this is often regulatory, since in some countries the mortgage banks have a different regulatory regime (e.g. the exclusive ability to issue covered bonds) and therefore are a strong presence.

Most mortgage banks make the bulk of their money from credit risk. There is considerable evidence that there is a natural hedge between credit risks and interest rate risks and that there is a negative correlation between profits made on a duration gap and the level of credit losses – that is, when the yield curve is steep, credit losses are often high; when the yield curve is flat or downward-sloping, this is often to cool the economy and so credit losses are low. As a result, the profits from interest rate risk and credit risk do represent something of a natural hedge. However, mortgage banks are often prevented from realising this hedge by regulators who seek to restrict their activities: perversely, this can actually increase their overall levels of risk and hence their need for capital.

5.1.1.2 Universal banks

These shareholder-owned institutions tend to use mortgage lending as a relationship product. In a number of European markets, some institutions look simply to minimise the costs of the business and are less concerned with returns on stand-alone mortgage products. The products are often used as a way of getting access to customers on a long-term basis, which can then be used to cross-sell more profitable products. There are, of course, exceptions and many universal banks pride themselves on the profitability of their mortgage books. Universal banks will typically have both corporate and retail franchises and so will typically be highly rated. As with any lender, they will look for the lowest-cost option in terms of funding and risk management commensurate with their rating.

5.1.1.3 Mutuels and government owned banks

Mutuals and government banks play very important roles in the mortgage market. They often have regulatory protection and are able to make use of localised distribution networks to reach and saturate particular markets. Government banks can take advantage of a privileged guarantee system or regulatory scheme to undercut private competitors to a greater or lesser degree, depending on geography. Markets where they have a large presence, such as Germany, tend to be less sophisticated. However, there is no reason why this should not change – Spanish and Italian savings banks are now fairly indistinguishable from their private competitors in terms of product offerings; in the UK, most of the mutual sector has disappeared through de-mutualisation.

5.1.1.4 Insurance companies

Mortgage lending is an attractive long-term asset (especially in countries with long-term fixed rate products) and as a result attracts insurance companies into some markets as a way of managing their investments and matching their long-term liabilities. Insurers also have extensive broker networks that may be able to sell mortgages alongside their more traditional range of products.

5.1.1.5 Non-bank institutions

As we discussed in the previous chapter, non-banks have been attracted into certain markets. These players look to exploit individual niches within the mortgage value chain and either compete on a superior risk management/distribution/product basis or set themselves up as scale players whose backing from large parent balance sheets allows them to survive on very tight margins. Currently, these players are only present in a few markets (and we would argue the most developed and competitive ones). In some countries, non-banks' activities are limited by law – as in Germany, where anyone doing loan business with the public must be a bank or insurer, thus stifling the development of mortgage finance companies.

In addition, a country's competitive make-up has an impact on the price of funding for that country, since rating agencies are likely to take all relevant factors into account when assessing lender ratings and the ratings of any capital market instruments they might use to raise funds. It is worth noting that the speed of financial integration of the markets is relevant here since integration makes local country-specific conditions less important. This could create something of a paradox: competitors will look to local conditions to steer their product and customer choices, but will seek to fund these choices at a global level. This will of course only arise if global funding becomes a reality, but could nonetheless have an impact on the survival of certain institutions in certain geographies.

5.1.2 Customers and products

Given these different types of institution, and the differing demand across our risk profiles, we must now look to see if there is any correlation between the different institutions, the customers they seek to serve and the products they provide. In order to match the institution, the customer and the product, we need to look at the key factors that drive lending to different types of customer. There are five key lender characteristics that determine which institutions might lend to a given customer. For ease of explanation, we have contrasted the characteristics of a high-risk lender with those of a standard lender:

- **Financial capital:** One of the cornerstones of mortgage lending is capital management. A bank that wishes to lend only to standard mortgage borrowers will need to carry substantially less risk (i.e. economic) capital than one that wishes to lend to a high-risk segment. The available funding instrument also impacts the amount of capital needed to lend to a borrower of a given type.
- **Human capital:** Banks lending to standard borrowers do not need the same level of underwriting, risk transfer or capital management expertise as a high-risk lender. This results in a very different cost base, with a lean model for low-risk customers and a higher-cost model for higher-risk customers.

- **Distribution:** A standard lender's distribution network needs to be much larger than that of a niche high-risk player. Standard mortgage lending is a scale game in most European countries, and requires a large front-line distribution presence backed up by good customer support functions. This is very costly to support. A niche player does not need the same scale and is typically able to use a much smaller and more specialised sales force to exploit the segment.
- **Data:** A standard lender needs only basic data on its customers compared with the sophisticated risk data and analytic skills required by a high-risk specialist.
- **Customer franchise:** Many mutual and public banks exist to serve low-income clients. Equally, some private banks focus on more upscale customer bases.

This analysis is illustrative; there may be other practical reasons why certain risk segments are more attractive to certain types of institution.

5.1.3 Regulation

5.1.3.1 Country specific

Regulators and laws within any given country typically emphasise protection of specific elements of the mortgage market within the value chain, and do this by imposing restrictions on mortgage providers. This in turn affects both the competitive make-up of the market and the level of demand within each of our risk segments. This emphasis can be characterised as follows:

- **Consumer:** protection of consumers from lenders in many areas, for example: pricing, penalties or recovery;
- **Lender:** protection of the lender, for example: fast and efficient recovery in the case of default;
- **Investor/system:** protection of the funding components which indirectly protect the mortgage system and investors, with the aim of creating a stable market.

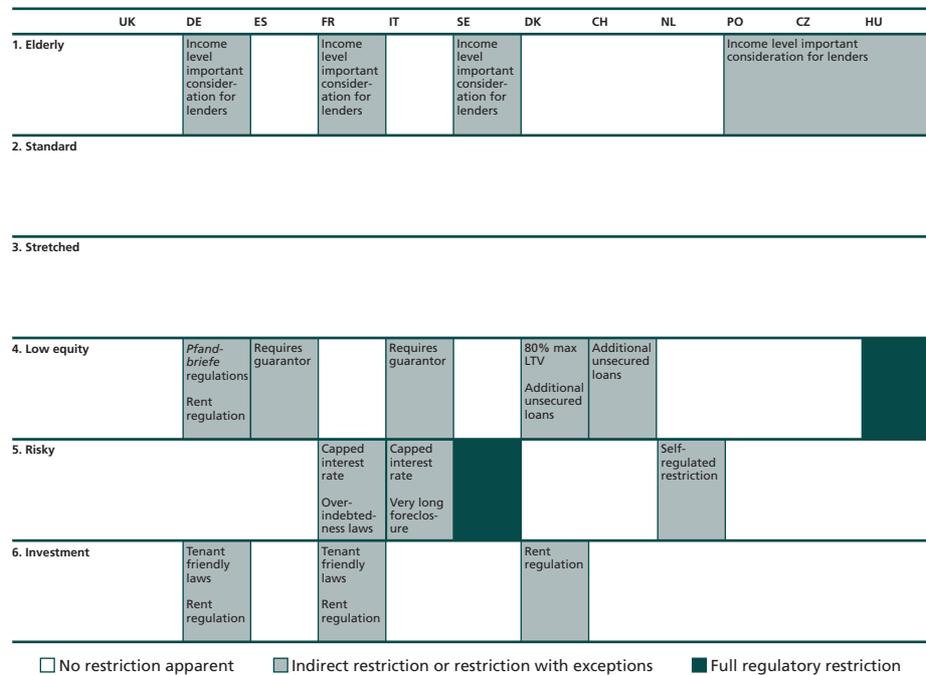
The emphasis of regulation can have a profound influence on the way that individuals borrow or even how lenders lend. An example of this would be a market where foreclosure times are unclear. Such lack of clarity would typically deter lenders from lending to high-risk individuals, due to the uncertainty around recovery of assets. In markets where the laws are clear, lenders are better able to price in any regulatory issues and therefore provide lending to these segments. Table 5.2 summarises the levels of regulatory emphasis placed on each of these three elements in the countries studied:

Table 5.2 Categorisation of legal and regulatory emphasis

Country	Consumer protection	Lender protection	Investor/System protection
Czech Republic	Medium/Low	Medium/Low	Low
Denmark	Medium	Medium	High
France	High	Low	Medium
Germany	High	Medium	Medium/High
Hungary	Medium/High	High	Low
Italy	High	Low	Low
Netherlands	Medium	High	Medium
Poland	Medium/Low	Medium/Low	Low
Spain	Medium	Medium	Medium
Sweden	High	Medium	High
Switzerland	High	Medium	Medium
UK	High	Medium	High

Regulators impose few total prohibitions (such as Sweden’s credit-quality laws) on the mortgage market, but many limitations, as summarised in Figure 5.3. For example, in France and Italy capped interest rates deter suppliers from lending to high-risk segments, due to the increased potential for losses. However, there tend to be ways round these restrictions – e.g. a credit-enhancement product such as mortgage insurance can be used as a guarantee, which ensures better credit risk coverage without breaking the interest rate cap.

Figure 5.3 Regulatory restrictions by risk profile



Note that for the Stretched segment, there are certain very indirect restrictions (multiples of income, for example).

5.1.3.2 EU legislation

The European Code of Conduct has largely been implemented and the Forum Group has reported back, but we look to the progress of the Consumer Credit Directive (CCD) as an indicator of the speed with which a mortgage directive is likely to be indicated. There has been great difficulty in agreeing and introducing the CCD, and after much discussion many of its proposals have been removed or diluted. Given this history, a pan-European mortgage directive focused on the primary lending side is likely to have limited success – in our view, any directive would be better targeted at the back-end risk and funding processes. However, the CCD has been implemented by half of the countries considered in this report with respect to mortgage lending and the Code of Conduct is now universal, but voluntary. Thus EU legislation has had some impact, albeit at a slow pace.

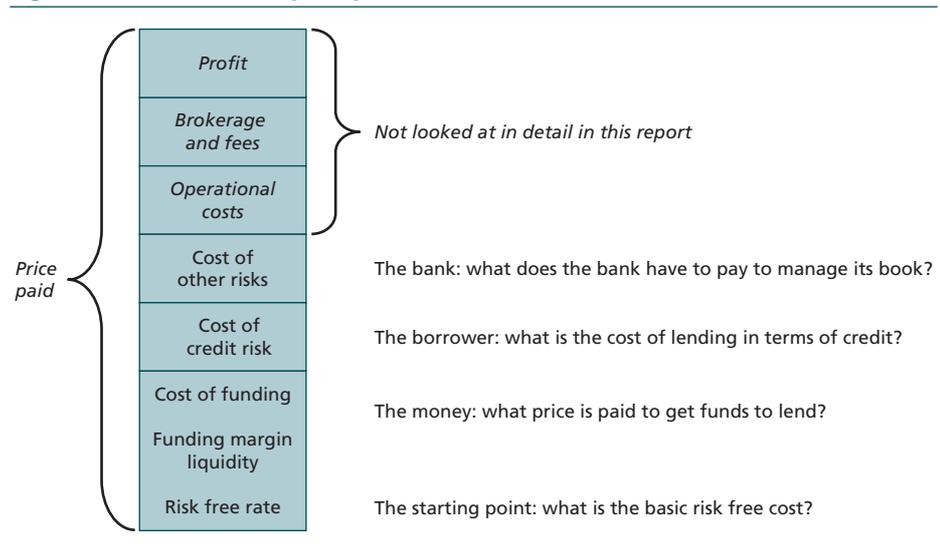
The other current pan-European rules concern capital requirements. The key regulation is the Basel I (the 1988 Basel Accord on Capital Adequacy), which prescribes how much capital banks have to hold against certain types of lending and regulates the types of investments they can hold. Of course, local regulators additionally prescribe their own LTV rules and capital requirements. Basel I will shortly be replaced by Basel II, implemented through the Capital Requirements Directive (CRD), which we address in more detail below.

5.2 Supplier economics

5.2.1 Overview

The price of a mortgage can be decomposed to align with elements of supplier economics as shown by Figure 5.4 below.

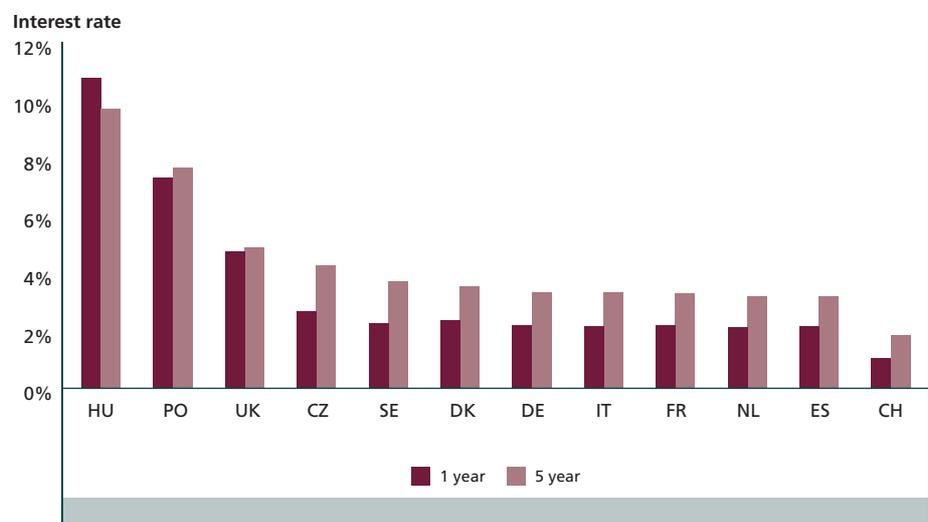
Figure 5.4 Breakdown of price paid



5.2.2 Cost of funding

The cost of funding comprises the risk-free rate and a funding margin that comprises a cost of liquidity plus (for non-interbank borrowers) a small credit cost. The risk-free rate is not covered by this study, but is relevant to the extent that the maturity of funds sought will have a knock on effect on the cost of funding and risk (and this will differ by country depending on the typical length of a standard mortgage loan). The rate clearly varies from country to country, as we can see from Figure 5.5. The supplier has to pay this and will pass the cost straight on to the borrower. This has a major effect on the level of demand, as noted in the previous chapter. As a result, there should be a big opportunity in countries such as Poland and Hungary if and when they join the Euro and benefit from lower base interest rates, or as rates come down due to convergence.

Figure 5.5 One and five year government bond rates



Source: Bloomberg and Datastream

The next element in the chain is the funding margin, by which we mean the cost to the distributor of obtaining the funds for providing the mortgage, rather than the cost of capital or risk that may (or may not) be included in the actual price paid.

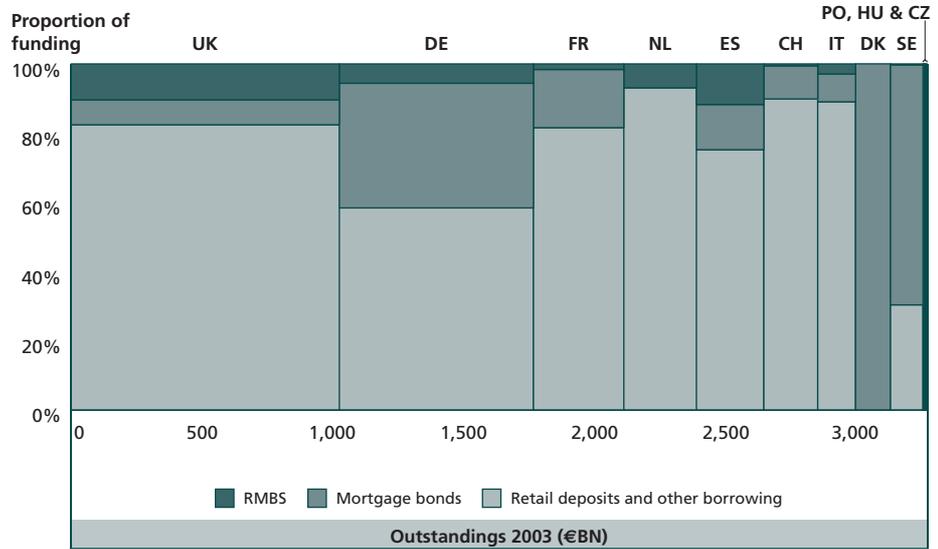
The funding margin costs will be higher than government debt, primarily because of liquidity. We have separated the credit element out from other costs, except in the case of wholesale market funding, where counterparty risk will also exist. Unless otherwise stated, we have assumed an AA rating for interbank counterparties.

There are three different ways of funding residential mortgages:

- On-balance sheet (through retail and wholesale customer deposits, and interbank loans);
- Covered bonds; and
- Residential mortgage-backed securities (RMBS).

The vast majority of loans are currently funded on-balance sheet, except in Denmark and Sweden, as we can see from Figure 5.6 below.

Figure 5.6 Residential mortgage funding by outstandings (stock), 2003



Source: EMF Hypostat, Merrill Lynch Guide to International Mortgage Markets and MBS, EMF, A Dübel

All three types of funding have pros and cons, and not all are available to all providers in all countries. Covered bonds are only available in certain European countries, although structured covered bonds are becoming more popular in countries where there is no specific legislation. While liquidity issues in Eastern Europe make access to the capital markets harder than in the richer Western European countries, the Czech Republic and Hungary do have quite large covered bond markets – the issue for banks in these countries is the cost of deposits in a higher interest-rate environment and the existence of alternatives to their own balance sheets for the interest rate risk.

Why deposits are so common

As can be seen in Figure 5.6, deposits are by far the most common funding instrument for mortgages. They are actually quite a good one. Why? There are three main reasons:

- The maturity of deposits often matches that of mortgages reasonably well. Although deposits are notionally short-term, most are still relatively stable. In a stable macroeconomic environment, deposits have a practical maturity of five years or more for many players, particularly those that operate branch networks. Since this is behavioural rather than contractual, it is a relatively cheap source of maturity. This makes deposits a natural funding instrument in markets that price mortgages off the short-end of the yield curve (such as Spain or the UK), since they both duration- and maturity-match mortgages reasonably closely. In other markets, the interest rate risk needs to be managed; deposit-rich, highly-rated universal banks can do this effectively through the swap market, meaning that deposits can still be an attractive funding instrument.
- Deposits are generally not sensitive to bank rating, so the cost of deposits will not rise during a downturn. That makes deposits most valuable to those with low and/or unstable ratings. Mortgages are a low margin business and very sensitive to the cost of funds. If a bank, or its mortgage bonds/MBS, are downgraded or trade at wider spreads, the returns on mortgage lending can be severely affected if funding is via RMBS or bonds. By using deposits, banks operate on a net-interest margin basis and so the earnings are more stable in aggregate, which supports the rating and creates a virtuous circle.
- Deposits help manage the convexity created by prepayment risk. When rates fall (assuming a parallel shift), triggering prepayment, deposit maturities will likely fall, meaning that less is locked up in funding. Conversely, deposit maturities will increase as rates rise and maturities lengthen. This behaviour is not easily replicated by other funding instruments.

Deposits are not a perfect funding instrument for mortgages, and using them inevitably entails some risk, but they are robust and have stood the test of time in many markets.

5.2.2.1 On-balance sheet

Banks tend to have customer deposits that can be used to fund their lending activities. They also have access to the interbank market and the debt capital markets in their own names, through commercial paper or bond issuance. Deposits are still a very important part of the funding landscape and are used by smaller banks or specialist providers, particularly in countries where the markets are less sophisticated and less liquid. Deposits are also a useful source of funding for low or unrated lenders, for whom interbank loans are relatively expensive. For the purposes of our study, we have assumed that the economics of using deposits and interbank lending are the same, attributing any surplus margin from deposits to the deposit business itself.

The cost of direct (i.e. on-balance sheet) funding from the debt capital markets depends on two main factors: the rating of the banks and the yield curve. The spreads on senior unsecured debt from banks over the risk-free rate are shown in Table 5.7 below:

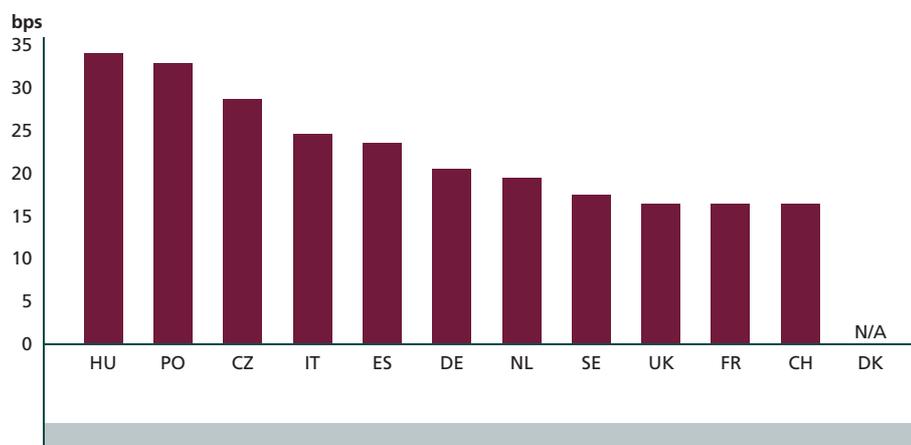
Table 5.7 Spreads by rating over risk-free rate (bps)

	AA+	AA	AA-	AA+	A	A-
1 year	4	7	11	13	20	22
2 years	7	12	19	24	36	36
3 years	9	16	21	26	35	38
4 years	11	21	22	27	34	40
5 years	14	22	24	30	37	42
6 years	16	23	25	32	41	44
Average	10	17	20	25	34	37

Source: Bloomberg, ECB

We have simplified these down into averages from AA+ to A-, assuming blended mortgage terms. Figure 5.8 shows the weighted average of on-balance sheet funding – calculated by taking the mortgage asset-weighted cost of balance sheet funding for each of the mortgage lenders in each country (based on their ratings):

Figure 5.8 Cost of on-balance sheet funding by country



Source: Mercer Oliver Wyman benchmarks

5.2.2.2 Covered bonds

Covered bonds are an on-balance sheet obligation of the bank or institution that issues them. Their main benefit is that they enable the issuing institution to pierce the rating ceiling of the underlying bank (up to six levels with Moody's) and to simultaneously lower interest rate risk by matching the term of the funding. The legal structure of the product means that the bond is backed by the underlying mortgage assets – in effect, it is 'covered' by the underlying mortgage loans.

Traditionally, covered bonds were linked to a specific pool of assets on the issuer's balance sheet, as distinct from RMBS, which were off-balance sheet and typically covered a pool of assets. Now, structured covered bonds are also being used for funding in countries such as the UK, where there is no specific covered-bond

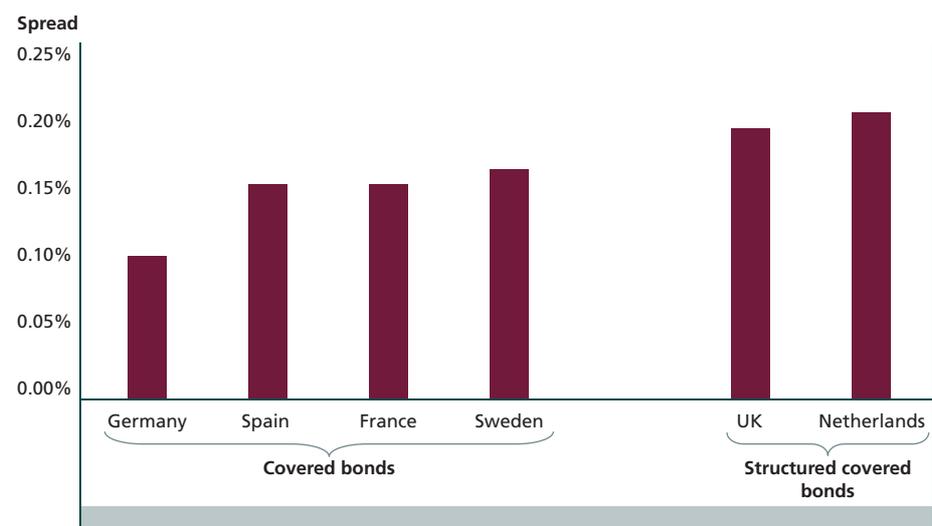
legislation. These are essentially covered bonds that offer similar benefits to traditional covered-bond transactions, such as structural protection within the contract that de-links them from the fundamental credit rating of the issuer. These structures are aimed at reducing the residual credit risks for bondholders, and can therefore earn a higher rating than that of the issuing bank. For the rest of this analysis, we will assume that the majority of bonds are standard covered bonds.

This type of funding is typically rated AAA/AA and is therefore very cheap. The high rating is obtained through a series of security features, including quality requirements for the loans eligible to the cover pool. In those countries where covered bonds are issued frequently (Germany, France, Spain, Switzerland, Denmark and Sweden), there are, for instance, restrictive LTV ratios on the amount of the mortgage that can be funded (60 % in Germany, 75% in Sweden or 80% in Denmark, for example).

Covered bonds are used to fund prime lending and low LTV lending, since in most cases LTVs for mortgages within a covered bond structure are restricted from a regulatory perspective. We would stress at this point that there is no economic rationale for these restrictions, since the ratings and creditworthiness of the issue could be guaranteed in other ways e.g. credit enhancement (as indeed happens with the public *Pfandbriefe*). A covered bond market without a formal LTV cap, but with credit enhancement for the proportion above a given LTV level, could work equally well from an investor perspective, while helping lenders to offer a wider range of products and fund a larger proportion of loans externally.

Figure 5.9 shows a point-in-time comparison of the average spreads on covered bonds issued in different countries. Factors affecting the price include the degree of development and liquidity of the market, the legal status of the bonds (traditional vs. structured covered bonds) and the perceived creditworthiness of the issuing institutions and underlying markets.

Figure 5.9 Mortgage bonds spread over risk-free comparison



Source: JP Morgan UK Covered Bonds vs. UK RMBS, Lehman Brothers – European structured products 8 September 2003, Bloomberg and European Commission Borrowings and Treasury report and SDC

Because of their usage and low risk, covered bond spreads tend to be very low and thus represent a cheap source of finance for certain types of lending. Danish law

requires all mortgages to be funded directly using matched covered bonds, which pass through interest rate and market risk to investors. In Germany, and other countries where covered bond legislation exists, lenders make frequent use of these bonds due to investors' preference for their safe and steady income stream; however, the market is also driven by an increasing number of investors affected by European legislation on portfolio proportions⁹. This form of funding is comparatively cost effective for lenders.

Germany has the biggest market for covered bonds in Europe, and the likely removal of state guarantee from the *Landesbanken* combined with the widening of *Pfandbriefe* access to these institutions will mean the market could well get bigger. These institutions will need to make up the shortfall in their deposit base somehow, and are likely to do so by issuing securities, of which *Pfandbriefe* are by far the most obvious. This shortfall is anticipated to be in the region of €300 BN.

5.2.2.3 Residential Mortgage Backed Securities (RMBS)

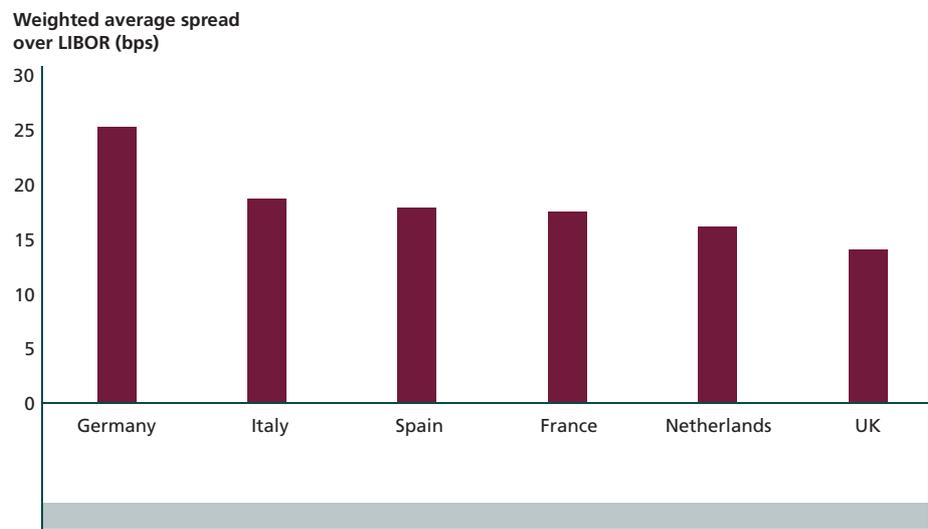
Residential Mortgage Backed Securities are a type of asset-backed security, representing just over ~5% of mortgage outstandings in the countries studied. Securitisation involves the sale of assets off the balance sheet to a bankruptcy-remote special purpose vehicle (SPV). Once the assets are off-balance sheet, the SPV then issue securities to investors that are backed by the income stream from the underlying assets. This product allows banks to convert a pool of on-balance sheet mortgage loans into a rated security that can be traded on the open market, thus improving liquidity. There are two types: actual (or cash) MBS, where the portfolio of loans is actually transferred into the SPV; and synthetic MBS, where the assets are not actually transferred but their risks are transferred using a credit derivative product.

'Tranching' of loans into differently-rated classes of security allows risk to be spread to the parties best suited to manage it, increasing market efficiency. Each tranche carries a rating commensurate with its risk, with returns to match. First losses are typically borne by the bottom tranche (which could be equity), which is usually held by the originator; as the rating of the tranches improves, they get less risky and the returns diminish. Investors need to weigh up the risk against the return to see which is the correct tranche for them. The RMBS market is not regulated in Europe and provides a flexible environment in which to structure risk. It thus tends to be used to finance higher-risk lending, since the risk can be allocated down the tranches and there are no regulatory restrictions as to the assets that go into the transaction.

The RMBS markets are very well developed in some European countries (such as the UK and Spain) but less so in others. Much of this disparity derives from a lack of market liquidity and sophistication on the part of the lenders and investors. This, in turn, is often a function of the high costs of securitisation transactions in some countries (driven by the legal framework), which has deterred lenders, particularly smaller ones, from entering this market. Because of the slightly higher inherent risk in the portfolio, the spreads on RMBS tend to be higher than on covered bonds. Spreads in countries where the RMBS market is not as developed are also higher due to lack of liquidity.

⁹ European legislation allows for a maximum of 25% of funds to be invested in covered bonds, whereas it is only 5% in standard bonds (1988 UCITS Directive)

Figure 5.10 RMBS AAA spread over risk-free comparison



Source: JP Morgan, European Structured Products Weekly 13 May to 27 September 2004

AAA-rated RMBS can be issued at costs similar to those of structured covered bonds in some countries (including the UK and the Netherlands). However, the overall cost will depend critically on how much of the rest of the securitisation can be brought up to the same level via credit enhancement, and at what cost. This is considered in more detail in the section on risk costs below.

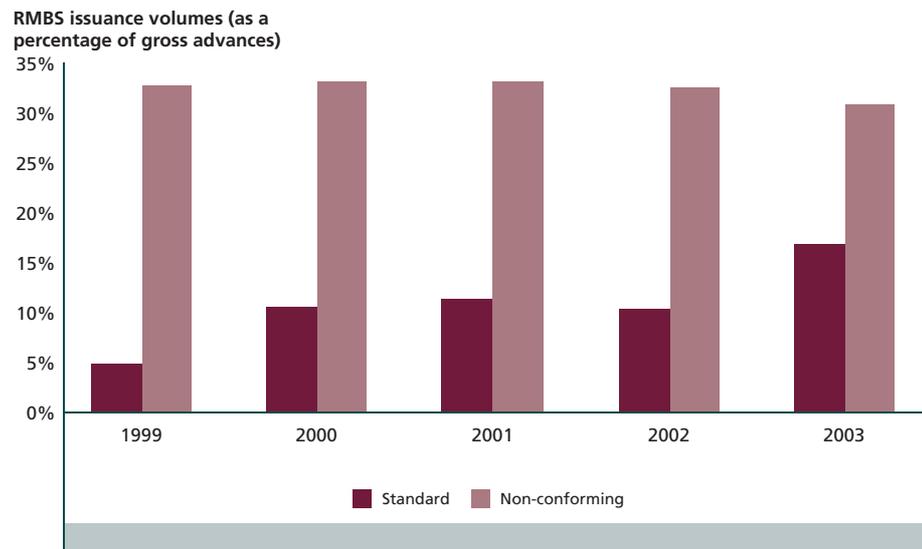
The current Basel I regulations favour lenders using RMBS, since they allow significant regulatory arbitrage. For example, if a bank has a mortgage portfolio of €100 MM, assuming a target regulatory capital (Tier 1 and Tier 2) of 8%, they would be required to hold €4 MM of capital against the book (under the current Basel regulations, mortgages carry a risk weighting of 50%). If the bank were to securitise the portfolio and retain a first loss position of, say, 2%, it could release the majority of that capital. The bank would securitise off €98 MM of the portfolio, and hold the first loss portion of €2 MM. Assuming this is unrated, the bank would be required to match all of this with capital, but that still gives it a capital release of €2 MM (that is, €4 MM less €2 MM). Basel II will substantially reduce the appeal of such arbitrage by sophisticated lenders in 2007; it will still exist, but charges for on-balance sheet retention will be so low under the new regulations as to render it unattractive. The arbitrage opportunity will remain for lenders taking the more basic standardised approach to capital calculation, but the potential capital saving will be reduced (since the weighting for residential mortgage assets will fall from 50% to 35% under Basel II).

RMBS can be less costly than on-balance sheet funding for high-risk lending. Covered bonds may be unavailable because of LTV restrictions, while interbank borrowing is less attractive because of the need to retain the assets on balance sheet and therefore provide risk capital to support them.

RMBS derive their credit quality from the underlying asset pool and can be attractive and effective for smaller lenders who do not have access to customer deposits or competitive interbank funding. The main challenge with RMBS is their relatively high cost structure, due to the need for underwriting. This can only be supported by higher-yielding assets, again explaining their prevalence in the non-

conforming segments, where spreads tend to be highest. In the UK, lenders to non-conforming segments are typically specialists who do not have access to retail deposits and therefore use a high proportion of RMBS compared to mainstream lenders. 30% of the funding for non-conforming segments came from RMBS in 2003, compared with only 16% for mainstream segments.

Figure 5.11 Comparison of UK non-conforming and standard RMBS funding levels



Source: Merrill Lynch Guide to European Mortgage Markets and MBS and EMF, Commerzbank, JPMS

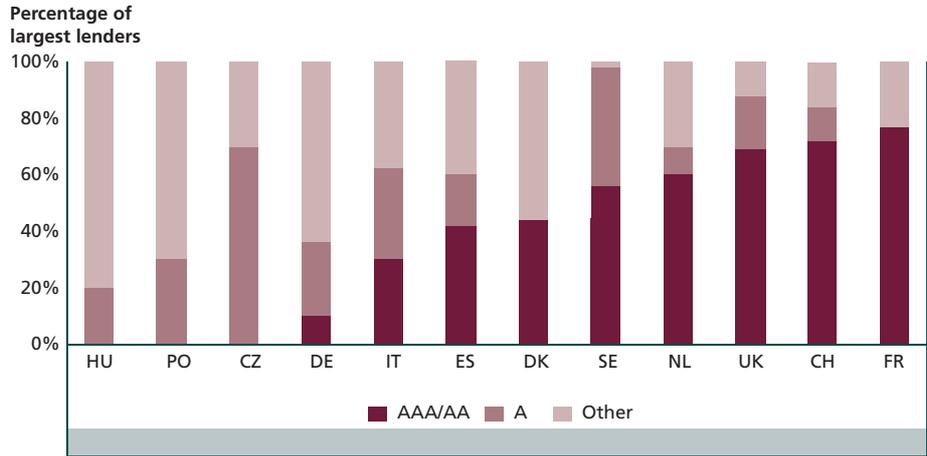
RMBS are not typically used in developing countries, due to lack of investor appetite and their high level of costs. If the mortgage providers are mono-line specialists, the RMBS market is likely to develop more quickly than if they are all universal banks. Transition economies typically begin by developing prime lending, whose risk characteristics are well understood, so there is little need to pay for flexible but expensive alternatives. Furthermore, RMBS issues are rarely of the scale required. Thus, the only potential value in these markets is long-term; RMBS have a large role to play in ensuring the good risk mitigation needed to create a robust mortgage market, particularly in the higher-risk segments. In the medium term, we expect RMBS to develop in Eastern Europe.

As discussed above, the funding costs we have analysed so far have focused on the basic cost of funds for AA lenders. Clearly, the riskier a mortgage lender itself is, the greater that basic cost of funding will be. The debt rating of a lender has a direct impact on its own cost of borrowing and therefore on the way that lender funds itself.

The impact of a mortgage lender's ratings on its cost (and therefore choice) of funding will only become more important after the introduction of Basel II and IAS 39. Unless a mortgage lender with a poor rating or low capital base has access to customer or interbank deposits, it is more likely to look to the capital markets and RMBS or covered bonds to fund mortgages. This allows it to use the rating of the underlying asset, which will be higher than its own rating, to reduce its cost of funds. Conversely, the higher the debt rating of the lender, the greater its access to low-rate funds in its own name.

Figure 5.12 below shows the ratings for the major mortgage lenders in each country. This split allows us to understand the prices that the average bank in each country would expect to pay for different types of funding. Note that 'Other' includes any banks whose rating is less than A, or which is unrated.

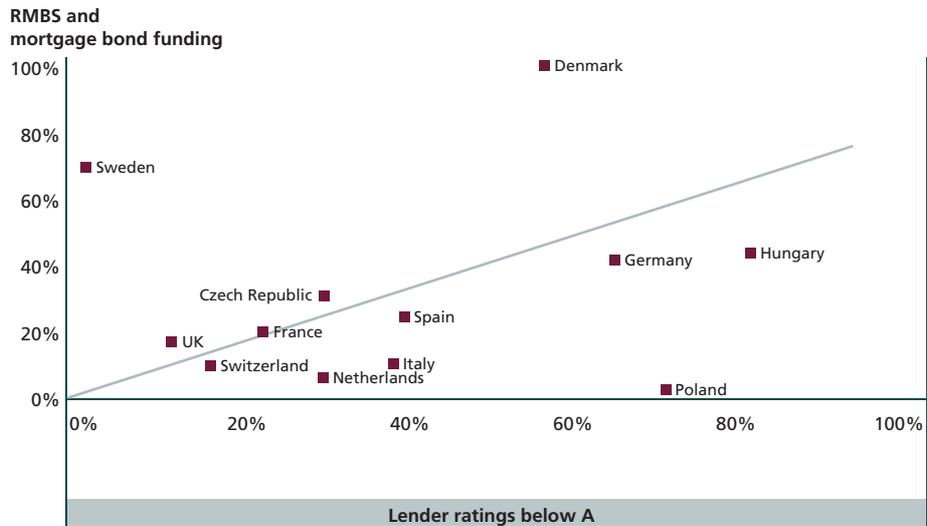
Figure 5.12 Lender rating based on largest¹⁰ lenders by country, 2003



Source: Fitch ratings, bank websites, reports and bank officials

In most countries today, lenders' main motivation for accessing RMBS or covered bonds is to diversify funding or transfer interest rate risks. However, once Basel II/CRD is in force, mortgage providers with lower credit ratings will find it easier to operate in countries with good covered bond markets or liquid RMBS markets. Figure 5.13 below shows the rating of the largest lenders by country based on outstandings (stock)¹¹ vs. the proportion of RMBS and covered bond funding. **Excluding Denmark (where there is a regulatory requirement for bond usage), Poland (illiquid bond and RMBS market) and Sweden (high reliance on bonds due to regulatory pressure), there is a high correlation between lender rating and use of bonds and RMBS.**

Figure 5.13 Relationship between lender rating and non-deposit funding



Source: Fitch ratings, bank websites, reports and bank officials

Note: Banks without ratings (such as the German Sparkassen) are included in the 'below A' category

¹⁰ Largest lenders represent lenders who hold more than 75% of stock outstanding residential mortgages for all countries, with the exception of Germany

¹¹ The analysis covers at least 75% of stock outstandings by country

5.2.3 Cost of credit risk

We next consider the cost of credit risk and the cost of holding capital against that credit risk.

In relation to capital, lenders are focused on three different metrics:

- **Regulatory capital:** the amount that needs to be held to satisfy the local regulator;
- **Rating agency capital:** the amount that the bank must hold to maintain its debt rating (and thus, amongst other things, its implicit funding cost base); and
- **Economic capital:** the amount required to meet the economic risks inherent in the business, of which the most important is credit risk.

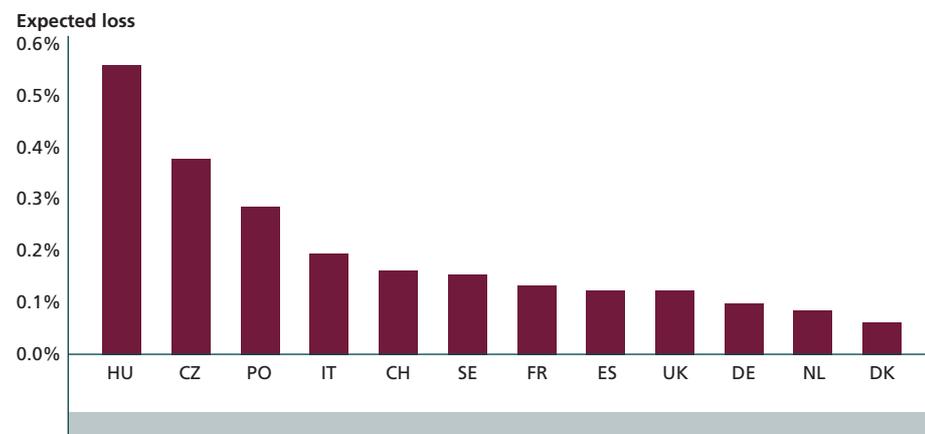
In addition, and as part of the calculation of economic capital, banks have to factor in the amount they expect to lose on their portfolio. The expected loss (EL) is the average level of credit losses expected over one year of an economic cycle. The EL should be viewed as a cost of doing business rather than as a risk in itself, since if losses always equalled their expected levels there would be no uncertainty; risk arises as the variation of actual losses from the EL in any specific year.

The economic capital will differ according to the credit quality of the borrower, the amount borrowed and the country of residence. As applied to mortgages, the key factors are:

- **Borrower credit quality:** Cash flow stretch and previous credit history;
- **Loan-to-value:** A measure of the equity risk; and
- **Country:** A proxy measure of the general lending environment.

We have calculated the probability of default rates for each level of LTV across all of our countries in our survey. Taking exposure at default to be 100% allows us to calculate the expected loss¹² for each country:

Figure 5.14 Expected loss by country (average for all borrowers)



Source: Fitch IBCA, Mercer Oliver Wyman benchmarks

¹² Expected loss calculation is the probability of default x exposure at default x loss given default

We should stress that we are taking a long-term view with these estimates, which are based on typical levels of risk – in other words, we are not pricing in a potential near-term house price bubble. Given this information, we can assess the EL that a bank can expect to suffer as a result of retaining loans to each of our risk profiles on its balance sheet across all of our countries. Note that we have not included loss predictions for the Investment, Risky and Low equity segments in the Eastern European countries in Table 5.15, as these segments do not currently exist.

Table 5.15 Expected loss by country by risk profile

	UK	FR	DE	IT	ES	DK	SE	NL	CH	PO	HU	CZ
Elderly	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Standard	0.12%	0.13%	0.09%	0.19%	0.12%	0.06%	0.15%	0.08%	0.16%	0.27%	0.54%	0.36%
Stretched	0.32%	0.32%	0.25%	0.53%	0.34%	0.17%	0.41%	0.22%	0.44%	0.77%	1.53%	1.02%
Low equity	0.89%	1.02%	0.68%	1.45%	0.93%	0.46%	1.13%	0.62%	1.22%	NA	NA	NA
Risky	1.62%	1.85%	1.24%	2.64%	1.69%	0.84%	2.05%	1.12%	2.21%	NA	NA	NA
Investment	0.25%	0.28%	0.19%	0.40%	0.26%	0.13%	0.31%	0.17%	0.34%	NA	NA	NA

Source: Fitch IBCA, Mercer Oliver Wyman benchmarks and US Mortgage Insurer pricing

Given these results, we can calculate the cost of holding credit risk capital against the EL. As mentioned above, we are using economic capital as our base calculation; we have calculated the cost of holding economic capital against our six different risk profiles in each of our twelve European geographies. We have done this on a like-for-like basis, differentiating between five different risk levels and applying these to the profiles depending on the country. Each country has its own risk tendencies and, given the bank ratings in each country, its own level of risk tolerance (i.e. banks with higher ratings will have to hold more capital against the same risks than a lower rated bank).

We have taken a standard 9% cost of capital across all of our countries with the exception of the three Eastern European ones, where we have used 10.5% for Hungary and 11% for Poland and the Czech Republic. These benchmarks, coupled with our previous analysis, have allowed us to calculate the amount of economic capital needed and what the cost of holding that capital across our different risk profiles might be. This is shown in Table 5.16 below as a percentage of total outstandings:

Table 5.16 Cost of credit risk capital by risk profile by country

	UK	FR	DE	IT	ES	DK	SE	NL	CH	PO	HU	CZ
Elderly	0.01%	0.01%	0.01%	0.02%	0.01%	0.00%	0.01%	0.01%	0.02%	0.03%	0.03%	0.03%
Standard	0.06%	0.06%	0.04%	0.07%	0.12%	0.05%	0.03%	0.07%	0.08%	0.13%	0.16%	0.16%
Stretched	0.11%	0.11%	0.07%	0.14%	0.34%	0.09%	0.06%	0.13%	0.14%	0.23%	0.30%	0.29%
Low equity	0.19%	0.18%	0.12%	0.22%	0.93%	0.14%	0.10%	0.21%	0.24%	NA	NA	NA
Risky	0.27%	0.26%	0.17%	0.32%	1.69%	0.20%	0.14%	0.29%	0.34%	NA	NA	NA
Investment	0.10%	0.10%	0.06%	0.12%	0.26%	0.08%	0.05%	0.11%	0.13%	NA	NA	NA

Source: Mercer Oliver Wyman benchmarks, Fitch IBCA, US Mortgage Insurer pricing

We see that, in general, countries with higher EL levels attract higher capital costs although this is also affected by the credit ratings of the banks in each country and the implied cost of capital (Swiss lending institutions' high ratings mean their capital costs are relatively high compared to those in Italy, where ratings are lower and thus require lower levels of capital for the same risk).

While these are the current cost estimates, we recognise that a forward-looking business might look to charge a different price. For example, it is doubtful that a commercial risk taker would consider entering the Dutch tax-induced/high house price risk/low-equity market with a 12 basis-point risk premium at the present time.

The figures by risk profile allow us to calculate the overall cost of credit risk for each country, again as a percentage of outstandings. Different countries have different levels of exposure to the different risk profiles – we can see that the UK has a higher overall cost than Poland, even though the cost of risk capital for each profile in the UK is approximately half that in Poland. This is due to the higher relative exposure to the riskier segments in the UK.

Figure 5.17 Cost of credit risk capital by country



5.2.4 Cost of other risks

5.2.4.1 Operational risk

Operational risk has traditionally been at the back of most businesses' minds but is increasingly moving to the front. Until now, banks have not been required to hold capital against the operational risks of their businesses, but many have begun to budget in anticipation of Basel II, which will introduce such capital requirements. The implications of this shift are considered in the following chapter.

Operational risk does carry a cost and as such we need to assess the amount and cost of the capital that should be put aside to cover it. The methodology we have used is to say that banks need to hold 15% of total credit risk capital against operational risk. In theory, it would probably be better to use 15% of total risk capital, but if we used this calculation in markets where there is a high level of prepayment and market risk, operational risk would also be higher, which might lead to a skewed analysis. Hence we have removed market and prepayment risk from the equation.

5.2.4.2 Market, interest rate and pre-payment risk

The final major risks that a lender must consider are market, interest rate and pre-payment risks, all of which are linked. In relation to mortgages, the key issue here is pre-payment – the cost to the lender of holding capital against the fact that a borrower might pre-pay a loan prior to term.

An analysis of pricing structures, penalties and funding types (fixed- and floating-rates) compared to product rates reveals that not all prepayment and interest rate risks are fully mitigated in all circumstances and some lenders prefer to retain risks. Table 5.18 indicates the typical methods used to mitigate the risks of pre-payment and the level of interest rate pass-through.

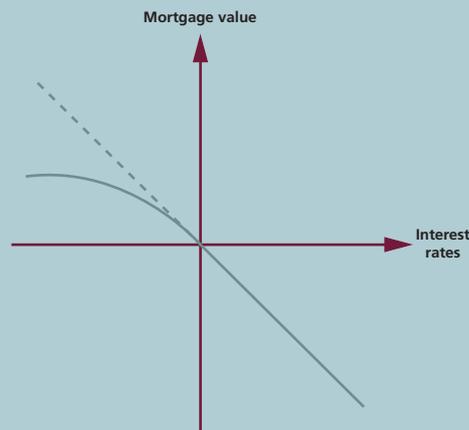
Table 5.18 Prepayment and interest rate risk management

Country	Pre-payment	Interest rate
Czech Republic	Mortgage Bond Act allows for an exclusion for five years. Otherwise penalties arise although these vary in practice. The legal enforceability is also doubtful	Up to five years fixed in local currency
Denmark	No risk held by lenders due to product and regulatory structures	Linked directly to funding (bonds) – i.e. fully passed through
France	Penalties and fees regulated	Mostly fixed-rate, lender takes some risk
Germany	Very high penalties on fixed rate mortgages (to protect covered bonds)	Mostly fixed-rate, typically linked to funding
Hungary	Mortgage bond act allows for an exclusion for five years. Otherwise penalties arise although these vary in practice. The legal enforceability is also doubtful	Up to five years fixed in local currency
Italy	High penalties (1% to 3%)	High variable rate proportion, with most fixed-rate risk passed through
Netherlands	Some penalties, but lender has some risk	Mostly fixed-rate, lender takes some risk
Poland	Mortgage bond act allows for an exclusion for five years. Otherwise penalties arise although these vary in practice. The legal enforceability is also doubtful	Up to five years fixed in local currency longer fixed-rates available in FX
Spain	Fees and penalties cover risk	Mostly variable-rate, fixed passed through
Sweden	Regulated fees and penalties	Mostly fixed-rate, linked to funding type
Switzerland	Penalties cover risk	Mostly fixed-rate, lender takes some risk
UK	Penalties and fees indirectly cover risk	Lender takes some risk, however mostly short term mortgages

The Danish callable bond phenomenon

In Denmark, all mortgages are funded by covered bonds. Bonds and loans are matched one-to-one so that every mortgage originated has its own bond issuance. Furthermore, the bonds issued are callable – in other words, the borrower can decide to pre-pay and re-mortgage on either side of the interest rate curve. Figure 5.19 shows the typical value of a mortgage against interest rate movements:

Figure 5.19



In general, people pre-pay as interest rates fall in order to get a better deal: hence the curve slopes off the 45° line. When interest rates are rising, people are unwilling to pre-pay since the debt simply becomes more expensive unless, as in Denmark, the funding is callable. Hence if rates rise, a borrower can call his funding in and re-issue a lower value of debt at the higher interest rate, since the costs would be the same to him. This action then realigns his LTV to a sensible level and mitigates the risk in the system. For example, assume that interest rates are initially at 9% and a borrower has a €100,000 loan, if rates rise to 10%, he calls in his loan and reissues €90,000 worth of debt at the same cost. This phenomenon enables Danish covered bonds to maintain their credit quality even during times of rising interest rates – and also provides a useful macroeconomic transmission mechanism. It is also worth noting that non-callable bonds provide symmetric penalties, so that the borrower can buy back the bonds at the lower price when rates have risen, enabling them to transfer the benefit they have gained through advantageous funding to a new mortgage. This clearly enhances mobility.

5.2.5 Current risk management approaches

There are a variety of different credit risk mitigation techniques and credit enhancement techniques, the economic consequence of which must be assessed in relation to the cost to the lender of retaining the risks on-balance sheet.

Across all of the credit enhancement products, there is the important question of tax treatment: insurance contracts attract an insurance premium tax (which is as high as 15% in Germany) while other forms of enhancement do not. This will have an impact on the attractiveness of these products which can be influenced by governments.

5.2.5.1 RMBS tranche management

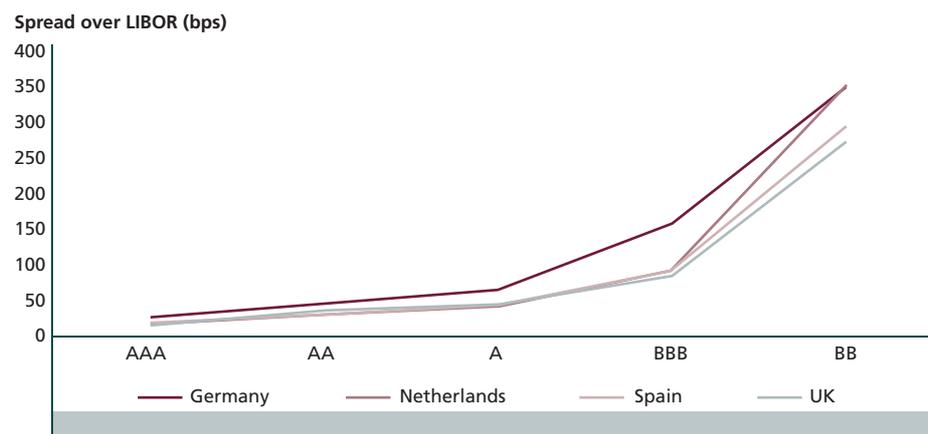
One way of managing credit risk is to securitise the assets and sell the different tranches off to investors, thereby taking both the asset and the risk off the balance sheet.

In the analysis of funding above, we looked at the cost of AAA-mortgage backed securities across our geographies. These tranches – the biggest – are sold off to investors to raise capital. The remaining tranches are then either sold off to other investors with a greater risk appetite or retained on the bank's balance sheet.

If these tranches are retained, then the cost of managing that risk is the same as discussed in the previous section. Now, given that these are priced according to rating rather than EL, it is impossible to assess the cost for each of our risk profiles unless we are somehow able to match up the tranche rating with our risk definitions. For the purposes of this analysis, we have assumed that the costs of managing the non-AAA and -AA tranches of an RMBS issue on-balance sheet are the same for our risk profiles as set out above.

That leaves us with the question of the price that the lender should pay at a particular point in time in order to sell the tranches off to investors, and to compare this to the cost of retaining the risk on-balance sheet. We have calculated the average costs of RMBS tranches across Europe, set out in Figure 5.20 below. The cost of selling off the tranches includes an intrinsic cost-of-capital calculation. Nonetheless, this analysis still does not reflect the cost of any retained-equity portion of the securitisation. We have therefore estimated the likely size of that equity portion and the price for that equity. As we can see from the chart, the cost of tranches is almost identical in our sample countries down to BBB. The exception is Germany, where almost all low-risk mortgages are funded by *Pfandbriefe*, meaning that only the more risky mortgages are securitised. Hence the higher spreads for German RMBS tranches.

Figure 5.20 Cost of RMBS tranching



Source: JP Morgan, European Structured Products Weekly 13/05/2004 to 27/09/2004

5.2.5.2 Covered bonds

Covered bonds tend by their very nature to fund the low- or zero-risk portions of mortgages. Whilst most of the exposure is low-risk, many issuers tend to introduce a level of over-collateralisation and so some of the bonds carry more risk than others.

There is a cost of capital here since the bonds remain on-balance sheet, and that cost has been imputed to be the same as the cost of on-balance sheet funding above.

5.2.5.3 Mortgage insurance

The mortgage insurance industry has been active in the United States and Australia for some time but has only recently entered the European mortgage market, and even then is only in certain countries, most notably the UK. The box below outlines the different types of mortgage insurance. The US industry was initially regulatory-driven but has now evolved into a niche that adds genuine value to the mortgage chain.

The pricing of mortgage insurance contains both an implicit EL for the risk that is mitigated and a capital charge for both single contract and pool insurance. One of the main benefits of mortgage insurance is capital management, as well as risk mitigation, since the large, well-diversified insurers who write the contracts typically have a much lower cost of capital and, as a result, are more capital-efficient.

Insurers' capital regime also differs fundamentally from banks', since they take longer-cycle risk than banks. This creates arbitrage opportunities for both banks and insurers.

What is mortgage insurance and who are mortgage insurers?

There are three different types of mortgage insurance:

- **Single contract or Primary**, where the lender effectively acts as an intermediary between the mortgage company and the borrower on a loan-by-loan basis. The lender agrees to lend, say, a 95% LTV but requests that the borrower take out an insurance contract on the top 25% of that loan. The borrower is therefore paying a risk 'premium' to the lender, which the lender then passes through to the mortgage insurance company. This type of insurance is very common in the USA and Australia where, tables of prices for different LTV coverage are published state by state.
- **Pool insurance**: this is where a lender pools together a portfolio of mortgages and writes an insurance contract for a certain loss limit on the pool. The lender is free to choose how much of the portfolio to insure, and the insurance company will decide on the basis of this what price to charge.
- **Bulk bond insurance**: this is credit enhancement for junior tranches of an asset-backed securities issue. For example, the lender might retain tranches of an RMBS rated single-A or lower, but insure the losses on these tranches with a specialist mortgage insurer (e.g. as a protection seller on a credit default swap).

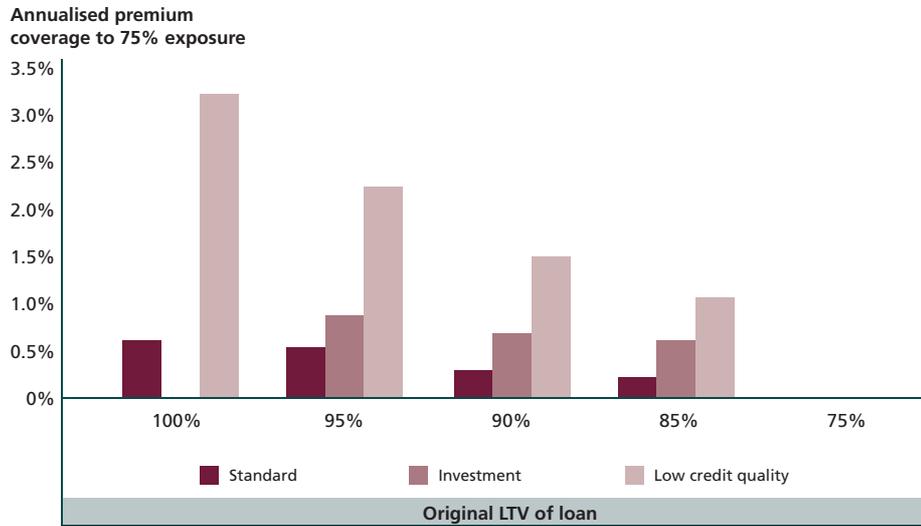
Australia and the US both have specific regulations established for residential mortgage insurers. This detailed classification arose from the USA's Depression-era experience with less rigorously regulated mortgage insurance products. These rules require mono-line status and stress the need for specialisation and a long-term commitment of capital. Europe does not currently benefit from such regulation.

A European mortgage might be a composite/multi-line insurer, a property and casualty insurer, a financial guarantor, or potentially an insurer of any characterisation that holds at least a Class 14 (credit), Class 15 (surety), or Class 16 (miscellaneous financial) insurance license from an EU country. In practice, the companies best suited to insure mortgage risk insurance – that is, the ones that have demonstrated staying power through the business' inevitable cycles – are those with the following characteristics:

- **Specialisation:** a clear focus on mortgage default risk with the associated skills, experience, and technology to measure, monitor and manage the risk;
- **Capitalisation:** a specific capital allocation for the unexpected, potentially catastrophic level of possible loss;
- **Diversification:** a size and scale of operation that enables diversification of mortgage default risk across a broad range of geographical and economic factors
- **Rating:** a 'claims paying ability' rating from an internationally recognised rating agency. This rating measures the adequacy of the company's capital to withstand a given level of economic shock and associated losses. Given that mortgage insurance in large part provides coverage for catastrophes, a suitably high rating is integral to the effectiveness of the risk relief.

The pricing of this risk mitigation technique is opaque to market observers in the majority of cases. There is no regulation in Europe that forces publication of prices. This is unlike the United States, where these products are sold direct to the consumers and so price publication is a consumer protection issue. In the UK and other European markets, they are sold to the lending institution; the US prices do, however, provide an indication of cost.

Figure 5.21 Cost of single contract mortgage insurance in USA, 2004

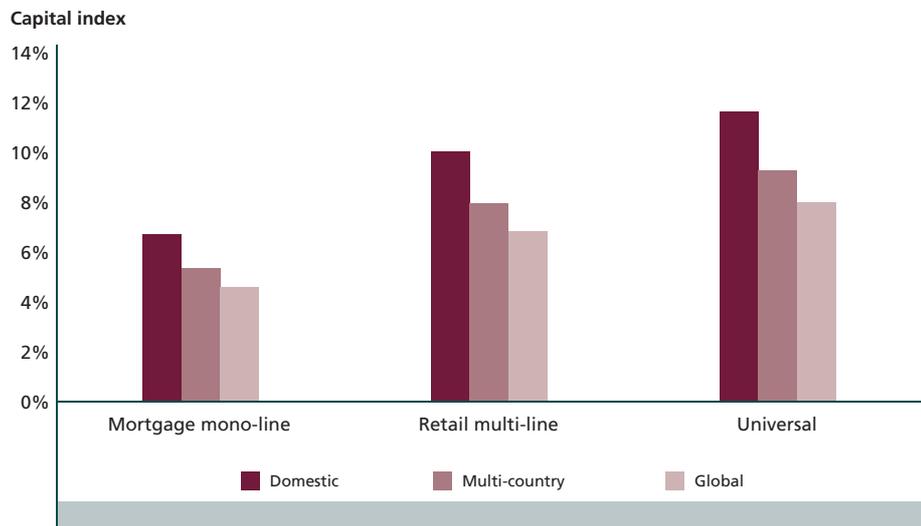


Source: Genworth, PMI and Radian

5.2.5.4 International diversification

As we have noted, one of the benefits of mortgage insurance is accessing international risk diversification. It is worth noting that this can be very worthwhile, potentially lowering the bank’s required credit capital base by up to 30%. Figure 5.22 below shows our analysis of the potential diversification benefit for three different types of institution: a mortgage specialist, a retail multi-line and a universal bank.

Figure 5.22 Assessment of international diversification benefit



Source: Mercer Oliver Wyman Analysis

In this analysis, we have looked at two scenarios for internationalisation:

- Multi-country (60% domestic, 2 x 20% foreign expansion)
- Global (5 x 20%)

The capital effect is driven by the differences in economic and business cycles, so we considered a broad range of countries (the USA, UK, Germany, France, Italy, Japan, Asia Emerging Markets and Latin America Emerging Markets), but the results are largely independent of country choice. This is perhaps surprising, but in fact, the Emerging Markets trade greater independence for higher risk, realising less diversification benefits, and therefore effectively achieve the same level of capital benefits. The benefits of this have been seen outside the mortgage industry with the collapse of Enron and WorldCom a few years ago. Both collapsed leaving huge liabilities and exposures, but these had been effectively diversified internationally and no single institution or country suffered unduly. Clearly, diversification benefits would be significantly reduced if a bank chose to diversify only across a narrow range of smaller neighbouring economies (for example, the Baltic states and Russia).

While we recognise that there is limited short-term action that a mortgage provider can take to diversify geographically, it should be an important financial consideration in evaluating any merger or acquisition and one a regulator should assess in establishing capital requirements.

5.2.5.5 Credit derivatives

Credit derivatives are essentially a means of transferring risk on an underlying asset via the payment of a premium, and so are not dissimilar from an insurance contract. What they do is allow the market to differentiate between credit origination and credit risk bearing, and they have allowed risk in financial services to be spread outside of the financial sector. There are arguments against them: among other things, critics charge that they create greater opacity about who is actually taking the credit risk and that some investors are unclear of the risks that the underlying assets bear (for example, in certain complex credit default contracts). This study does not go into the rights and wrongs of such instruments, but rather looks at their use in mitigating the risks inherent in mortgage portfolios.

Credit derivatives tend to be used when a provider wants to manage mortgage credit risk separately from funding. Institutions such as hedge funds want to hold funding but are not keen on holding the credit risk, so would typically swap with an insurance company that is keen to take on more credit risk exposure. In this way, the hedge fund gets an upgrade on its funding (from, say, BBB to AA) and the insurance company gets unfunded exposure to credit risk.

The majority of credit derivatives are single contract credit default swaps (CDS) which account for as much as 50% of all exposure in some countries, although Collateralised Loan Obligations (where the bank sells the credit risk on a portfolio of mortgages) and Credit Linked Notes (where the bank uses a securitisation to issue notes to investors, the payback on which is linked to the performance of the securitised portfolio of loans) are also used. CLOs and CLNs are similar in scope and structure to pool and bulk mortgage insurance, although they differ in the key respect that they are funded.

Credit derivatives also provide a capital advantage in much the same way as mortgage insurance; a low-rated asset or lender can use a CDS to enhance credit and use the better capital position of a counterparty to reduce its overall cost of capital. Credit default swaps do, on the other hand, carry an implicitly higher level of operational risk and counterparty risk than mortgage insurance.

Insurers have historically bought CDS, but this market is likely to contract as regulatory gaps are closed. In its place, the market is developing new classes of investor, notably hedge funds, but how far and fast these will develop is an open question. Alternatively, insurers may continue to absorb credit risk as an alternative to the large equity exposures they have previously bought, since they remain underweight in credit.

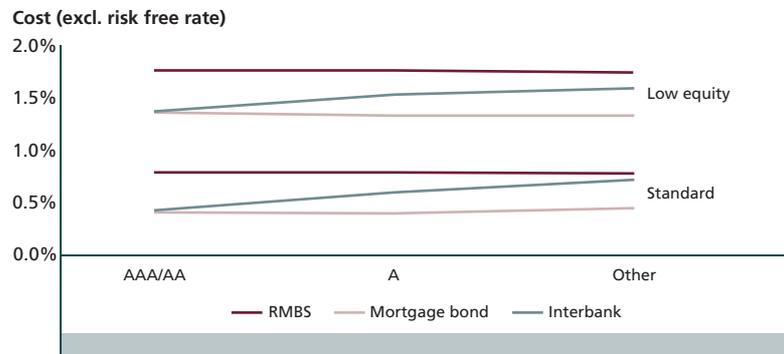
5.2.5.6 Other

There are a number of other types of risk mitigation techniques, including bank guarantees (where another bank agrees for a fee to guarantee the obligations of a contract) and borrower guarantees (where an individual, typically a relative of the borrower, agrees to guarantee the loan). All of these risk mitigation techniques have a price, but their share of the market (and, in some cases, such as borrower guarantees, their questionable usefulness as a risk transfer vehicle) mean that they are relatively unimportant to our analysis. Furthermore, they are really only loss mitigation techniques, since there is little capital advantage to be gained from using them. While they may have a slight impact on the loss-given-default and can therefore reduce the amount of credit risk capital, this effect is slight. As a result, we have not looked at these in any more detail other than to consider them and do some very basic pricing analysis. We also note that all effective risk mitigation techniques should provide the same level of capital reduction for the same amount of risk mitigation, whereas under some regulatory frameworks only a subset of risk mitigation approaches receive this credit.

5.3 Results and examples

We first considered the impact of funding, risk and capital costs on supplier economics. We then conducted a cost comparison for all twelve countries in our study across all six risk profiles and looked at the impact of different types of funding on the overall costs of differently-rated institutions (including cost of funding, credit risk including EL, and other risks). Figure 5.23 below shows Germany as an example for two selected risk profiles.

Figure 5.23 Germany – Example supply cost breakdown by risk profile



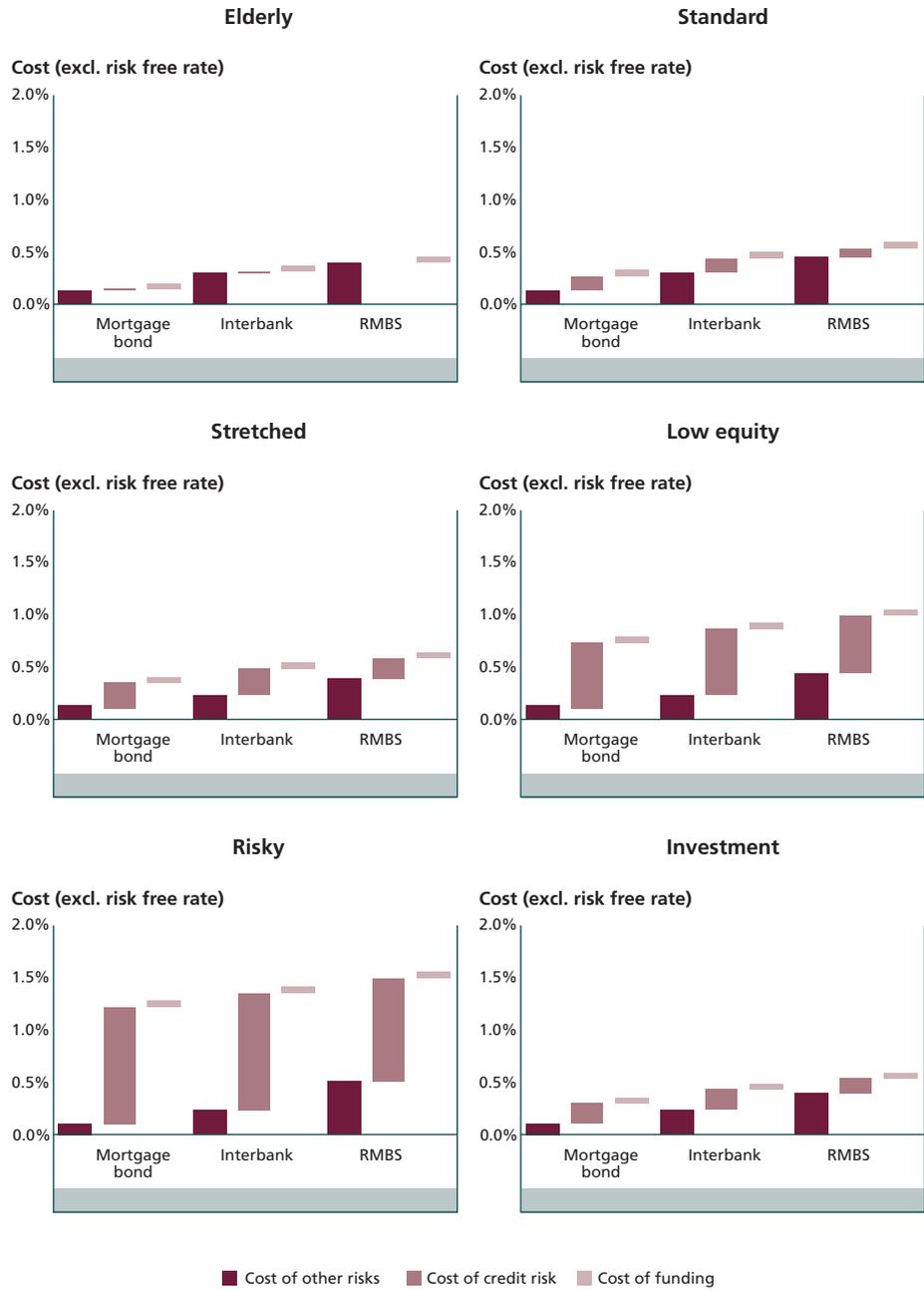
Lender rating		Funding type	Cost of funding	Cost of credit risk	Cost of other risk	Total cost
AAA/AA	Low equity	RMBS	0.57%	0.68%	0.08%	1.33%
		Mortgage bond	0.10%	0.85%	0.08%	1.03%
		Interbank	0.10%	0.85%	0.08%	1.03%
	Standard	RMBS	0.44%	0.09%	0.07%	0.60%
		Mortgage bond	0.10%	0.14%	0.07%	0.31%
		Interbank	0.10%	0.14%	0.07%	0.31%
A	Low equity	RMBS	0.57%	0.68%	0.08%	1.33%
		Mortgage bond	0.10%	0.82%	0.08%	1.00%
		Interbank	0.25%	0.82%	0.08%	1.15%
	Standard	RMBS	0.44%	0.09%	0.07%	0.59%
		Mortgage bond	0.10%	0.13%	0.07%	0.30%
		Interbank	0.25%	0.13%	0.07%	0.45%
Other	Low equity	RMBS	0.57%	0.68%	0.07%	1.32%
		Mortgage bond	0.15%	0.78%	0.07%	1.01%
		Interbank	0.35%	0.78%	0.07%	1.21%
	Standard	RMBS	0.44%	0.09%	0.06%	0.59%
		Mortgage bond	0.15%	0.12%	0.06%	0.33%
		Interbank	0.35%	0.12%	0.06%	0.53%

Note 1: 'Cost of Credit Risk' includes expected loss and the cost of holding credit risk capital

Note 2: 'Mortgage Bond' includes covered bonds (e.g. Pfandbriefe) and structured covered bonds; 'Interbank' includes deposit funding

The shaded lines indicate the cheapest sources of funding for these two particular risk profiles (it might of course potentially differ for each profile). The graph and table above show how, for two selected borrower profiles, we have calculated a cost of funding by instrument type. Our conclusions are fairly universal across countries and consistent with experience. Highly-rated banks should in general fund on balance sheet. Where mortgage bonds exist, they should be the instrument of choice for banks with lower ratings (A+ or below). RMBS are rarely the cheapest instrument at a country level and this is illustrated for Germany below, where mortgage bonds are favoured because banks' average ratings are low, although RMBS do offer flexibility. Figure 5.24 shows the cost for each of our risk profiles for each element of the cost, but as an aggregate for the whole of Germany depending on the rating mix of the major lending institutions. In other countries, where this rating mix is different, the cost of various funding instruments for different risk profiles will differ.

Figure 5.24 Germany funding comparison



It should be noted that local regulations and customs, as well as the ratings of individual banks, will dictate the choice of funding mechanism and credit risk management. Nonetheless, the analysis does give an indication of the relative cost of funding for each different risk profile.

If this is the case, what is the rationale behind the use of RMBS? In some countries, mortgage bonds either do not exist or are restricted in the assets that can be funded through them, so RMBS might then be the cheapest source of funds for certain lenders. In the UK, for example, there is no specific legislation of covered bonds (although structured covered bonds do exist) and non-conforming securitisations

are common. Equally, if an organisation is genuinely capital-constrained, it will need either to seek credit enhancement from a third party or use RMBS regardless of the cost, as they are the only instruments that will completely remove assets from the balance sheet, with the associated potential to sell off risks to third parties in the market.

6 Meeting future demand

6.1 Introduction

The previous two chapters considered all aspects of the mortgage value chain, showing where current demand lies and how it is met and funded, together with the potential future demand. The key questions arising – and these are the crux of this study – are:

- How will suppliers meet future demand, fund it and manage the risk inherent in it?
- What are the best business models for suppliers, third party funders and risk managers to exploit this demand?

The riskier borrower segments are not well served at present, and lenders need to understand how to provide for them. In that respect, the future is more about credit risk management than funding or the management of other risks, although these will clearly have an impact.

Banks in Europe have enjoyed high rates of growth in recent years and market valuations suggest that investors expect continued growth into the future. Furthermore, there has been a rising trend for capital accumulation, which will only get higher (from a regulatory capital perspective) for mortgage lenders under Basel II. **Banks will need to assess how best to deploy that capital.**

The trend in recent years has been for lenders to increase their risk exposure. Banks and other institutions are providing more products to a greater range of consumers and finding more and more innovative ways of funding them and managing the risks. The development of the credit derivative market is just one example.

Nonetheless, in many of the geographies looked at in this study, this appetite for risk is relatively conservative. If the results from our demand model are accurate, then the Low equity and other higher risk segments form a significant proportion of future value opportunities in Europe.

That said, there are a number of things that would need to change on the supplier side in order to realise the opportunities projected under Scenario 2. Lenders will generally need to extend their product offerings, introduce new products to different segments, increase distribution (e.g. making products more widely available using additional sales channels) and increase their appetite for risk. Furthermore, regulations may need to change to enable this to happen, and to enable lenders to access the funds and risk management products that will provide for the demand.

The implications of these changes are that lenders will need to enhance their risk management capabilities and potentially explore additional risk mitigation products in combination with different forms of funding. Under our modelled scenario, over half of the opportunity (equating to approximately €300 BN, approximately 9% of mortgage outstandings across the countries covered) will be in the Low equity, Risky and Investment risk segments.

6.2 Supplier challenges

A huge number of challenges face banks and other mortgage lenders in their quest to capture latent demand. These challenges fall into a number of broad categories:

- **Product Management:** Most new segments require different propositions and product structures. Occasionally, adventurous structures will be required to meet regulations for specific risk segments, as we have noted in those countries where interest-rate capping has limited lending to higher risk borrowers.
- **Distribution:** There is a huge variety in the effectiveness and efficiency of the distribution networks of mortgage providers across the countries surveyed. Lenders will need to consider if their networks are sufficient to manage the demand or whether alternative channels and structures will need to be put in place to capture it.
- **Risk Management:** If the growing consumer segments are at the riskier end of the spectrum, lenders will need to be able to manage that risk or to find alternative ways of mitigating it through credit enhancement. If lenders have restricted risk appetites, risk mitigation products can be used to access a wider customer base, using funding products to pass additional risk to investors with an appetite for risk and higher returns.
- **Funding and Capital Management:** Lenders will need to carefully manage how they fund the demand increase and the appropriate mix of own balance sheet and via the markets.
- **Cost Management:** the operational costs of originating and servicing mortgages have not been considered in this study. Nonetheless, if we assume greater financial integration and access to products, capital will flow to where it is most efficiently used and this will have an impact on lenders whose cost bases are too large.
- **Regulation:** Regulations are a constantly changing factor on the value chain, but have a particular impact on how lenders are able to behave. Both pan-European and local legislation will be important in determining how demand is met. The single most important piece of legislation here is the new Basel II Capital Accord, as implemented in the EU's Capital Requirements Directive (CRD).

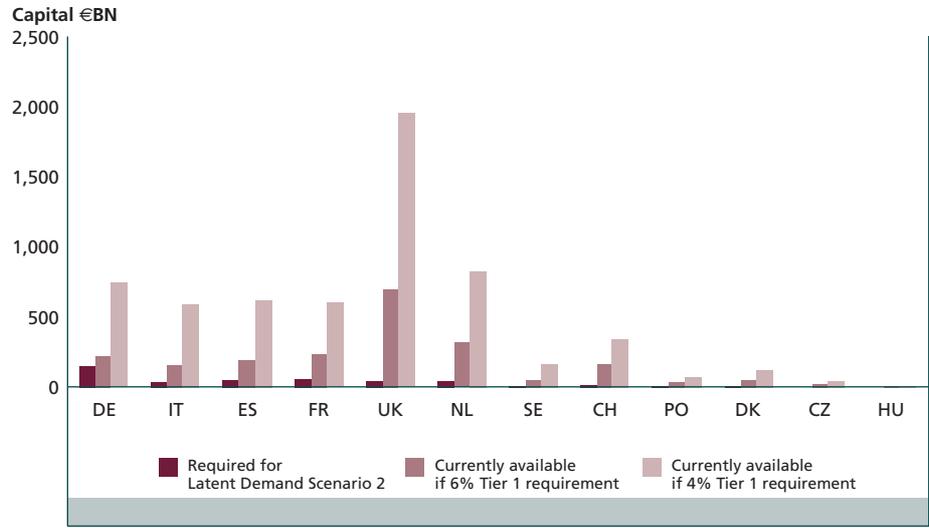
The rest of this chapter looks in more detail at three closely related challenges:

- The economics of funding demand;
- The economics of risk management;
- The regulatory impact of Basel II (and, to a lesser extent, IAS39).

6.3 Funding demand

In order to assess how lenders should approach the funding question, we first reviewed the current levels of capital held by the major mortgage lenders in each country. Germany is the only country where the level of market potential appears to be significantly higher than current capital availability, but even here the reduction in the regulatory capital requirement under Basel II IRB will probably be sufficient. The UK is very highly capitalised and may well be an international acquirer, or it may represent an opportunity for capital release to shareholders or acquirers.

Figure 6.1 Tier 1 capital requirement



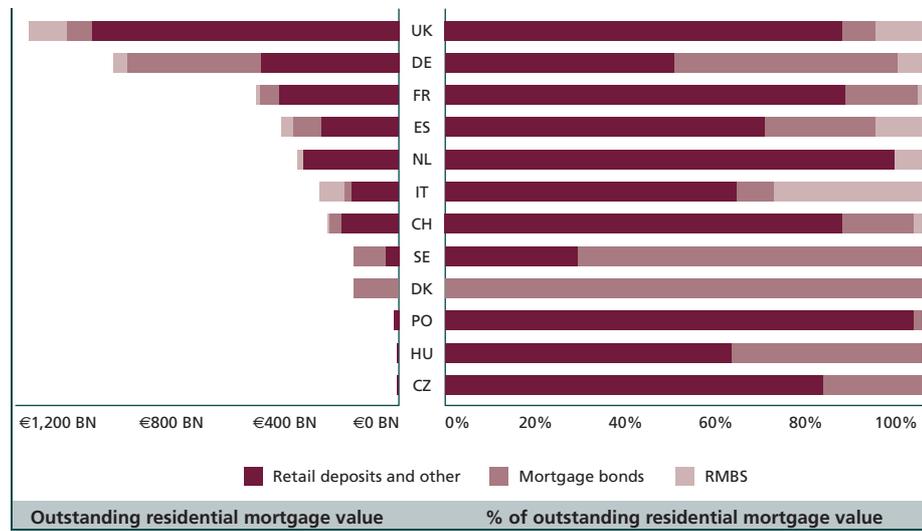
Source: Mercer Oliver Wyman European Mortgage Latent Demand model, Bankscope

However, even though banks might have sufficient capital to fund, this does not necessarily mean that this is the most cost efficient way forward. The choice of funding mechanism will depend on a number of other factors:

- Lender rating
- Borrower risk profile
- Country regulatory framework

We have assessed the most efficient funding instrument for each risk segment in each country, based on the lender ratings within that country and the latent demand estimated in chapter 4. The resultant 'optimal' funding structure for this new demand in each country is shown below in Figure 6.2.

Figure 6.2 Future funding and supply cost picture



The numbers here reflect the debt ratings for banks in each country and assume that higher-rated banks will choose to fund on balance sheet. In countries such as Spain and Switzerland, which have both high rated banks and developed covered bond markets, the picture may turn out differently if those banks choose to fund via covered bonds rather than deposits and interbank funding.

This analysis shows the funding profile for both current outstandings and potential demand, and includes the cost of funding, credit risk and other capital costs. Our model has selected the most cost-effective way of funding, based on the all-in cost of the lending to different risk profiles. What this shows us is a theoretical snapshot of the future funding and risk requirements for each country.

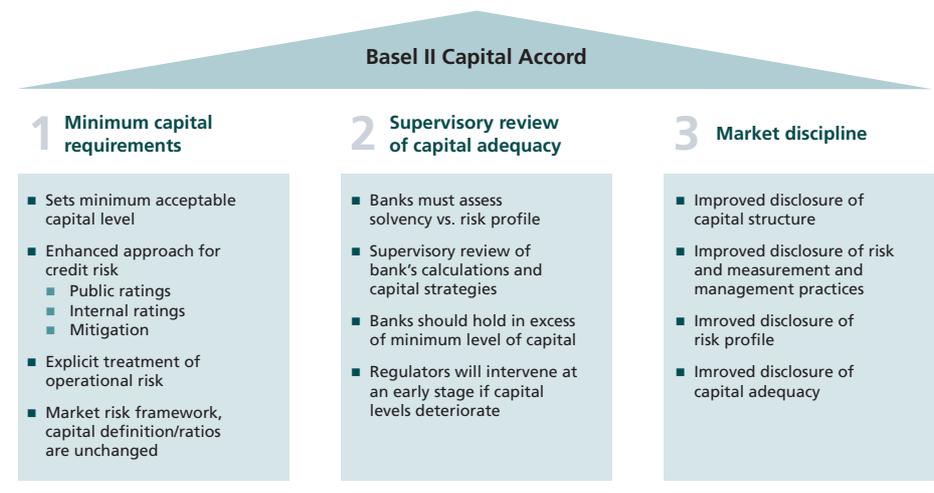
6.4 Regulatory change

6.4.1 Basel II

The Bank for International Settlements in Basel is in the process of introducing a new Accord regulating the capital that financial institutions need to hold. This is a huge topic in its own right and we do not propose to go into it in great detail, merely to cover those issues which affect risk and funding in residential mortgages¹³.

¹³ For further reading on the subject, see the Mercer Oliver Wyman report produced in June 2003 entitled *The Strategic Impact of Basel II*

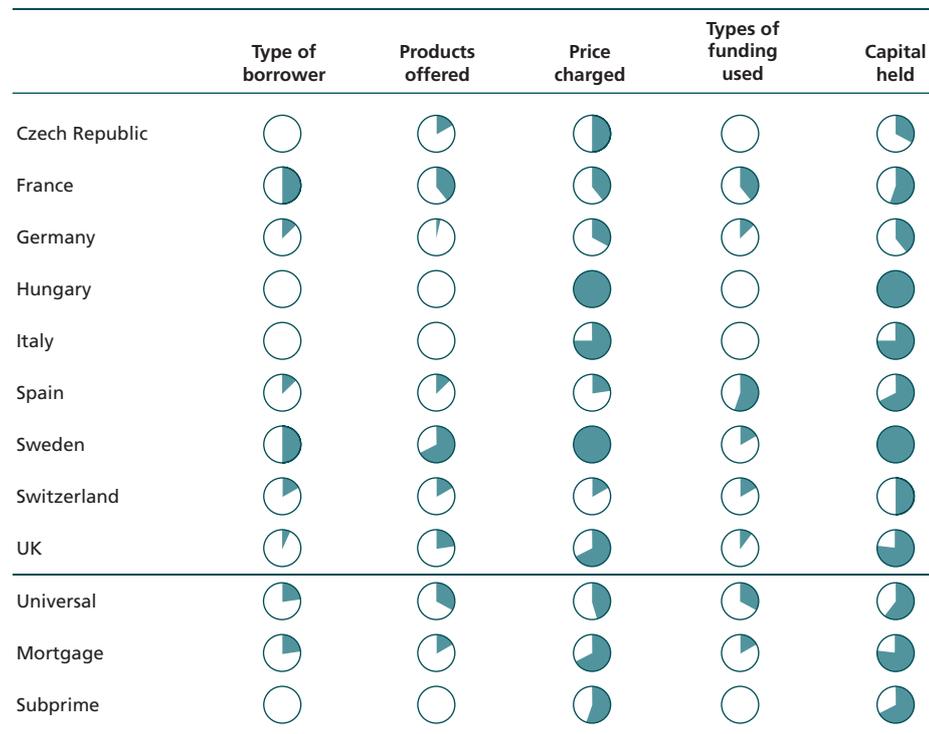
Figure 6.3 Basel II three pillar approach



Basel II focuses on correcting the level of capital currently held against credit risks and introduces capital adequacy for operational risk via the three pillar scheme shown in Figure 6.3 above. Basel II seeks to improve risk management and measurement by rewarding higher levels of compliance and complexity with releases in capital. There are three classifications of lender under the new regulations, but only two are relevant to residential mortgage lending: IRB (Internal Ratings-Based) and Standardised.

Realistically, banks need to become IRB compliant in order to be credible mainstream lenders. The state of readiness of banks varies between country. The majority of larger lenders are aiming for IRB compliance for credit risk and Standardised/AMA for operational risk. For mortgage lenders, development is varied across countries, with no lenders at all likely to be IRB qualified in some countries. **Lack of IRB qualification has clear implications for capital, since the minimum capital requirement is less onerous for the IRB level than under the existing rules.** Lenders themselves have different opinions as to the impact of the new regulations – our survey showed a variety of different reactions in different countries, as is shown by Figure 6.4 below. The key effects – perhaps unsurprisingly – are expected to be on mortgage pricing and capital requirements.

Figure 6.4 Potential impact of Basel II



Source: Mercer Oliver Wyman analysis of survey results

Note 1: white balls indicate a belief that Basel II will have no impact while teal balls indicate a belief that Basel II will have a very strong impact

Note 2: no survey replies to this question were received from lenders in Denmark, the Netherlands or Poland

Basel II will also have some implications for the pricing of covered bonds and RMBS, compressing the difference between them. Furthermore, there are some potentially complex RAROC implications for banks. Under Basel I, in the covered bond market, banks have traditionally funded the subordinate (or higher risk) positions of mortgage banks through other bond issues (unsecured bank debt). Under Basel II, this practice could become quite expensive, although the cost will depend on the issuer rating.

By contrast, in the RMBS market under Basel I, if a bank underwrote a subordinate piece of the debt based on a low level of recourse (or indeed, if it bought a subordinate portion of its own RMBS issue), it would end up having to hold capital against all of this. Under Basel II, this might still make economic sense if the banks are IRB-qualified. For covered bonds, however, the lower-risk position in the covered bond model is de-linked from the IRB approach, and so this approach will not work. In fact, if the counterparty risk weighting in the covered bond market moves from 20% to 50%, a bank will have to hold the same capital, but with a reduced RAROC.

The result is that if covered bond issuers drop below a certain rating level, banks will be priced out of writing sub positions. There will therefore be a need for third party providers such as mortgage insurers to underwrite these subordinate positions.

The reduction in regulatory capital requirements will further exacerbate 'excess' capital accumulation in the European banking sector. There are many options for using this capital in the mortgage sector, most importantly greater risk appetite in lending and an ability to undertake greater on-balance sheet funding and risk

management. The impact of Basel II could dramatically affect the method by which higher-risk lending is offered, how it is funded, how risk is mitigated and how this cost is passed onto the borrower. We see three main implications for mortgage lenders from this situation:

- **Increased competitive advantage to larger, more diverse institutions:** These lenders will enjoy higher levels of capital release from more sophisticated levels of compliance (pillar 1) and higher levels of diversification (pillar 2), thereby lowering the 'cost' of mortgages compared to smaller and less sophisticated institutions.
- **Higher cost of higher-risk mortgages:** Unless inexpensive forms of risk mitigation or effective forms of credit risk transfer can be found for higher-risk mortgages, lenders are likely to pass on more risk costs to higher risk-borrowers than they did previously. However, the increased transparency of risk may drive down the price of risk mitigation.
- **Reduced use of regulatory arbitrage:** Exotic derivatives that took advantage of capital arbitrage opportunities under Basel I will become less attractive due to the increased cost from capital requirements both for investors covered by Basel II and for issuers.

6.4.2 Other regulations

Aside from the impact of Basel II, there are other pan-European and country specific regulations that will affect the take-up of market potential. We look at these briefly below, but will discuss changes to regulations that are likely to have a beneficial impact on the European mortgage market and enable the smooth development of the latent demand in the following chapter.

6.4.2.1 IAS 39

IAS 39 has been set up to introduce the concept of 'fair-value accounting' at the top of the house and to introduce some clarity to the way in which banks report. Under a default swap or securitisation, the transfer of risk off balance sheet enables banks to release capital (as discussed above). This process can be opaque to investors and some of the risk may in fact still reside with the bank. The IAS 39 rules have been designed to allay fears that off-balance sheet SPVs may be misused by improving balance-sheet transparency through introducing fair value accounting.

IAS 39 requires all financial instruments to be classified into one of four categories and specifies a measurement approach for each category (e.g. available-for-sale = fair value; all non-hedging derivatives in held-for-trading = fair value); requires separation of derivative from underlying asset in a hybrid instrument (e.g. the pre-pay option in a mortgage); provides new standards on de-recognition of assets (important to securitisation markets); restricts the recognition of losses (which cannot now be based on future events, no matter how likely (affects banks' use of general provisions); and provides strict rules on use of hedge accounting.

Banks will probably have to think more carefully about using securitisations and default swaps as a way of managing risk and funding. Banks have raised many concerns over the proposed legislation and it has been adapted to take account of some of those fears.

6.4.2.2 Country specific

Besides the localisation issues of Basel II and IAS 39 – since local regulators will have the power to impose additional or variant requirements on their domestic banks – there are a number of country-specific regulations that are being discussed and which are likely to come into force in the medium term to a greater or lesser extent. For example:

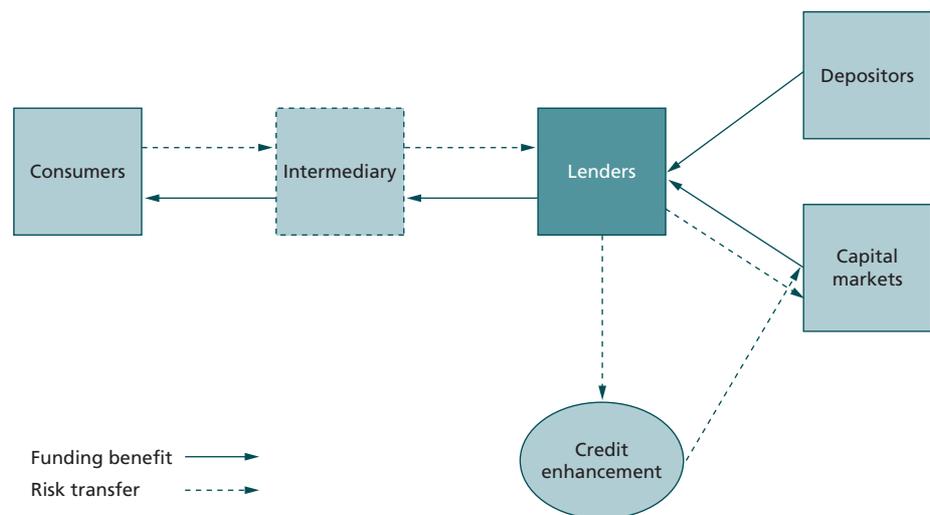
- The FSA became the official regulator of the UK mortgage industry in October 2004. While few immediate changes are expected, it is potentially a huge shift in the way in which the industry does business.
- In Italy and the Netherlands, legislation is being introduced to allow the use of covered bonds to fund mortgages.

7 Business models

7.1 Introduction

We have examined the implications for the mortgage industry business models, based on the likely future shape of demand and supplier economics. How will consumers get their mortgages in the future, and who will bear the risks for them?

Figure 7.1 Suppliers of capital and funding to the Mmortgage markets



We have focused our attention on lenders, since they sit in the middle of the supply side and have the ability to dictate what will (and will not) succeed. We also consider the impact their behaviour will have on other supply-side players, in three major areas:

- **Risk management options:** Which risk management options are lenders likely to choose over others?
- **Supplier reaction:** Given the likely approaches, how will different players on the mortgage supply-side define their businesses and approaches to the market and each other?
- **Policy environment:** What public policies might facilitate this and how they might be implemented at a European level or at a country-specific level?

7.2 Risk management options

Lenders control the supply of risk to the market and through their individual distribution and underwriting decisions determine the shape of the industry's outstandings. Lenders therefore need to control two key related variables in shaping their portfolios:

- **Price:** Are they getting sufficient return to pay for the risks being underwritten, given the borrower and country characteristics?

- **Execution:** Are they maximising their returns by funding the mortgage and managing the associated risks in the most efficient manner?

In practice, these two variables are interlinked: price is influenced by the available execution in the market; and if execution improves so may the price offered to customers. However, we have estimated demand on the basis that consumers must pay an economic price for the risk they represent to the lender.

The issue for lenders is this: How should they manage the risks they take in the market? To do this, we need to understand what roles the lenders want to play and what roles the other supply-side players can play to enhance the execution for the lenders. Winning models will be 'win-win' scenarios where the lender's economics are enhanced through third party transactions, either by increasing the available volume of lending, by decreasing the cost of funds or by improving capital efficiency.

7.2.1 Credit risk

Lenders broadly take on two types of credit risk in mortgage lending. The first is what we have called 'underwriting risk', based on the lender's assessment of an individual borrower's creditworthiness and ability to pay. The second is 'cyclical risk': a mortgage can be viewed as a lender writing a put option on the property market.

Underwriting risk is highly idiosyncratic. Lenders may use a variety of processes to underwrite the customer and verify the decision, but ultimately it is risk that third parties would be reluctant to take on without considerable discussion of the underwriting process. In principle, this makes this risk difficult to transfer, and there are conflict of interest issues with selling off the entire equity tranche of an RMBS issue.

The cyclical risk, by contrast, is really an asset class risk. It is a highly diversifiable risk and one where there is considerable logic in managing it as part of a portfolio of risks. When transferring cyclical risk, a lender has two basic choices (although these can be blurred):

- **Specialists:** Institutions like mortgage insurers have a deep knowledge of mortgage risk. They will be able to work with the institution to ensure risk is avoided upfront and reduce the cost of cover. Specialists can use their deep knowledge of the mortgage market to offer advice on the entire risk-taking process (both lending and underwriting) with particular credibility, as they are putting their own capital at risk. Specialists are also able to offer a third-party perspective on the risk in the book, and thus enhance capital markets execution, either ensuring a favourable rating outcome for a particular tranche or pool (through a guarantee), or expanding the size of the AAA tranche (e.g. through individual loan protection products reducing the risk in the pool).
- **Capital markets:** the theoretical advantages of capital markets are well known – they offer access to the greatest level of diversification by creating products that appeal to the broad investor universe. This is typically done either through RMBS tranching (and sale of the higher-risk tranches) or via a credit derivative. Historically the price achieved for the higher-risk elements of these products has been weak, and so they are often bought or enhanced by specialist mortgage insurers. Consequently, the capital markets benefits of theoretically cheap risk and capital management and improved diversification must be set against the disadvantages of a lack of specialist mortgage knowledge, no process

improvements and incomplete risk transfer. In practice, the specialists are the major players in facilitating the exchange of mortgage assets between lenders and the capital markets at the higher-risk end and so this knowledge gap does not come into play to any great extent.

In practice mortgage insurers and RMBS investors are very comfortable with cyclical risk but there are two broad reasons that most lenders have not historically sold this risk:

- Large diversified banks already obtain portfolio management benefits within their own books.
- Banks are not short of risk bearing capacity and are reluctant to pass up margin. Many organisations consider the prices being charged for the transfer of cyclical risk to be too high. In practice, there is a competitive and reasonably broad market in cyclical risk transfer; if banks consider the price to be too high, this reflects a difference in opinion over the long-term risk in the business or a difference in time horizon. Certain lenders are willing to accept pro-cyclical returns, rather than pay for unused cover in good times. With the introduction of Basel II, the inherent capital issues will become more apparent and it will be the change in the capital requirement for lenders that will become the crucial factor in deciding how to manage cyclical risk.

Not surprisingly, therefore, few lenders actually adopt this strategy even though it appears fundamentally efficient for lenders to transfer the cyclical risk and retain the underwriting risk. We feel this is primarily due to lack of appetite for paying in a benign environment. There is also no evidence that a mortgage lender would be rewarded with a higher valuation for lowering its risk profile (it might even be penalised for doing so).

However, in Eastern European countries where the capital markets are not well developed, and where risks are less certain, mortgage insurance allows for more accurate pricing and better due diligence than the capital markets can offer. In more developed economies, the type of lender and portfolio – as well as the economics of the lender itself – will have an impact on what is chosen, but in practice the role of the specialist may be more restricted.

It is hard to talk about credit risk in mortgages without mentioning loan-to-value risk. Loan-to-value is a critical measure of the cyclical risk in the portfolio (as it represents the strike price of the put option). In a number of countries, it is limited directly, whether by governments (through legislation), by regulation (through access to funding mechanisms) or through internal lending policies. Specialists are by definition experts in underwriting these cyclical risks.

Lenders tend to ration credit at time of cyclical downturns and it is at this nexus of credit rationing (through supply limitation whether imposed by governments, regulators or lenders) in the face of borrower demand that mortgage insurance is potentially most valuable.

Mortgage insurers are flexible at structuring products that enable lenders to stay in the market at higher risk levels, and/or improving the execution at those higher risk levels through risk avoidance, where a lender is entering a part of the risk spectrum from which they have been historically absent. They may also enhance the underwriting process to avoid poor risks.

In some instances, regulation prevents mortgage insurers from taking this role, or practice has grown up to structure products to avoid this. For example in Denmark, which in many ways has an exemplary mortgage lending system, there is a restriction of 80% LTV for covered bond funding, with the remainder made up by a bank loan. In practice, it would be more efficient to have the mortgage entirely bond-funded but with mortgage insurance, or equivalent, taking up the excess risk tranche. Once a system is well established however, transition costs to move from one equilibrium (bond + loan) to another (bond + mortgage insurance) are high and thus lenders, paradoxically, reject the most efficient solution.

In other instances, high LTV risk is mitigated through additional collateral, such as parental or personal guarantees. While these guarantees have the positive effect of keeping borrowers honest, it is important to see them for what they are – enhancements to the underwriting risk. The recovery on these guarantees in cyclical downturns tends to be poor and in many instances inappropriate. The transfer of cyclical risk to a specialist mortgage insurer is economically superior. To retain the value of the underwriting benefit, a modest personal guarantee could be put in place in addition to the mortgage insurance.

Mortgage insurance provides a rigour and process for high-LTV, higher-risk loans; it is up to the lender whether or not to include this in the process as a mandatory part of low equity lending (as some already do). But since much of the market potential lies with low equity, it is likely that those lenders that have a rigorous approach to managing this process – and covering the additional risk – will have a more robust economic framework in the event of a cycle downturn, and will therefore be able to pursue the market demand opportunity more aggressively.

7.2.2 Interest rate risk

For many lenders, the first question is whether to use deposits or the capital markets to fund loans. In practice, we know that the majority of mortgages are still deposit-funded and it is worth looking at this in a little more detail, particularly in relation to its effect on interest rate risk.

For a traditional branch-based retail bank, deposits' behavioural maturity probably equals or exceeds that of mortgages. The bigger issue is the duration of deposits. Most deposits re-price off the short end of the yield curve. Where mortgages also price off the short end of the curve (as in Spain and the UK), deposits are a natural instrument to fund mortgages, and players that have sufficient deposits would not typically look to other instruments.

For mortgages that are re-priced off the longer end of the curve, there is a real interest rate risk to be managed. For a longer-term, fixed-rate mortgage, a lender really only has the option of managing the interest rate risk in the capital markets. Depositors are unwilling or unable to place funds for the required duration while lenders often do not have the expertise to manage the prepayment risks, where these are a big feature of the market. This risk must therefore be managed on the capital markets. This can be done in three main ways:

- The mortgage book can be explicitly hedged. Funding is managed centrally and the mortgage book's interest rate risk is managed on a replicating portfolio basis, typically by amortising swaps to group treasury.
- The mortgage book's interest rate risk is transferred to treasury, where it is

managed as part of the group ALM position. The mortgage book, as part of the group position, will be managed through swaps and futures. Equally, any funding deficit will come from general unsecured debt.

- The mortgage book is match-funded via external capital markets instruments – typically, covered bonds such as *Pfandbriefe*.

Of these, external funding is the only practical solution for longer-term fixed rates where they make up the majority of the balance sheet of an institution. There is obviously very considerable interest rate risk in these instruments and the effective funding instruments typically separate this risk from the underlying credit risk. Thus long-term fixed rate mortgages are funded with covered bonds, which pass interest rate risk to investors while shielding them from credit risk. Where RMBS are used to pass on interest rate risk, it is normal for only the AAA portion to be sold.

Clearly, if mortgages are only a small part of the balance sheet, as for example in Italy, the size of the mortgage-related interest rate risk is less material and they can be funded externally under normal MTN programmes, together with swap positions.

In summary, **interest rate risk is most material for markets where the long-term fixed rate is the norm**. This product can be most effectively funded with credit risk free bonds, such as covered bonds, and this is the only practical solution for lenders where mortgages dominate the balance sheet. Lenders where mortgages are a less significant part of the balance sheet can choose between specialist mortgage funding programmes, and general bank funding programmes – and this choice is likely to be ratings driven. Where mortgages price off the short-end of the curve, there is little interest-rate risk and deposits effectively maturity-match the mortgage portfolios, and are thus an effective funding source. Otherwise, the choice of funding source is driven by the price and availability of the different instruments and the rating of the lender.

7.2.3 Operational and geographical risk

Basel II has focused attention on operational risk, and while it perhaps remains more art than science, the process of AMA certification has highlighted to many lenders the large range and scope of risks within the mortgage lending business – and a number of gaps in their processes. Overall, our impression is that the lenders themselves are at very different stages of development when it comes to managing operational risk.

Lenders will increasingly need to pay attention to the impact of operational risk and how it is managed within their business. Given the riskiness of the segments where the market potential lies, there is very considerable scope for lenders to ‘get it wrong’, leaving themselves exposed to poor credit approval processes, mis-selling charges, weak collections and so forth. Operational effectiveness will be key to exploiting the demand opportunities identified earlier and is an area where lenders may well benefit from third party validation.

Third-party validation of processes can come in two forms – either from a consultant (which uses a broad range of industry experience to assess processes and their effectiveness) or from a mortgage insurer (which puts its own capital at risk, and thus has a closely-aligned interest in ensuring rigour). Mortgage insurers can provide an extremely high level of validation in an on-going business context. By contrast, the capital markets, except in limited single-contract credit derivatives, do not provide any expertise in mortgages or rigour in their mortgage approval and risk management process.

More robust processes afford lenders have greater confidence in the higher-risk lending business. This will, in turn, enable them to offer a wider range of products to riskier borrowers, secure in the knowledge that processes that could lead to a credit crunch are not being abused.

Geographical location (and the related legal jurisdiction) has an impact on all risks but particularly on credit risk (through enforcement processes) and operational risk (through consumer protection and the broader regulatory environment). Where a geography is high-risk, or where there is limited risk transparency, third-parties can again play a role in either reducing the risk or adding transparency to the risk; this is particularly true in the newer markets of Central and Eastern Europe.

7.2.4 Funding

The funding mechanism is typically driven by price, and we have analysed it as such. It is, however, worth noting that rating agencies are increasingly demanding a diversity of funding sources and in this context, many institutions are raising funds from a variety of sources, not just the cheapest.

Our analysis shows that a lender's funding choices depend on two key factors: rating and country. Both of these have an impact on the price paid for different types of funding. We can, however, draw conclusions as to what the ideal funding type would be for different rated institutions on a broad pan-European level. Broadly speaking deposits or unsecured debt represent the lowest cost source for higher-rated banks in developed countries and for all types of lending.

For mid-rated lenders, the choices are more complex. In jurisdictions where covered bonds exist, these are typically the most economical source of funds for the prime book – where covered bonds do not exist, RMBS offer the best execution. For most forms of non-conforming mortgage, RMBS offer the only means of execution. However, the availability of structured covered bonds now available has created increasing convergence of the instruments. But while structured covered bonds may now be theoretically cheaper, in practice, they are principally used in most markets to target a different investor base, rather than compete on price. For mid-rated lenders, deposits represent an extremely cheap source of funds as they are not differentially priced by bank rating and so are likely to be optimal if they can be duration-matched or hedged. In practice, many lower-rated institutions are mortgage specialists; as a result, they have insufficient deposits and thus require non-deposit funding:

Table 7.2 Best theoretical funding source by lender rating

Bank rating	Funding source
AAA/AA	Unsecured debt (e.g. Interbank, MTN)/Deposit
A – prime low LTV	Covered Bond (where available)/Deposit
A – other	RMBS/Deposit

The choice of funding affects the lender's risk profile and capital requirements. Where funding is locked in for the life of the mortgage, there is less liquidity risk – lenders who have funded on a shorter-term basis will profit over the short term but suffer enormously on rating downgrade. It should be noted that this analysis ignores the impact of regulation on the funding choice.

Liquidity is a major concern when funding, and many funding choices, especially in less developed mortgage markets, are based as much on liquidity considerations as anything else. Mortgage insurance has a role to play in funding as well as in risk mitigation. By using insurance, the lender enhances the credit quality of the loan/portfolio, increases the liquidity of the pool and therefore reduces funding costs. In this way, it can be efficient to credit-enhance certain types of loan to ensure good execution and stabilise the overall portfolio. This addition of liquidity to the market via the insurer's cover opens up the possibility of cheaper funding for lenders and enables a bigger, more liquid market for mortgages.

7.3 Impact

The way in which lenders address these risk and funding issues affects each of the different types of institution on the supply side of the mortgage value chain, and will dictate which business models are best placed to exploit the market potential.

7.3.1 Lenders

Lenders dominate the mortgage value chain. As can be seen from the Tier 1 capital chart in Chapter 6, and as noted by market commentators, they are capital-rich and getting richer. Lenders currently have very sizeable risk appetites and are in general looking to increase risk levels. However, they wish to make such increases efficiently, whilst still maximising their returns through both price and process.

Broadly speaking, the other supply-side players need to enhance lender returns or they will not get business. It is therefore worth asking: what are the winning models for lenders in the medium term? This question is clearly very wide, and will depend on a range of issues such as government policy, target borrower segments and lender rating to name but a few. Nonetheless, there are certain constants in relation to risk and funding that are likely to improve a lender's chances of success:

- **Risk management processes:** Modelling techniques and data gathering (including bureaux) have evolved over the past decade and resulted in more accurate underwriting and therefore better risk management. Lenders seeking to exploit the market potential in the higher risk segments will need to be expert risk managers, either through in-house expertise or by out-sourcing to specialist providers. Lenders will need to have clear policy and risk management procedures that appropriately balance the risk in the target segment with the cost of improved underwriting. Higher-risk segments are more costly to risk-manage and the ensuing demands of risk management are more onerous.
- **Basel II compliance:** Compliance with Basel II's IRB approach will be mandatory for firms that wish to compete as mortgage lenders. This will have key advantages: improved risk management capabilities (the push for IRB will upgrade data and quantitative risk management capabilities) and very significant capital release (potentially over 60% for low-risk prime mortgages). Lenders who qualify will be able to use their capital surplus either to fund higher-risk mortgages or to ensure good management of existing assets; lenders who do not will be capital-disadvantaged.
- **Capital diversity:** Our analysis shows that a diversified capital base provides a distinct advantage, since it reduces the capital required to support a given type of lending. Lenders can either seek to become diversified themselves (as multi-country players) or can seek to use third parties such as the capital markets or

mortgage insurers to help diversify their capital base. Interestingly, diversification across asset classes is not that helpful, as mortgage assets are low risk and therefore while the asset correlation may fall, the critical default correlation does not. As seen above, there is a potential benefit of up to 25% of the capital base for true global diversity. The reality is that few will achieve this benefit and many may be reluctant to pursue pure return-on-capital optimisation, rather than absolute return optimisation, in an era of excess capital. Linked to capital diversity is the fact that capital-efficient lenders are likely get better funding execution in recognition of their low-risk profiles.

- **Process efficiency:** as we have stated already, one of the driving forces behind the lender's business in relation to risk and funding is process – how the risk elements of the mortgage are managed from cradle to grave. Lenders who manage their processes well are likely to be in a much better position in the event of a credit crunch. Moreover, in times of credit rationing, when markets are tough, they will be better placed to cherry-pick the better performing assets. The relevant processes are both internal (how the business is run) and external (choice of external providers and how these providers are used).

7.3.2 Mortgage insurers

Mortgage insurers perform a number of distinct functions. They primarily act as a risk-sharer with the lender, but they also as a sort of quasi-rating agency for on-balance sheet credit risk, providing the rigour and due diligence that a rating agency demands when assessing the creditworthiness of the borrower. Furthermore, they also act as process consultants, highlighting weaknesses and potential solutions in the mortgage lending process. As mortgage specialists, they clearly have considerable expertise and large amounts of experience in the high-risk mortgage sector in which they specialise, bringing three distinct benefits:

- **Credit enhancement:** lenders use the insurer as a way of mitigating credit exposure, through single-contract policies, pool or bulk insurance. This ensures that the insurer – who is better-placed in relation to cyclical risk than the lender – shares the loss on the portfolio, or takes the first loss on specific high LTV assets. This allows lenders access to risk profiles that they might otherwise have been unable to provide for.
- **Process enhancement:** As already discussed, the insurer can provide process rigour to lenders which will result in lower underwriting losses (loss avoidance) and may result in lower operational risks, lower operational costs and again, access to more borrowers.
- **Capital enhancement:** Single-jurisdiction lenders can take advantage of the mortgage insurer's capital diversification to broaden their capital bases and obtain capital efficiency benefits without the capital markets' costs for the higher risk tranches.

However, while the benefits of mortgage insurance are considerable, there are also barriers to take-up. Many lenders currently have low-margin mortgage products and do not want to make the economics 'worse' by paying away margin, even if this merely reflects the true products' true economics. Larger and more sophisticated lenders can achieve most (but not all) of the benefits of the credit enhancement process themselves. They have the specialist skills needed to underwrite asset risk and feel able to bear underwriting risk. This leaves them looking at the capital enhancement issue.

Mortgage insurance plays its greatest role in two places. The first is where the banking system is relatively unsophisticated and/or there are many lower-rated banks. In this instance, mortgage insurers have a strong value proposition that will enhance the mortgage lending process from both credit management and funding diversification perspectives. Credit enhancement is less of an issue for higher-rated lenders in these less sophisticated countries, (especially as under Basel II they are likely to have a greater appetite for risk), but the access to funding diversification is still very important.

The second place is in more developed economies where there is an established industry and bank or bond ratings are AA or better in much of the market. In this case the justification is likely to be a mixture of regulation and economics. In some instances, regulation results in credit rationing, and mortgage insurance provides the flexibility to provide products into that rationed space – typically it is the high-LTV lending space, but the details of the exact restrictions vary by market. It is at this point that mortgage insurance has its strongest value proposition, particularly given the potential demand highlighted during this study. For example, in Germany there is a need for credit enhancement products. This is likely to become even more of an issue when the Landesbanken issue an anticipated €300 BN of covered bonds to cover their shortfall from the withdrawal of state guarantees.

As a result, we see that in the medium term there is both a regulatory and economic rationale behind the business of the mortgage insurers; where mortgage insurers help banks lend beyond regulatory limits, they do so by absorbing risk themselves and ensuring that the overall mortgage system is robust and therefore safer from loss. They also provide specialist risk mitigation to lenders who would otherwise be constrained by capital or process restraints.

From the regulators' perspective, the mortgage insurers can provide rigour in the system and diversification of risk and funding, both of which enable a more secure mortgage market. This should give them comfort as the industry uses mortgage insurance to move down the risk curve.

Mortgage insurance has a big role to play in the medium term from a theoretical perspective. The issue in practice is whether lenders see the insurers as offering a big enough advantage. Certainly in developed markets such as Germany and the UK, insurance will have to compete with lenders' beliefs that the credit risk can be safely retained 'in-house'.

If regulators want to see the system benefits that mortgage insurance provides, they will need to encourage its use. It is hard to see them serving anything other than a niche market without significant regulatory changes.

Insurers have much to offer in less developed markets, where market customs, regulation and lenders are less entrenched, and it may well be that more of an opportunity lies in these markets.

7.3.3 Capital markets

Most investors, and the capital markets in general, are not mortgage experts. Investors are looking to maximise their yield from any given investment; market intermediaries are also looking to maximise their economics. However, they do demand a level of due diligence and look to rating agencies and other institutions to ascertain a level of risk and reward for their investments. Moreover, it is fair to

say that while regulators have different agendas, they are broadly driven by investor or consumer protection, not the desire to improve market execution. Lenders must therefore pay attention to trends in the market place and attempt to craft their risk and funding strategies to mesh with investor demand.

This study is not the place to second-guess what investors and the markets may or may not want from mortgage assets, but what is critical is the fact that they are a fast growing asset class. Retail deposits are a declining source of liabilities at many institutions and there will be a greater need for the capital markets to both take on risk and to provide funding. As a result, the needs of the market need to be considered closely by lenders when assessing strategy.

7.3.4 Regulators

Regulators have a number of challenges ahead of them. Basel II constitutes a big change in the structure of regulation, and the challenge for regulators is whether they fully take on board the risk-based regulation concept. The risks inherent in the mortgage system are increasingly well understood and controlled – many of the rules that are set down are designed to manage this systemic exposure and provide a framework for the lenders to focus on interest rate, origination, asset quality and so forth. However, regulations do create barriers to lenders, making products and profiles unattractive from a business perspective. Regulators need to increasingly focus on lowering barriers to lending across the risk spectrum, given that Basel II will shift to a risk-based capital regulation regime.

Regulators will continue to have a very active role to play within the European mortgage industry. We do not think that a pan-European set of mortgage credit regulations is likely in the medium term, but we do think that national regulators will attempt to work more closely as the mortgage markets in the developed economies begin to converge.

There are a number of specific changes that we feel would benefit the market and enable lenders to access some of the market potential we have outlined. Moreover, we feel that they also have a role to play in promoting alternative, off-balance sheet credit risk mitigation such as mortgage insurance. Lenders, and other players who wish to succeed in the medium term, will need to work closely with the regulators to shape the market and ensure that they are well placed to exploit it. We address some of these specific changes in the next section.

8 Policy issues

8.1 Elements of a development strategy

We wish to formulate an appropriate policy strategy to address the challenge of expanding the European mortgage market, whether under Scenario 2 (in a more limited way) or even under Scenario 3 (in a comprehensive way). This requires a thorough understanding of the interaction between the policy agenda that consists, on the one hand, of direct interventions and (indirect) regulations of the private sector; and on the other, the economic goals of mortgage market efficiency, sufficient market scale (i.e. access and affordability) and market stability.

8.2 Direct public intervention

The European mortgage market at the outset of 2005 is characterised by certain major policy constraints that reflect lessons learned from excessive and indiscriminate public interventions made in the past. Such interventions were extremely popular in the post-war era and covered the entire spectrum of direct lending, public guarantees and mortgage and rent subsidies, competing directly with private suppliers. However, both the declining fiscal room for manoeuvre and the increasing level of legal constraints imposed at EU level have considerably reduced the opportunities for direct public intervention into the European mortgage markets.

Our analysis shows that the strong use of direct public intervention is likely to leave significant gaps in those segments of the mortgage market that are of interest for a development strategy, as well as producing significant fiscal costs. A large part of this is due to policy inconsistency, in particular the fact that a direct intervention 'go' was frequently combined with a regulatory 'stop'. For example, public lending in Germany reduced mortgage market rates for the average mortgagor; however, marginal mortgagors, for instance those requiring high-LTV loans, remained crowded out by strict financial regulations until very recently.

In France, by contrast, public-private partnership (e.g. by the insurance agency FGAS) produced reasonable results in attracting marginal mortgagors to the market. The key issue in France was the slow legal reform process and high levels of consumer protection that led to process and product inefficiencies. In particular, low-income mortgagors in France are de facto forced to turn to public-private insurance rather than simply pledging their property as collateral. This socialisation of surety cost tends to produce perverse incentives and is not very efficient.

While public interventions continue on a larger scale in a number of jurisdictions, the implementation of existing EU rules (such as Article 87 of the EU Treaty defining the conditions for state aid) should lead in time to greater or even exclusive provision by the private sector. Public-private partnership models may continue to serve useful purposes, but will need to be aimed at specific target groups and meet certain cost-benefit requirements. This is therefore likely to impact any untargeted public interventions, such as the public guaranty funds in Sweden and the Netherlands and public lending in Germany and Spain. As the European mortgage market has demonstrated (especially during the interest rate convergence process

of the 1990s), greater private sector involvement is consistent with social goals, in particular improved access to credit and affordability. On a market basis, specific groups can be served by specialist intermediaries or investors (through risk-based pricing) or by self-help through mutuals. Where applicable, e.g. because risk-based prices are too high, governments can support affordability for well-defined target groups through a variety of non-distortive mechanisms, such as grants.

8.3 Regulation of the private sector

Because of the constraints on direct interventions, regulation of the private sector has become the single key strategic variable for European mortgage market development.

We have seen that such regulations are behind all of the elements of the mortgage value chain, particularly in relation to the way in which lenders are able to manage risk and fund their mortgage books and therefore expand the market.

Relevant regulations for developing that potential can be found in various areas, including the legal quality of the mortgage, consumer protection, and competition rules. However, the impact of financial regulation is perhaps the strongest. An excellent example of this is the largest potential market segment, the high LTV (or Low equity) market.

The inconsistent financial regulation framework of the high LTV market

High LTV markets are perhaps more sensitive to financial regulation than any other mortgage sector. As a result, mortgage insurers that specialise in this segment of the general mortgage market depend in a mathematically leveraged fashion on other market participants' regulatory requirements. Moreover, they are usually themselves subject to strict regulation and thus are something of a high cost business anyway. As a result, the feasibility of mortgage insurance as a business hinges on equivalent regulatory standards imposed on competitors in their market segment; for example, on banks undertaking self-insurance of high LTV loan portions or on governments providing second mortgages.

Taking the bank example further, we can see that mortgage insurers are highly rated and therefore required to hold regulatory capital sufficient to cover the worst business cycle (both house price and credit) from their premium reserve holdings. In contrast, banks doing self-insurance are not, even under Basel II. This means that mortgage insurers are overcapitalised from a short-term investor perspective in times of low levels of guarantee calls. Closing down the insurer and using the capital elsewhere would be a profitable option, if there were no opposition from long-term investors.

In order to reduce this vulnerability to short-termism, mortgage insurance in many jurisdictions is explicitly required or needed by banks to obtain regulatory benefit in high-risk market segments. In economic terms, the higher supply costs imposed by regulation are counterbalanced by

quantitative restrictions imposed on banks. In other words, competition becomes limited. A classical example is the Canadian National Banking Act, which requires all loans over 75% loan-to-value ratio to carry mortgage insurance. Many other countries, including Australia and the U.S., have similar (although usually less stringent) regulations.

Regulators need to recognise the diversification value brought by mortgage insurers. The creation of a level playing field will require an adjustment to the regulatory part of the mortgage insurance supply costs to bring it into line with the regulatory portion of the supply costs of self-insurance. This requires major fine-tuning work, and essentially implies an identical regulatory treatment of insurers and banks. Despite current attempts to introduce such convergence – and here the keyword is Solvency II, the equivalent of Basel II in the insurance industry – the regulatory reality is still quite distinct. To date, most European countries have pretty distinct regulations (with the exception of Spain, where recent financial regulation reform has introduced incentives for banks to use insurers in the high LTV market).

Similar arguments can be made about the other market segments discussed in the study, in particular the Stretched and Elderly segments, which are blocked in many jurisdictions by financial regulations.

8.4 Current European policy debate

The current regulatory reform debate on the EU level is not specifically focused on development issues. Instead, its focus is to remove obstacles to financial integration, especially cross-border lending. This is evident from the goals pursued by the EU FSAP agenda, which largely deal with broadening the ambit of the internal market in financial services while seeing the deepening of the market as a subsequent step; and also the Commission's Forum Group on mortgages¹⁴, set up early in 2003.

The EU's discussion of mortgage-sector reform focuses on four areas:

- **Collateral quality:** The goal here is the improvement of the creation, (cross-border) transfer and accessibility and execution of mortgage collateral according to deficiencies identified in various jurisdictions. The impact of collateral quality levels on market development can be considerable, since lenders tend to ration credit if collateral is not good, or is costly to realise. In particular, this affects the market for the Stretched and Elderly borrowers, who have little besides their properties to secure credit.

There is a consensus among stakeholder groups in this area. Mortgage collateral is now widely seen as superior (or at least strongly complementary) to alternative guaranty schemes, such as the French caution.

- **Consumer protection:** There is a certain degree of agreement on this at the EU level as to the relevance of common standards for consumer information (similar to the USA, which passed the Truth in Lending Act in the 1980s). It is still a matter for debate, however, as to whether a certain level of product standardisation would be conducive to making lenders offer their products

across borders. Here, lenders advocate a 'maximin' strategy, in other words a full (maximum) harmonisation at the minimum common regulation level, in order to allow the maximum number of products to continue to be produced within the regulatory framework. Consumer groups, in contrast, advocate a 'minimax' strategy, or a minimum harmonisation that allows national regulators to impose 'stricter' rules to a level above the EU requirement.

From the developmental perspective taken in this study, the maximin strategy is by far the preferable approach. Existing national consumer protection regulations continue to limit product choice excessively, especially in the sub-prime market. Examples include over-restrictive usury ceilings, borrower-counselling requirements with legal liability for the lender and age limits (with regard to amortisation). Furthermore, predatory lending or 'redlining' rules are coming to the fore in some countries and probably will need to be balanced.

- **Competition policy:** This is linked primarily to the EU's desire to limit the role of government in the market. Political engineering of banking champions, for example, has made cross-border takeovers and the effective use of excess capital extremely difficult in the past. Political fault lines here are found less between consumers and lenders than between the private and public sectors.

It seems fair to be cautiously optimistic that competition rules will make a positive impact on market penetration and development, at least as far as arguments made around Article 87 of the EU Treaty and the restrictions imposed on public interventions by the EMU and the Stability Pact are concerned. However, takeover rules remain hotly contested, and as a result the implicit barriers to entry may continue to prevail for the foreseeable future. In that regard, enabling cross-border lending and insurance service provision becomes even more pivotal, in order to allow takeover of market shares as a weaker substitute for the actual takeover of institutions.

- **Capital markets:** This is the area with the highest incidence of cross-border activity, and the area of actively EU-level discussion that is likely to have the most significant future impact on market development. Formal agreement mostly centres on market standards (e.g. the Prospectus Directive or capital standards), rather than on the products themselves. However, this is not critical, since almost every EU country now has both of the main mortgage-backed instruments in place (i.e. covered bonds and mortgage-backed securities), and most have formulated domestic legal minimum standards.

One problem for market development along the lines discussed in this report is that a greater emphasis on capital markets, and in particular on covered bonds, initially implies some form of asset standardisation for the sake of liquidity. In Europe, this is exacerbated by the fact that issuers are fragmented (more than 70, according to the last EMF count) and, in the case of covered bonds, pool different forms of collateral. Reform of standards here could particularly benefit the high LTV market, but this is unlikely to be achieved at the EU level any time soon.

As positive as these developments are, two key areas need addressing at the European level to achieve greater access to mortgage credit for all borrower segments. These now need to be put at the heart of the discussion:

- First, there is no formal EU jurisdiction when addressing housing sector subsidies and regulations. This leads to the paradoxical situation where the convergence of standards defines the central relative price of the mortgage

¹⁴ See Mortgage Market Forum Group results published on the Commission's website (DG Markt) on 12 December 2004

market (the interest rate), but not of the housing market (the rent). Rent controls and rent subsidies are still pervasive in many European jurisdictions and distort the potential for the mortgage market. For example, practically the entirety of the German market potential, identified in Scenario 3, depends on the progress of rent subsidy reform, which is painfully slow due to the fact that the average voter is a rental tenant. By contrast, the Spanish legacy rent controls could lead to excessive growth in the mortgage market, which may come at the expense of stability since it reaches into groups that, based on their risk-based interest rate, should probably remain rental tenants in an undistorted market. Addressing the legacy problems of the European housing sector clearly remains high on the agenda for mortgage sector development.

- Second, the constraints imposed by financial regulation and discussed in the preceding analysis are, if anything, only indirectly addressed by the current EU reform debate. While many stakeholders (the European Roundtable on Financial Services and large banks and insurers amongst others) advocate a single European regulator, there remains considerable national opposition to this proposal. The main fear is that idiosyncratic national financial service providers or products would disappear if such an institution were created. Moreover, the problem of ‘negative seignorage’, i.e. the distribution of the fiscal costs of bailing out an insolvent European financial institution put into bankruptcy by a pan-European regulator, would have to be addressed, most likely along similar lines to the rules adopted for the European Central Bank. However, any harmonisation of financial regulation under the current decentralised institutional structure seems no more than a remote possibility.

It remains our belief that larger volumes of cross-border lending, which are at the heart of the Forum Group discussions, will help to expand the product menu and realise the market’s potential, given the strong historical product differences between European countries. However, at the same time we believe that the process of inducing cross-border lending, which has, to date, been discouragingly slow, continues to remain fraught with risk and is on a long time scale. As a result, action by the EC will need to be supplemented by specific domestic financial regulation policies to ensure that the full market development potential can be achieved.

8.5 Specific domestic financial regulation policies proposed

We believe there are three main areas of policy that could be addressed:

- LTV restrictions
- Covered bond and RMBS legislation
- Specific credit enhancement

8.5.1 LTV restrictions

The largest opportunity for the mortgage market lies with low equity lending, which is precisely the segment that is disenfranchised by the current array of European LTV regulations. Governments have attempted to minimise credit risk exposure by imposing these limits on lending, but all that has actually happened is that borrowers have used alternative ‘top-up’ sources of finance to purchase their houses, particularly given the climate of rising house prices across much of Europe for the past decade. This top-up funding is often unsecured, and as a result can be

very difficult or expensive to access; it could have a very detrimental impact were the property markets to collapse.

Basel II sweeps away much of the need for prudential limits, as it moves the lending system to an internal assessment approach and places the onus on the lenders. Lenders will need to respond sensibly and be transparent about their mortgage risks rather than being tempted to hide 'top-up' loans at the higher-risk end. There may be an argument, however, for imposing LTV restrictions up to a certain level (and 80% seems to be a sensible place to set that level) for plain-vanilla lending, allowing lending beyond that level provided that suitable cover for that risk is in place. The regulators would need to work with lenders and specialist providers to enable this (perhaps in conjunction with Basel II preparations). 'Baking in' credit enhancement beyond a suitable LTV limit would ease both funding and risk management restrictions.

8.5.2 Covered bond and RMBS legislation

The German *Pfandbriefe* law is a prime example of regulators imposing a fairly arbitrary cut-off point for the issue of covered bonds that is incommensurate with the risks inherent in the underlying assets. AAA-rated funding is possible for much higher levels of exposure than the current 60% cut off point.

Again, regulators could expand covered bond legislation to enable funding for higher LTV levels, assuming a level of risk cover and capital diversification for those bonds was in place. Specialists such as mortgage insurers would be well placed to provide that cover.

8.5.3 Specific credit enhancement

This comes back to our point earlier of 'baking in' credit enhancement into the mortgage process. The regulators could work with the mortgage insurers and other credit enhancement specialists to ensure that lending at the higher risk levels was not only possible but also well-regulated and securely managed.

9 Conclusion

We have seen that the mortgage-lending sector is a critical part of the European economy. The health of that sector is therefore of great importance. Institutions at all points in the value chain need to understand the risks inherent in the business and how they can best manage those risks.

There are huge differences in the mortgage markets across the 12 countries examined in this study, and as a result it is difficult to draw wide-ranging conclusions. Nonetheless, as we have seen, there are a number of factors on both the demand and the supply side that are common to all geographies and which will shape the future of those mortgage markets. Risk mitigation and funding are the core components of any mortgage business, and understanding both the dynamics of borrower risk and the supplier economics required to meet that risk is very important to success.

This study has shown that there is large market potential out there, particularly in the more risky segments of demand. The current market serves low LTV prime customers well, but higher-risk borrowers are often left out due to a mixture of regulation, product availability, risk appetite and funding challenges.

We believe that this demand can be tapped, and that there are existing business models that are well placed to capture it. The key issue that needs to be addressed by all is: is there sufficient belief in the robustness of the mortgage markets to generate the appetite for meeting that demand?

In practice, we believe that mortgages will increasingly be funded by the capital markets and where this is the case, the capital markets will look to high-quality names to provide credibility to the offering. For large highly-rated banks that may be possible on a stand-alone basis, but for lower-rated banks, there will likely be a need to rely on third parties, such as mortgage insurers, to enhance credit risks down the risk spectrum.

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