

Housing Finance Review: analysis and proposals

March 2008



HM TREASURY



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CONTENTS

	Page
Executive Summary	3
Chapter 1	11
Homeownership and housing finance in the UK: key challenges	
Chapter 2	21
Secondary market finance	
Chapter 3	35
Long-term fixed-rate mortgages	
Chapter 4	49
Innovations in the UK mortgage market	
Chapter 5	57
Summary of policy proposals	
Annex A	59
Models of housing finance systems	
Annex B	69
Assessment of swaptions proposal	
Annex C	81
The conduct of the review	
Glossary	85
Bibliography	89

EXECUTIVE SUMMARY

E.1 The Government believes that everyone should have access to a decent home at a price they can afford in communities where they want to live and work. Since 1997, there has been good progress towards this objective, with increasing housing supply, investment in social housing, and a stable macroeconomic environment, leading to 1.8 million more homeowners in the UK.

E.2 There are a number of ways in which people can have access to housing, and in the recent Housing Green Paper the Government set out measures to address all aspects of housing, including social housing, private rental and homeownership.¹ This review focuses on the challenges of housing finance for homeowners and people wanting to become homeowners. The cost of a home is one of the largest financial commitments that people make throughout their lifetime. It is therefore vital that housing finance is widely available, affordable and allows borrowers to manage their financial risks appropriately.

E.3 Although homeownership brings many benefits, taking on a mortgage exposes individuals to risks. Risks include, for example, that house prices decline, interest rates increase or a member of the household becomes unemployed or experiences a decline in income. Financial institutions that supply mortgage finance are also exposed to risk, and these risks can spill over to the wider economy, as has been seen in the recent disruption in financial markets which was triggered by concerns about the US sub-prime mortgage market.

E.4 The Government and the Financial Services Authority (FSA) have done much in recent years to improve the way mortgage markets work for borrowers and mortgage lenders. There are still, however, challenges in the UK mortgage market. Given its centrality to housing affordability, the financial sector and the wider economy, the Chancellor in July 2007 announced that the Treasury would undertake a review of housing finance. The terms of reference of the review included an assessment of:

- the supply of and demand for financial instruments to allow the risks of mortgage prepayments to be hedged efficiently. This included an up to date assessment of whether the UK Debt Management Office (DMO) could use 'swaptions' to manage better the Government's debt portfolio;
- the residential asset-backed securities market, and assessing whether there are remaining obstacles or inefficiencies preventing further improvement in liquidity allowing securitisation to become a greater source of housing finance; and
- the recent financial innovations aimed at re-packaging housing and funding related risks which tend to be aimed at consumers on higher incomes, and assessing whether there may be important obstacles that prevent these opportunities from becoming more widely available.

E.5 The Housing Finance Review has not looked specifically at the retail mortgage market, which was addressed by the 2004 Miles Review and is regulated by the FSA.² The current liquidity challenges in secondary markets are best addressed by the private

¹ *Homes for the future: more affordable, more sustainable*, Communities and Local Government, 2007.

² *The UK Mortgage Market: Taking a Longer-Term View, Final Report*, D.Miles, 2004.

sector. However, the proposals set out here are designed to work with and encourage market-led initiatives to address these challenges. The Government's proposals also address the longer-term challenge of encouraging the availability of affordable and flexible mortgage products which help borrowers manage better the risks associated with housing finance.³

THE UK HOUSING FINANCE SYSTEM

- Competitive market** **E.6** Chapter 1 highlights that the UK mortgage market has many strengths. It is very competitive, with hundreds of lenders operating in the market including a wide variety of domestic and international banks, building societies and specialist lenders, supported by one of the largest intermediary markets in Europe. A 2003 Mercer Oliver Wyman report on competition in European mortgage markets found that the UK market was one of the least concentrated and most diverse in Europe.⁴ More recently, the trend towards regular refinancing of mortgages by borrowers is another indication of competition.
- Finance widely available** **E.7** In the UK, mortgage finance is generally available for a wide range of borrowers. A large number of products have been developed to meet borrowers' circumstances, including those with limited equity, credit-impaired borrowers, those who wish to take out Sharia'a-compliant products, the self-employed and borrowers required to self-certify their income. This means that more people can enjoy the benefits of homeownership, and the UK now has homeownership rates higher than in the US, Japan, France and Germany.
- Challenges** **E.8** The review has identified two key challenges for the UK mortgage market:
- the recent and ongoing disruption in global financial markets has raised issues about the functioning of the secondary funding markets, in particular the transparency and liquidity of the mortgage-backed securities markets, which can have important consequences for UK mortgage borrowers; and
 - although there has been an increase recently in short-term fixed-rate mortgages, it remains the case that few homeowners are purchasing fixed-rate mortgages of ten or more years – even though some borrowers might be expected to benefit from long-term protection from interest rate rises.
- E.9** This is a period of considerable uncertainty in financial markets. Many of the key challenges raised in the review have wide-ranging implications for the mortgage markets and industry. A number of the key proposals in this document therefore should be seen as the start of a process which requires further work to develop longer-term solutions.

ADDRESSING CHALLENGES IN SECONDARY FUNDING MARKETS

E.10 Chapter 2 details how secondary markets funding (or securitisation) have been a source of housing finance for at least three decades around the world. Securitisation is the process of originating or purchasing mortgages and other assets, and then

³ "Long-term fixed-rate mortgages" is used in this document to refer to mortgages with interest rates fixed for 10 years or more.

⁴ *Study on the Financial Integration of European mortgage markets*, Mercer Oliver Wyman, 2003.

packaging and reselling them to investors and other banks. This releases capital for funding other investments and, depending on how the securitisation is structured, can distribute some or all of the associated credit risk to investors. In the UK in 2006, secondary markets funding accounted for 31 per cent of mortgage lending, with the remainder being funded from retail deposits.⁵

E.11 UK lenders access secondary funding markets mainly by issuing two types of financial product to investors:

- residential mortgage-backed securities (RMBS): where lenders package together a pool of mortgages and transfer them to a special purpose vehicle from which claims are sold to investors. The securities can be sold in tranches allowing investors with varying appetites for credit risk to purchase different seniority of claims on the pool of mortgages; and
- covered bonds: securities that are backed by a pool of mortgage assets, but with certain features to ensure that they are very high quality. In particular, the investor has a claim on the pool of assets and the issuer. Covered bonds have been traditionally bought as low risk investments.

E.12 UK secondary market funding to date has been overwhelmingly through RMBS rather than covered bonds, which are relatively new in the UK. In 2007 the outstanding stock of RMBS was £201 billion, compared with a stock of covered bonds of £49bn. This balance contrasts with secondary market funding in the EU. UK RMBS account for 50 per cent and covered bonds account for only 4 per cent of their respective EU markets.

E.13 Secondary funding markets around the world have been significantly affected by the ongoing disruption in financial markets. Lenders in the UK, as elsewhere, have been unable to access secondary funding markets and have been obliged to turn to alternative and potentially more costly funding sources as a result. This has significant implications for borrowers and the housing market. Lenders have responded by tightening lending conditions, increasing mortgage fees and not passing on fully to mortgage borrowers cuts in the Bank Rate or lower swap market interest rates.

E.14 This has highlighted the importance of lenders having access to diverse, liquid and stable sources of funding. While it is too early to say how funding markets might evolve in light of the recent disruption, it is likely that market solutions will be a key element to delivering more resilient financial markets. The Government is working with the financial services industry on market initiatives in both the covered bonds and RMBS markets.

Covered bonds legislation **E.15** On covered bonds, the Government introduced a UK legislative framework which entered into force on 6 March 2008. The new regime provides significant benefits for investors and issuers by reducing the amount of regulatory capital investors are required to hold and allowing UK issuers access to a larger European investor base.

E.16 The covered bonds consultation coincided with the onset of the market disruption and many respondents suggested that the legislation should have a clearer focus on quality, in order to strengthen investor confidence in these types of bonds. **As a result of consultation, the Government has also introduced in the legislation**

⁵ Merrill Lynch estimates provided to the review.

requirements relating to the quality of assets eligible for inclusion in the asset pool. This will help to strengthen investor confidence in the market in the longer-term.

RMBS E.17 In recognition of the importance of the mortgage-backed securities market for housing finance, and the potential consequences of the recent and ongoing disruption in financial markets for wider credit conditions and therefore for households and the broader economy, the Treasury has had discussions with issuers and investors on market-led initiatives to help improve market liquidity. The Government's aim is to encourage industry to develop a gold-standard market which would allow:

- access to finance – providing lenders with renewed access to a continuous source of mortgage finance at the earliest opportunity; and
- a broader investment base – extending the appeal of mortgage-backed securities beyond the existing investor base to help strengthen the market in the longer term.

Working Group E.18 The Government believes that a gold-standard market is best taken forward by the industry as a market initiative. This is the best way of encouraging financial innovation, taking a considered approach incorporating all interests. There is recognition that this should not create detrimental consequences for existing or new mortgage-backed securities issues. There is also a commitment to broaden the current mortgage securities market to become a more robust source of mortgage finance. The Tripartite Authorities (the Treasury, the Bank of England and the FSA) also have a clear role to play at a time of market instability in coordinating and supporting industry-led action.

E.19 The Government is announcing a Working Group that will take forward these ideas. The Working Group will include the mortgage industry and the investment industry, and also the Treasury, the Bank of England and the FSA. The Working Group will report initially to the Chancellor in the summer and present proposals at the next Pre-Budget Report.

REMOVING BARRIERS TO LONG-TERM FIXED-RATE MORTGAGES

E.20 A long-standing feature of the UK market is that most borrowers take out variable-rate or short-term fixed-rate mortgages. Unlike in many other countries, there has been very little mortgage debt that is at interest rates fixed for more than a few years. In 2003, the Chancellor asked Professor David Miles to undertake analysis of the supply and demand side factors limiting the development of the fixed-rate mortgage market in the UK, to establish why the share of fixed-rate mortgages is so low compared to many other countries. Chapter 3 of this review focuses in particular on identifying the barriers in secondary markets to lenders offering affordable and flexible long-term fixed-rate mortgages.

E.21 Long-term fixed-rate mortgages can bring benefits to many borrowers by offering protection against interest-rate risk. For some households, particularly those on low incomes, fixing the level of mortgage repayments for several years makes sense by making the cost of borrowing more predictable over the life of the mortgage, and protecting them from unexpected interest rate rises over a long period. Long-term fixed-rate mortgages may also contribute to wider macroeconomic stability by decreasing the risks of defaults should interest rates rise.

E.22 Long-term fixed-rate mortgages will not be suitable for everyone. Depending on personal circumstances, such as the likelihood of income changing in the future or attitudes to risk, some households prefer to take on a variable-rate mortgage. Furthermore, early repayment charges on long-term fixed-rate mortgages may make these mortgages less attractive to UK borrowers.

E.23 There are indications, however, that a greater take-up of long-term fixed-rate mortgages might be expected in the UK market:

- as covered in the Miles Review, economic models suggest that long-term fixed-rate mortgages would be likely to have benefits for some borrowers, for example, those who have a high proportion of their income pre-committed on daily expenses, have a high loan-to-value ratio (for example, first time buyers) or a volatile income stream;
- international comparisons show that many developed countries have a significantly higher proportion of long-term fixed-rate mortgages than the UK, even though people tend to show similar appetites for risk in other financial products; and
- a recent survey published by the Council of Mortgage Lenders suggests that there is a strong potential demand for long-term fixed-rate mortgages compared with actual take-up. When asked what sort of mortgage they would prefer if choosing one now, 18 per cent of all respondents opted for mortgages with a rate fixed for more than five years and 9 per cent for a mortgage with a rate fixed for more than ten years.⁶ As a comparison, actual take-up of mortgages with rates fixed for more than five years was only 3.1 per cent in August 2007.⁷

E.24 A possible reason for the low take-up of long-term fixed-rate mortgages in the UK, as noted by the Miles Review, is that many households may find it difficult to assess properly the risks of mortgage products. It is important that borrowers are able to make informed choices about their mortgages, on the basis of clear information and access to high quality advice. Since 2004, the FSA has been responsible for the regulation of first charge residential mortgages, and with the Government has taken important steps in this direction.

Thoresen Review **E.25** In 2007, the Government asked Otto Thoresen, Chief Executive of AEGON UK, to lead a feasibility study into the provision of generic financial advice. Thoresen presented the findings and recommendations of his review to the Government in March 2008. **The Government welcomed the Thoresen Review's final report and announced that it will launch a £12 million Money Guidance pathfinder project in partnership with the FSA. The Government will provide further detail in its financial capability action plan later in the spring.**

FSA regulation **E.26** The FSA's mortgages regime incorporates many elements of the Miles Review recommendations on advice and disclosure and helps to ensure that borrowers are able to make informed choices about their mortgages. The FSA is undertaking a full review of the effectiveness of its mortgage regulation. The first stage findings published in 2006 suggest that the FSA's regime is working effectively in the prime market and consumers

⁶ Survey by YouGov for the Council of Mortgage Lenders. *Consumer attitudes to long-term fixed-rate mortgages*, Council of Mortgage Lenders, 2007.

⁷ Council of Mortgage Lenders, BankSearch.

are able to understand the risks and features of the mortgages they take out. The FSA will publish findings on the second stage of the review at the end of March 2008.

Early repayment charges **E.27** Low demand for long-term fixed-rate mortgages is likely to be explained by the early repayment charges currently on long-term fixed-rate mortgages. This charge is to cover the cost to the lender should the borrower decide to pay off their long-term fixed-rate mortgage early. This cost comes about because lenders will generally fund a long-term fixed-rate mortgage with long-term fixed-rate funding. This prepayment risk is a crucial reason why lenders in the UK cannot offer flexible long-term fixed-rate mortgages without early repayment charges.

E.28 Under FSA regulation the early repayment charge which lenders are permitted to impose must be a reasonable estimate of the cost resulting from the borrower repaying early. The Government does not prevent or cap charges, which would inhibit firms' willingness to lend products, or lead to higher costs for lenders and higher prices for consumers. Capping the charges may also distort lending behaviour by encouraging cross subsidy between those who repay early and those that do not.

E.29 The Government may, however, be able to work with lenders to help develop means for them to manage this risk better, which will in turn reduce the cost to borrowers. There are two primary ways in which lenders can deal with this risk when offering long-term fixed-rate mortgages, other than through early repayment charges:

- hedge prepayment risk on long-term fixed-rate mortgages by buying derivatives; or
- pass the prepayment risk to investors, who are better able to manage this risk.

E.30 The Miles Review suggested that lenders could buy particular interest rate derivatives which would give them a "call option" against interest rate changes, so that if prepayment occurred when interest rates went down lenders would be hedged against interest rate changes. The Miles Review suggested that there may be a shortage of issuers of such derivatives and that the Government may be a natural writer of these derivatives, and therefore the Debt Management Office should consider issuing these. **The Housing Finance Review has undertaken analysis of the proposal by the Miles Review and concludes that this is not recommended, in particular due to an added exposure to alternative sources of risk and the possibility of significant losses on occasions. See Annex B for a summary of the analysis.**

Prepayment risk information **E.31** A prerequisite for prepayment risk to be successfully managed is for there to be sufficient information on prepayment behaviour. In other countries, such as the US and Denmark, where there are financial securities which pass prepayment risks to investors, there is a well developed public body of information on prepayment behaviour and investors have an incentive to develop a competitive advantage in pricing this risk effectively.

E.32 **The Government will work with industry to investigate whether data on prepayment behaviour can be pooled and published.** At first, this data will necessarily be incomplete and will not in itself prompt a long-term fixed-rate market. However, in time it is expected that investors and lenders will see a benefit in understanding prepayment behaviour better, allowing them to better hedge and price the risk efficiently.

Passing prepayment risk to investors **E.33** These actions will help remove some barriers to long-term fixed-rate mortgages. However, evidence from other countries (for example, the United States or Denmark) suggests that a high prevalence of long-term fixed-rate mortgages which do not have early repayment charges occurs when prepayment risk is passed to a broad base of longer-term investors. See Annex A for a summary of different models of housing finance systems.

E.34 In these countries, there are particular long-term callable securities through which lenders can pass prepayment risk to a broad range of investors. Investors who manage portfolios of bonds can pool these assets with others and diversify away some of this risk, resulting in a lower cost of prepayment for the borrower. To increase investor appetite for callable mortgage-backed securities, however, requires reducing the other various sources of risk in these securities. Those countries which have developed these markets have frameworks – for example, regulation, market-based coordination, or agencies – to minimise other risks, particularly credit risk, in the mortgage-backed bonds.

E.35 It may be that there are elements of the frameworks of these other countries which have affordable and flexible long-term fixed-rate mortgages from which the UK can learn. National mortgage markets, however, are uniquely shaped by the broader institutions in each country, such as property rights, the structure of financial markets and government involvement in housing finance which have developed over many years. Changing elements of the institutional framework to incorporate elements of the frameworks of other housing finance systems could have wide-ranging implications for the UK mortgage market and related financial markets.

E.36 **The Government is inviting views on options for a UK framework to deliver more affordable long-term fixed-rate mortgages, including the lessons to be learned from international markets and institutions. The Government will work with a wide range of stakeholders and experts and will update at the Pre-Budget Report in the light of findings and stakeholders responses.**

INNOVATIVE PRODUCTS

E.37 As financial markets develop, a variety of innovative products may come onto the market that could help households access the housing market and manage some of the risks of homeownership more effectively. Chapter 4 reviews a number of products which could help some borrowers better manage the risks associated with mortgages and homeownership. The products examined include:

- shared equity schemes, which can be an affordable way for households who are unable to purchase a home outright to access homeownership;
- capped rate mortgages, which put an upper limit on the interest rate paid;
- stand-alone interest rate protection, which pays out to a borrower if interest rates rise;
- mortgage payment protection products, which can help borrowers to manage the risk that they are unable to keep up their mortgage repayments as a result of accident, sickness or unemployment;
- index-linked mortgages, which can protect against the risk of inflation changes and can flatten repayment profiles; and

- house price futures, which can enable innovative products such as house price insurance.

E.38 These innovative mortgage products could help some borrowers better manage the financial risks associated with mortgages. However, these products usually involve an extra degree of complexity and will not be suitable for everyone.

E.39 There are several key areas where the Government has, or will, take action to remove barriers to the availability of these products. In particular:

- **On shared equity, the Housing Corporation launched a challenge to the mortgage industry to bring forward new, affordable shared equity products, and two winning schemes have been selected and will be made available to eligible households from 1 April 2008;**
- Interest rate protection products can offer another way for borrowers to manage the risk of interest rate rises. **The Government believes that it is possible for companies to bring stand-alone interest-rate protection products to the market within the existing FSA definition of insurance and be classified as insurance for tax purposes.** The Government will continue to engage with firms seeking to introduce such products to the market going forward; and
- **the Government will work with industry to investigate the possibilities for the development of detailed house price indices to allow the development of insurance on house price movements.**

E.40 The Government stands ready to engage with private sector providers and is willing to discuss ways in which it could help remove any potential barriers to the availability of these products.

HOMEOWNERSHIP AND HOUSING FINANCE IN THE UK: KEY CHALLENGES

1.1 Housing finance is of central importance to housing affordability, financial stability and the wider economy. Given the Government's commitment to delivering affordable housing and the continuing long-term challenges in the UK housing finance market, the Chancellor in July 2007 announced that the Treasury would undertake a review of housing finance to report at Budget 2008.

1.2 This chapter sets the scene for subsequent analysis and policy proposals. It provides an overview of the Government's agenda on homeownership, sets out why housing finance is important to this agenda, outlines strengths of the UK housing finance system and identifies the challenges ahead. The subsequent chapters set out more detail on these challenges and proposals for action to address them.

HOMEOWNERSHIP AND AFFORDABILITY

The benefits of home- ownership

1.3 Different forms of housing will be appropriate for individuals and families at the various stages of their lives and in different circumstances. For example, rented accommodation may be most suitable for those who prefer greater flexibility and mobility, or who do not want to take on the levels of debt which homeownership typically involves. However, homeownership can bring benefits both to the individual and to the wider community and is an aspiration for many households. Homeowners often have greater certainty of tenure and therefore more incentive to improve their home. Homeownership can also add to social cohesion as homeowners have a greater incentive to improve the community and surrounding environment.

1.4 Homeownership can also bring financial benefits to individuals. Housing represents an important asset, which with financial innovation can be used as the collateral to secure loans in order to smooth consumption against variations in income. However, homeownership can also bring financial risks. Households with high levels of mortgage debt relative to their income are exposed to changes in interest payments as well as potential falls in house prices.

1.5 The Government aims to support those households that can sensibly take on the risks and rewards of homeownership, and ensure that alternative tenures offer a good quality housing solution for those who cannot. The recent Housing Green Paper included measures to address all aspects of housing, including social housing, private rental and homeownership.¹

Extending home- ownership

1.6 There has been good progress towards extending homeownership, with increasing housing supply and sustained economic growth and macroeconomic stability helping 1.8 million households to homeownership over the past decade in the UK. However, the Government recognises that affordability is acting as a constraint on extending homeownership to many others. House prices have doubled in real terms over the past decade, making it increasingly difficult for young people and families to buy their own home.²

1.7 Key to delivering the Government's aim of extending homeownership is addressing affordability by increasing the supply of housing to keep pace with rising

¹ *Homes for the future: more affordable, more sustainable*, Communities and Local Government, 2007.

² Mix-adjusted house price, *Housing Statistics 2007*, Communities and Local Government, 2008.

demand from population growth and changes in household structures. Housing demand is expected to remain strong while the number of households is projected to increase by 223,000 a year between now and 2026.³ In 2004, Kate Barker's Review of Housing Supply concluded that a weak supply of housing makes it harder for the least well-off to enter the housing market, bringing the potential for a widening economic and social divide between those able to access market housing and those unable to enter the market.

1.8 The Housing Green Paper and the 2007 Comprehensive Spending Review (CSR) set out the resources and reforms to deliver the Government's target of 240,000 net additional homes per year by 2016, and three million net additional homes by 2020. These include an increase in spending on housing from £8.8 billion in 2007-08 to £10 billion in 2010-11 and reforms to streamline the planning system, bring more land forward for development and better coordinate infrastructure delivery. The Government has made good progress towards its target with net housing supply increasing significantly to its highest level for 20 years.

HOUSING FINANCE IN THE UK

The importance of housing finance

1.9 Most people need to borrow in order to purchase a home. This means that the availability and cost of housing finance is a key factor in enabling homeownership. Lower cost housing finance can make a significant difference to the affordability of housing. Over the total life of a mortgage, interest costs will typically be similar to the initial value of the mortgage loan in nominal terms.⁴ More efficient and lower cost housing finance could particularly benefit low-income households and first-time buyers for whom the costs and risks of mortgage funding are often particularly significant.

Structure of housing finance in the UK

1.10 Housing finance in the UK is provided to borrowers by a variety of institutions, including banks, building societies, housing associations and local authorities. This review focuses on the provision of mortgage finance by the private sector, which provides housing finance to 11.8 million borrowers.⁵

1.11 The landscape of the UK's private sector housing finance has been transformed in recent decades. Regional based building societies previously dominated the mortgage market, but after de-mutualisation and large scale consolidation, major commercial banks now supply two-thirds of all mortgages. The growing importance of mortgage intermediaries in the retail market has contributed to the changing business models of mortgage lenders. In addition, there has been increasing use by lenders of securitisation to package mortgages together and issue financial claims, which are then sold to investors. This has indirectly enabled households to fund their mortgage through the international capital markets.⁶

1.12 Figure 1.1 shows the key structures of private sector housing finance in the UK. In relation to the retail side of the mortgage market, households receive mortgages directly from lenders, or buy through mortgage intermediaries. Currently 60 per cent of products are sold through intermediaries.⁷ Lenders can include banks, which provided

³ Communities and Local Government household projections.

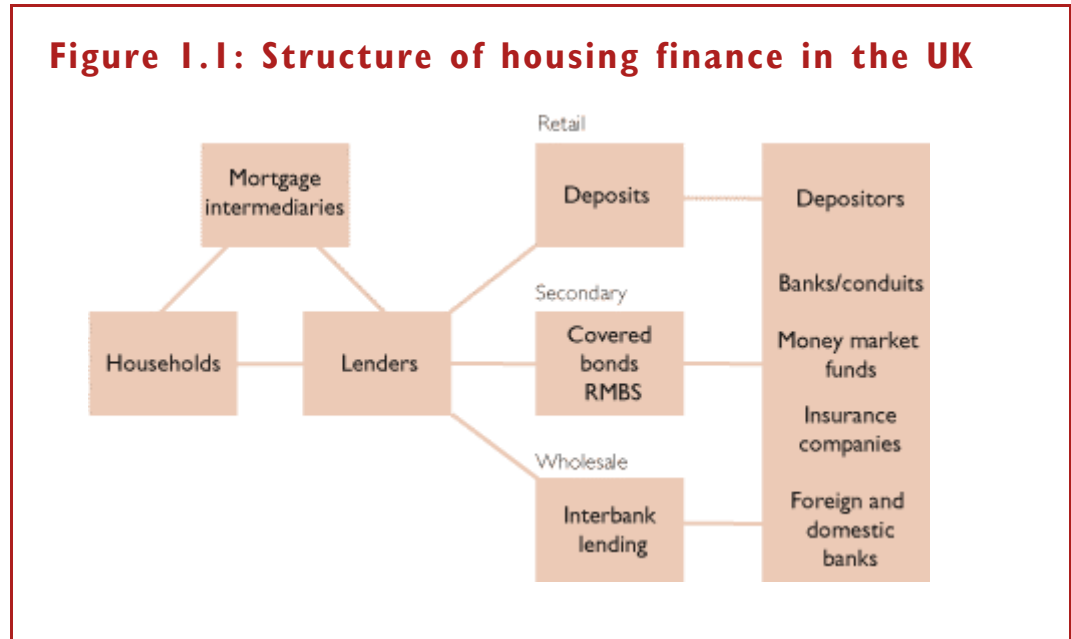
⁴ For example, a £100,000 mortgage paid back over 25 years with a 6 per cent interest rate will mean total repayments are around £195,500 in nominal terms.

⁵ Source: Council of Mortgage Lenders, 2007.

⁶ See *The Housing Finance Revolution*, R.Green and S.Watcher, 2007.

⁷ Source: Intermediary Mortgage Lenders Association (IMLA)

60 per cent of loans in 2007, building societies, which provided 19 per cent and specialist lenders, which provided 21 per cent.⁸ This compares to 1999, when banks provided 67 per cent of loans, building societies 26 per cent and specialist lenders only 7 per cent. UK banks predominantly fund mortgages through retail deposits, although the use of secondary market funding has increased significantly in recent years.



The changing structure of housing finance

1.13 The evolving structure of the UK housing finance system has been driven by technological change, greater domestic competition and the increasing integration and openness of global capital markets. For example, borrowers and intermediaries can now instantly compare thousands of products and secure funding through the internet. This brings benefits to borrowers by increasing competition in the market. Mortgage providers can also benefit by having access to customers nationwide, and can therefore achieve greater diversification of assets without the costs of maintaining a national branch network.

1.14 Competition in mortgage markets has encouraged banks and building societies to use a combination of sources for funding mortgages, in part to diversify their risk. The market share of secondary market funding in the UK has increased from 3 per cent in 1998 to 31 per cent in 2006, some of which comes from overseas markets.⁹ This is happening not just in the UK, but is a global trend, which has led to a lower cost of mortgage finance for borrowers (as institutions use a broader pool of funding) and a wider variety of instruments allowing for greater risk diversification. International regulations such as the Basel I capital adequacy requirements have contributed to an increasingly global housing finance market by giving financial institutions a greater incentive to securitise to free up capital for other uses.

1.15 However, recent events have shown that a significant consequence of the trend towards financing UK mortgages globally is that domestic mortgage market conditions are increasingly influenced by global financial market conditions. As set out in more detail in Chapter 2, the recent disruption in financial markets, triggered by concerns

⁸ Source: Bank of England

⁹ Estimates from Merrill Lynch, provided to the review.

about the US sub-prime mortgage market, has had significant implications for mortgage markets across the world including the UK.

Strengths of the UK market

1.16 The UK mortgage market is very competitive, with hundreds of lenders operating in the market including a wide variety of domestic and international banks, building societies and specialist lenders, supported by one of the largest intermediary markets in Europe.

1.17 The strengths of the UK market have been widely recognised. In 2003, Mercer Oliver Wyman published a study on competition in European mortgage markets.¹⁰ The report found that the UK market was one of the least concentrated and most diverse in Europe. Halifax reported similar findings in 2001, when they found that the UK mortgage market was one of the most competitive in Europe.

1.18 Competition brings benefits for mortgage borrowers including:

- **lower costs for borrowers:** In 2007 Mercer Oliver Wyman updated its analysis to compare the cost of mortgages across Europe 2003-06.¹¹ Overall, it found that mortgage costs fell over this period, with one of the largest declines experienced in the UK. The latest data on representative mortgage rates for Europe show that compared with the UK, the spread over the relevant central bank base rate was higher in European countries with the exception of Spain.¹²
- **more choice:** The UK mortgage market has a wide range of mortgage products and lenders, allowing borrowers to choose a mortgage that best suits their needs.¹³
- **more innovation:** Alongside mainstream mortgage lending, a large number of products have been developed in the UK to meet borrowers' circumstances, including those with limited equity, credit-impaired borrowers, those who wish to take out Sharia'a-compliant products, the self-employed and borrowers required to self-certify their income.

1.19 In terms of delivering outcomes, the UK housing finance system has been successful in enabling a wider range of borrowers to become homeowners. As Chart 1.1 shows, the UK has high levels of homeownership relative to other advanced economies. This has been achieved without undermining labour market flexibility and mobility due in part to the competitive and efficient nature of the UK housing finance market. Studies have found that while enjoying high rates of owner occupation, UK households are more mobile than their European counterparts. Maclennan et al (2000) suggest that low mortgage switching costs in the UK are associated with high levels of regional mobility.¹⁴

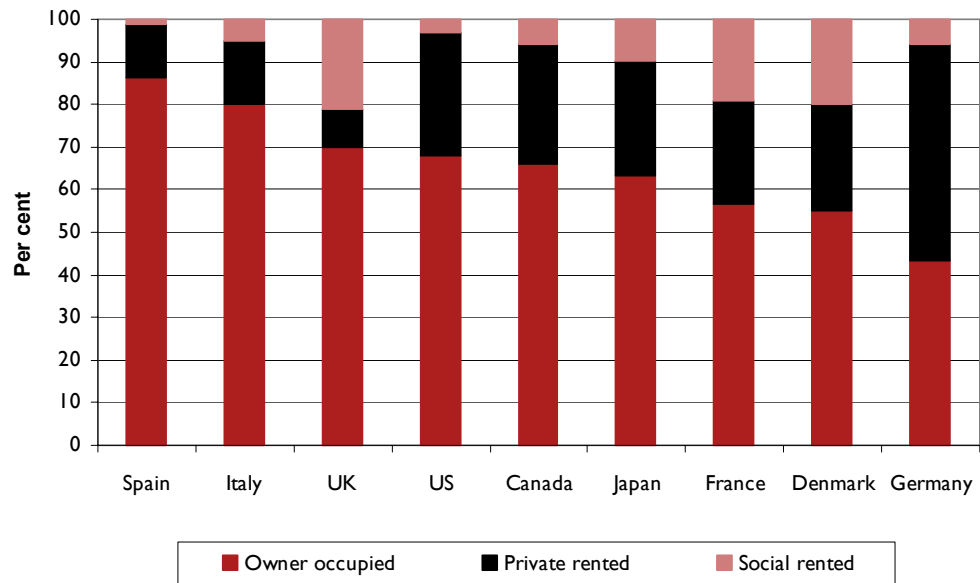
¹⁰ *Study on the Financial Integration of European Mortgage Markets*, Mercer Oliver Wyman, 2003.

¹¹ *European mortgage markets – 2006 adjusted price analysis*, Mercer Oliver Wyman, 2007.

¹² *European Mortgage Federation Quarterly Statistics*, 2007 Q3.

¹³ In 2001, the Halifax found that the UK had over 2,300 mortgage products available from 110 different lenders – significantly more than continental neighbours including Germany, Spain and the Netherlands.

¹⁴ There is discussion on whether high ownership occupation is associated with high unemployment and low mobility, although the evidence and interpretation is conflicting. Oswald (1996) suggests that high unemployment in Western economies has been a result of rising home-ownership, while Munch, Rosholm and Svarer (2006) find evidence to suggest the opposite.

Chart I.1: International comparisons of housing tenure

Source: European Social Housing Observatory at CECODHAS, European Mortgage Federation, Merrill Lynch, US Census Bureau, Communities and Local Government

Note: Latest data available for each country.

Challenges facing the UK housing finance system

1.20 The UK mortgage market is seen as very competitive and provides mortgages to a wide range of individuals. This review has, however, identified two key challenges for the UK system:

- the recent and ongoing disruption in global financial markets has raised issues about the functioning of the secondary funding markets, in particular the transparency and liquidity of the mortgage-backed securities markets, which can have important consequences for UK mortgage borrowers; and
- although there has been an increase recently in short-term fixed-rate mortgages, it remains the case that few homeowners are purchasing fixed mortgages of ten or more years – even though some borrowers might be expected to benefit from long-term protection from interest rate rises.

1.21 The remainder of this chapter outlines these two key challenges and subsequent chapters provide more detail and set out proposals for addressing them.

Secondary funding markets

1.22 Secondary markets funding, or securitisation, have been a source of housing finance for at least three decades around the world. Securitisation is the process of originating or purchasing mortgages and other assets, and then packaging and reselling them to investors and other banks. This releases capital for funding other investments and, depending on how the securitisation is structured, can distribute some or all of the

associated credit risk to investors. In the UK in 2006, secondary markets funding accounted for 31 per cent of mortgage lending, with the remainder being funded from retail deposits.¹⁵

1.23 UK lenders access secondary funding markets mainly by issuing two types of financial product to investors:

- residential mortgage-backed securities (RMBS): where lenders package together a pool of mortgages and transfer them to a special purpose vehicle from which claims are sold to investors. The securities can be sold in tranches allowing investors with varying appetites for credit risk to purchase different seniority of claims on the pool of mortgages; and
- covered bonds: securities that are backed by a pool of mortgage assets, but with certain features to ensure that they are very high quality. In particular, the investor has a claim on the pool of assets and the issuer. Covered bonds have been traditionally bought as low risk investments.

1.24 Secondary funding markets around the world have been significantly affected by the ongoing disruption in financial markets. Lenders in the UK, as elsewhere, have been unable to access secondary funding markets and have been obliged to turn to alternative and potentially more costly funding sources as a result. This has significant implications for borrowers and the housing market. Lenders have responded by tightening lending conditions, increasing mortgage fees and not passing on fully to mortgage borrowers cuts in the Bank Rate or lower swap market interest rates.

Long-term fixed-rate mortgages

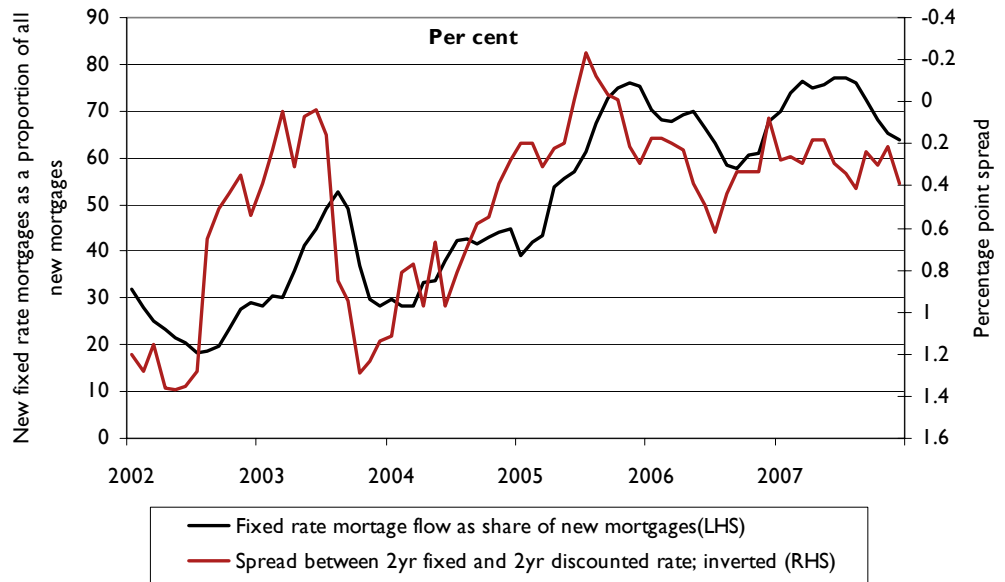
Increase in short-term fixed-rate mortgages

1.25 A key development in the UK housing finance market over the past five years has been an increase in the popularity of short-term, primarily 2-year fixed-rate mortgages. Chart 1.2 shows that fixed-rate mortgages have increased from around 30 per cent of all loans at the beginning of 2004 to 75 per cent by the second quarter of 2007, and despite falling back recently still represent two-thirds of all new mortgages.¹⁶ The primary factor behind the increasing popularity of short-term fixed-rate mortgages has been the decline in the difference between the level of 2-year fixed-rates compared to discounted variable rates.

¹⁵ Merrill Lynch estimates provided to the review.

¹⁶ Note this chart is for fixed-rate mortgages of all terms, but the vast majority are short-term fixes of 2-5 years.

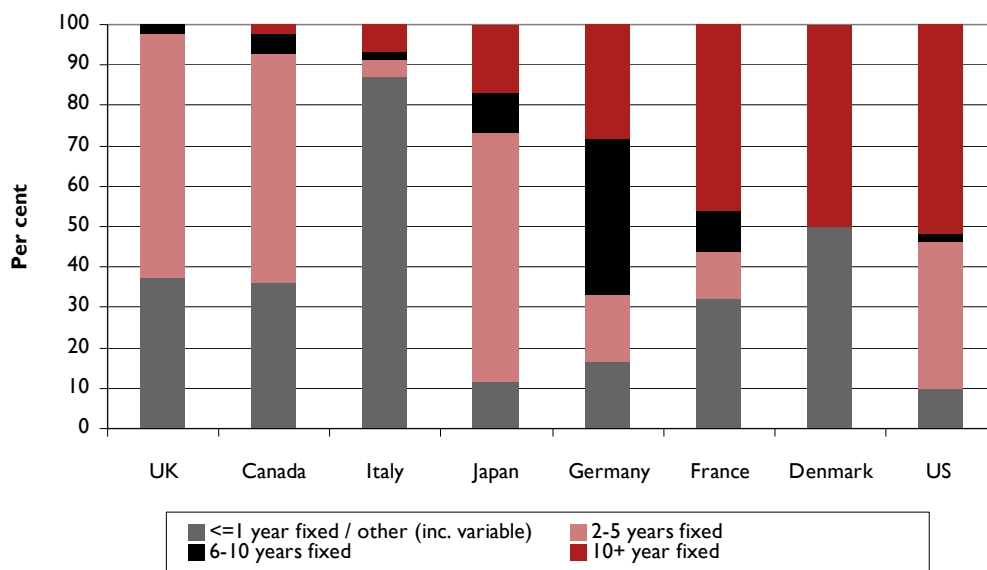
Chart 1.2: Spread between two year fixed-rate and variable-rate vs. share of fixed-rates in flow of mortgages



Source: Bank of England, Council of Mortgage Lenders

Low levels of long-term fixed-rate mortgages

1.26 Despite this recent increase in short-term fixed-rate mortgages, however, the UK has a low percentage of long-term fixed-rate mortgages compared with countries with similar income levels. Chart 1.3 shows the flow of new mortgages for a particular recent year, split by type of interest rate. In the UK there are almost no mortgages originated with the interest rate fixed for more than ten years and a very small proportion fixed for over five, while many other countries have a higher proportion of long-term fixed-rate mortgages. The first ten years are when borrowers are most exposed to risks, as during this time only a limited amount of the initial principal debt will be repaid. Given this, “long-term fixed-rate mortgages” is used in this document to refer to mortgages with interest rates fixed for 10 years or more.

Chart 1.3: Mortgage origination by interest rate type

Source: European Mortgage Federation, CML/Bank Search, Merrill Lynch, HM Treasury calculations, Statistics Canada

Notes: 2007 data for Canada, 2006; UK and US; 2005, Japan, Denmark and Germany; 2004 data for France and Italy. Includes adjustable-rate mortgages (ARMs) where the initial rate is fixed for a defined period. For the UK: data does not split 6-10 years fixed and 10+ year fixed. Therefore assumption made that 10+ year fixed is negligible, given that it is known that less than 1 per cent of the stock of mortgages are 10 year fixed-rates.

1.27 As set out in the Miles Review, longer-term fixed-rate mortgages can bring benefits to many borrowers by offering protection against interest-rate risk. For some households, particularly those on low incomes, fixing the level of mortgage repayments for several years makes sense by making the cost of borrowing more predictable over the life of the mortgage, and protecting them from unexpected interest rate rises over a long period.

1.28 However, many of the long-term fixed-rate mortgages currently available in the UK have charges for early repayment. These compensate lenders for the risk of financial loss in the event of early repayment – known as prepayment risk. This seems to be an important factor in deterring the take-up of these mortgages. As set out in Chapter 3, recent survey evidence suggests that underlying demand for long-term fixed-rate mortgages is constrained by this lack of flexibility.

The Miles Review

1.29 In 2003, Professor David Miles was commissioned to undertake a review to analyse the supply and demand side factors limiting the development of the longer-term fixed-rate mortgage in the UK and to establish why the share of longer-term fixed-rate mortgages is so low compared with other countries.¹⁷ The Miles Review made a number of recommendations with the aim of helping to make markets work better on both the demand and supply side. On the demand side, the review found that consumers found it difficult to understand the risks and features of different products and that the structure of mortgage pricing lacked transparency. On the supply side, the

¹⁷ The UK Mortgage Market: Taking a Longer-Term View, Final Report, D.Miles, 2004.

review found a number of potential barriers to the cost effective funding of longer-term fixed-rate lending. The Government and FSA have taken action to address these issues and a full statement on progress was set out in the 2005 Budget Report.

1.30 The Miles Review also recommended that Government should give further consideration to the potential costs and benefits of Government issuing interest rate derivatives to help mortgage providers to hedge the prepayment risk on long-term fixed-rate mortgages. The Government responded to this in the Debt Management Office Annual Review 2004-05.¹⁸ The response concluded that there was a substantial degree of uncertainty over the net benefits to the Government of issuing such instruments, and that there was insufficient evidence that issuing interest rate options would enhance the Government's ability to minimise the long-term cost and risk of debt. This review reconsiders these conclusions in Chapter 3 and in Annex B, and finds that these still hold.

STRUCTURE OF THE REPORT

1.31 This chapter has discussed why housing finance is central to the Government's objective of extending homeownership. It has considered the structure of housing finance in the UK, finding that it offers a wide range of innovative products at competitive prices. However, it also identifies two key challenges in the market: the current constraints in the secondary funding market and the low take-up of long-term fixed-rate mortgages. Both of these issues are potentially important for the provision of housing finance in the UK. The remainder of the report addresses these issues in more detail:

- **Chapter 2** provides analysis on the impact of financial market disruption on the secondary funding market and sets out proposals to strengthen the covered bond and RMBS markets;
- **Chapter 3** focuses on long-term fixed-rate mortgages, building on the findings of the Miles Review. It sets out a range of possible methods of dealing with prepayment risk and suggests next steps in this area. These include further analysis of the Miles Review recommendation to examine the issuance by the Government of interest rate options;
- **Chapter 4** examines the range of innovative products that could help borrowers and lenders diversify housing risk and so lower the cost of housing finance;
- **Chapter 5** summarises the main proposals of the report;
- two **Annexes** provide supplementary analysis on international housing finance models and analysis responding to the outstanding Miles Review recommendation on the case for the Government issuing swaptions; and
- **Annex C** sets out the conduct of the review and is followed by a **Glossary** of terms.

¹⁸ DMO Annual Review 2004-2005, United Kingdom Debt Management Office, 2005.

Covered bonds and residential mortgage-backed securities (RMBS) have grown in importance as a means by which UK lenders can finance mortgages. These markets have been effectively closed in the UK following the recent financial market disruption. This has led to higher funding costs for mortgage lenders and tightened lending conditions for many borrowers.

Ensuring a continuous flow of secondary market funding is important for housing finance and for the development of the long-term fixed-rate mortgage market. This chapter sets out the steps the Government is taking to help improve liquidity in the secondary funding markets:

- **introducing a UK legislative framework for covered bonds which entered into force on 6 March 2008. The new regime provides significant benefits for investors and issuers by reducing the amount of regulatory capital investors are required to hold and allowing UK issuers access to a larger European investor base; and**
- **announcing a Working Group that will take forward market-led initiatives to improve liquidity in the mortgage-backed securities market. The Working Group will include the mortgage industry and the investment industry, and also the Treasury, the Bank of England and the FSA. The Working Group will report initially to the Chancellor in the summer and present proposals at the next Pre-Budget Report.**

2.1 This chapter focuses on two sources of secondary market funding: covered bonds and residential mortgage-backed securities (RMBS). These markets have grown rapidly over the last decade and have become an important means by which UK lenders can finance mortgages. The evolution of these markets has helped to lower mortgage costs and increase choice for borrowers. In 2006, nearly one third of all UK mortgages were funded through secondary markets.

2.2 The recent and ongoing disruption in global financial markets has, however, led to a sharp contraction in liquidity in the markets for securitised finance. This has meant that these markets have effectively closed to new issuance, leading to higher costs for lenders, with significant implications for UK mortgage borrowers. This has raised issues about the complexity and transparency of secondary market finance, and the degree to which credit risks are transferred from lenders to investors as a result.

2.3 This chapter sets out:

- the benefits and costs of secondary market finance;
- the development of these markets over the past decade;
- an overview of explanations for the recent market turbulence; and
- the steps that the Government and industry are taking to help improve liquidity in the secondary funding markets.

MORTGAGE SECURITISATION

2.4 Two decades ago most UK mortgages were funded by retail deposits, with only a limited amount of secondary or wholesale funding.¹ This has gradually changed as the principles of securitisation – transforming illiquid loans into tradable securities – have been applied to mortgage finance. Securitisation is the process of originating or purchasing mortgages and other assets, and then packaging and reselling them to investors and other banks. This releases capital for funding other investments and, depending on how the securitisation is structured, can distribute some or all of the associated credit risk to investors.

2.5 As discussed in Chapter 1, the UK mortgage market has developed significantly over the last decade, with hundreds of mortgage lenders and the largest intermediary market in Europe. As well as high street banks and building societies, a wide range of non-bank lenders participates in the market. Securitisation has been one of the drivers behind these changes as it has increased funding options beyond establishing a large deposit base.

2.6 Securitisation in its modern form began in the early 1970s, and asset-backed securities constitute one of the largest debt markets in the world. Whereas retail mortgage markets are broadly national in scope, secondary funding markets are global, offering lenders access to investors internationally. While this may offer benefits, as set out below, it also means that developments in one market can spill over into others, as has become evident in recent months. Mortgage securitisation markets around the world, including the UK, have been significantly affected by the recent market turbulence.

Potential advantages of securitisation

2.7 The precise details of each country's securitisation model may differ, reflecting legal and institutional differences as discussed in Annex A. In general, until the recent market turbulence, securitisation was widely seen to offer a number of advantages for lenders:

- **efficient funding:** Lenders can use securitisation to diversify their funding sources. This may allow access to cheaper funding and also some diversification of their funding risks;
- **meeting investor demand:** Issuing institutions have been able to tailor securities to investors' risk appetites through the use of structured products; and
- **better regulatory capital and credit risk management:** Regulatory capital management was an important driver of securitisation. The regulatory capital lenders are required to hold may be reduced for assets where risk has been transferred to third parties.

Concerns raised by market turbulence

2.8 Recent events have raised a number of issues in relation to the operation of securitisation markets. These are discussed in more detail below, in particular:

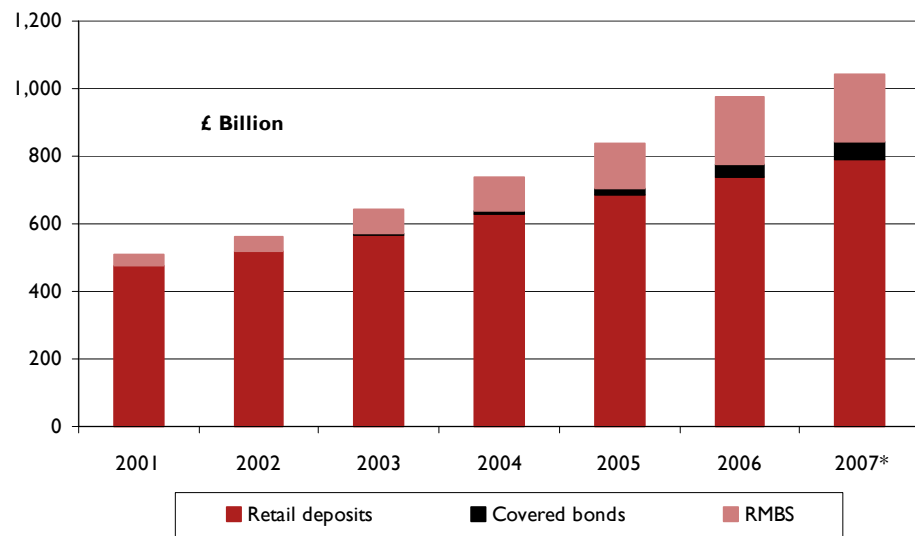
¹ The term 'secondary market' is used here and through this document to denote mortgage-backed securities financing e.g. residential mortgage-backed securities (RMBS) and covered bonds.

- **credit risk.** As credit risk is shared between lenders or issuers and investors, the incentives to monitor appropriately the creditworthiness of the mortgage borrower may be diluted;
- **complexity.** The complexity of some financial structures may make them more difficult to value. Complexity may also limit the extent of the investor base;
- **transparency.** If there is uncertainty about who is ultimately carrying the risks this may leave markets more vulnerable to periodic loss of liquidity; and
- **illiquidity.** Given this vulnerability to illiquidity, if firms become highly dependent on these markets and there is a disturbance, they will need to find alternative sources of finance.

UK mortgage securitisation

2.9 In the UK, retail deposits are the dominant source of mortgage funding, but secondary market funding has become increasingly important, as shown by Chart 2.1.

2.10 As discussed in Chapter 1, the two main ways by which lenders can raise funds in secondary markets in the UK are by issuing covered bonds and RMBS. UK secondary market funding to date has been overwhelmingly through RMBS rather than covered bonds, which are relatively new in the UK. In 2007, the outstanding stock of RMBS was £201 billion, compared with a stock of covered bonds of £49bn. RMBS funded approximately 27 per cent of all UK mortgages and covered bonds accounted for approximately 4 per cent. This balance contrasts with secondary market funding in the EU. UK RMBS account for 50 per cent and covered bonds account for only 4 per cent of their respective EU markets.

Chart 2.1: UK secondary market funding outstanding

* Covered bonds as of end-June 2007

Source: Bank of England, UBS, BIS Quarterly Review September 2007

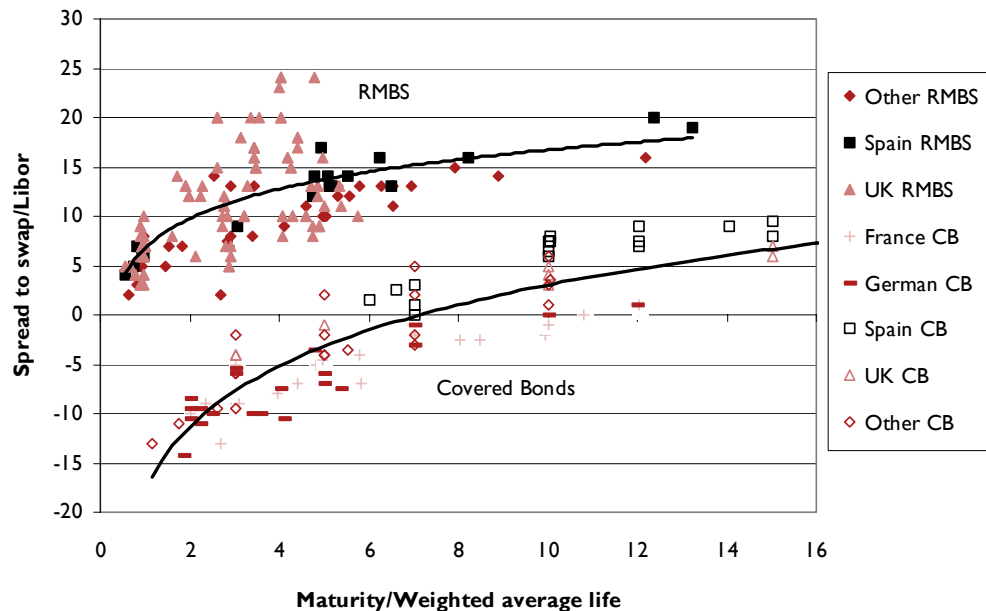
Notes: Covered bond and RMBS data converted to sterling using average euro-sterling spot rate for relevant year.

Credit risk 2.11 While covered bonds and RMBS are both forms of securitisation there are key differences between them relating to the degree to which credit risk is transferred to investors, and how they are traded in secondary markets:

- a covered bond holder has a dual credit claim on both the cover pool of assets and the issuer institution. This means that the issuer bears the credit risk first, protecting the bondholder; whereas
- an RMBS holder typically only has a claim on a special purpose vehicle (SPV), which is remote from the mortgage lender. This means that in the event the loans default, the RMBS holder may bear some of the losses.

2.12 While there are other important differences between these forms of securitisation, discussed below, it is the issue of where credit risk resides that determines the different pricing structures and appeal to different investors, as shown by the different yield curves across European issues in Chart 2.2. RMBS tend to have a higher yield and shorter maturities than covered bonds. By contrast, covered bonds have lower spreads reflecting perceived lower risks and may be traded alongside sovereign bonds. Since the UK has relatively greater reliance on RMBS than covered bonds, this suggests that the maturity of funding may be shorter and the cost of funding may be higher as a result.

Chart 2.2: Yield curve showing issuances between January and June 2007



Source: UBS

2.13 The following sections outline the different structures and markets of covered bonds and RMBS in more detail.

Covered bonds

Covered bonds structures

2.14 A covered bond is a class of bond issued by the credit institution and backed by a pool of assets, generally mortgages or public sector loans. Covered bonds generally have high credit ratings and are perceived by investors as an alternative to government debt. This is because investors have a dual credit claim on the asset pool and the issuer.

2.15 Issuers must top up the asset pool with new loans in the event that existing loans are repaid or if there is deterioration in credit quality. Investors also have the added protection that, in the event of insolvency of the issuer, they have recourse to the asset pool backing the bond and the issuing institution.

2.16 The asset pool is ring-fenced and in the event of insolvency of the issuer, priority will be accorded to bondholders. This may be achieved in different ways:

- one common approach involves the issuer keeping the asset pool on balance sheet but with the pool ring-fenced in the event of the issuer’s insolvency; or
- an alternative approach is the ‘structured’ covered bond, as has been adopted in the UK. Under this model, the issuer lends the sums derived from the sale of the covered bond to a Special Purpose Vehicle (SPV). The SPV uses the loan to purchase a portfolio of assets sufficient to cover the claims of bondholders. If the issuer becomes insolvent the asset pool is available to pay the claims of bondholders.

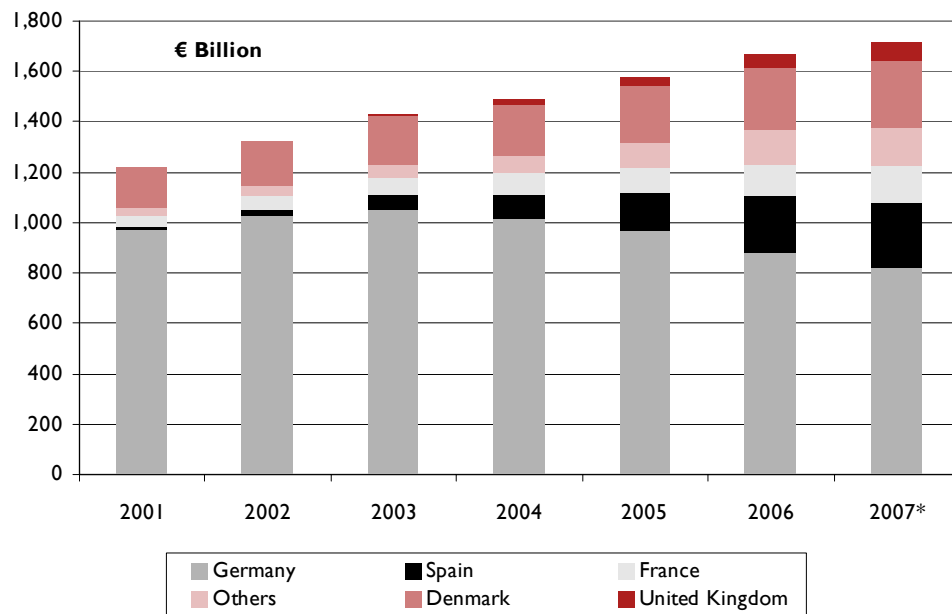
2.17 Covered bonds are issued in a number of countries to assist the funding of longer-term fixed-rate mortgages and other longer-term assets. By minimising the credit risk passed to investors, European issuers have been able to issue longer-term fixed-rate bonds with a range of maturities between two and 15 years. As a result, they appeal to a wide investor base, including banks and asset managers as well as mutuals and pension funds.

2.18 The Miles Review suggested that the growth of the UK covered bond market could help lenders to match longer-term assets with longer-term liabilities, thereby facilitating a longer-term fixed-rate mortgage market in the UK.²

UK covered bond market

2.19 The UK covered bond market is relatively new, with the first UK covered bonds having been issued in 2003. The market has grown in recent years, but remains small by European standards, as shown in Chart 2.3.

Chart 2.3: European covered bond balances outstanding



* As of end-June 2007.

Sources: Realkreditrådet; BIS Quarterly Review September 2007

2.20 Covered bonds that comply with criteria established by EU Directives benefit from preferential regulatory treatment, making them more attractive for investors to hold and therefore lenders to issue. Several European countries with large covered bond markets already benefit from compliance with this EU legislation. In the UK, as set out later in this chapter, the Government has recently taken steps to establish a covered bond regime that allows UK issued covered bonds to compete on a level playing field with the EU market.

² The UK Mortgage Market: Taking a Longer-Term View, Final Report, D.Miles, 2004, p.76.

Residential mortgage-backed securities (RMBS)

2.21 RMBS differ from covered bonds in the way that they are structured and the extent to which credit risk is held by investors. RMBS are issued by an SPV, which is remote from the mortgage lender. This separation is important for lenders, as they are able to reduce regulatory capital costs as a result. It also has significant implications for investors as they are not exposed to the credit risk of the mortgage originator and, in the event that the loans default, they have no recourse to the originator.

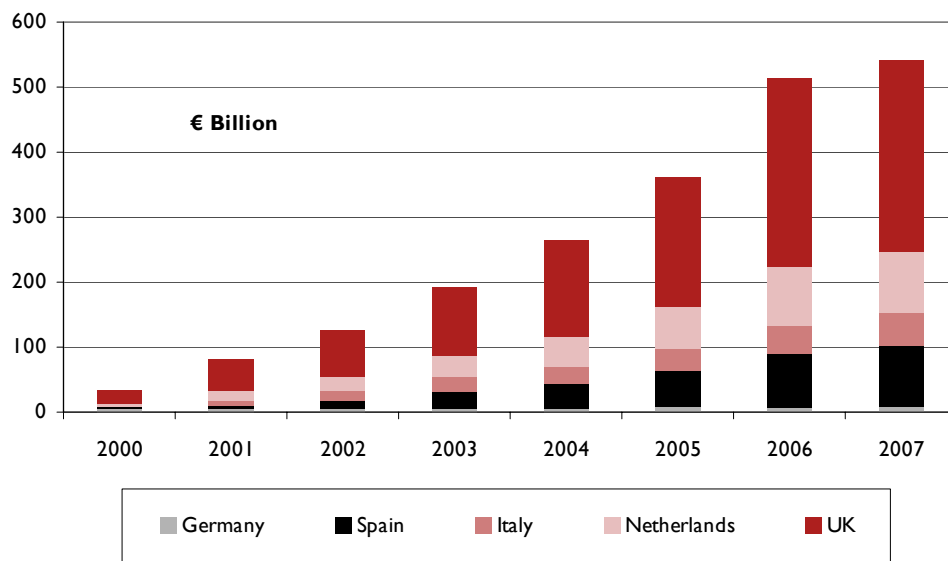
2.22 Greater credit risk is therefore transferred from lender to investor. Lenders may separate or reduce credit risks for investors by separating the securities into different tranches, bearing different risk profiles. A cash reserve can also be built into the structure. If any loans in the cover pool default, the reserve will absorb the first losses, followed by the most subordinated securities. Complex payment structures, known as waterfall payments, determine how RMBS payments are prioritised, so that there is sufficient cash flow to meet the claims of different investors in order of seniority.

Pass-through structure **2.23** There are several different structures for RMBS transactions. The simplest model is the pass-through structure. Under this model, a lender sells a pool of mortgages to an SPV, which purchases the mortgages by issuing securities to investors. These securities are redeemed by the cash flows that are generated by the mortgage pools. This is described as a pass-through structure because the securities will be redeemed as the borrower pays back the loan. One of the disadvantages of this model is that investors do not have certainty about when the securities will mature.

Master trust structure **2.24** A second, more complex structure is the master trust model, which was first used by credit card issuers in the US in the late 1980s. The first master trust for mortgages in the UK was established in 2000. A key feature of the master trust model is that new loans may be sold to a master trust to replace redeemed loans or to cover new issuances, subject to certain criteria. Unlike pass through securities, the benefit of this model is that it enables the master trust to issue securities with different maturities, matching different investor preferences. This benefit may also lead to added complexity, as the size and composition of the master trust asset pool will change over time.

2.25 Currently, master trusts are the standard vehicle for securitising mortgages in the UK. There are master trusts that are designed to securitise purely prime mortgages, buy-to-let, or non-conforming mortgages, or a combination of these different types of loans. Each master trust will have its own defined criteria to determine an eligible mortgage loan.

CDOs **2.26** Recent years have also seen a rapid growth of other, increasingly complex product structures, of which collateralised debt obligations (CDOs) are common examples. CDOs are securities backed by a portfolio of fixed-income assets that are issued in tranches of varying seniority. As default losses accrue to the underlying portfolio they are applied to the securities in order of seniority.

Chart 2.4: European RMBS balances outstanding

Source: UBS

2.27 Unlike other European countries, UK lenders have relied on RMBS rather than covered bonds for secondary market funding. UK RMBS account for approximately one half of European RMBS, as shown in Chart 2.4.

2.28 RMBS attract a global investor base, and are structured and traded in a range of different currencies. The investor base is concentrated and made up primarily of banks, structured investment vehicles (SIVs) and asset managers.³ Longer-term investors, such as pension and mutual funds, and retail investors, do not tend to invest in RMBS. One reason for this may be that RMBS are typically shorter to mid-term securities, ranging from two to five year maturities. This may also reflect credit risk.

RECENT EVENTS

2.29 As set out in Chapter B of Budget 2008, global financial markets have experienced a period of severe disruption since July 2007, triggered by concerns in the US sub-prime mortgage market and spreading swiftly across countries and markets. Credit markets have suffered from reduced liquidity and some of the world's largest banks have announced significant losses. These developments have posed significant domestic and international challenges to policymakers.⁴ Box 2.1 describes the implications of these developments for markets for mortgage-backed securities and covered bonds.

³ Estimates from Deutsche Bank and Merrill Lynch

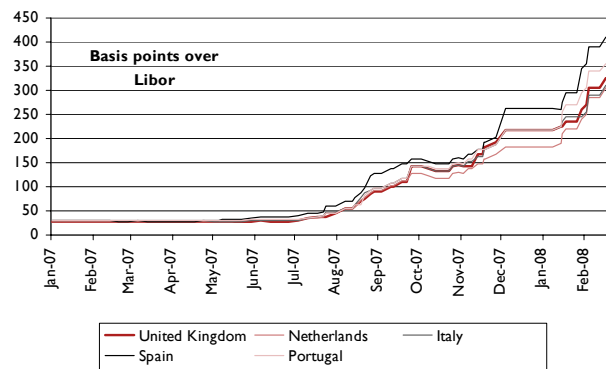
⁴ The Government's response to these challenges is discussed in *Financial stability and depositor protection: strengthening the framework*, HM Treasury, Bank of England and FSA, 2008, Chapter 2.

Box 2.1: Recent developments in global financial markets

Recent months have seen a period of severe disruption in global financial markets. Mortgage securitisation markets have been particularly badly disrupted. There has been a sharp contraction of liquidity, particularly for more complex structured products, which has created difficulties in valuing RMBS and other products. UK RMBS and covered bond markets are effectively closed to new issuance at present, and offered at large spreads over LIBOR as shown in Charts a and b below.

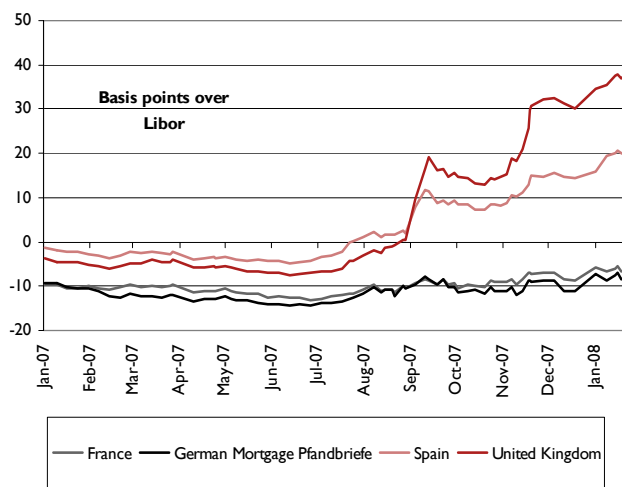
Banks have been forced to fund growing stocks of assets that they had not expected to retain on their balance sheets. The reduction of liquidity has also affected conduits and structured investment vehicles (SIVs). These were set up to purchase RMBS and other assets from their sponsor bank or other banks, and fund this by issuing short-maturity asset-backed commercial paper or other securities. This has forced some banks to support their sponsored conduits and SIVs, and in some cases to take these vehicles' assets back on balance sheet, adding to pressures on banks' funding.

Chart a: RMBS spreads



Notes: A-rated five-year spreads over Libor except for Spain which uses 10-year spreads over Libor. Source: Lehman Brothers

Chart b: Covered bonds spreads



Source: Deutsche Bank

2.30 The recent market disruption in financial markets has affected lenders across the UK, including Northern Rock, as set out in Box 2.2 below.

Box 2.2: Northern Rock

As explained in this chapter, residential mortgage-backed securities are common financing vehicles used across the banking sector. One of the highest profile users of these was Northern Rock. Northern Rock's securitisation vehicle – the group of companies collectively known as Granite – was set up in 1999 for the purpose of providing a source of funding to Northern Rock.

Northern Rock's business model was highly dependent on generating funding through this securitisation vehicle. Its interim results showed that at 30 June 2007 securitised notes amounted to 43.6 per cent of total funding, and its securitised loan book grew by £14 billion in the 12 months to 30 June 2007. It was therefore particularly affected by the closure of the RMBS markets last summer, which was a key factor in why Northern Rock approached the Bank of England for emergency liquidity assistance. The Government has been taking steps necessary to achieve its objectives of protecting depositors and taxpayers, and promoting financial stability. On 22 February the Government brought Northern Rock into a period of temporary public ownership.

2.31 The disruption in financial markets has important implications for UK housing finance. Lenders in the UK, as elsewhere, have been unable to access secondary funding markets for securitisation and have been obliged to turn to alternative and potentially more costly funding sources as a result. Lenders have responded by tightening lending conditions, increasing mortgage fees, reducing higher-risk lending, and not passing on fully the cuts in the Bank Rate since December 2007 or lower swap market interest rates.

2.32 The recent market turbulence has raised a number of issues about the way that these markets function, and whether this can be improved so that, in turn, households are less exposed to the consequences of market disruptions. Areas of particular concern focus on:

- **credit risk.** Securitisation may reduce the incentives for those originating the loans to assess and monitor ongoing credit quality. There may be a long chain of participants between the originator of the mortgages underlying RMBS and the end investor, which serves to reduce the information available to investors about the quality of the underlying loans. This may also mean that the market is more vulnerable to a general reduction in investor confidence;
- **complexity.** The securities used to repackage and sell mortgages and other loans are often complex and frequently trade in illiquid markets, if traded at all. This makes these products difficult to value, and can result in originators and end investors relying on complex models, rather than market signals, to value them. This may also limit the investor base and hence liquidity in the market;
- **transparency.** Some commentators argue that there is a lack of uniformity and transparency for investors, and that recent events may draw investors

towards simpler securitisation structures.⁵ A recent survey suggests that simpler structures could be an attractive development for investors;⁶ and

- **illiquidity.** These markets may be vulnerable to periodic illiquidity. If firms become highly dependent on these markets and there is a disturbance, they will need to find alternative sources of finance.

International and European initiatives

2.33 The Treasury, the Financial Services Authority (FSA) and the Bank of England are working together and with their counterparts across the world to understand the causes of the ongoing market disruption, with a focus on the markets for structured products. The G7 has asked the Financial Stability Forum (FSF) to analyse the underlying causes of the ongoing market turbulence and recommend appropriate responses. As a key global marketplace the EU also has a strong role to play. The Economic and Financial Affairs Council (Ecofin) has endorsed a programme of work on the issues raised by market turbulence. Both work programmes include considering measures to increase the transparency of securitisation markets, amongst other things.

2.34 At the European level, the European Securitisation Forum (ESF) has led market initiatives to improve the transparency of information provided to investors. In 2006, the ESF published *Securitisation Market Practice Guidelines*, setting out best practice standards for providing information about mortgage pools in aggregate pre and post-issuance.⁷ The ESF has also recently undertaken a project to standardise loan-by-loan information provided to RMBS investors.⁸ These initiatives have been widely welcomed in Europe.

Capital Requirements Directive

2.35 Recent changes to regulation may also affect the future development of the RMBS market. The 1988 Basel Accord established minimum amounts of capital that banks would be required to hold against different assets, including mortgages. Basel II requirements came into effect under the Capital Requirements Directive (CRD) at the beginning of 2007. The CRD refines banks capital requirements so that they are more sensitive to risks. The effect may be to reduce the amount of capital that lenders are required to hold against mortgage lending, and therefore reduce lenders' incentives to securitise in order to reduce their capital costs.

SECURITISATION: NEXT STEPS

2.36 The current lack of liquidity in secondary markets has important consequences for UK mortgage borrowers and is occurring at a time of increased uncertainty concerning economic prospects in the UK and globally. In the Government's view, it is important that lenders continue to have access to diverse, liquid and stable sources of funding, helping to spread funding risks across a wide investor base, and drive down costs for borrowers. While it is too early to say how funding markets may develop in light of recent events, market solutions will be a key element to delivering more resilient financial markets.

2.37 The next section sets out the steps the Government is taking, in partnership with the industry, to strengthen the covered bonds and RMBS markets, in order to enable

⁵ See for example Professor Willem Buiter's description of complexity of securitised structures to the Treasury Select Committee, *Financial Stability and Transparency*, Treasury Committee Sixth Report, 2008.

⁶ *European ABS Outlook Survey*, JP Morgan, 2008.

⁷ *Securitisation Market Practice Guidelines*, European Securitisation Forum, 2006.

⁸ *ESF Standardised Loan by Loan Data File for UK Non-Conforming RMBS*, European Securitisation Forum, 2007.

access to robust and liquid secondary market funding at the earliest opportunity, and to help facilitate the provision of UK housing finance over the longer term.

UK covered bonds: next steps

2.38 The lack of specific covered bonds legislation in the UK has been recognised as a potential obstacle to the development of the market, reducing the extent to which European investment funds may invest in UK issued covered bonds.

2.39 The Government has taken action to address this issue. In 2007, the Treasury and FSA consulted on a UK legislative framework to allow UK issued covered bonds to benefit from the advantages of compliance with the Undertakings for Collective Investment in Transferable Securities (UCITS) Directive. **The new regime entered into force on 6 March 2008.**

2.40 The new regime provides significant benefits for investor and issuers. UCITS-compliant covered bonds benefit from higher prudential investment limits, increasing their attractiveness to investors. UCITS can invest up to 25 per cent (rather than 5 per cent) of their assets in the compliant covered bonds of one issuer. The new regime will therefore allow UK issuers access to the larger investor base of the European covered bond market.

2.41 UCITS-compliant covered bonds also benefit from a preferential credit risk weighting under the Banking Consolidation Directive (BCD). The new regime will reduce the amount of regulatory capital that regulated firms are required to hold, helping to make them more attractive and facilitating further the growth of the covered bond market.

2.42 The Treasury and FSA's consultation in 2007 coincided with recent market turbulence, and the responses were informed by these events. Many respondents suggested that the legislation should have a clearer focus on credit quality. **As a result, the Government has also introduced in the legislation requirements relating to the quality of assets eligible for inclusion in the asset pool, which will help to strengthen investor confidence in the market in the longer-term.**

UK RMBS: next steps

2.43 In recognition of the importance of the RMBS market for housing finance, and the potential consequences of disruption in securitised finance markets for credit conditions and therefore for households and the broader economy, the Government has had discussions with issuers and investors on steps to help improve market liquidity. The Government's aim with any initiative is to develop a gold-standard market which would allow:

- **access to finance** – providing lenders access to the RMBS market to finance mortgages at the earliest opportunity; and
- **a broader investment base** – extending the appeal of RMBS beyond the existing investor base could help to strengthen the RMBS market in the longer term.

2.44 The Government believes that a gold-standard market is best taken forward by the banking industry as a market initiative. This is the best way of encouraging financial innovation, taking a considered approach incorporating all interests. There is recognition that this should not create detrimental consequences for existing or new

RMBS issues. There is also a commitment to broaden the current mortgage securities market to become a robust source of mortgage finance. The Tripartite Authorities (the Treasury, the Bank of England and the FSA) also have a clear role to play at a time of market instability in coordinating and supporting industry-led action.

2.45 The Government is announcing a Working Group that will take forward these ideas. The Working Group will include the mortgage industry and the investment industry, and also the Treasury, the Bank of England and the FSA.

2.46 The Working Group's terms of reference are to:

- consider market initiatives to improve the mortgage-backed securities market as stable source of mortgage finance over the medium and longer term. These may include measures aimed at broadening the investor base for mortgage-backed securities and improving the robustness of the market.
- consider specifically:
 - the appropriateness of documentation and reporting requirements;
 - the suitability of existing issuance structures; and
 - full and regular disclosure of the quality of the underlying assets.
- take into account any potential adverse impact on existing mortgage-backed securities;
- assess all proposals in terms of their benefits, costs and risks and ensure they are consistent with the authorities' broader objectives of macroeconomic and financial stability and prudent financial management.
- report initially to the Chancellor in the summer and present proposals at the next Pre-Budget Report.

The UK has a low proportion of long-term fixed-rate mortgages. This chapter reviews the arguments for why a higher take-up of these mortgages might be expected, explores why this has not come about, and outlines options for addressing the barriers to this.

Long-term fixed-rate mortgages might be appropriate for some borrowers to help protect them against changes in interest rates. However, UK long-term fixed-rate mortgages are less flexible for borrowers than is the case in other countries. This is because it is difficult for lenders to manage the risk that borrowers repay early, and therefore lenders put early repayment charges on these mortgages to cover this cost.

The Miles Review investigated the reasons for the low proportion of long-term fixed-rate mortgages. As set out in Budget 2005, the Government and the Financial Services Authority have already taken action on many of his recommendations.

The Miles Review recommended that the Government could issue interest rate derivatives to help lenders hedge their interest rate risk. The review has looked further at this option and does not recommend it, as it would be likely to increase the risks associated with Government debt management.

Evidence from other countries suggests that long-term fixed-rate mortgages without early repayment charges are possible when interest rate risk can be passed through to investors. To assist with this:

- the Government will work with industry to investigate whether data on prepayment behaviour can be pooled and published, which could benefit lenders, investors and ultimately borrowers; and
- the Government is inviting views on options for a UK framework to deliver more affordable long-term fixed-rate mortgages, including the lessons to be learned from international markets and institutions. The Government will work with a wide range of stakeholders and experts and will update at the Pre-Budget Report in the light of findings and stakeholders responses.

3.1 A striking feature of the UK mortgage market is the virtual absence of long-term fixed-rate mortgages.¹ This was one of the findings of the EMU study on housing and consumption that the Government carried out in 2003 to inform the assessment of the case for the UK to join the Economic and Monetary Union (EMU).² Following the EMU study, the Chancellor asked Professor David Miles to investigate the reasons for the lack of a long-term fixed-rate mortgage market in the UK. The Miles Review recommendations addressed issues of demand from consumers and supply by lenders which might be affecting the take-up of long-term fixed-rate mortgages in the UK, giving particular attention to aspects of the retail market. Building on the Miles Review, this review focuses in particular on identifying the barriers to lenders offering affordable and flexible long-term fixed-rate mortgages.

¹ Through this document, “long-term fixed-rate mortgage” refers to mortgages with the interest rate fixed for 10 or more years.

² *Housing, consumption and EMU - EMU Study*, HM Treasury, 2003.

3.2 The low prevalence of long-term fixed-rate mortgages in the UK contrasts with that seen in other countries. Long-term fixed-rate mortgages might be expected to be attractive for some households as a way of better managing the risks of mortgage payments (although borrowers could lose out if interest rates fell and the mortgage did not have the flexibility to allow them to re-mortgage). Given the potential benefits which affordable and flexible long-term fixed-rate mortgages can offer to some borrowers, the Government is committed to removing the barriers that hold back their availability. The Chancellor re-emphasised this in his speech of 6 February 2008:

“[We] want to see greater availability of affordable long-term fixed-rate mortgages. For many households, particularly those on low incomes, fixing the level of mortgage repayments for several years makes real sense; and it can also contribute to wider macroeconomic stability.”³

3.3 This chapter focuses on a key barrier to the availability of affordable and flexible long-term fixed-rate mortgages: the cost to lenders of the interest rate risk associated with these mortgages. Many of these issues were raised in the Miles Review, and some of the Miles Review’s recommendations are revisited here for further analysis. The following sections set out:

- some potential advantages of long-term fixed-rate mortgages for borrowers and why economic theory and survey research would suggest greater take-up were availability increased;
- the interest rate risk for lenders on long-term fixed-rate mortgages should borrowers seek to repay their mortgage early, and the ways in which lenders compensate for this risk by charging borrowers early repayment charges;
- ways to help borrowers better understand interest rate risk, including a summary of Financial Services Authority (FSA) work in this area;
- lenders’ options for hedging risk through interest rate derivatives, and in particular, whether the Government could issue swaptions to help lenders better hedge their risks, as recommended in the Miles Review; and
- the barriers to the development of financial structures in the UK which can facilitate the passing of interest rate risk to investors.

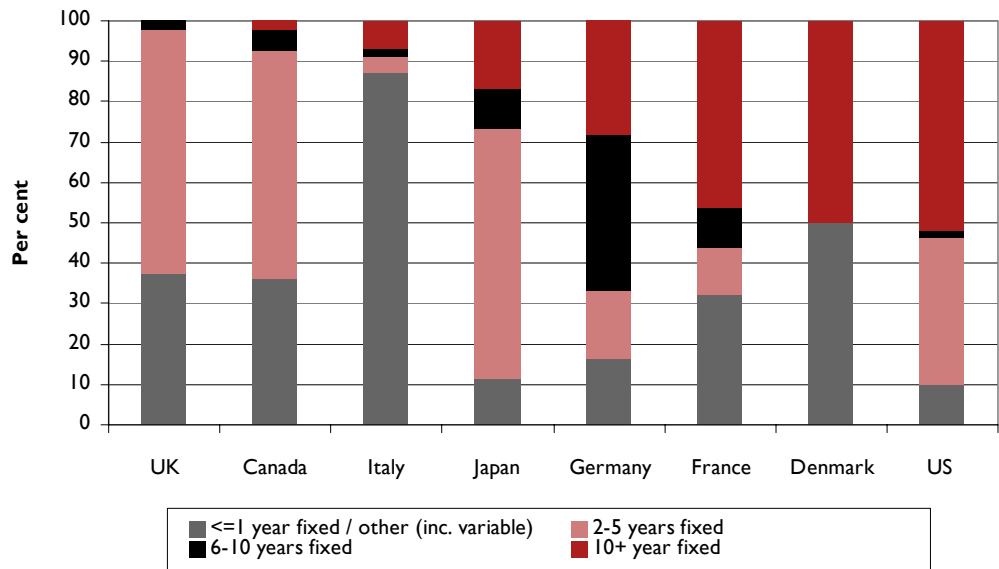
POTENTIAL ADVANTAGES OF LONG-TERM FIXED-RATE MORTGAGES

3.4 The UK has a low percentage of long-term fixed-rate mortgages compared with countries of similar income levels. Chart 3.1 shows the flow of new mortgages in the most recent years available, broken down by type of interest rate. Whereas in the UK, where there are almost no mortgages originated with an interest rate fixed for more than ten years, such products represent the majority of new mortgages in the US (52 per cent) and Denmark (50 per cent), and significant percentages in France (46 per cent), Germany (28 per cent) and Japan (35 per cent). The flow of mortgages in a particular year is clearly dependent on time-varying factors, such as the relative spreads between fixed-rate and variable-rate mortgages, which is influenced by the swap rate and as such, is only a proxy for the overall stock. While there is insufficient data to provide an international comparison of the stock of mortgages by interest rate type, the data on

³ Speech by the Chancellor of the Exchequer, the Rt Hon Alistair Darling MP, 6 February 2008, www.hm-treasury.gov.uk/newsroom_and_speeches/press/2008/press_12_08.cfm

flows suggest that the UK has a low proportion of mortgages that are long-term fixed-rate compared with other countries.⁴

Chart 3.1: Mortgage origination by interest rate type



Source: European Mortgage Federation, CML/Bank Search, Merrill Lynch, HM Treasury calculations, Statistics Canada

Notes: 2007 data for Canada, 2006; UK and US; 2005, Japan, Denmark and Germany; 2004 data for France and Italy. Includes adjustable-rate mortgages (ARMs) where the initial rate is fixed for a defined period. For the UK: data does not split 6-10 years fixed and 10+ year fixed. Therefore assumption made that 10+ year fixed is negligible, given that it is known that less than 1 per cent of the stock of mortgages are 10 year fixed-rates.

3.5 Long-term fixed-rate mortgages are not likely to be suitable for everyone. Depending on personal circumstances, such as the likelihood of income changing in the future or attitudes towards risk, a variable-rate mortgage may be more suitable for some people. Furthermore, as discussed in later sections, early repayment charges on long-term fixed-rate mortgages currently make these mortgages less attractive to many UK borrowers.

3.6 There is an economic case, however, for why long-term fixed-rate mortgages are preferred by some borrowers in some circumstances, explaining the prevalence in some other countries. This is discussed in detail in the Miles Review Interim and Final reports and is briefly summarised here.⁵ The choice between a variable or long-term fixed-rate mortgage will depend on a number of factors, including their attitude towards risk, whether they face or are likely to face borrowing constraints in the future and a range of macroeconomic risks.⁶ In certain circumstances a long-term fixed-rate mortgage which allows borrowers flexibility to re-mortgage (although at the cost of a higher rate to

⁴ Data on the flow of mortgages in 1999 presented in the Miles Review Interim Report and data on the flow in 2002 presented in the EMU housing and consumption study demonstrate similar patterns.

⁵ This review follows the Miles Review in assuming that it is not plausible that UK households have very different attitudes towards risk than households in the US, Germany or Denmark, all of which have a majority of long-term fixed-rate mortgages. *The UK Mortgage Market: Taking a Long-Term View - Interim Report*, D.Miles, 2003.

⁶ *Household Risk Management and Optimal Mortgage Choice*, J.Campbell and J.Cocco, 2003.

account for the cost of the prepayment option) is preferable to a variable-rate mortgage. Economic research and findings on this are summarised in Box 3.1.

Box 3.1: Long-term fixed-rate mortgages: Some recent research

Campbell and Cocco (2003) consider the choice in the US between a fixed-rate mortgage and an adjustable rate mortgage (defined as a 2-year fixed-rate). Both contracts are in nominal or money terms. They set-up an intertemporal consumer optimisation problem with income, interest rate house price risk and borrowing constraints. While highly stylised, the model provides insights into how different types of households, in different circumstances will prefer either fixed or adjustable rate mortgages.

In a textbook financial world, all households should prefer an adjustable rate mortgage as real interest payments will be constant – any increase in nominal interest rates is offset by a corresponding rise in inflation. In this stylised world, households also face no borrowing constraints, so if nominal interest rates increase pushing up short-term mortgage payments consumers can always borrow on the basis of the now higher income tomorrow.

In the real world, real interest rates are not always constant and the presence of borrowing constraints mean that households could face difficulties if nominal rates increase sharply. For these reasons, a fixed-rate mortgage may be preferred. However, while a fixed-rate mortgage can provide insurance against movements in nominal interest rates, it also exposes the borrower to inflation being lower than expected and therefore facing higher real interest rates. As set out by Campbell (2006), the relative benefit of adjustable rate mortgages to fixed-rate mortgages depends on the balance between inflation and real interest rate risk. If inflation risk is low relative to real interest rate risk, fixed-rate mortgages will tend to be preferred to adjustable-rate mortgages.

Household characteristics are also important. As seen above, a household facing significant borrowing constraints will, other things equal, tend to prefer a fixed-rate mortgage over an adjustable rate mortgage. In addition, Campbell and Cocco find that that households with a larger mortgage relative to income, less stable income, higher risk aversion, less lenient treatment if declared bankrupt and a lower probability of moving should be the households that find fixed-rate mortgages more attractive.

This work highlights how different types of household will prefer different mortgage contracts. It is clear that for some households, a adjustable-rate mortgage will be the favoured option, but for others, a long-term fixed-rate mortgage will be the more suitable choice.

3.7 Those who are most likely to benefit from affordable long-term fixed-rate mortgages often have characteristics which are commonly associated with first-time buyers, for example, lower incomes and savings. If long-term fixed-rate mortgages can reduce some risks, this may mean that more households are able to access the housing market. That long-term fixed-rate mortgages can help borrowers manage their risk was recognised by the charity Shelter, which supports investigation into how a market can be developed for these mortgages and other products to limit mortgage rate risks.⁷

3.8 Another mortgage risk for homeowners is the cost of re-arranging a fixed-rate mortgage contract. Those households who are more inclined to move will be less inclined to take a fixed-rate mortgage contract when there are higher costs of refinancing the mortgage. Some short-term fixed-rate mortgages are portable (that is,

⁷ Policy Briefing: Mortgages and Repossession, Shelter, 2008.

transferable to a new property), but in some countries (including the US) long-term fixed-rate mortgages involve substantial re-negotiation costs. Long-term fixed-rate mortgages that are portable and those that offer borrowers options to prepay their mortgage (repay before the end of the fixed-interest rate term expires), are likely to be more desirable to borrowers that expect to move or need to refinance their mortgage. This is particularly important to ensure continued labour mobility and flexibility, building on a strength of the UK economy.

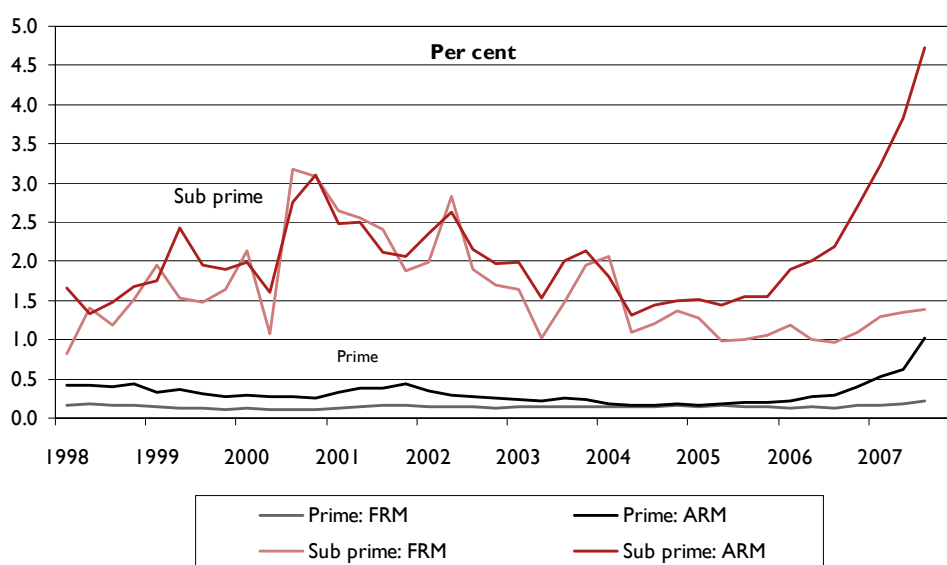
3.9 As well as benefiting some households by enabling greater certainty about mortgage payments, flexible long-term fixed-rate mortgages may also promote greater macroeconomic and financial stability. If households have mortgages that better suit their needs, then the economy should be more resilient to shocks as they will find it easier to make gradual adjustments.

3.10 The recent experience of US delinquency rates is suggestive of some of the benefits of having protection from interest rate rises. Chart 3.2 shows the delinquency rates for both prime and sub-prime borrowers on adjustable and fixed-rate mortgages over the last decade.⁸ There are marked differences in delinquency rates for those on adjustable-rate mortgages, as would be expected given the sensitivity to interest rates. This could of course reflect other factors, such as the fact that those who choose fixed-rate contracts might have more secure jobs, or different levels of education, or in households with more than one income stream. Furthermore, with US adjustable-rate mortgages even the subsequent floating rate period can be subject to caps on the mortgage rates. The difference in delinquency rates for those with prime mortgages (who are known to have good credit records) has however been increasing since 2006, when there was a rise in interest rates.⁹

⁸ Adjustable-rate mortgages tend to have an initial period fixed, on average for two years, while fixed-rate mortgages tend to be fixed for on average twenty-five years.

⁹ Equally those who are most vulnerable might be more inclined to opt for a fixed-rate mortgage. This appears to have been the case in the past where this relationship has not held.

Chart 3.2: Percentage of loans going into foreclosure per quarter



Source: Mortgage Bankers Association, Deutsche Bank Global Markets Research

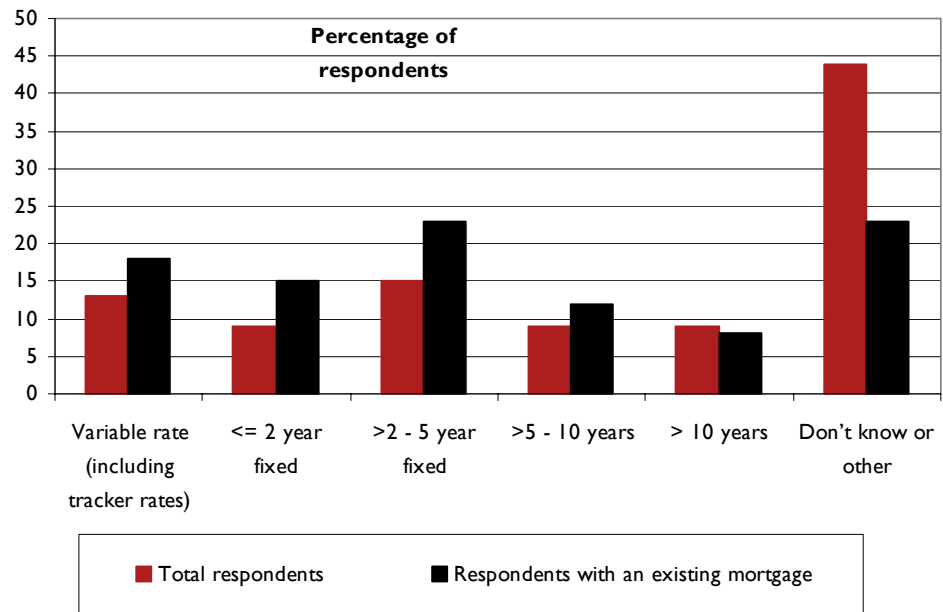
Note: "FRM" refers to fixed-rate mortgages, "ARM" refers to adjustable-rate mortgages

Survey evidence in the UK on long-term fixed-rate mortgages

3.11 A recent survey published by the Council of Mortgage Lenders (CML) offers some evidence of latent demand for long-term fixed-rate deals that is not being met by current products.¹⁰ This had several key findings:

- when asked what sort of mortgage they would prefer if choosing one now (early November 2007), 18 per cent of all respondents said they would opt for mortgages with a rate fixed for more than five years and 9 per cent for a mortgage with a rate fixed for more than ten years (see Chart 3.3); and
- people were asked what would encourage or discourage choosing a mortgage with a fixed-rate for more than ten years. The most common factors in favour of fixing were peace of mind in case of interest rates rises, easier management of household budgets and greater certainty. The most common factors discouraging choice of a long-term fixed-rate mortgage were losing out if interest rates fall, being locked in to the same lender and lack of flexibility.

¹⁰ *Consumer Attitudes To Long-term Fixed-rate Mortgages*, Council of Mortgage Lenders, 2007.

Chart 3.3: Type of mortgage preferred

Source: Council of Mortgage Lenders

3.12 This survey is of course only a snapshot of people's preferences, and could be influenced by particular circumstances such as expectations about the economy or the direction of interest rates. It is interesting, however, that the proportion of respondents favouring a long-term fixed-rate mortgage of greater than ten years (in particular when compared with 5-10 years) is much higher than the actual levels of long-term fixed-rate mortgages in the UK market.

3.13 While long-term fixed-rate mortgages are not necessarily suitable for all, economic theory, survey evidence and experience in other countries suggests that there could be potentially significant benefits for some households. To enjoy these benefits, however, long-term fixed-rate mortgages must be affordable and flexible, and in particular early repayment charges must be kept to a minimum. Why these costs arise, and whether and how they could be minimised, is discussed in the next section.

PREPAYMENT RISK

3.14 Although long-term fixed-rate mortgages are already on offer in the UK, all of these contracts carry prepayment charges, or early repayment charges (ERCs), to compensate the lender for their financial exposure in the possible event of early mortgage repayment.

3.15 A sample of ERCs on medium-term (five to ten year) fixed-rate mortgage contracts is presented in Table 3.1.¹¹ Deciding to prepay a £150,000 mortgage would cost approximately £7,500 if activated in the first five years of the mortgage. This is clearly a significant financial disincentive unless there is high degree of certainty about future circumstances. It is also consistent with the survey evidence outlined earlier, that

¹¹ Short-term fixed-rate mortgages also have ERCs during the fixed-rate period, but consumers are able to refinance after a shorter fixed period.

borrowers are put off long-term fixed-rate mortgages by the lack of flexibility and the constraints these place on adjusting to new circumstances.

Table 3.1: Typical early repayment charges from major UK lenders

Product	Initial rate	Early Redemption Charge (ERC)
10yr fixed	5.64%	6% for 10yrs
10yr fixed	5.59%	6% for 10yrs
10yr fixed	5.99%	5% for 5yrs then 5%, decreasing 1% each subsequent year for final 5yrs
10yr fixed	5.88%	3% for 10yrs

Note: Typical arrangement fee between £500-£800

Source: Lenders websites, correct as of 23 February 2008

3.16 Lenders generally fund long-term fixed-rate mortgages with matched long-term fixed-rate finance to minimise their interest rate exposure. If instead they were to use short-term funding sources, and interest rates were to rise unexpectedly, the lender could be paying more for the funds than they were making on their loans.

3.17 Even when a mortgage lender has matched maturity funding, they remain exposed to interest rate risk as the borrower may decide to prepay (or repay early) their mortgage. All mortgages carry prepayment risk, but this is particularly acute for long-term fixed-rate lenders. If a borrower decides to prepay their mortgage, the lender is at risk of losing out if they are unable to re-lend the funds at the same rate as their long-term funding. The longer the mortgage contract, the greater the potential loss.

3.18 Prepayment risk therefore depends on whether and when borrowers are likely to prepay, which is difficult to predict. Prepayment may occur when borrowers decide to move house, or if their income level changes for a range of unpredictable reasons (for example, inheritance, or a bonus). However, the greatest financial incentive to prepay is when a cheaper long-term fixed-rate mortgage deal becomes available due to lower interest rates. Therefore, prepayment rates tend to increase when interest rates fall. Of course when interest rates fall, some borrowers prepay quickly while others require a large movement in interest rates to make this worthwhile.

3.19 Early repayment charges on long-term fixed-rate mortgages have three implications, explored in the rest of this chapter:

- it is important to ensure that borrowers fully understand interest rate risks of mortgages in order able to judge properly whether they should protect themselves against these risks and at what cost;
- if lenders could hedge prepayment risk better, this might lower early repayment charges; and
- if lenders could pass this risk to investors, this could also lead to lower early repayment charges.

HELPING BORROWERS UNDERSTAND INTEREST RATE RISKS

3.20 A possible reason for the low take-up of long-term fixed-rate mortgages in the UK, as noted by the Miles Review, is that many households may find it difficult to assess the risks of mortgage products. It is important that borrowers are able to make informed choices about their mortgages, helped by high quality information and access to advice. Since 2004, the FSA has been responsible for the regulation of first charge residential mortgages, and has taken important steps in this direction.

Thoresen Review **3.21** Getting good financial advice is an important part of this. In 2007, the Government asked Otto Thoresen, Chief Executive of AEGON UK, to lead a feasibility study into the provision of generic financial advice. Thoresen presented the findings and recommendations of his review into generic financial advice to the Government on 3rd March 2008. This sets out a blueprint for the national provision of Money Guidance – that is, impartial, sales-free information and tailored guidance on financial matters – and recommended that the Government, together with the FSA, undertake a pathfinder to road test this model prior to rolling out a full service.

3.22 **The Government welcomed the Thoresen Review's final report on 3rd March 2008 and announced that it would launch a £12million Money Guidance pathfinder project in partnership with the Financial Services Authority. The Government will provide further detail in its financial capability action plan later in the spring.**

Responding to Miles Review **3.23** Since 2004, the FSA's regime has incorporated many elements of the Miles Review recommendations on advice and disclosure. In Budget 2005, the FSA also committed to consider further Miles recommendations during its post-implementation review of its regime.¹² This included consideration of recommendations aimed at strengthening consumers' understanding of the risks of different types of mortgages, including interest rate risk. The FSA currently addresses this by requiring an indication of the impact on the monthly cost of a 1 per cent increase in interest rates, accompanied by a statement that rates can increase by much more than this. This is complemented by an FSA Affordability Leaflet that provides a simple explanation of the risks associated with changes in the interest rate or the consumer's circumstances.¹³

3.24 The FSA has concluded that there are likely to be limited benefits to consumers from further changes to written disclosure requirements. Its view is informed by extensive consumer testing in the run up to the introduction of regulation in 2004 and after.¹⁴ Furthermore, research findings on the limitations of written disclosure illustrate the challenge many customers face in interpreting and using complex material to assess a range of possible outcomes.¹⁵

Other work on retail market **3.25** As set out in the Government's Housing Green Paper, the FSA is undertaking a full review of the effectiveness of its mortgage regulation.¹⁶ The first stage findings published in 2006 suggest that the FSA regime is working effectively in the prime market and that consumers are able to understand the risks and features of the mortgages they take out. The FSA will publish findings on the second stage of the review, which will

¹² *Budget 2005*, HM Treasury.

¹³ *Buying a home series - You can afford your mortgage now, but what if...?*, FSA, 2007.

¹⁴ *Mortgage effectiveness review - Stage 1 Report*, FSA, 2006.

¹⁵ See, for example, *Warning: Too much information can harm*, Better Regulation Executive and National Consumer Council, November 2007 on maximising the positive impact of regulated information for consumers and markets. See also, *Financial Capability in the UK: Establishing a Baseline*, FSA, 2006.

¹⁶ *Homes for the future: more affordable, more sustainable*, Communities and Local Government, 2007.

focus on non-standard lending (including the sub-prime mortgage market) at the end of March. The FSA has also undertaken significant work to assess whether firms are meeting its regulatory standards. In November 2007, the FSA also published a study on the standards of advice in the mortgage broker market and is following up with enforcement action with a number of firms.

3.26 The FSA's recent thematic and supervisory work has indicated that in some areas the regulatory regime may not be delivering the desired outcomes for consumers. **A new broad Mortgage Policy Review, announced in the FSA's Business Plan, will bring together these findings and assess the need for change, including a simplification of rules where appropriate.**¹⁷

3.27 In the consultation process surrounding the review, stakeholders often raised retail market issues, including the incentives for brokers to offer longer-term fixed-rate mortgages. If the FSA finds evidence of problems, it may also consider within the Mortgage Policy Review whether the financial incentives for mortgage brokers operate against the long-term interests of those they are advising. The FSA review will also take on board the FSA's Financial Risk Outlook 2008 and the impact on consumers of changing lending conditions in the market.

LENDERS HEDGING PREPAYMENT RISK

3.28 Mortgage lenders have some scope to manage the prepayment risk associated with medium-term and long-term fixed-rate mortgages in a number of ways, apart from the early repayment charges discussed above. Three common approaches are:

- to estimate the likelihood of prepayment and arrange the funding at particular maturities such that they match likely prepayments using swap contracts. For example, the proportion of medium-term and long-term fixed-rate mortgages likely to prepay can be matched with shorter maturity funding. The benefit of this approach is that it involves a relatively low cost transaction. However, the downside is that the initial estimate may prove to be inaccurate leaving the institution open to loss. The greater the volume of fixed-rate lending, the greater are the risks associated with this approach;
- to update the funding structure as prepayments occur. This takes account of most recent behaviour and so should further reduce risks, but at the cost of a greater number of transactions for the lender; and
- to use derivatives to offset some of the prepayment risk. If lenders can buy derivatives which increase in value when interest rates fall, then they can offset some, but not all, of the prepayment risk. One form of derivative that can be used to achieve this cover is receiver swaptions. These assets give the holder the right, but not the obligation, to receive a flow of payments at a fixed interest rate in exchange for a flow of floating rate payments at some date or dates in the future, allowing the flow of fixed payments to be replaced if a mortgage is prepaid.

¹⁷ *Financial Services Authority Business Plan 2008/09*, FSA, 2008.

Government swaptions to help lenders hedge prepayment risk

3.29 The Miles Review argued that one of the reasons why lenders did not use swaptions more often to hedge the risk of long-term fixed-rate mortgages was that the options were too expensive. In particular, there might not be enough writers of longer-term call options in the private sector to create a liquid and efficient market in which options could be bought at a cost which made this strategy feasible. The review also proposed that the Government could have an interest in becoming a writer of longer-term call options, given the interest rate risk exposure which it incurs already from its programme of gilt issuance. This could help smooth debt service costs and reduce uncertainty about the overall cost of the national debt, although the review recognised that this would require detailed analysis of the risks.

3.30 The Debt Management Office (DMO) conducted an assessment of this proposal in 2005 and found insufficient evidence that writing interest rate call options would improve the Government's ability to minimise the long-term cost and risk of debt. The Government said, however, that if such evidence were to arise in the future, it would reflect further on this conclusion.

3.31 The Housing Finance Review has conducted an updated assessment of this proposal and had extensive discussions with market participants. A summary of the analysis is included in Annex B. The analysis had three main aspects:

- investigating whether issuing swaptions would leave unaffected, or reduce, the risk associated with meeting the Government's financing needs. This entailed examination of the risk profiles of a constant bond and swaptions issuance strategy;
- examining the stability of the relationship between the quantity of debt the Government issues, and real and nominal interest rates; and
- integrating a swaptions strategy into the DMO's current strategic debt issuance model (SDA) to examine the distribution of possible payouts.

3.32 **The conclusion of this analysis is that the Government should not pursue a policy of issuing swaptions.** While the variability of debt servicing costs to interest rates might be reduced, this would only be achieved by running open positions in swaptions which would bring sensitivity to the debt strategy to another dimension of risk known as implied volatility. **There is also little evidence that the funding requirement moves in a consistent way with interest rates. This implies a risk of very large periodic losses for the Government in issuing swaptions.**

3.33 **It was also found during discussions with market participants that it was not evident that there were insufficient private sector writers of longer-term call options.** Market players reported that there was no shortage of supply of volatility and that it was not clear that further supply would significantly reduce the cost of long-term fixed-rate mortgages. Many lenders noted that they would in any case need more data on the characteristics of prepayment risk of long-term fixed-rate mortgages to allow them to implement hedging strategies with swaptions.

Prepayment data to help lenders hedge prepayment risk

Prepayment data 3.34 A prerequisite for any successful hedging of prepayment risk, and for prepayment risk to be passed on to investors, is that there must be sufficient information on prepayment risk to allow all parties to estimate the size and characteristics of the risk and to price that risk efficiently. In countries such as the US and Denmark, where there are financial instruments to pass prepayment risk to investors, there is a well developed body of information on prepayment behaviour, and investors have an incentive to develop a competitive advantage in pricing this risk effectively. In the UK, by contrast, there is limited information on prepayment behaviour with long-term fixed-rate mortgages, in part reflecting of the low prevalence of these mortgages.

3.35 The Government will work with industry to investigate whether data on prepayment behaviour can be pooled and published. At first, this data will necessarily be incomplete and will not in itself spark a long-term fixed-rate market. However, in time the Government expects that investors and lenders will see a benefit from understanding prepayment behaviour better as it allows them to hedge and price the risk more efficiently.

DEVELOPING AN INVESTOR MARKET FOR PREPAYMENT RISK

3.36 Evidence from other countries suggests that there is likely to be a greater prevalence of flexible long-term fixed-rate mortgages without early repayment charges only when prepayment risk is passed on to a wider range of long-term investors. In those countries with affordable and flexible long-term fixed-rate mortgages, for example Denmark, United States or Japan, there are particular financial structures that generate callable mortgage bonds (where the mortgage borrower can prepay without charge), which long-term investors are willing to hold.

3.37 Callable mortgage-backed bonds are less valuable to investors than mortgage-backed bonds without a call option. However, investors who manage portfolios of bonds can pool these assets with others and diversify away some of the risk. Any residual risk is shared among a wide range of investors. This process of managing or diversifying away some of the risk reduces the cost of the prepayment option, resulting in a lower prepayment charge to the borrower.¹⁸ In countries with significant callable mortgage bond markets, investors include pension funds and retail consumers.

3.38 Increasing investor appetite for callable mortgage-backed securities, however, requires reducing the other various sources of risk in these securities. Long-term callable mortgage-backed bonds are commitments to repay over a long period, and therefore minimising credit risk is particularly important for investors. Those countries which have developed these markets have particular frameworks to do this. There are essentially two models for achieving this:

- the Danish model, where mortgage banks take on only high credit quality loans and issue bonds to investors which can be repaid ('callable bonds') if a borrower prepays. Mortgage banks are regulated in Denmark to ensure that they have only minimal levels of credit risk. This means that investors can take the prepayment risk without having to consider credit risk. The Danish

¹⁸ The process of diversification is supported particularly in the US and Japan by the availability of derivatives on the securities which can be used to reduce the interest rate risk exposure.

system, however, has limited competition given its tight regulation, and the five biggest lenders account for 99 per cent of the market;¹⁹ and

- the US model, where agencies similarly take on high credit quality loans which conform to set criteria, and either manage prepayment risk themselves, or issue callable bonds to investors. The agencies charge lenders or originators for accepting this credit risk, and are widely perceived to be implicitly guaranteed by the government, allowing investors to treat these securities as being similar to a government bond in terms of credit.

3.39 The liquidity risk of the callable bonds also needs to be minimised to make these bonds attractive for investors. This is achieved by standardising the generic contract terms, the way in which the bonds are traded, and the maturity pools at which the securities are offered, ensuring that callable bonds are essentially a homogenous asset class. In the US, most agency mortgage bonds are not broken down into different credit risks, but all have (at least initially) the same credit status.

3.40 It may be that there are elements of the frameworks of these other countries which have affordable and flexible long-term fixed-rate mortgages from which the UK can learn. National mortgage markets, however, are uniquely shaped by the broader institutions in each country, such as property rights, the structure of financial markets and government involvement in housing finance which have developed over many years. Changing elements of the institutional framework to incorporate elements of the frameworks of other housing finance systems could have wide-ranging implications for the UK mortgage market and related financial markets.

3.41 **The Government is inviting views on options for a UK framework to deliver more affordable long-term fixed-rate mortgages, including the lessons to be learned from international markets and institutions. The Government will work with a wide range of stakeholders and experts and will update at the Pre-Budget Report in the light of findings and stakeholders responses.**

¹⁹ Denmark: *Financial Sector Assessment Program, Technical Note, The Danish Mortgage Market, A Comparative Analysis*, IMF, 2007.

4

INNOVATIONS IN THE UK MORTGAGE MARKET

As financial markets develop, a variety of innovative products may come onto the market that could help households access the housing market and manage some of the risks of homeownership more effectively. This chapter reviews a number of products that have been discussed by the industry, and which could be appropriate for some borrowers.

The Government stands ready to engage with private sector providers and is willing to discuss ways in which it could help remove any potential barriers to the availability of these products.

On shared equity, the Housing Corporation launched a challenge to industry to bring forward new, affordable shared equity products, and two winning schemes have been selected and will be made available to eligible households from 1 April 2008.

Interest rate protection products can provide a way for borrowers to manage the risk of interest rate rises. The Government believes that it is possible for companies to bring stand-alone interest rate protection products to the market within the existing Financial Services Authority definition of insurance and for it to be classified as insurance for tax purposes. The Government will continue to engage with firms seeking to introduce such products to the market.

House price insurance can help protect households from falls in the value of their home. Government will work with industry to investigate the possibility of the development of detailed house price indices to help the development of insurance on house price movements.

4.1 A mortgage presents financial risks for both borrowers and lenders. Over past decades, product innovation by financial institutions has given borrowers more options for tailoring a mortgage to their needs. It has also provided new ways for financial institutions to manage their risks, allowing a greater range of mortgage types to be offered. However as discussed in Chapter 3, the lack of affordable long-term fixed-rate mortgages in the UK is an important exception to this.

4.2 Innovative mortgage products can lead to improvements in flexibility and mobility for borrowers, which can in turn lead to greater overall economic stability. In the majority of cases, it is preferable for the private sector to design and provide innovative products, as they are best placed to understand and meet consumers' needs. But in some cases, Government action may be required to remove potential barriers that may hold back progress in the development or availability of products.

4.3 This review is concerned with enabling homeownership for those who want it and who can manage the risks that homeownership brings. Innovative products, including long-term fixed-rate mortgages, can help in this regard. This chapter reviews some other recent and possible future innovations in mortgage markets that could also help borrowers better manage the risks associated with mortgages of all types, or extend access to homeownership more widely.

The chapter will examine:

- shared equity products;
- capped interest rate mortgages;
- interest rate protection products;
- mortgage payment protection products;
- index-linked mortgages; and
- house price futures and house price insurance.

4.4 These products will not be suitable for everyone, and this will depend on their personal circumstances and attitudes towards risk. However, the Government stands ready to engage with private sector providers and is willing to discuss ways in which it could help remove any potential barriers to the availability of these products.

INNOVATIVE PRODUCTS IN MORTGAGE MARKETS

Shared equity products

Shared equity **4.5** Shared equity schemes enable households to get a foot on the housing ladder through either an equity loan or the opportunity to buy a share of a home. Such schemes are available in many countries and the majority have been government-led. A notable exception is Australia, which has also seen the development of some market based initiatives.

4.6 Although there are several variants, there are two main types of scheme currently on offer in England. The first supports the outright purchase of a home with assistance of an equity loan from either the Government or a private lender. When repaying the equity loan, the homeowner shares any increase in the property's value with the lender. The second type – often referred to as shared ownership – offers households the opportunity to buy a share in a home, and pay a rent on the outstanding equity. Purchasers have the option to buy further shares in the property and, ultimately, achieve full ownership. If the property is sold the purchaser benefits from any equity that has built up on the share that is owned.

Benefits for consumers **4.7** The Report of the Shared Equity Task Force, published with the 2006 Pre-Budget Report, explained how sharing the equity in a home can be an affordable and sensible way for households who are unable to purchase a home outright to benefit from home ownership.¹ Shared equity can also allow households to diversify their wealth. For most households, the vast majority of their wealth is in their house, and this makes them vulnerable to unexpected changes in house prices. By using shared equity, households are able to transfer some this risk to others, and partly insure themselves against house price declines.

4.8 The first phase of “open market” shared equity products, jointly funded by lenders and Government, offered a maximum equity loan value of 25 per cent of the property value. **The Housing Corporation launched a challenge to industry to bring forward new, affordable shared equity products. Two winning schemes - by the Co-operative Bank / Places for People Group and Chase (a housing association**

¹ Report of the Shared Equity Task Force, HM Treasury and Communities and Local Government, 2006.

consortium) – have been selected from the many proposals put forward and will be made available to eligible households from 1 April 2008. These new products offer larger equity loans than previously available (up to 50 per cent) and therefore bring homeownership within the reach of households who were previously excluded.

Benefits for investors 4.9 For investors, shared equity offers a new way to access housing equity in the residential housing market. Despite being one of the largest assets classes in the UK, in the past investors have primarily only managed to gain exposure to housing equity via direct ownership, which is both illiquid and involves an administrative burden.

4.10 Consultations with lenders has shown that many see benefits in shared equity and shared ownership programmes, yet few currently see the schemes as a significant part of their future business model. Uncertainty over the timing of returns, and a lack of appetite to provide loans to borrowers with low incomes, remain important factors dampening investors' desire to engage in the market.

4.11 For the benefits to investors to be realised on a larger scale requires the development of a liquid secondary market where the equity can be packaged and freely traded. While this is still some way off in the UK, the Government will continue to engage with the private sector to develop solutions that are both attractive to homebuyers and workable from the perspective of investors.

Capped interest rate mortgages

4.12 Capped interest rate mortgages, which put an upper limit on the interest rate paid, can in theory provide the benefits of a fixed-rate mortgage while also allowing borrowers to benefit from any declines in interest rates. Although they have been available for many years, the take-up of capped rate mortgages is currently very low. According to data from the Council of Mortgage Lenders (CML), less than 1 per cent of the flow of new mortgages have been capped rate mortgages for the majority of the last five years. This is in contrast to the US and Germany, where many variable-rate mortgages have interest rate caps.

4.13 One reason for this low take up is that consumer demand is dampened by the price – capped rate mortgages typically have higher initial interest rates than other types of mortgage. In addition, some lenders do not offer capped rate products due to a desire to keep their product range simple.

4.14 The relatively high initial rate charged by lenders on capped rate mortgages reflects similar problems to those faced when offering conventional long-term fixed-rate mortgages. The rate charged needs to incorporate the additional costs lenders undertake to hedge the risk that interest rates will rise above the cap. Unlike a fixed-rate mortgage, lenders do not face repayment risk if interest rates fall, but they do not enjoy all the benefits of a fall in rates which goes to the borrower. There are ways for the lender to reduce this cost; for example, the cap can be set at a rate much higher than the current prevailing interest rate, or a collar can be added that also puts a lower limit on how far the interest rate paid by the borrower can decline. **The Government believes the development of capped rate mortgage products should be market led, although if industry identifies potential barriers to their availability it stands ready to discuss them.**

Interest rate protection products

4.15 Stand-alone interest rate protection offers an alternative way for borrowers to manage the risk of interest rate rises. In return for the payment of a premium, such protection pays out, typically on a monthly basis, in the event of rates going above a predefined level. These products therefore offer homeowners some certainty over their nominal interest rate payments, while allowing them to benefit from the flexibility and features associated with variable-rate mortgages.

4.16 The Miles Review outlined some possible tax and regulatory barriers that might limit the development of a market for stand-alone interest rate products. If interest rate protection were classified as an investment product rather than insurance for tax purposes, then payouts would be subject to capital gains tax. Additionally, a product classified as an investment by the Financial Services Authority (FSA) is regulated differently to one classified as insurance. The Miles Review recommended that interest rate protection should be treated as insurance for tax purposes.² Following engagement with market participants and the FSA, **the Government believes that it is possible for companies to bring stand-alone interest rate protection products to the market within the existing FSA definition of insurance and be classified as insurance for tax purposes. The Government will continue to engage with firms seeking to introduce such products to the market.**

Mortgage payment protection products

4.17 Mortgage payment protection insurance (MPPI) can help borrowers to manage the risk that they are unable to keep up their mortgage repayments as a result of accident, sickness or unemployment.

4.18 Currently MPPI is not taken up by a majority of borrowers, and the number of policies in force has been on a downward trend over the past two years. The CML estimates that policies are currently in force for 18.5 per cent of all mortgages, compared with a high of 23.7 per cent in 2003, despite industry efforts to strengthen confidence in the market by publishing consumer guidance and voluntary minimum standards. There may be several barriers to the take-up of MPPI products, including competition barriers, and negative perceptions about PPI (which also includes protection for unsecured credit), limitations and exclusions more generally. The FSA has undertaken extensive work in recent years to test the sales standards for the PPI market, including MPPI. Its most recent review suggested that sales of premium prime MPPI on an advised basis are most likely to meet FSA requirements.

4.19 Separately, the Office of Fair Trading (OFT) announced in February 2007 that it would refer the PPI market to the Competition Commission for investigation. The statutory deadline for the Competition Commission's inquiry is February 2009. The Government awaits the findings of the inquiry and will respond as appropriate.

Index-linked mortgages

4.20 As detailed in Chapter 3, a long-term fixed-rate mortgage reduces nominal interest rate risk compared with a variable-rate mortgage.³ However, a conventional

² *The UK Mortgage Market: Taking a Longer-Term View, Final Report*, D.Miles, 2004. Recommendation 11.

³ In a textbook world, a variable rate mortgage should have real interest payments that are constant; any increase in nominal rates is offset by an increase in inflation. However, over the long-term real interest rates may change. Additionally, if households face borrowing constraints, they may experience difficulties if an increase in expected future inflation leads to an immediate jump in nominal payments, but a delayed increase in nominal income.

fixed-rate mortgage does not protect the borrower from changes in *real* interest rates caused by changes in inflation. Movements in inflation require borrowers to understand movements in real variables, which are inherently more complex compared with changes in nominal variables. For example, if inflation falls unexpectedly, the borrower on a nominal fixed-rate mortgage faces a higher real interest rate. Although their nominal payments remain unchanged, their income will now increase more slowly than expected and the effect of inflation eroding the value of their debt will be reduced. The more volatile the inflation rate, the larger this risk becomes.

4.21 One potential product that removes both nominal interest rate risk and inflation risk is an inflation-indexed, or index-linked, fixed-rate mortgage. These mortgages could, as discussed by Fabozzi and Modigliani, Kearl, Statman, Campbell and Cocco and more recently Miles and Pillonca,⁴ fix mortgage repayments in real rather than nominal terms. In other words mortgage repayments would rise over time with a positive inflation rate, the higher the inflation rate, the larger the nominal repayment will be each year, leaving the real repayment unchanged.

Advantages of index-linked mortgages

4.22 A mortgage of this type has both advantages and disadvantages for borrowers compared with a conventional fixed-rate mortgage. The main advantage is that the risk of lower than expected inflation is removed. With index-linked mortgages, if inflation is lower than expected, then mortgage repayments will also be lower than expected. Because of this feature, the incentive to prepay and refinance when inflation and interest rates are low is reduced, which could in turn allow lenders to reduce the early repayment charges associated with conventional nominal long-term fixed-rate mortgages. Additionally, an index-linked mortgage would help reduce the ‘front loading’ in mortgage contracts. With a positive rate of inflation, a conventional nominal fixed-rate mortgage has real monthly repayments that are much higher at the start of the loan. Borrowers therefore pay more in real terms at the start of their mortgage, when their income will tend to be lower, than at the end, when their income will tend to be higher. An index-linked mortgage would reduce this ‘front end’ loading by having nominal repayments start lower and then increase over time.

4.23 Finally, fixed-rate index-linked mortgages may be attractive to investors. Much like index-linked government bonds, they provide investors with a stream of payments that are constant in real terms, removing inflation risk. Given the popularity of index-linked bonds, there may also be investor demand for other index-linked assets with different risk characteristics.

Risks of index-linked mortgages

4.24 Despite these apparent advantages, index-linked mortgages are currently not offered by any lender in the UK. One reason for this may be that the scale of the potential benefits outlined above is reduced in a low and stable interest rate environment. A low inflation rate minimises the front-loading of repayments, and stable inflation reduces the risk of large movements in real interest rates. The success of the Government’s macroeconomic framework in keeping inflation low and stable and anchoring inflation expectations may therefore have reduced the potential benefits of index-linked mortgages.

4.25 Depending on the path of inflation, index-linked mortgages may also require borrowers to pay more in nominal terms than they expected or lead to ‘negative

⁴ *Mortgage and Mortgage-Backed Securities Markets*, F.J.Fabozzi and F. Modigliani, 1992; *Inflation, Mortgages and Housing*, J.Kearle, 1979; *Fixed-rate or Index-Linked Mortgages from the Borrower’s Point of View: A Note*, M.Statman, 1982; *Household Risk Management and Optimal Mortgage Choice*, J.Campbell, and J.Cocco, 2003; *European Economics: Financial Innovation and European Housing and Mortgage Markets*, D.Miles and V.Pillonca, 2007; Miles and Pillonca discuss an index-linked mortgage with a shared equity component.

amortisation' - owing more in nominal terms than originally borrowed. As with capped rate mortgages, **the Government believes the development of index-linked mortgage products should be market led, although if the mortgage industry identifies potential barriers to their availability the Government stands ready to discuss them.**

House price futures

4.26 Derivative markets give investors the option to purchase assets and commodities in the future at a price agreed today. They are available for a wide range of assets and commodities, and provide opportunities for investors, companies and others to reduce their risks. Airlines, for example, typically use oil price futures to increase their certainty over future fuel costs, and exporters frequently use exchange rate futures to guarantee the value of their goods in their domestic currency.

4.27 Although centralised derivatives markets have been in existence for over 150 years, it has only been very recently that residential property derivative markets have started to develop. These give investors the opportunity to lock-in future house prices,⁵ and can therefore allow them to insure against possible future changes. Although still small, these markets have the potential to allow banks and other institutions to offer certain products that expose them to house price risk, such as house price insurance, more widely.

House price insurance

4.28 Housing assets are the single largest component of wealth for the majority of households in the UK. However, apart from the shared equity products discussed above, there is virtually no way for the average family to reduce the risk of a fall in the value of their home, which can in the worst cases lead to negative equity. A potential option is to take out house price or housing equity insurance, which pays out if the value of a home declines. Shiller and Weiss have examined in detail the role of house price insurance and the various issues surrounding its introduction.⁶ They point out that insurance of individual houses will lead both to moral hazard, where homeowners would have no incentive to maintain their property knowing its value was guaranteed, and adverse selection, where those most likely to take out insurance would be those who felt they had paid too much for their home.

4.29 To mitigate these problems, Shiller and Weiss recommend that insurance policies are based on movements in a house price index rather than individual house prices. The challenge is to use an index local enough so that the homeowner feels protected (as movements in regional house prices can be significantly different from national house prices), but not so local that moral hazard and adverse selection problems arise. One challenge to the development of house price insurance is therefore the construction of appropriate house price indices. The UK has an advantage over many countries in that detailed house price information is available from a number of providers, including the Land Registry. **To take this forward, the Government will work with industry to investigate the possibilities for the development of detailed house price indices which would help the development of insurance on house price movements.**

4.30 Well-developed house price futures markets can support the development of affordable and widely available house price insurance products, allowing the providers

⁵ All property derivatives currently trade using the Halifax price index. As with nearly all modern derivatives, the underlying asset is not physically exchanged, rather payment is made to the value of the difference between the price at which the index was bought and what it turns out to be.

⁶ *Home Equity Insurance*, R.Shiller and A.Weiss, 1994.

of the insurance to hedge the risk of paying out if prices fall, by taking appropriate positions on these markets. Such markets could lead to the introduction of a variety of types of insurance, from more complex products where providers merely pass through the housing future or option direct to the consumer, to more conventional type insurance products where households pay a fixed premium and can only claim if they have experienced an actual monetary loss (i.e. if house prices have declined and they have had to move house).

4.31 As noted above, residential property derivatives are still a relatively new development, but are growing. In the UK, the residential property derivatives market is an 'over the counter' (OTC) market, with contracts traded directly between two parties, without going through an exchange. These deals are aimed at the wholesale market, with the smallest deal size being around £5 million. In the US, the Chicago Mercantile Exchange launched exchange traded residential property derivatives in the spring of 2006, based on the S&P/Case-Schiller Home Price Indices.

5

SUMMARY OF POLICY PROPOSALS

5.1 Housing finance is of central importance to delivering the Government's housing affordability goals, financial stability and economic prosperity. The cost of housing is one of the largest financial commitments that people make throughout their lifetime. It is therefore vital that housing finance is widely available, affordable and allows borrowers to manage their financial risks.

5.2 The Government and the Financial Services Authority (FSA) have done much in recent years to improve the way mortgage markets work for borrowers and mortgage lenders. There are still, however, challenges in the UK mortgage market and given its centrality to housing affordability, the financial sector and the wider economy, the Chancellor in July 2007 commissioned the Treasury to undertake a review of housing finance.

5.3 The UK mortgage market is one of the largest and most competitive in Europe, with hundreds of providers and the largest intermediary market in Europe, and mortgage finance is available for a wide range of borrowers. This review has, however, identified two key challenges for the UK mortgage market:

- the recent and ongoing disruption in global financial markets has raised issues about the functioning of the secondary funding markets, in particular the transparency and liquidity of the mortgage-backed securities markets, which can have important consequences for UK mortgage borrowers; and
- although there has been an increase recently in short-term fixed-rate mortgages, it remains the case that few homeowners are purchasing fixed mortgages of ten or more years – even though some borrowers might be expected to benefit from long-term protection from interest rate rises.

5.4 A summary of policy proposals is set out in the next sections.

Improving secondary market funding

5.5 Covered bonds and residential mortgage-backed securities (RMBS) have grown in importance as a means by which UK lenders can finance mortgages. Ensuring a continuous flow of secondary market funding is important for housing finance, and for the development of the long-term fixed-rate mortgage market.

5.6 On covered bonds, the Government introduced a UK legislative framework which entered into force on 6 March 2008. The new regime provides significant benefits for investors and issuers by reducing the amount of regulatory capital investors are required to hold and allowing UK issuers access to a larger European investor base.

5.7 As a result of consultation in 2007, the Government has also introduced in the legislation requirements relating to the quality of assets eligible for inclusion in the asset pool in UK covered bonds.

5.8 The Government is announcing a Working Group that will take forward market initiatives to improve liquidity in the mortgage-backed securities market. The Working Group will include the mortgage industry and the investment industry, and also the Treasury, the Bank of England and the FSA. The Working Group will report

initially to the Chancellor in the summer and present proposals at the next Pre-Budget Report.

Long-term fixed-rate mortgages

5.9 A prerequisite for prepayment risk to be successfully managed is that there is sufficient information on prepayment behaviour. **The Government will work with industry to investigate whether data on prepayment behaviour can be pooled and published.**

5.10 The Miles Review suggested that lenders could buy particular interest rate derivatives which would give them a “call option” against interest rate changes, and if prepayment occurred when interest rates went down, lenders would be hedged against interest rate changes. The review suggested that the Debt Management Office should consider issuing these derivatives. **The Housing Finance Review has undertaken analysis of the proposal by the Miles Review and concludes that this is not recommended, in particular due to an added exposure to alternative sources of risk and the possibility of significant losses on occasions. See Annex B for a summary of the analysis.**

5.11 Evidence from other countries suggests that there is likely to be a greater prevalence of flexible long-term fixed-rate mortgages without early repayment charges only when prepayment risk is passed to a wide range of long term investors. **The Government is inviting views on options for a UK framework to deliver more affordable long-term fixed-rate mortgages, including the lessons to be learned from international markets and institutions. The Government will work with a wide range of stakeholders and experts and will update at the Pre-Budget Report in the light of findings and stakeholders responses.**

Innovative products

5.12 As financial markets develop, a variety of innovative products may help households access the housing market and manage some of the risks of homeownership more effectively:

- **on shared equity, following the Housing Corporation’s challenge to the mortgage industry to bring forward new, affordable shared equity products, two winning schemes have been selected and will be made available to eligible households from 1 April 2008;**
- **the Government believes that it is possible for companies to bring stand-alone interest-rate protection products to the market within the existing FSA definition of insurance and be classified as insurance for tax purposes; and**
- **the Government will work with industry to investigate the possibilities for the development of detailed house price indices to allow the development of insurance on house price movements.**

5.13 The Government stands ready to engage with private sector providers and is willing to discuss ways in which it could help remove any potential barriers to the availability of these products.

MODELS OF HOUSING FINANCE SYSTEMS

A.1 National mortgage markets are uniquely shaped by the broader institutions in each country. These institutions, which shape the structure of financial markets, the rights that property ownership confers, and the degree of government involvement in housing finance explain the wide variety of mortgage markets observed across different countries.¹ This annex summarises some of the main features of different key mortgage markets, with particular reference to long-term fixed-rate mortgages.

A.2 International mortgage markets can be grouped broadly into four main categories, based on the relative shares of funding sources:²

- **retail deposits:** deposit taking institutions (banks and building societies) receive deposits from households. This model is the main source of funding in many Anglo-Saxon countries, with the notable exception of the US;
- **non-callable covered bonds:** lenders issue long-term bonds with a dual credit claim on a covered pool of specific mortgages and the issuer. This is a traditional source of funding in many European countries;
- **callable covered bonds:** as covered bonds above, but which can be repaid (or called back) by the issuer at regular intervals. The main country with this funding source is Denmark; and
- **agency:** long-term callable (or pass-through) mortgage-backed securities with credit enhancement by the government. The leading example is the US, but there are also examples in Asia and Central America.

A.3 In almost all countries, mortgage lenders use deposits and one or more other sources of funding. Lenders increasingly have various avenues of finance from global investors and institutions, and so typically use more than one funding source to diversify their risks. Differences between countries are therefore more a matter of degree than a firm boundary. However, it is still possible to distinguish between national mortgage systems on the basis of the relative shares of funding sources.

A.4 The differences between these funding models largely depends on who bears the risks associated with mortgages, in particular, the credit risk and the interest rate risk. Credit risk refers to the likelihood of the mortgage borrower being unable to meet their mortgage repayments. In all cases credit risk is ultimately with the investor. However, the institutional structure in each model determines who bears the risk in the first instance. This is shown in Table A.1. For example, for covered bonds the investor has a dual claim on both the covered pool and the issuer. Therefore the issuer bears the credit risk first, but if they also become insolvent it is ultimately born by the investor.

A.5 Interest rate risk refers to how the value of a mortgage or mortgage-backed security changes depending on whether interest rates rise or fall. This in turn depends on whether the mortgage contract is variable-rate or fixed-rate. For variable-rate mortgages the interest rate risk clearly lies with the borrower. As discussed in Chapter 3, prepayment risk on long-term fixed-rate mortgages presents a particular form of

¹ *World Economic Outlook-Financial Systems and Economic Cycles*, IMF, 2006. For example, chapter 4 contains a cross-country comparison of how different financial systems affect economic cycles.

² There are of course other sources of funding which do not fit easily within these categories, for example residential mortgage backed securities.

interest rate related risk. If borrowers prepay their fixed-rate mortgages, often to access cheaper deals when interest rates fall, then issuers' face the risk that they cannot re-invest the funds at the same initial rate. Standard covered bonds leave interest rate risk with households because of the prepayment charge, while callable agency and callable covered bonds place the interest rate risk with investors.

Table A.1: Mortgage funding models

Funding model	Examples	Primary owner (Secondary owner)		Mortgages
		Credit risk	Interest rate risk	
Retail deposits	UK; Australia	Lender (government)	Household	Variable and short-term fixed
Non-callable covered bonds	Germany; France	Lender (investor)	Household	Long-term fixed, plus prepayment charge
Callable covered bonds	Denmark	Lender (investor)	Investor	Long-term fixed, no prepayment charge
Agencies	US; Asia	Agency (investor / government)	Investor	Long-term fixed, no prepayment charge

Source: EMFA Project Team and HM Treasury

A.6 It should be noted that each form of funding in Table A.1 involves a degree of government involvement. All countries protect retail deposits either by explicit or implicit deposit insurance. In the covered bond model, governments also regulate the issuing banks to ensure that they maintain high credit standards. Agencies are generally supported with either an explicit or perceived implicit government guarantee.

A.7 The different models lead to very different outcomes in terms of the degree of competition and range of products offered, as shown in Table A.2. These different models are explored in the following sections. It is worth noting at the outset, however, that there are very few countries – US, Denmark and Japan are the foremost examples – which have a large share of long-term fixed-rate mortgages without early repayment charges. In Denmark and the US there are uniform issues of callable mortgage bonds and securities, which trade in highly liquid secondary markets, where the end investor accepts the prepayment risk.

Table A.2: Comparison of international mortgage markets

	Mortgage debt to GDP (%)	Owner occupation (%)	Typical initial LTV (%)	Specialist mortgage products	New fixed-rate mortgages (% >10 years)	Explicit Pre-payment charges	Funding model
Denmark	101	55	60-80	Yes	50	No	Callable covered bond
US	84	68	80	Yes	52	No	Agency
UK	83	70	80	Yes	1	Yes	Deposit
Spain	59	86	70	Some	1	Yes	Deposit
Germany	51	43	70	Some	28	Yes	Non-callable covered bonds
Canada	42	66	65	Some	2	Yes	Deposit
France	32	57	67	Some	46	Yes	Non-callable covered bonds
Japan	32	63	70-80	Some	17	No	Agency
Italy	19	80	55	Yes	7	Yes	Deposit

Sources: European Mortgage Federation, HM Treasury, IMF, Mercer Oliver Wyman, Merrill Lynch, Statistics Canada, US Census Bureau.

A.8 This suggests that the range of mortgage products on offer depends, to some extent, on the specific funding model in each country. The IMF shares this observation.³ To a large extent the differences in funding models are the outcome of how each country deals with market failures in mortgage lending.

A.9 Separating mortgage origination from mortgage investments by some form of securitisation has the potential advantage of lower costs and a more varied supply of funds. But differences in information about the borrowers’ circumstances between the originator and the investor can lead to incentives being distorted and sub-optimal outcomes. The consequences of this information asymmetry can to some extent be reduced by the reputation of originators. However, differences in funding structures also reflect regulatory responses to this problem. For example, the dual credit claim in covered bonds is an attempt to keep most of the credit risk with the originator.

A.10 Another area of government involvement is around the standardisation of the structure of the mortgage-backed securities or bonds. In some countries, most notably Denmark and the US, there is a high degree of standardisation of the securities issued.⁴ Agency bonds for example are simple products with generic characteristics issued at regular intervals, and the standard Danish bonds are seen as near perfect substitutes.

³ World Economic Outlook – The Global Demographic Transition, IMF, September 2004. “What then determines the type of mortgage contracts lenders prefer to offer? The underlying structure of a country’s financial markets greatly influences the various funding possibilities, and thus the risk-adjusted profits from mortgage contracts and their offerings”.

⁴ See The Impact of the GNMA Pass-Through Program on FHA Mortgage Costs, D.G.Black, K.D.Garbade, W.L.Silber, 1981.

This uniformity of securities creates “networking benefits” through a larger single market and so more liquidity. This leaves investors only with the task of managing the interest and prepayment risk, rather than relative pricing between financial assets.

A.11 The type and consequences of market failures invariably change over time, for example with changes in technology and agents’ responses. Whether some of the regulatory frameworks are still the best structures is an ongoing question. For example, some of the funding models discussed here have existed for centuries. Others were initiated before private securitisation markets became widespread. It is also important to note that regulatory or institutional responses inevitably carry adverse as well as beneficial consequences, for example they can restrict competition and product variety.

RETAIL DEPOSITS

A.12 The traditional model of mortgage lending in the UK is where a bank or building society holds customers’ retail deposits and uses these resources to fund mortgages. The original building society model began over two centuries ago on a cooperative lending model specifically to fund homeownership. Many building societies have since become banks, or merged with banks, but some large societies remain. The banks that have replaced them typically have less reliance on retail deposits, but in many cases deposits remain the main source of funding.

A.13 In this model there is a maturity mismatch between the liabilities of the bank or building society and its assets. The liabilities can either be demanded for immediate repayment or are short-term, whereas the assets (such as mortgages) are typically long-term and less liquid. Furthermore, the payment on deposits is on a sequential first come first served basis, and so almost all countries protect depositors through either implicit or explicit deposit insurance. With deposit funding the credit risk largely rests with the lender, and they therefore have a strong incentive to monitor the ongoing risks associated with the borrower.⁵

A.14 A drawback of this system is that it is less conducive to long-term fixed-rate mortgages.⁶ Since deposits can be demanded for immediate repayment, the rate of return is typically variable (otherwise depositors would simply migrate into higher yielding assets). If loan rates were fixed and short-term interest rates rose, the lender would clearly be faced with a loss. An example of this was the US Savings and Loan crisis in the late 1980s. By contrast, if short-term interest rates fell then the lender would make profits only if they can prevent the borrower from refinancing the fixed-rate mortgage. Typically this is achieved through early repayment charges to deter prepayment.

A.15 In this system, with variable or short-term fixed-rate mortgage rates, the interest rate risk is firmly with the borrower. However, in general households are not well placed to manage this risk as they have little means of diversification. As interest rates change the borrower must adjust either their savings or consumption, either of which can cause short-term hardship.

A.16 Many countries in recent decades have seen a general decline in retail deposits as a proportion of total financial assets, with households increasingly willing to put their savings in investments other than banks and building societies. Therefore, greater financing has come from secondary markets, in particular from covered bonds and

⁵ See for example *A Theory of Bank Capital*, D.Diamond and R.Rajan, 2000.

⁶ The wider use of swaps has greatly reduced this mismatch, as floating rate funds can readily be swapped for fixed-rate funds.

mortgage-backed securities. It should be noted that while on a year-to-year basis the deposit ratio can rise and fall, in many countries the long term trend is downwards.

NON-CALLABLE COVERED BONDS

A.17 Many countries have long-term bond markets that were developed specifically for mortgage lending. The long-term (non-callable) covered bond funding model is often associated with the German Pfandbrief model, which developed in the eighteenth century. A number of other European countries, including France, are developing similar markets.

A.18 In this model, mortgage loans are funded by long-term fixed-rate covered bonds issued by the mortgage lender. Covered bonds give the bondholder a claim over both a specific pool of mortgage assets and the issuer itself. Long-term bond funding overcomes the potential fragility of retail deposit funding by giving lenders stability of funding over a long period. This finance better matches the maturity of the loans they make.

A.19 The dual claim in covered bonds means the issuer has a clear incentive to monitor the credit quality of the assets in the covered pool. This provides reassurance to the investor that the underlying assets are of high quality. Covered bonds issued under a particular legislative framework in Europe qualify for a lower capital requirement under the European Capital Requirement Directive (CRD) in conjunction with article 22 (4) of the UCITS Directive.

A.20 In this model, the credit risk ultimately resides with the investor, as there is a possibility that the issuer itself might become insolvent. However, this risk is clearly minimised by having the dual claim noted above. Furthermore, Government regulations play a key role in setting out detailed rules on the mortgages that can be included in the pool.

A.21 Long-term covered bond regimes therefore have a number of features which give investors confidence that credit risk is being managed effectively by the lender, including:

- regulations allowing only high quality loans to be put into the mortgage pool. Maximum loan-to-value (LTV) ratios range from 60-80 per cent in Europe;
- the right of the investor to claim on the issuer, should the pool of mortgages become impaired. In most covered bond regimes, if the collateral is insufficient to repay all covered bond claims, covered bond creditors rank equally with senior unsecured creditors. In some regimes, the covered bond holders have priority;⁷ and
- dynamic cover pools, which require that the issuer replace assets which become ineligible (for example, if house prices have declined and the LTV ratio has increased). In some countries, for example Germany, the approval of the cover pool monitor is necessary before new assets can enter the pool.

A.22 Given the regulatory requirement that lenders demonstrate to investors that credit risk is being monitored, this model allows lenders less flexibility to offer products to non-standard borrowers such as the credit-impaired or the self-employed. This

⁷ This is the case for the French system of covered bonds.

means that mortgage markets with long-term covered bond funding models are likely to be characterised by lower levels of homeownership.

A.23 While this model allows low cost long-term funding, fixed-rate mortgages are likely to be available only with early repayment charges (ERCs). This is because the bonds are not callable, and so lenders cannot pass the prepayment risk to investors. Were lenders not to add an ERC on to the mortgage, they would be exposed to reinvestment risk if interest rates fell and borrowers refinanced. This limits the flexibility for borrowers, and may contribute to lower labour mobility in these countries compared with those where the prevailing mortgages allow prepayment without an ERC.

A.24 Some countries using this model set statutory limits on the size of prepayment penalties. In France, for example, there is a statutory limit of 3 per cent of the loan, and lenders cannot charge penalties if the borrower is forced to move for a variety of non-economic reasons.⁸ Although this penalty is quite high and will deter prepayment, the cap still puts some prepayment risk on to the lender which will either be reflected in the rate paid by the borrower, or may act as a disincentive to provide long-term fixed-rate mortgages. Mortgage rates in France are approximately 30 basis points more expensive than mortgage rates in Germany, representing the implicit charge for the cap.⁹

A.25 An important feature of this model is that the more standardised and homogenous the mortgage-backed securities, the easier it is for investors to understand and price them accordingly. Regulation and industry standards are therefore developed to ensure standardisation of mortgages to some degree. This has the advantage of delivering low cost finance for borrowers, but this can also limit the variety of products available.

CALLABLE COVERED BONDS

A.26 The second model of covered bond mortgage funding is where lenders issue callable bonds, which allow the issuer to repay the bond to the investor at frequent intervals. The main example of this is Denmark, although some emerging market countries, such as Chile, have also followed this model.

A.27 As with non-callable covered bonds, government plays a strong role, in particular through the regulation of the mortgage banks. In Denmark, regulated mortgage banks have traditionally had the exclusive right to issue mortgage bonds (although since July 2007, commercial banks are now able to issue different covered bonds to fund mortgages). The Danish model is highly concentrated, with two banks accounting for around 75 per cent of outstanding mortgages.¹⁰

A.28 Under this model, lending institutions give long-term mortgages to borrowers with a prepayment option. Legislation imposes strict rules on lenders to ensure that the maturity and cash flows of its assets match its liabilities. The issuing of a callable bond of the same term and maturity, therefore, finances each new loan. When individuals refinance or move house, the lender buys back the bonds (that is, these bonds are “called”). As with the previous model, Danish callable bonds are highly standardised.

⁸ Article 97 of the 1999 Law states that lenders cannot charge early prepayment penalties on residential mortgage loans if prepayment is required by forced disposal of residence for professional reasons, death, redundancy, or invalidity.

⁹ See *Fixed-rate Mortgages and Prepayment in Europe – A model review and conclusions for the prepayment indemnity model*, H. Duebel, 2005. France also has a very low take up of mortgages anyway, with mortgage debt to GDP of 32 per cent

¹⁰ *Overview: Covered Bonds*, Deutsche Bank, 2008.

A.29 The advantage over the non-callable covered bond is that borrowers do not have to pay a charge to prepay their mortgage. This is possible because the prepayment risk is not held by the borrower but – through the callable bond – by investors. The Danish model has a further advantage in that, if a borrower decides to move and their current fixed-rate is lower than the prevailing rate, they can transfer their current mortgage to the new property. This removes some of the prepayment risk due to lifestyle factors, such as a change of jobs or location, and therefore makes prepayment risk easier to assess and price.

A.30 Callable bonds raise similar incentive problems relating to the management of credit risk. As with the non-callable covered bond model, regulation ensures that mortgage credit institutions take on only minimal credit risk, giving investors confidence in the bonds. This management of credit risk is very successful in Denmark, where the spreads on mortgage bonds are low when the cost of the prepayment option is taken into account.¹¹ Credit risk for mortgage institutions is constrained by strict lending rules, for example maximum LTV limits of 60-80 per cent.

A.31 There are some disadvantages to this model for borrowers. The initial deposit for borrowers is high, given the need for mortgage institutions to keep credit risk low. As with the non-callable covered bond model, it is more likely that there will be standardisation of mortgages, because borrowers in Denmark must fit a strict and uniform set of underwriting criteria to qualify for a mortgage, ensuring that mortgages are homogenous and easy to securitise. This excludes some borrowers from of the market.

AGENCIES

A.32 Mortgage agencies issue credit enhanced mortgage-backed securities, either through an explicit or perceived implicit government guarantee. They do not offer mortgages directly. They can have a variety of objectives, including the promotion of homeownership to low-income families, or supporting the development of long-term fixed-rate mortgages. They deliver their objectives by ensuring well functioning markets for mortgage-backed securities. By far the largest mortgage agencies are in the US (see Box A1), although many other countries such as Canada, Japan, and recently Hong Kong also have agencies.

A.33 The US agencies were created after the Depression, in response to the lack of housing finance following the large fall in house prices and disruption to financial markets. In 1938 Fannie Mae was created to expand the available pool of mortgage finance and to unify regional differences by borrowing from regions where credit was more available and lending to regions with shortages. This was carried out by acquiring federally insured residential mortgages and issuing debt securities. Today the two largest agencies, Fannie Mae and Freddie Mac, issue mortgage-backed securities as federally chartered private companies.

A.34 The original function of the mortgage agencies, to ensure that mortgage finance is continuously available at all places and at all times, still stands today.¹² In economic downturns private mortgage lending criteria are often tightened, as investors seek to

¹¹ *The Danish mortgage market – As housing finance evolves, are there reasons to follow the Danish model?* Bank of International Settlements, 2004. The option-adjusted spread is the same as that of US mortgages, which have the advantage of an implicit government guarantee. It is arguable, however, that Danish banks also benefit anyway from an implicit guarantee although this has not been tested.

¹² *The Housing Finance Revolution*, R.Green and S.Watcher, 2007.

preserve capital, leading to a reduced supply of finance. By contrast, the agencies stand ready to accept pools of mortgages that meet certain criteria.¹³ This is a similar mechanism to the highest quality covered bond regimes, where credit risk is minimised to ensure an ongoing supply of finance and support greater standardisation of long-term mortgage bond markets.

A.35 Since mortgage agencies take the credit risk from the mortgage originators, this raises the risk that the originators' incentives to adequately screen the credit risk of borrowers is diluted. Fannie Mae and Freddie Mac reduce this risk in a number of ways. First, the mortgage lenders or originators are charged a fee for the credit enhancement on the basis of their past record and the mortgage characteristics. Second, mortgage agencies generally have strict criteria for the mortgages they buy. In the US, for example a "conforming" mortgage has a maximum LTV ratio of 80 per cent and there are limits to the maximum value of the loan (in 2008 this is \$417,000), credit scores and other measures. Third, higher risk borrowers are required to buy mortgage insurance before being included in the pool.

A.36 The US agencies take various measures to increase the standardisation of the mortgage-backed securities market.¹⁴ They have standard underwriting models for assessing the credit worthiness of borrowers. Mortgages are pooled by the type of mortgage, and at regular maturities such as 15 and 30 years. The bonds have coupons, which are set at half per cent increments, and the agencies publish all data on the underlying payment performance of the mortgages each month. Moreover, the securities all have the same backing and are not sub-divided into different levels of credit. In the US this has allowed mortgage-backed securities to be sold to a global investor base, which reduces the cost of mortgages for borrowers.

A.37 The risk of borrowers repaying their fixed-rate mortgages early is passed to the investors in agency mortgage-backed securities. The longer the maturity of the securities the greater is this risk. However, as credit risk is the same across both Fannie Mae and Freddie Mac securities, there is no incentive to compare the underlying credit of one mortgage pool versus another. Uniformity of the securities also minimises the marketability risk by creating large and liquid pools of homogeneous securities. The development of collateralised mortgage obligations which repackage mortgage-backed securities can create more predictable payment streams making the securities more attractive to a wider range of investors including retail investors around the world. This widespread acceptance shares the prepayment risk among many investors and therefore minimises its cost.

A.38 Several economists argue that the agencies have achieved their objectives by creating highly liquid secondary markets, and since private-label (non-agency) mortgage-backed securities now exist, the rationale for federally chartered agencies is no longer valid. The perceived implicit government guarantee may also reduce private investors' incentives to assess credit risk before investing in agency securities. There are, however, still important differences as private-label securities are typically divided into credit tranches and require over-collateralisation to reduce credit risks for investors. Whether these securities will be treated as homogenous in the future is an open question. The costs and benefits of agencies remains a keenly contested issue.

¹³ Indeed the Economic Stimulus Act proposes to increase the conforming loan limit on mortgages from \$417,000 to \$723,000 for some metropolitan cities until year-end. This is an effective easing of lending conditions, as opposed to fully private agents typical response of tightening conditions.

¹⁴ There is some evidence that the standardisation of Ginnie Mae securities reduced the cost of mortgage financing. See *The Impact of the GNMA Pass-Through Program on FHA Mortgage Costs*, D.G.Black, K.D.Garbade, W.L.Silber, 1981.

Box A1: US mortgage system and agencies

The US has several mortgage agencies, which are either explicitly or perceived to be implicitly guaranteed by the government, which issue mortgage-backed securities and supply mortgage finance. These include:

- Federal National Mortgage Association (“Fannie Mae”) and Federal Home Loan Mortgage Corporation (“Freddie Mac”). These agencies are referred to as Government-Sponsored Enterprises (GSEs), and are private sector companies with federal charters, often interpreted as inferring an implicit government guarantee. They have two main roles: credit enhancement (achieved by buying mortgages and issuing mortgage-backed securities which commit to timely payment of interest and principal on the mortgages); and secondary market management (achieved by buying mortgages and other mortgage-backed securities and holding these on their balance sheet as a retained portfolio);
- Government National Mortgage Association (Ginnie Mae). This agency has an explicit federal guarantee on the timely payment of interest and principal to investors in their mortgage-backed securities. Qualifying mortgage loans, which are made to low and middle-income families, are insured by the Federal Housing Association or guaranteed by the Department of Veterans Affairs. Ginnie Mae does not have a retained portfolio and is on the federal government balance sheet; and
- Federal Home Loan Bank system. A cooperative of 12 regional banks, owned by over 8,000 local member banks, which for a fee provide loan advances in return for collateralised loans which are then financed by issuing debt instruments.

The GSEs are private companies listed on the stock exchange, but they maintain federal charters that convey rights and responsibilities. They are exempt from state and local income taxes, their securities are eligible collateral for the Federal Reserve’s open market operations, they are not required to register issuances with the Securities and Exchange Commission and they have a line of credit with the US Treasury. In return, the GSEs are limited to buying residential mortgages in secondary markets that meet certain criteria, including a limit on the size of the loan and a maximum LTV ratio. They are subject to federal regulation and are set housing objectives by the Office of Housing and Urban Development.

While the benefits and costs of GSEs are contested, one area of broad agreement is the need for strong regulation. The combination of a federal charter and the perceived implicit guarantee with private profit incentives may lead to excessive risk taking. As of mid 2007 the GSEs held a retained mortgage portfolio of \$1.45 trillion. The size of this exposure to a single asset class has raised concerns regarding possible losses from the underlying capital and the size of transactions which may be necessary to re-balance portfolios in response to price changes.^a Some have argued this poses a systemic risk and the size of the portfolios should be capped.^b Others have argued that the GSEs should be privatised.^c

^a The Interest Rate Risk of Fannie Mae and Freddie Mac, D.Jaffee, 2003.

^b Testimony Before the Committee on Housing and Urban Affairs, A. Greenspan, 2004.

^c Reforming Fannie and Freddie: Privatisation is the Way, L. White, 2002.

B

ASSESSMENT OF SWAPTIONS PROPOSAL

MILES REVIEW SWAPTION PROPOSALS

B.1 As discussed in Chapter 3, the Miles Review suggested that long-term fixed-rate mortgage lenders could reduce their exposure to prepayment risk if they could buy call options, or similar financial assets, whose value moves in line with the borrowers' option to prepay. However, the Miles Review suggested that there might not be enough writers of call options in the private sector to create a liquid and efficient market to make this a workable strategy. However, the Government, through the Debt Management Office (DMO), as a regular issuer of long-term fixed-rate bonds might be a "natural writer" of these call options. Additionally, the Miles Review suggested that this strategy may be consistent with the DMO's debt management policy "to minimise, over the long term, the cost of meeting the Government's financing needs, taking account of risk, whilst ensuring that debt management policy is consistent with the aims of monetary policy."¹

B.2 Therefore, the Miles Review recommendation 17 was "that Government should give further consideration to the potential costs and benefits of Government issuing interest rate derivatives."²

B.3 The Miles Review suggested that the cost of Government debt issuance would normally move in an opposite direction to payments associated with call options. Therefore Government borrowing would be more stable if both bonds and call options were issued compared with issuing bonds alone. For example, when interest rates rise the higher cost to the Government of issuing new bonds at higher coupons may at least be partly offset by the premium income it would receive from writing call options. By contrast, when interest rates fall the benefit of lower coupons on new debt issuance is also at least partly offset by paying out on the call options. In this way, writing call options could be helpful by reducing the variability of the cost of servicing the Government's debt.

B.4 However, the Miles Review cautioned that if interest rates were low because of a weak economy, then the payout on the written calls might occur just when the funding requirement is increasing. This would increase the variability of the funding requirement. The degree to which debt service costs move together with longer-term interest rates, therefore, is key to working out whether writing call options would contribute to or detract from the Government achieving its debt management objective.

HOUSING FINANCE REVIEW ANALYSIS

B.5 To test this proposal, the review has carried out an assessment of whether:

- the strategy of writing call options is consistent with the DMO's mandate; and
- this would make a meaningful difference to the hedging of prepayment risk by mortgage lenders.

¹ *Annual Report and Accounts 2006-07*, DMO, 2007, p5.

² *The UK Mortgage Market: Taking a Longer-Term View, Final Report*, D.Miles, 2004, p101.

B.6 The first stage was carried out using a modelling strategy, and the second stage through consultation with mortgage lenders in the UK and mortgage investors in the US (who have portfolios of prepayable long-term fixed-rate mortgages). The modelling strategy had three aspects:

- investigating whether issuing swaptions would leave unaffected, or reduce, the risk of meeting the Government's financing needs. This was undertaken by examining the risk profiles of a constant bond and swaptions issuance strategy;
- examining how stable the relationship is between the quantity of debt the Government issues and real and nominal interest rates; and
- integrating a swaptions strategy into the DMO's current Strategic Debt Analysis model (SDA) to examine the distribution of possible payouts.³

Choice of instrument

B.7 There are a number of types of call option that Government could issue. Writing call options on bonds (i.e. puttable bonds) and writing options on swaps (i.e. receiver swaptions) were considered in this analysis. It was concluded that, given the Government's position as monopoly supplier of government bonds, if it were to write options on those bonds this might be seen as a conflict of interest. It might also influence expectations about the future path of gilt yields. The greater market depth and indirect link to gilt issuance suggested that such concerns would be less likely in the long-dated swaptions market. For this reason the review focused on the proposal that the Government could issue receiver swaptions, or options on swaps.

B.8 Receiver swaptions give the holder (perhaps a mortgage lender) the right, but not the obligation, to enter into a swap and receive a fixed-rate flow of income at a pre-agreed rate at some future date or dates. This is summarised in the payout function below. On the exercise date of the option, the holder of the swaption will choose to exercise the swaption, and therefore receive the pre-agreed fixed-rate or strike (X), if this is above the current rate on the fixed leg of a swap (S), otherwise the swaption expires worthless. On exercise of the swaption, the mortgage lender would be able to use the fixed-rate income received on the swap (in exchange for floating rate income) to replace the fixed-rate it had lost on prepayment of a mortgage loan (and pay the floating rate income from the interest received from a deposit of the prepaid funds). If the borrower acts rationally, and prepays according to interest rate movements, then buying a receiver swaption can fully protect the lender against financial loss in the event of prepayment, if the contract maturity is selected to coincide with the prepayment date.

$$\text{Swaption payoff} = \text{Max} [X - S, 0] \times [\text{present value of cash-flows}]$$

B.9 The Government's overall debt management strategy is designed to minimise market uncertainty by conducting operations in accordance with the principles of openness, predictability and transparency. The Government judges that by conducting its operations in this manner, the DMO will effectively contribute to achieving long-term cost minimisation, subject to risk. Each year the Debt and Reserves Management Report, published with the Budget, announces the net funding requirement including the amount of maturing gilts to be refinanced, and the gross new supply of gilts to be

³ See *Annual Review 2005-06*, DMO, 2006, for a discussion of the SDA model.

issued within the financial year. The amount of new supply is given by broad maturity bracket and between conventional (nominal) and index-linked (real) gilts. In addition a formal auction calendar is provided for the financial year ahead. In conjunction with sound judgement, formal modelling using the SDA model plays a key role in providing analytical support for the formulation of the medium term debt management policy. The DMO takes the amount of issuance each year and level of interest rates as a given, and current or implied volatility of interest rates are not parameters, other than possibly indirectly through the maturity structure of the issuance strategy.

Portfolio risk characteristics of debt and swaptions

B.10 The first modelling approach taken was to examine whether issuing swaptions alongside regular bond issuance reduced the risk of the Government's funding strategy. To isolate the price risk of both assets, it was assumed that the amount of debt to be issued each period is constant and funded only by nominal gilts. It is also assumed that the net expected return on swaptions is zero, otherwise the Government could earn a positive net return on a consistent basis. Therefore, the Government issues a constant amount of debt and some zero net expected value swaptions.

B.11 The current cost and risk of issuing fixed-rate debt is a function of interest rate levels. When interest rates are high, the cost of issuing debt is also high and vice-versa. After issuance of the bonds all nominal payments are known with certainty. The net cost of a swaption position is less certain. On issuance the Government receives a premium for writing the swaption, equal to the expected net cost of the swaption being exercised in the future. However, after the swaption is written the expected payout is constantly changing depending on several underlying variables.

B.12 As the Miles Review recognised, the underlying variables driving option prices on fixed-rate bonds are complex, "whether [writing calls] reduces the risk of funding costs will depend on the particular sources of uncertainty and the correlations between them".⁴

B.13 Because the value of a swaption today depends on unknown interest rates in the future, to illustrate the impact on the funding requirement requires a model of the term structure of interest rates. Model selection was motivated by a desire to understand the sources and correlations of the risks, and to have a model that is a reasonable representation of the actual yield curve.⁵ A two-factor Gaussian model allows the level and slope of the yield curve to be modelled (effectively short and long rates) with an additional allowance to change the correlation between these rates, for example to see how a shock to short-term interest rates influences long term interest rates.⁶

B.14 To see the effect of issuing swaptions on debt management the review assumed a benchmark case of the Government issuing a continuing flow of £100 five-year bonds each period with a 5 per cent coupon. The red line in Chart B.1 shows how the change in the costs of this strategy change with movements in interest rates. For example, a 1 per cent fall in interest rates creates a reduction in funding costs relative to the benchmark of approximately 5 per cent over the five years. A swaption contract with notional value of £100 is also issued with two years to maturity to receive fixed funding at 5 per cent. The black line in Chart B.1 illustrates the payoff function. If interest rates

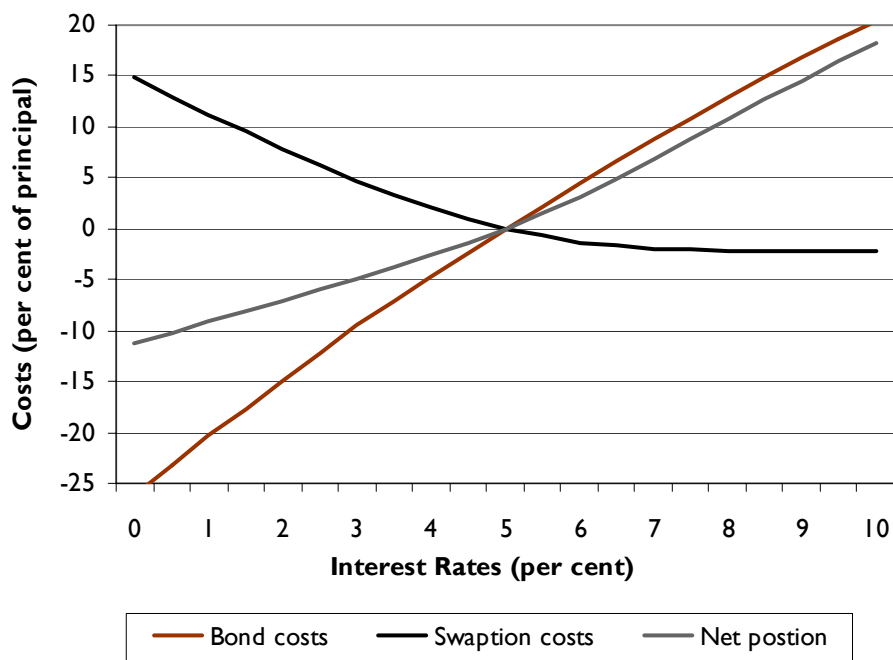
⁴ *The UK Mortgage Market: Taking a Longer-Term View, Final Report*, D.Miles, 2004, p83.

⁵ *Interest-Rate Option Models*, R.Rebonato, 1998, estimates that two principle components can explain 99 per cent of movements in the sterling yield curve.

⁶ See *Interest Rate Models, Theory and Practice*, D.Brigo and F.Mercurio, 2001.

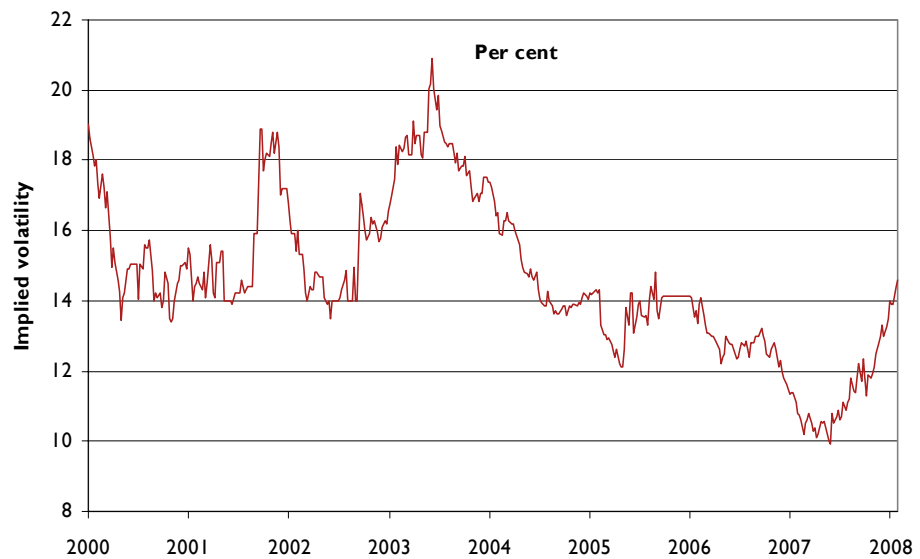
fall and so fixed-rate mortgages are prepaid, then the swaption is worth more to the buyer and has a greater cost to the Government. For interest rates above 5 per cent the option is not exercised and the Government takes the premium initially paid as profit. The net cost of funding is found by adding the two cash flows together, illustrated by the grey line in Chart B.1. This has a lower maximum and higher minimum across the interest rate schedule, which illustrates the Miles Review proposal that issuing swaptions can make the cost of funding with respect to interest rate levels less volatile. The degree to which this occurs depends on the notional value of the swaptions issued.

Chart B.1: Bond and swaption payoffs



Source: HM Treasury

Chart B.2: Implied volatility (two-year into five-year receivable European swaption)



Source: Bloomberg

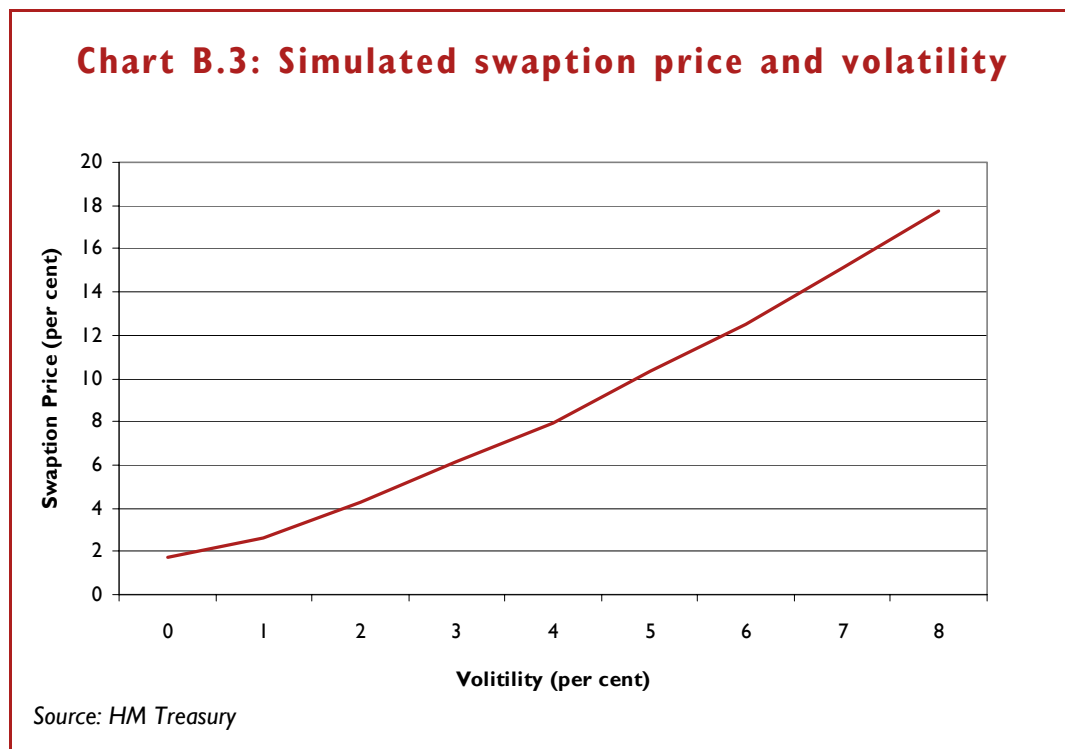
B.15 Yet as with all options the main source of uncertainty is the implied volatility of the price of the underlying asset over the remaining life of the contract. In other words, since the future level of interest rates is unknown, swaption prices are driven by the implied volatility of interest rates over the life of the swaptions contract. Implied volatility is used to price options in the market, and this is not a stable variable. Chart B.2 shows market quotes of implied volatility of a swaption with two years to maturity on a five-year receiver swap over the past eight years. Clearly the implied volatility changes significantly over time.

B.16 The extent to which the swaption price changes with the volatility of the modelled interest rate level only (the first underlying factor) is shown in Chart B.3. The chart shows that the higher the volatility of the interest rate paths, the higher the swaptions price. This is based on modelled volatility. Real world implied volatility is a constantly changing variable as shown in Chart B.2. Based on this model and calibration, a doubling of volatility roughly doubles the cost of the outstanding swaption. The general point is that running an open swaptions position introduces risk based on implied volatility, which changes over the remaining life of the contract.

B.17 A second source of uncertainty comes from the shape of the yield curve, as longer-term interest rates have information about the future levels of short-term interest rates. The extent to which they move together will also be relevant for pricing swaptions. For example, if there is a shock to long-term rates, are short-term rates unchanged, leading to a change in the slope of the yield curve, or are short-term rates also influenced? An advantage of the Gaussian model term structure model is that “a non-perfect correlation between different maturities is introduced. This results in more precise calibration to correlation-based products like European swaptions.”⁷ Increasing the correlation between the two factors, means that any change in the level of interest

⁷ *Interest Rate Models, Theory and Practice*, D.Brigo and F.Mercurio, 2001.

rates have a greater impact on the swaptions price. Therefore, it is the implied volatility and also how the implied volatility interacts across the yield curve that matters for valuing the open swaptions position.



B.18 Having reviewed the payoff characteristics of issuing swaptions along with bonds, how does this change the DMO's funding strategy? With respect to changes in the level of interest rates, by issuing swaptions the Government could in principle reduce the risk of its funding strategy. But with respect to the volatility of future interest rates over the swaption contract, adding swaptions will add to the risk of its funding strategy. Furthermore, changes in the volatility of interest rate levels can have different impacts on the swaptions prices depending on the movement of the yield curve. Because the funding requirement is now sensitive to implied volatility, it cannot be claimed that the risk of the funding strategy is lower. These effects can be demonstrated by looking at actual swaption pricing. A 50 per cent rise in current implied volatility and in interest rates, according to the Bloomberg pricing algorithm, shows broadly the same impact on at-the-money two into five receiver swaptions (two-year option on a five-year swap).

B.19 It is also important to note that while interest rates are influenced by monetary policy and so bounded around fairly narrow levels, implied volatility and so the swaption price can reach far greater extremes. In such circumstances the DMO would be obliged to recognise the current value of its debt position (which could easily be inferred by market participants) and a prudent course of action would be to limit its exposure. This would require buying back options from the market, but just at the time when those exposed to prepayment risk would be looking for cover.

B.20 This analysis suggests that combining debt with receiver swaptions can reduce the interest rate variation on the flow of debt issuance. But this is only achieved by maintaining open positions in the swaptions market thereby adding (in particular) implied volatility risk in a complex way. This introduces another and significant dimension of risk to the debt issuance strategy.

Correlation between funding levels and interest rates

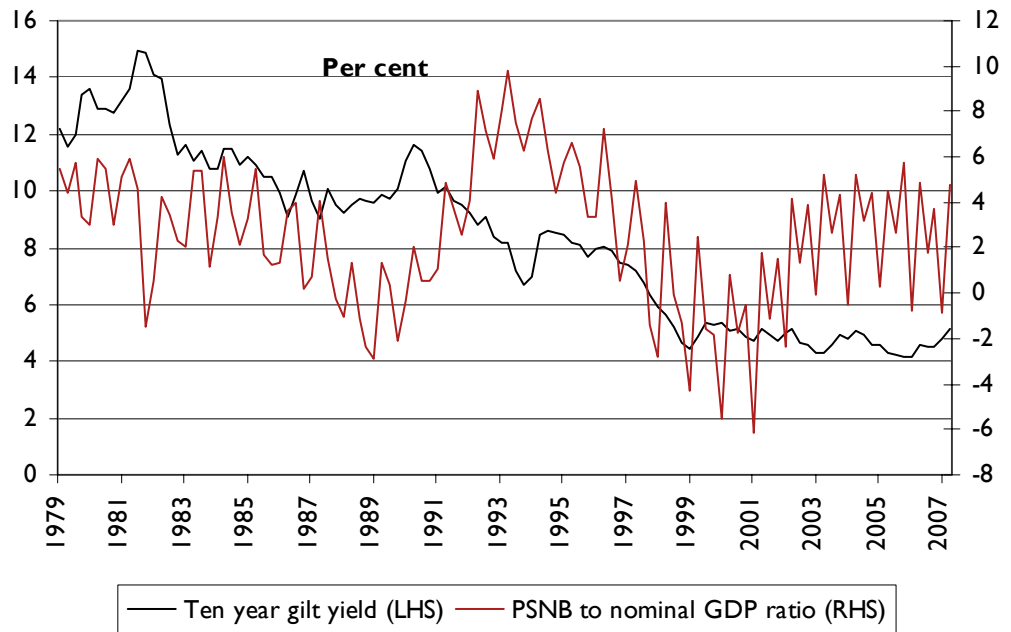
B.21 The second modelling exercise is to leave aside the portfolio risks of managing implied volatility and simply ask whether swaptions would historically have tended to require payouts when the borrowing requirement level was low. If swaptions would only have been exercised when the level of Government borrowing was low, this would have had the effect of smoothing borrowing over time. Since swaptions are only exercised when interest rates are low, this comes down to whether the funding requirement was moving in the same direction as interest rates.

B.22 The relationship between the level of the funding requirement and interest rates depends on the type of economic shock driving the funding requirement. When the economy is in a downturn, the funding requirement is generally higher as the automatic stabilisers work to decrease incomings and increase outgoings. Whether interest rates are also high or low depends on the nature of the shock. A downturn caused by a demand shock will tend to coincide with lower interest rates whereas a supply shock will tend to lead to higher interest rates. Therefore, if most shocks are to supply then there will tend to be a positive relationship between interest rate levels and funding requirements. Of course, such a clean distinction can rarely be made in practice.

B.23 Chart B.4 reproduces Chart 7.3 from the Miles Review Final Report, and shows non-seasonally adjusted public sector net borrowing (PSNB) as a percentage of Gross Domestic Product (GDP) and ten-year nominal gilt yields since 1979. The correlation coefficient over this period is around positive 0.28, which provides support for the proposition that issuing swaptions may reduce the risk of the funding requirement. However, for swaptions to reduce the expected level of government borrowing it is important that this positive correlation is stable over time. If there are occasions when the relationship is negative, this could lead to large swings in the government borrowing requirement. To see how the correlation changes over time Chart B.5 shows the ten-year rolling correlation coefficient between the PSNB and ten-year nominal gilt yields. Clearly, the relationship is not stable over time, with a significant negative correlation during the mid 1990's.⁹ This suggests that swaptions issuance could have led to a more volatile borrowing requirement, as it is possible that they would have been exercised at a time when the level of borrowing was also high.

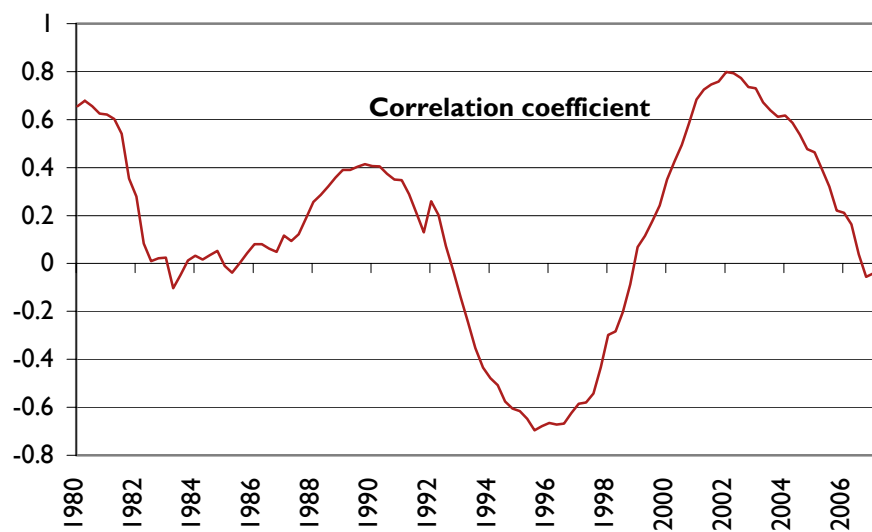
⁹ Chart 2.2 of the 2006 End of Year Fiscal Report shows how both the fiscal stance and automatic stabiliser components of PSNB have changed compared to changes in real interest rates from 1997 - 2005. This shows that fiscal policy tends to support monetary policy, with a fiscal loosening (increases in the PSNB) generally occurring at the same time as a decline in real interest rates, suggesting a negative correlation between PSNB and interest rates.

Chart B.4: Public sector net borrowing and ten-year gilt yields



Source: Bank of England, Office for National Statistics

Chart B.5: Ten-year rolling correlation between PSNB and ten-year gilt yields



Source: Bank of England, Office for National Statistics, HM Treasury calculations

Real borrowing vs. nominal interest rates

B.24 However these comparisons are between an implicitly real variable, borrowing as a percentage of nominal GDP, and nominal interest rates. An alternative approach would be to look at the relationship between borrowing as a percentage of GDP and real interest rates. A similar result holds when real interest rates are used; there is no stable positive relationship between borrowing and interest rates. Real interest rates (as measured by index-linked ten-year gilts) came down sharply in the early 1990s at the same time as the level of borrowing was rising, and there is a negative relationship over the past ten years.

B.25 Overall therefore the level of borrowing tends to be higher when interest rates are low. This suggests that shocks to the economy are primarily demand driven, with a negative demand shock leading to lower output, higher borrowing but lower interest rates. In turn this does not support the proposition that swaptions could help smooth Government borrowing, as the level of borrowing tends to be high when interest rates are low and swaptions are being exercised.

Swaptions and the SDA model

B.26 The DMO mandate (as set out in paragraph B.1) ensures consideration not only to the cost of Government financing but also the risk or volatility in that cost of financing. To help inform advice on the financing remit the DMO maintains a simulation model for the analysis of the UK's sovereign debt strategy - the SDA model.¹⁰

B.27 This model incorporates a small macroeconomic model, which includes for example a stochastic output gap and a Taylor Rule for interest rates, with typical properties for such a model.¹¹ It also includes a model of the yield curve and a stylised model of the Government's funding requirement. The model has been calibrated to broadly match the observed yield curve and its volatility since 1998.

B.28 The SDA was augmented to include various issuance programmes for swaptions alongside the issuance of Government debt. It is relatively easy to evaluate the cost of swaptions on exercise, as this is simply the current price of the interest rate 'Swap' underlying the swaption. All other things equal swaption costs are greater the lower current interest rates are relative to past expectations.

B.29 By contrast it is difficult to price swaptions, and hence estimate how much revenue the DMO might earn from regularly writing call options. To price swaptions 'Tree' models are a standard toolkit, and these models require specification of the volatility process for the underlying interest rate model directly, or calibration to match the properties of the yield curve generated by a model in simulation. As noted above generally the price of a swaption is determined almost entirely by the assumed volatility of future interest rates.

B.30 To distinguish clearly between the cost and risk aspects of swaptions in government finance the simulations were designed so that issuance was cost neutral, with revenue earned from writing swaptions roughly equal to the costs from their exercise over the long run.

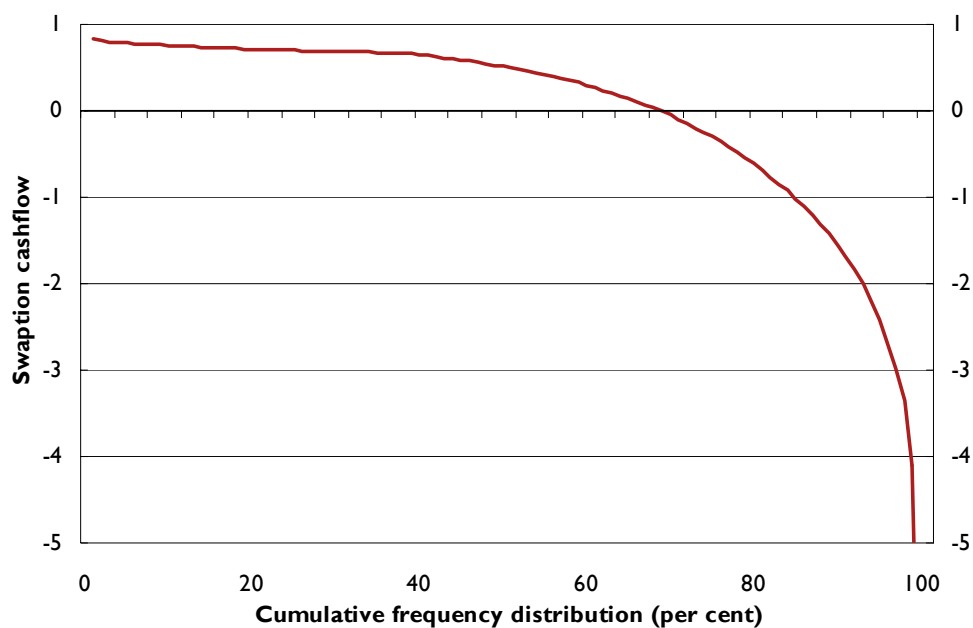
¹⁰ Results from the SDA were included in, *Debt and Reserves Management Report 2007-08*, HM Treasury, March 2007, Annex B.

¹¹ *A simulation model for the analysis of the UK's sovereign debt strategy*, DMO, 2006.

B.31 The simulation showed that the price of swaptions and hence revenue for the DMO, as a writer of swaptions for the Government, exhibited a low volatility. Therefore typically a relatively constant premium from writing swaptions was received every period. By contrast the cost of swaptions that were assumed to be cash-settled on exercise was very volatile: while costs were often zero in any one period they were occasionally very much larger than the premiums received in the same period. These results are illustrated in Chart B.6.

B.32 Overall swaptions were not found to provide any significant and consistent fiscal smoothing. This was due to two key factors. First, within the SDA the Government's financing requirement varies inversely with the output gap, and typically interest rates are lower when the economy is operating below trend. Hence the Government typically needs to borrow more when it is less expensive to do so, and vice-versa. This volume or "quantity" effect naturally provides some fiscal smoothing. However, the inclusion of swaptions within the Government financing portfolio tends to undermine this effect, as the swaptions costs are highest when interest rates are lowest. Secondly, the volatility of a swaption position can be much higher than the volatility of the cost of conventional Government financing. While the costs of swaptions and interest rates are typically negatively correlated, to reduce the volatility of financing costs overall this negative covariance must more than offset any extra volatility created by the inclusion of swaptions within the portfolio.

Chart B.6: Distribution of net swaption cashflows



Source: HM Treasury

Notes: Swaption cashflow indexed, where 1 is the maximum payout seen in the model.

Market participant discussions

B.33 The proposal to issue swaptions was brought up in many of the consultations (see Annex C for a full list of parties consulted). All investment banks pointed out that the current price of swaptions (implied volatility) is historically low and yet the participation of mortgage lenders in the market is small. While the volume of trading was relatively small at long dated maturities, it was suggested that were demand to increase, the market could provide enough supply. If the Government were to carry out such a large issuance as to influence the market price, then this may have some effect on the pricing of the underlying swaps and therefore distort the cost of capital.

B.34 Only one of the lenders consulted during the review reported being a regular buyer of swaptions. Most lenders thought that measuring the characteristics of prepayment risk of long-term fixed-rate mortgages was a necessary first step before assessing the relative costs of hedging strategies. Mortgage investors in the US who take the same risk position as a lender of long-term fixed-rate mortgages use swaptions, but they were keen to stress the importance of managing the risk from implied volatility which required regular trading. Some hedge funds suggested that they would be able to predict the DMO's swaptions strategy unless they bought and sold, which could possibly lead to position taking against such a one-sided issuer.

B.35 Two other governments consulted had either considered or had been regular participants in the swaptions market. One had decided that it had no role in influencing capital market prices, and the other has withdrawn from trading in swaptions.



THE CONDUCT OF THE REVIEW

C.1 The Housing Finance Review has been conducted by the Treasury, assisted by a Steering Group consisting of officials from Treasury and the UK Debt Management Office. The review team has engaged with around seventy stakeholders involved in different aspects of housing finance through a series of meetings and visits. In addition, organisations and individuals were able to submit their views via a Housing Finance Review web page on the HM Treasury website.

C.2 The review team are very grateful to all those who have contributed to this review. The review has drawn on these discussions, although the analysis and proposals in this review document are those of the Treasury. Thanks are due to:

Abbey National

Bank of England

Barclays Bank

Barclays Global Investors

BlackRock Investment Management

BlueCrest Capital Management

Brevan Howard Asset Management

Bristol and West Mortgages

Britannia Building Society

Building Societies Association

Professor Lara Cathcart, Imperial College London

Chelsea Building Society

Cheltenham and Gloucester

Cheshire Building Society

Citigroup Global Markets

Citizens Advice Bureau

Council of Mortgage Lenders

Coventry Building Society

Credit Suisse Asset Management

Danish FSA

Deutsche Bank

Hans-Joachim (Achim) Dübel, Finpolconsult

European Investment Bank
European Securitisation Forum
Fannie Mae
Federal Housing Finance Board
Federal Reserve Bank of New York
Federal Reserve System Board of Governors
Fidelity Investments International
Financial Services Authority
Freddie Mac
Ginnie Mae
GMAC-RFC
Goldman Sachs
HBOS
Housing Corporation
HSBC Bank
Intermediary Mortgage Lenders Association
International Monetary Fund
Joseph Rowntree Foundation
JP Morgan Chase & Co
King & Shaxson
Lloyds TSB Group
MarketGuard
McKinsey&Company
Merrill Lynch International
Professor David Miles, Morgan Stanley
Morgan Stanley
Morley
Nationwide Building Society
Nycredit Realkredit
Office of Federal Housing Enterprise Oversight

Paragon Finance

Royal Bank of Scotland

Schroders Investment Management

Securities Industry and Financial Markets Association

Shelter

Skipton Building Society

Standard Life

UBS Investment Bank

US Department of Housing and Urban Development

US Department of the Treasury

Professor Christine Whitehead, London School of Economics

Mike Williams, Ex Chief Executive, UK Debt Management Office

World Bank

Yorkshire Building Society

GLOSSARY

Adjustable Rate Mortgage (ARM) – a variable rate mortgage in the US and some other countries. These mortgages often have fixed-rate initial terms of between 1-5 years.

Callable bonds – a bond that can be redeemed by the issuer prior to its maturity.

Capped rate mortgage – a mortgage which has an upper limit on the interest rate paid, which can provide the benefits of a fixed-rate mortgage while also allowing borrowers to benefit from any declines in interest rates.

Collateralised debt obligations (CDOs) – securities backed by a portfolio of fixed income assets that are issued in tranches of varying seniority.

Collateralised mortgage obligations (CMOs) – securities backed by a portfolio of mortgage obligations with different credit and prepayment profiles.

Covered bond – a security backed by a pool of assets. The investor has a claim on both the pool of assets and the issuing institution.

Credit risk – risk associated with a borrower failing to meet their scheduled repayments in accordance with agreed terms.

Early Repayment Charge (ERC) – a fee applied to borrowers should they repay their mortgage before the end of the agreed term.

Foreclosure – a legal process by which the lender or the seller forces a sale of a mortgaged property because the borrower has not met the terms of the mortgage.

Government Sponsored Enterprise (GSE) – privately held corporations with federal charters, created to reduce the cost of capital for certain borrowers.

House price futures – contracts that allow investors to lock-in a future value of a house price index today.

House price insurance – a contract that protects homeowners from declines in the value of their home equity.

Index-linked mortgages – mortgage where repayments are linked to inflation.

Interest rate swap – a bilateral contract having a fixed notional principal amount and a series of agreed payment dates on which one counter-party to the contract pays the other a fixed rate of interest (the swap rate) and receives a floating rate, usually pegged to LIBOR.

LIBOR – London Interbank Offered Rate, a daily reference rate based on the interest rates at which a panel of banks offer to lend unsecured funds to other banks operating in the London wholesale, or interbank, market.

Liquidity – the ability to acquire or dispose of an asset without causing a significant price movement.

Loan-To-Value Ratio (LTV) – mortgage loan amount as a percentage of the property value.

Long-term fixed-rate mortgages – loans where the repayments are made at a fixed rate of interest for the long term, which in this report is deemed to be 10 years or more.

Mortgage payment protection products (MPPI) – private insurance that borrowers can take out to insure mortgage payments against sudden loss of income due to unemployment or health related difficulties.

Prepayment risk – risk that arises from outstanding balances on mortgage loans being repaid before their scheduled dates, leaving lenders at risk of being unable to reinvest at the contracted rate if market interest rates have fallen.

Public sector net borrowing (PSNB) – the sum of current spending (including depreciation) and net investment, less total revenues.

Puttable bonds – similar to a callable bond, with the exception that the option to redeem the bond early is sold to the investor rather than retained by the issuer.

Receiver swaption – gives the owner the right to enter into a swap in which it receives the fixed interest rate on the agreed notional principal amount and pays the current floating rate.

Residential mortgage backed securities (RMBS) – lenders package a pool of mortgages which are sold to investors. The securities can be sold in tranches with different levels of credit quality, allowing investors with varying appetites for credit risk to purchase different parts of the pool of mortgages.

Retail deposit funding – use of savers bank deposits to fund mortgages.

S&P/Case-Schiller Home Price Indices – measure of the US residential housing market, tracking changes in the value of the residential real estate market in 20 metropolitan regions across the US. These indices use the repeat sales pricing technique to measure housing markets

Secondary mortgage market – used in the report denote mortgage-backed securities financing e.g. residential mortgage-backed securities (RMBS) and covered bonds.

Securitisation – the process of originating or purchasing mortgages and other assets, and then packaging and reselling them to investors and other banks.

Shared equity scheme – a scheme to support the outright purchase of a home with assistance of an equity loan from either the Government, private lender or both. When repaying the equity loans, the homeowner shares any increase in the property's value with the lender.

Shared ownership – schemes which offers households the opportunity to buy a share in a home, and pay a rent on the outstanding equity. Purchasers have the option to buy further shares in the property to eventually achieve full ownership. If the property is sold the purchaser benefits from any equity that has built up on the share that is owned.

Special Purpose Vehicle (SPV) – a legally distinct entity with a limited set of purposes.

Stand-alone interest rate protection – a contract that pays out should rates go in excess of a predefined level. The concept is similar to an interest rate cap although the product can be offered separately from the mortgage lender.

Strategic Debt Analysis model (SDA) – a stochastic simulation model developed by the UK Debt Management Office (DMO) to quantify expected cost and risk of various debt issuance strategies.

Structured Investment Vehicles (SIVs) – a fund that raises capital from investors in order to purchase portfolios of assets.

Swaption – an option granting its owner the right but not the obligation to enter into a swap, typically an interest rate swap. Swaptions can be exercised on a single option expiry date (European-style), on a series of pre-agreed dates at or prior to expiry (Bermudan-style), or at any time prior to expiry (American-style).

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