UK mortgage underwriting

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The Council of Mortgage Lenders

The Council of Mortgage Lenders (CML) is the trade association representing the mortgage industry. Its members comprise banks, building societies, insurance companies and other specialist residential mortgage lenders, which together represent around 98% of the UK mortgage assets.

This publication forms part of the research programme commissioned by the CML on issues related to the mortgage and housing market.

A list of recent research reports and CML publications can be found at the end of this report.

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Foreword

I started working in the mortgage industry just over four years ago. Over that time, the industry has changed considerably and not just as a result of regulation, though that has had a major impact. With more lenders entering the market each year, we have all had to find different ways of staying competitive and one of the most notable ways is the way in which applications are assessed.

When I first entered the mortgage industry, a large number of lenders including GMAC RFC were still manually assessing applications. Credit scoring and automated underwriting was a fairly new concept to the mortgage industry, though it was frequently used in other financial markets. Intermediaries and borrowers alike were wary of this new technology, as there was the belief that fewer applications would be accepted, as credit scoring and automation created uncertainty. Fast forward to 2006 and most of the major lenders in the market use some form of automated underwriting. Credit scoring has advanced significantly and customers are much more comfortable with the overall concept. The move to automated underwriting allows a lender to offer a fast and consistent decision, which is an advantage in a competitive and fast paced market.

It will therefore come as no surprise that one of the findings of this research is that large lenders with significant market share use automated underwriting, which includes credit scoring and affordability techniques. However, this research also looks at the drivers of moving to automated underwriting, or staying manual, as well how different techniques are applied depending on the type of applicant.

The various ways of assessing affordability are also covered; the findings show that while most lenders use affordability techniques, there are many different factors which are considered. Finally, the report focuses on valuations and the increase in popularity of using an Automated Valuation Model (AVM).

I hope you will agree with me that this is a very useful piece of research, as it provides a valuable insight into the level of automation used throughout the industry. Innovation is the key to staying successful and understanding the drivers of this important part of the mortgage life cycle will help to keep the industry creative and vibrant.

Victoria Barnard, Policy Advisor, GMAC RFC

Executive Summary

Basis of results

- All of the findings presented in this report are from a survey of full CML members conducted in December 2005/January 2006. 40% of members responded, representing 71% of total gross mortgage lending and 69% of residential mortgage assets in the UK. A smaller proportion of small lenders than medium-sized and large lenders responded, but the high response rates and broad market coverage for all three size bands mean that the results present a reliable picture of the mortgage industry as a whole.

Recent changes

- The penetration of recently-developed underwriting tools into the industry has been rapid. At the time of the survey, nearly half of all lenders were using a credit score model compared with a little over 10% before 2000. Over 50% were using an affordability model compared with less than 10% six years earlier. Over the next few years, the proportion of lenders using credit score models and affordability models is expected to rise to 55% and 67% respectively.
- According to the survey, large and medium-sized lenders are more likely to have credit score models in place than small lenders:
    - 91% of large lenders use credit score models, with the remaining 9% using credit reference agency information.
    - 33% of medium-sized lenders use their own credit score models, with 62% using credit reference agency information. The remainder use neither a credit score model nor credit reference agency information.
    - No small lender uses a formal credit score model. 71% of small lenders use credit reference agency information, but the remainder do not.
- All lenders use income multiples, an affordability model or a combination of the two to assess affordability. 43% use income multiples only, 16% use only an affordability model and 38% use a combination. Large lenders are more likely than medium-sized or small lenders to use an affordability model: 32% of large lenders use only an affordability model, while 5% of medium-sized and 8% of small lenders use only an affordability model.
- Automated valuation models (AVMs) are a more recent innovation. The proportion of lenders using them rose from close to zero in 2003 to around 30% at the end of 2005. Use is expected to increase towards 40% over the next few years. AVMs are typically used for valuing properties for remortgages and, to a lesser extent, further advances.

- Most of the small and medium-sized lenders (around 87% and 90% respectively) use manual underwriting processes. By contrast, most of the large lenders (around 77%) use partly automated processes. 9% of large lenders use fully automated processes.
- Generally speaking, the larger the lender, the more likely the process is to be automated and the quicker the decision in principle about whether or not to grant the mortgage. Almost 70% of large lenders reach a decision in principle, at least regarding the applicant, within 10 minutes. 38% of medium-sized lenders and 33% of small lenders reach a decision in principle within 10 minutes.

Drivers and impact on the market

- Regulation is a major driver of change. Almost all lenders that have introduced an affordability model consider regulatory guidance as the most important driver. In 2004, the FSA introduced regulation for mortgage providers. The rules explicitly state that mortgage providers must assess applicants' ability to repay.
- An important driver behind the automation of underwriting processes is the ability to take application decisions quickly. Consumers shopping around for the best deal want to know quickly whether they will be granted a mortgage, and on what terms, and they are increasingly applying through intermediaries that have access to a wide range of competing lenders and products.
- The automation of underwriting processes and decisions has a number of advantages for mortgage applicants and lenders. It reduces the time required to process the loan application, resulting in cost savings for lenders that can be passed on to the borrower in more favourable terms.
- Prior to the introduction of credit scoring, lending was largely undertaken on a 'relationship' basis, whereby local knowledge was important, or where there was already a relationship with the customer, for example a current or savings account.
- As credit score models based on broader datasets are utilised, new segments of the market can be identified and entered. Credit scoring can help lenders take a balanced approach to risk. It produces more consistent decisions and transparent measurement enables consistency of reporting, control and governance.

Bespoke approaches for certain market segments

- Increasing automation in underwriting processes has not resulted in a one-size-fits-all approach. Applicants in certain market segments may have different characteristics and risk profiles, and so require a bespoke approach. Some of the different approaches followed by lenders are outlined below.

Manual assessment

- Although an increasing proportion of applications are subject to automated processes, there remain a significant number of lenders in the market using manual processes. These are mostly small lenders, accounting for around 60% of lenders by number, but only 6% of gross lending. Furthermore, in the prime market, 24% of the applications processed by lenders with partly automated processes are referred for manual review.
- In the sub-prime market, a larger proportion of applicants are served by lenders with manual processes and more applications are referred for manual review by lenders with partly automated processes than in the prime market. This is to be expected as sub-prime applicants are likely to have characteristics that may not be acceptable on the basis of automated policy rules, and so are more likely to require manual assessment.

Bespoke credit score model

- Lenders active in the sub-prime market are more likely to have a credit score model than lenders in the prime market. 65% of sub-prime lenders use a credit score model compared with 44% of prime market lenders. This may reflect the fact that sub-prime mortgages generally involve higher risks and therefore require more detailed assessment.
- Where appropriate, tools are adjusted according to the type of market segment. For example, 50% of lenders using a credit score model have one or more bespoke credit score model in place. These models are used for sub-prime applicants, first-time buyers, further advances and remortgages.
- An alternative way of dealing with the different characteristics and risk profiles of certain groups of applicants is to change the cut-off point, that is the way the credit score is interpreted, while using the same credit score model across all market types. 18% of the lenders that use credit reference agency information or credit score models indicated that they vary the cut-off point according to the type of market. Typically, this is done for sub-prime applicants, first-time buyers and young borrowers.

Affordability models

- More sophisticated tools are sometimes used for specific categories of applications. For example, although most lenders with an affordability model use it for all applications, some lenders only use such models if the application exceeds the maximum income multiple allowed by lending policy rules. The lender then looks more closely at the applicant's income and expenditure to assess the size of loan the applicant could afford.

Entering new markets

- The bespoke approach of lenders is also reflected in the way they enter new market segments. 45% of lenders that have entered or are considering entering new market segments indicated that they assess applications in these segments manually, 33% by buying mortgage portfolios from other lenders, that is with the risk already assessed, 15% by using the existing credit score model with adjusted score cut-offs, and 6% by buying in and implementing a credit score model appropriate for the market segment. Small and medium-sized lenders typically enter new markets by buying portfolios or by assessing applications manually. Large lenders typically enter new market segments by using their existing credit score model with adjusted score cut-offs.

Chapter 1

Introduction

Objectives and remit

The Council of Mortgage Lenders (CML) and Standard & Poor's (S&P) commissioned Oxera to conduct research into the underwriting techniques and processes used by UK residential mortgage lenders.

There have been a number of developments in the tools employed in the mortgage underwriting decision in recent years. These reflect the increased availability of data on which to base the decision, the speed with which the data can be accessed, the development of statistical decisioning models based on the data and the incorporation of data and models into increasingly sophisticated and integrated IT environments. Processes have become more streamlined and the use of semi- and fully-automated decisioning systems is becoming increasingly widespread.

The objective of this research is to understand what tools and processes mortgage lenders in the UK use in the assessment of residential mortgage applications, how these are changing, and what factors are driving the changes.

The research focuses primarily on the tools and techniques used in the credit and affordability assessments of applicants for mortgages for home-ownership. The assessment of buy-to-let applications is excluded. Property valuation techniques are covered only to the extent that innovations are being used to streamline the final lending decision. Developments such as behavioural credit score models, risk-based pricing, and the impact of the EU Capital Requirements Directive (CRD - commonly referred to as Basel 2) on risk measurement and underwriting processes are outside the scope of this research.

Information sources

The following sources of information were used in this study.

- Literature—relevant literature on underwriting techniques and credit scoring was reviewed.
- Interviews—to obtain a clearer understanding of the underwriting techniques and processes used by lenders, interviews were conducted with eight lenders, two mortgage intermediaries, two UK credit reference agencies, and staff members of the Financial Services Authority (FSA).

- Survey—all full members of the CML were invited to complete a questionnaire. The results of the survey presented in this report are in aggregate form. The questionnaire was intentionally concise to encourage participation, covering a limited number of areas at a relatively high level. The final date for the processing of completed questionnaires was 13 January 2006.
- Discussion of results—the results of the survey were presented and discussed at a meeting with CML, S&P and a panel of mortgage lenders.

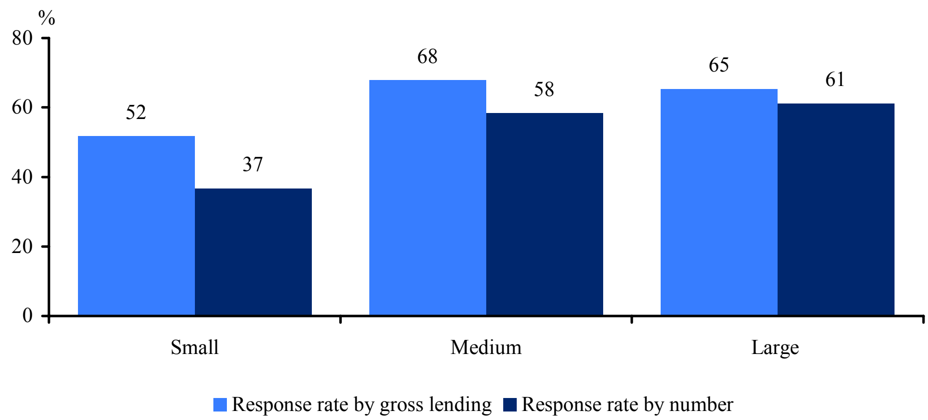
All of the findings presented in this report relate to the survey of CML members.

Sample of survey among mortgage lenders

The survey was sent to all full members of the CML. The membership covers around 98% of all UK mortgage lending and includes banks, building societies, specialist mortgage lenders, and centralised lenders. 40% of CML members completed the questionnaire, representing 71% of total gross mortgage lending and 69% of residential mortgage assets in the UK.

A smaller proportion of questionnaires was completed by small lenders than medium-sized and large lenders[1] (see chart 1), but the high response rates and broad market coverage for all three size bands indicate that the results present a reliable picture of the mortgage industry as a whole.

Chart 1: Representation of the small, medium-sized and large lenders in survey sample, %



Source: Oxera questionnaire

The mortgage portfolios of respondents can be broken down into categories:

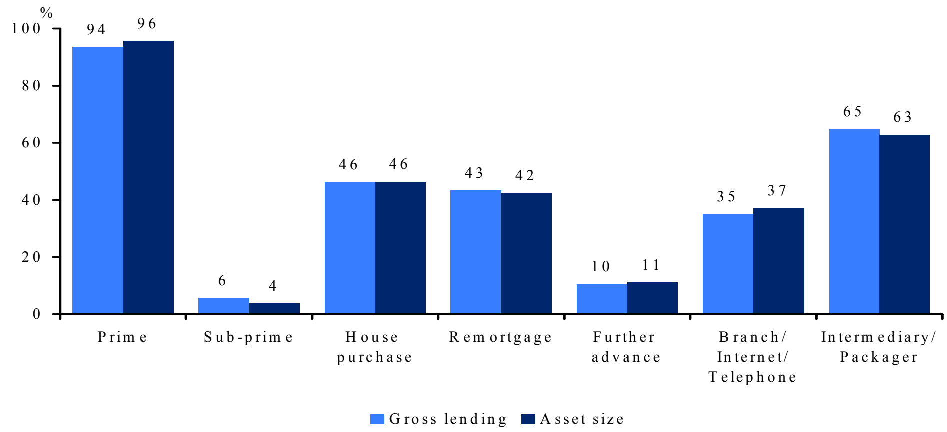
- type of market—prime or sub-prime;[2]

- purpose of loan—house purchase, remortgage or further advance;
- business channel—branch/Internet/telephone or intermediary/packager[3].

The split by category is shown in chart 2 below. In each case, the split by category sums to 100%.

- Prime lending accounted for 96% of respondents' mortgage assets and 94% of recent gross lending[4].
- House purchase accounted for 46% of recent gross lending, remortgages for 43% and further advances for 10%.
- Around 65% of mortgages by value are sold through intermediaries or packagers, and 35% through branch/Internet/telephone.

Chart 2: Presence of lender by type of market, purpose of loan and business channel, %



Source: Oxera questionnaire

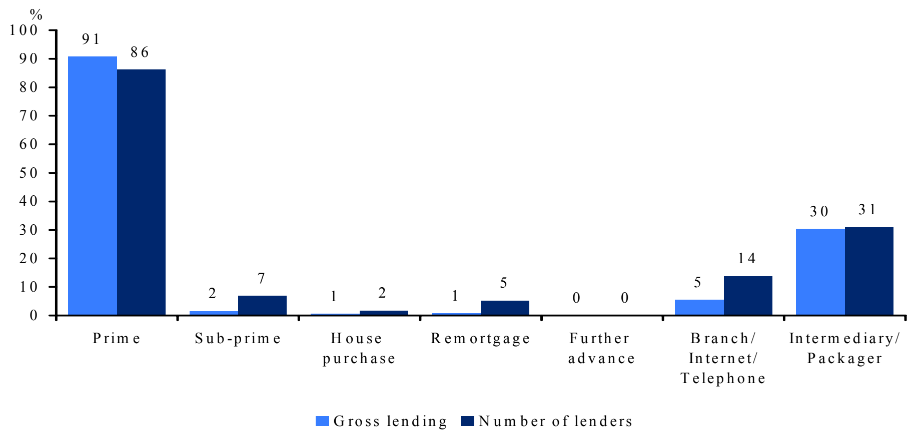
Chart 2 shows the split of business for all lenders in the market. However, some lenders have business models more heavily weighted towards certain types of market, purpose of loan, and business channel. Chart 3 shows the proportion of lenders for which more than 75% of their recent gross lending was in a particular type of market, purpose of loan or business channel.

- Type of market—the prime market accounted for more than 75% of recent gross lending for 86% of lenders. The corresponding figure for the sub-prime market was 7%.
- Purpose of loan—house purchase accounted for more than 75% of recent gross lending for only 2% of lenders and remortgaging accounted for more than 75% of recent gross lending

for only 5% of lenders. The vast majority of lenders have a balanced portfolio of loans for house purchase, remortgages, and further advances.

- Business channel—31% of lenders advanced more than 75% of their recent gross lending through intermediaries and/or packagers. 14% predominantly sold through branch/ Internet/telephone.

Chart 3: Proportion of lenders advancing 75% or more of gross lending in any market, loan purpose or business channel, %



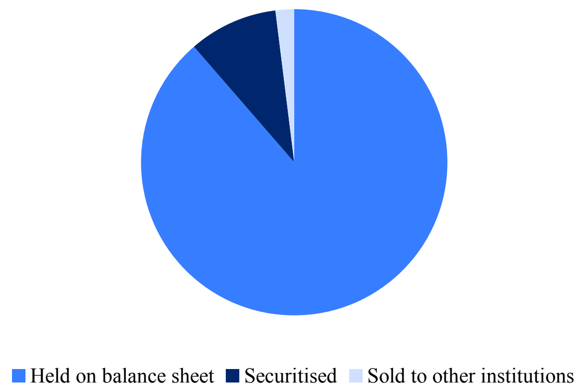
Source: Oxera questionnaire

Lenders have different business models surrounding mortgage origination, mortgage servicing and the extent to which the mortgages are held on their own balance sheets, sold to other lenders to hold on their balance sheets or securitised5. 89% of respondents' recent gross lending was held on their balance sheets, 9% was securitised and only 2% sold to other institutions (see chart 4).

Analysis by size of lender indicates that large lenders securitised 9% of their recent gross lending and medium-sized lenders securitised 8%. None of the small lenders securitised their recent gross lending. For them, 96% was held on balance sheet, with the remaining 4% sold to other institutions.

More detailed analysis shows that 78% of the lenders held their entire recent gross lending on their balance sheets; none securitised 100% of their recent gross lending, and 3% sold on all their recently originated loans to other institutions.

Chart 4: Lenders by business model/type of finance (%)



Source: Oxera questionnaire
Notes: The percentages are calculated on the basis of recent gross lending

Report structure

The remainder of this report is structured as follows:

- chapter 2 provides an overview of the underwriting process;
- chapter 3 describes the credit scoring process;
- chapter 4 describes the way in which affordability assessments are made;
- chapter 5 provides an overview of the techniques used for property valuation.

Chapter 2

Underwriting process

Introduction

Mortgage underwriting involves accepting the financial risk associated with a mortgage application. The process informing the decision to accept or reject an application involves assessing the likely performance of the applicant in the light of the experience of similar applicants in the past and the value of the property being offered as security.

It is a complex process because of the many dimensions involved and the fact that every applicant and property is unique. As a result, there are various possible approaches and no single standard.

Change in the tools and processes being used is occurring rapidly for a number of reasons, some of which are outlined below.

- The amount of available data on which to base a decision has risen substantially in recent years and is increasingly being made available in a structured form for credit assessment.
- The capture and analysis of past and ongoing data has enabled the development of statistical tools, such as credit score cards and affordability models. Credit score cards essentially attach weights to borrower characteristics based on past experience, including credit payment history, to produce a summary assessment of an applicant's ability to repay a loan. Affordability models play a complementary role, looking in detail at an applicant's income and commitments.
- The increased capability and enterprise-wide integration of IT systems means that raw data and structured information, including the derivation of credit scores and affordability assessments, can be processed more quickly and delivered increasingly quickly to operational decision points.
- Mortgage regulation, introduced in October 2004, requires lenders to lend responsibly and to treat customers fairly. A lender must be able to show that full account has been taken of an individual applicant's ability to repay.
- Using structured data and the objective and transparent outputs of credit score cards and affordability models helps produce better and more consistent decisions. Capturing these

measures and the resulting loan performance leads to consistent reporting, control and governance.

- Automation produces cost savings from process efficiencies. The time taken to make a decision is subject to competitive forces, with speedier, regulation-compliant, decisions generally benefiting applicants.

Whatever the tools and processes used, underwriting is about assessing the costs and benefits of providing a mortgage to an applicant.

Regardless of how much information is available for the credit decision, all that sophisticated credit assessment models are able to do is to allocate applicants to sub-populations, however fine, for which a probability of default over some future horizon has been calculated. Within these sub-populations, it is not possible to tell which loans will default and which will not.

The underwriting decision relates to where to 'draw the line' and the risk appetite of the lender. For most large and medium-sized mainstream lenders, increased automation will lower the cost of loan origination. For a given cost–benefit trade off, this allows the lender to underwrite more loans. However, one size does not fit all. In some segments of the market, particularly those dealing with applicants and/or properties with characteristics outside the mainstream, automation may offer few benefits.

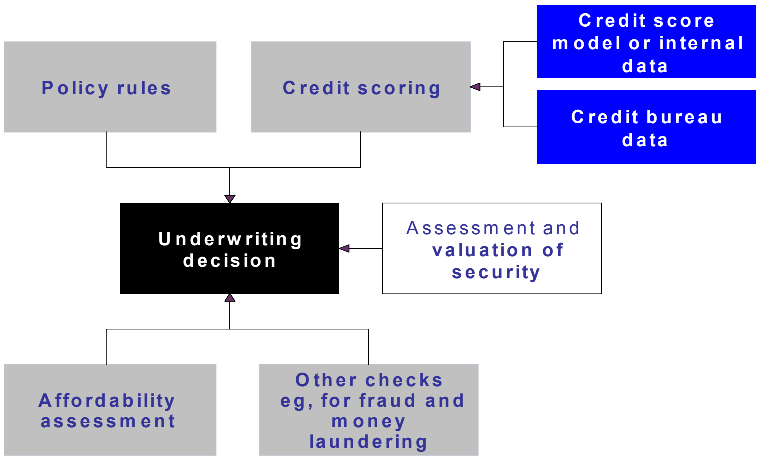
The underwriting process

There are typically two stages in the underwriting/credit assessment process:

- assessment of the applicant's ability to service and repay the loan applied for;
- assessment of the adequacy of the property being offered as security for the loan.

The types of input on which the lending decision is based are summarised in chart 5. These are covered in more detail below.

Chart 5: Overview of the underwriting process



Source: Oxera.

Assessment of applicant's ability to repay

The following approaches and tools, either taken together or in some combination, are used.

- Policy rules surrounding the applicant and loan—the policy rules are the minimum criteria that the applicant must satisfy to qualify for the loan. The criteria may cover, for example, minimum and maximum age of applicant, unacceptable credit history, legal entity of borrower, minimum and maximum loan amounts, maximum loan-to-value ratios (LTVs), maximum income multiples, and thresholds or cut-off points for the credit score. In general, these criteria are specified by the lender, but they could be prescribed by the regulator, and can be stipulated by the securitiser or institution to which an originator intends to sell the loans.
- Credit score—this indicates the probability that the loan will be repaid. Scores are typically a weighted combination of applicant and credit history information and generated by statistical models (see chapter 3).
- Affordability assessment—the lender uses a structured framework to assess whether the applicant can afford the loan applied for (see chapter 4).
- Other applicant checks—these include checks for fraud, such as verification of information provided by the applicant, and money laundering.

If the lender is satisfied that the applicant meets the necessary applicant criteria, the adequacy of the security is assessed.

Assessment of the adequacy of security

The assessment of the adequacy of security consists of the following steps.

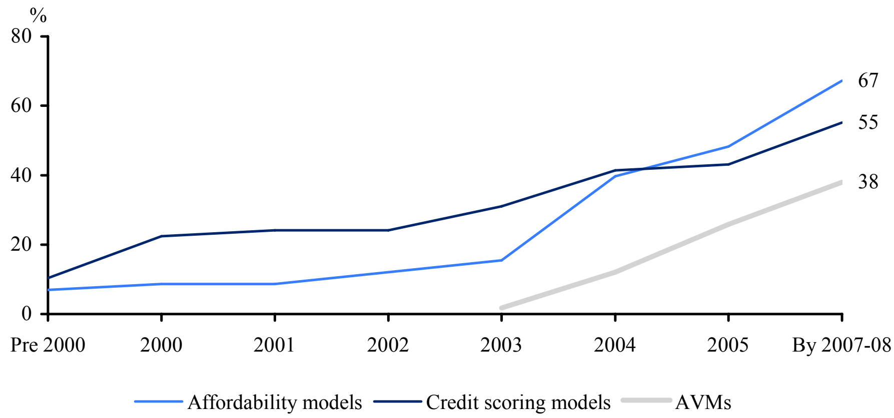
- Policy rules surrounding the property—the policy rules are the minimum criteria that the property must satisfy in order for the loan to be granted. The criteria may include, for example, type of property, construction method or materials, date of construction, defective properties, and postcode. These criteria are specified by the lender, but may reflect the requirements of insurers.
- Valuation of the property—property valuation methods are described in chapter 5. The most important recent innovation is the development and implementation of AVMs[6].

Market penetration of recent innovations

The penetration of recently developed underwriting tools into the industry has been rapid. At the time of the survey in December 2005/January 2006, nearly half of all lenders were using a credit score model compared with a little over 10% before 2000. Over 50% were using an affordability model compared with less than 10% six years earlier (see chart 6). Over the next few years, the proportion of lenders using credit score models is expected to rise to 55%, and the proportion using affordability models is expected to rise towards 70%.

The proportion of lenders using AVMs rose from close to zero in 2003 to around 30% at the end of 2005. Use is expected to increase towards 40% over the next few years.

Chart 6: Penetration of recently developed underwriting tools, %



Source: Oxera questionnaire

Underwriting arrangements

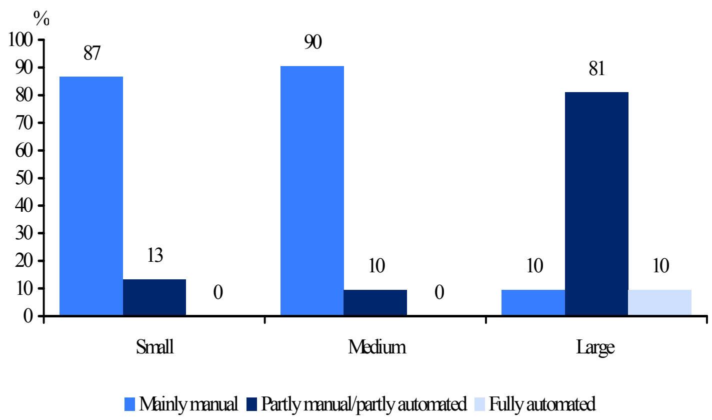
Three types of underwriting process can be distinguished. The following discussion refers to the assessment of applicants.

- Fully automated[7]—decisions are taken by a series of rules programmed into an automated system. Applications are accepted or rejected. No referrals[8] are made for manual assessment. The valuation of the property may still be done manually.
- Partly automated/partly manual—decisions are taken by an automated system, but may be referred for manual review.
- Fully manual—decisions are taken manually by underwriters. In other words, policy rules regarding the applicant are applied manually by staff members.

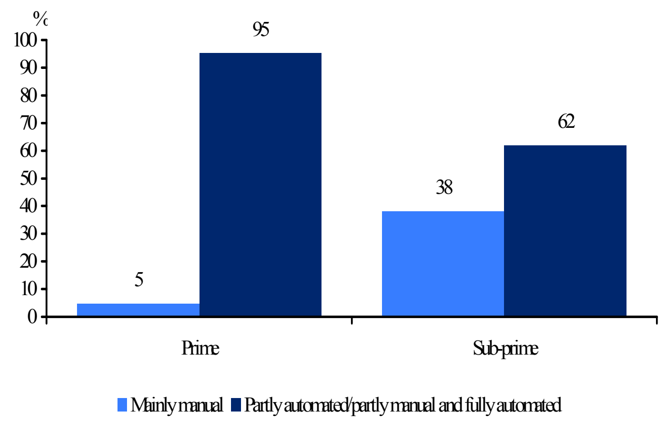
Most of the small and medium-sized lenders (around 87% and 90% respectively) have a manual underwriting system in place, while most of the large lenders (around 77%) use partly automated systems (see the left-hand chart in chart 7). 9% of large lenders use fully automated systems.

Of the lenders with manual underwriting processes, 94% indicated that they have a system of underwriting mandates in place. Typically this means that more senior and experienced staff have the authority to underwrite higher value lending or less straightforward applications. Lenders that use underwriting mandates could automate their process by programming their underwriting rules and policies into an automated decisioning system. However, not all loans may be amenable to automated decisioning processes, and mandates still apply to the underwriting of applications referred from automated processes.

Chart 7: Underwriting arrangements by size of lender and type of market, %



Source: Oxera questionnaire



Source: Oxera quesationnaire

Compared with the prime market, a larger proportion of applications in the sub-prime market is served by lenders with manual processes in place: 38% of sub-prime lenders use manual processes while the corresponding figure for the prime market is only 5%. This is shown in the right-hand chart in chart 7[9].

Lenders with partly automated/partly manual underwriting processes may refer applications for review. Table 1 shows the percentage of applications accepted, rejected and referred by lenders using a partly manual/partly automated process. The table shows that, in the sub-prime market, more applications are referred than in the prime market. This is to be expected as sub-prime applicants are likely to have characteristics which may not be considered acceptable on the basis of automated policy rules, and may therefore be more likely to require a manual assessment. The table also shows that outright rejections are much lower in the sub-prime market (2%) than in the prime market (11%). This could be due to the 'cascade effect', that is applicants who are rejected in the prime market are forced to go to the sub-prime market in order to borrow.

Table 1: Proportions of applications rejected, approved and referred, %

	Prime	Sub-prime
Accept mortgage application	65	38
Reject mortgage application	11	2
Refer mortgage application	24	60

Source: Oxera questionnaire
Notes: Only lenders with partly manual/partly automated processes in place were asked to provide data on decisions. Only a small proportion of these were able to provide data for the sub-prime market; the data in the table are therefore based on a small sample of lenders

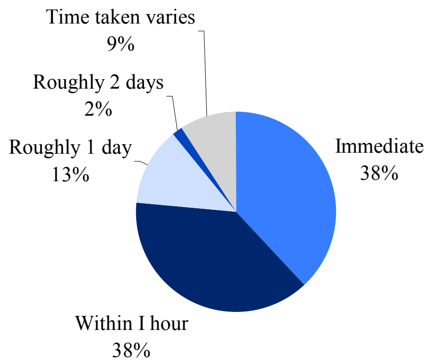
Speed with which decisions in principle are made

The speed with which decisions in principle are taken varies by lender. Chart 8 shows the number of lenders that take decisions in principle within certain time periods. Of the respondents, 38% make a decision immediately (within five minutes), and a further 38% within one hour. This refers to the time between the point at which the applicant or intermediary gives the lender relevant information and the point at which the lender takes a decision in principle regarding the applicant. Overall, three-quarters of lenders decide on an application within one hour.

Of the remaining respondents, 13% make a decision within one day, while 2% take approximately two days. For 9% of respondents, the time can vary substantially between one hour and two to three days, depending on the nature of the loan and the reliability of the data provided by the applicant.

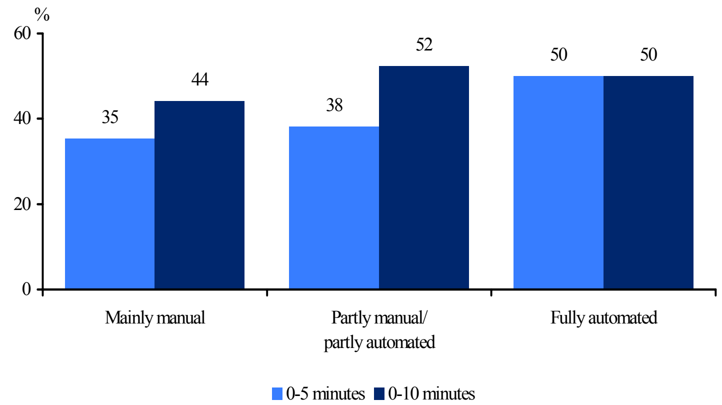
The survey question related to the time taken to reach a decision in principle. Some lenders make a binding applicant decision within these time intervals, with the offer then subject to a satisfactory property valuation. In this analysis, binding decisions are included with the decisions in principle.

Chart 8: Time taken for lenders to make a decision on the mortgage application, %

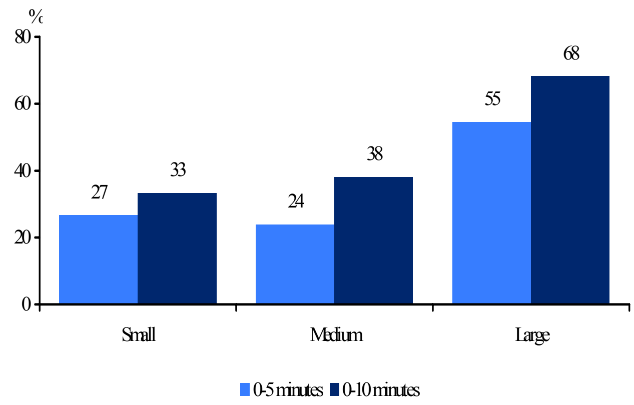


Source: Oxera questionnaire

Chart 9: Time taken to reach decision in principle by degree of automation and size of lender, %



Source: Oxera questionnaire



Source: Oxera questionnaire

Generally speaking, lenders with fully or partly automated processes are able to make quicker decisions in principle than those using fully manual techniques. This is shown in the left-hand chart in chart 9. 50% of the lenders with fully automated processes make a decision in principle within five minutes compared with 38% of lenders with partly automated processes and 35% of lenders with manual processes. The corresponding proportions for a decision in principle within 10 minutes are 50%, 52% and 44% respectively.

The right-hand chart in chart 9 indicates that large lenders make decisions more quickly than medium-sized and small lenders. 68% of the large lenders make a decision in principle within ten minutes, while the figures are 38% for the medium-sized lenders and 33% for small lenders.

Chapter 3

Credit scoring

Introduction

Credit scoring is an important step in the underwriting process. It is typically used to assess the probability that a loan will be satisfactorily repaid by the borrower. Such an assessment is usually based on an analysis of data on previous applications displaying similar characteristics to those of the applicant in question.

Credit scoring normally involves assigning points to a range of applicant and credit history characteristics predictive of the applicant's performance, and then summing these to generate an overall credit score. Credit scores can therefore be considered as a way of representing the overall credit-worthiness of the applicant.

In most processes where credit scoring is used, applicants have to reach a minimum score to obtain a mortgage. But some lenders use credit scores within a predominantly manual underwriting process to allocate work between underwriters of differing levels of seniority.

Where scores are used as an accept/reject decision tool, the minimum score is referred to as the cut-off point or threshold. Applications with scores above the threshold will generally be accepted as long as policy rules and affordability assessments are met and property valuations are acceptable. Those with scores below the threshold will be viewed as having a greater probability of turning 'bad', and will generally be rejected.

The scores may also be used to determine the terms and conditions of the mortgage, such as the loan amount, interest rate, and period of the loan. For example, applicants with a good credit score may be able to borrow more than applicants with lower credit scores.

Arrangements for determining credit scores

Lenders have different arrangements in place for determining the credit-worthiness of applicants.

- Credit reference agency data and summary credit scores—when assessing an application, lenders may use data from credit reference agencies to review the credit history of an applicant. Credit reference agencies are able to provide lenders with a range of raw and structured data on the applicant, such as information on county court judgements, bankruptcies and insolvencies; payment performance on existing and previous credit commitments; and outstanding borrowing commitments. Credit reference agencies also offer credit scores that summarise this data in a single measure, for example the Experian Delphi score, Equifax Risk Navigator score and Call Credit CallScore.

- Application credit score models—these models typically measure the statistical probability of credit being satisfactorily repaid. They rely on the assumption that an applicant's performance can be predicted using data on previous applications with similar characteristics. Lenders can develop their own models using combinations of applicant and credit history/credit reference agency information or commission external specialist developers to build a model for them.

  Credit scoring has a number of advantages for mortgage lenders and applicants. It can reduce the time required to process loan applications and facilitate online application processing, both resulting in cost savings for lenders that can be passed on to the borrower through more favourable terms. It also makes it easier for lenders to change the threshold score at which a loan application is accepted, for example if economic conditions require a lender to restrict the provision of credit. A further benefit is that, as credit score models based on broader datasets are utilised, lenders can identify and enter new segments of the mortgage market.

  Credit scoring can reduce risk by helping lenders identify applicants posing excessive risk. It produces more consistent decisions and transparent measurement facilitates consistency of reporting, control and governance.

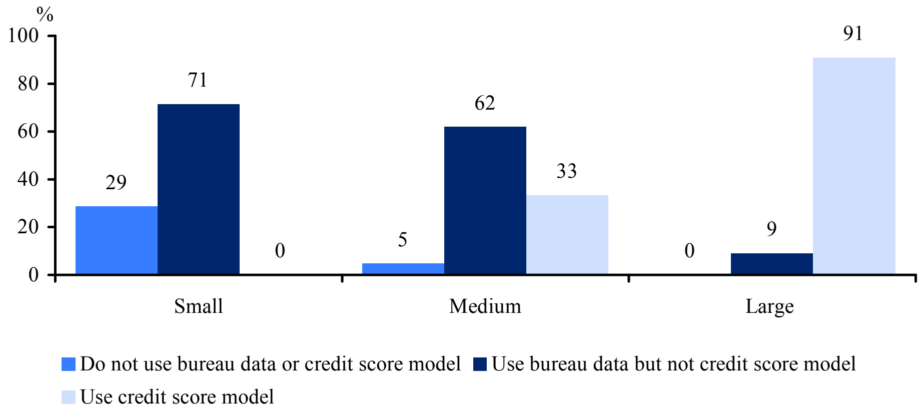
  There are two kinds of credit score model—application score model and behavioural score model. Application credit scoring is applied to a prospective applicant to decide whether to supply the loan. Behavioural scoring, uses information relating to an existing borrower's behaviour to predict future performance. Although outside the scope of this research, behavioural scoring is increasingly being used for assessing further advances and remortgaging by existing borrowers on the expiry of a lending product such as a fixed-rate loan.

- Other arrangements—these apply to lenders that do not have a credit score model in place and do not use credit reference agency data. Such lenders tend to be small and are likely to lend on a 'relationship' basis, where local knowledge is important, or where there is already a relationship with the customer, such as a current or savings account. Historically, most lending was undertaken on a 'relationship' basis prior to the introduction of credit scoring.

Overall, 47% of respondents have a credit score model in place, 41% do not have a credit score model in place but use credit reference agency data and the remainder use neither a credit score model nor credit reference agency data.

Large and medium-sized lenders are more likely to have a credit score model in place than small lenders, as shown in chart 10. 91% of the large lenders use credit score models, with the remaining 9% using data from credit reference agencies. 62% of the medium-sized lenders use data from credit reference agencies and 33% have their own credit score model. None of the small lenders have a credit score model. 71% use credit reference agency data, and 29% use neither a credit score model nor credit reference agency data.

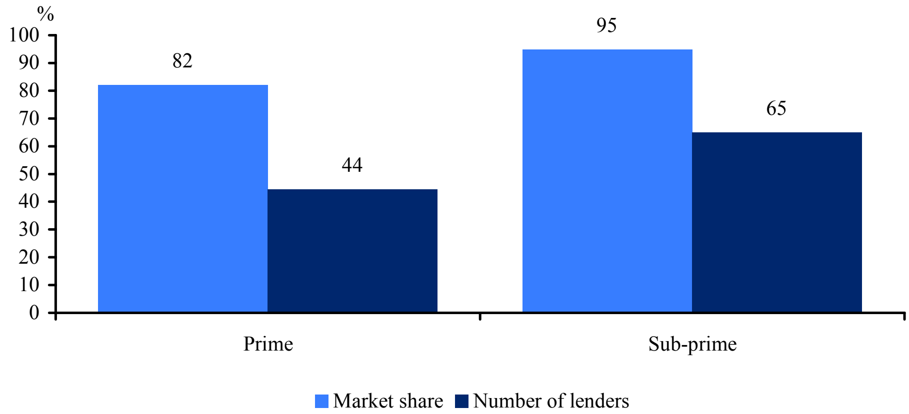
Chart 10: Variation in credit-scoring arrangement by size, %



Source: Oxera questionnaire

Lenders active in the sub-prime market are more likely to have a credit score model in place than lenders active in the prime market, as illustrated by chart 11. Of lenders active in the sub-prime market, 65% use a credit score model compared with 44% of lenders in the prime market. This may reflect the fact that providing mortgages in the sub-prime market generally involves higher risks and therefore requires more detailed assessment.

Chart 11: Lenders with credit score models by type of market, %



Source: Oxera questionnaire

Lenders may also obtain composite summary credit scores, such as the Experian Delphi score, Equifax Risk Navigator score or Call Credit CallScore, from credit reference agencies. 36% of the respondents indicated that they did so. Large and medium-sized lenders are more likely to use these composite credit reference agency scores than small lenders. 50% of the large lenders use these scores, 43% of the medium-sized lenders and 7% of the small lenders.[10]

Some lenders offer banking products other than mortgages to their customers. A relatively small proportion of respondents offer products such as current accounts, credit cards and personal loans. Not surprisingly, it is predominantly large lenders that do so. It would be a natural step for lenders to take this additional information into account, when it is easily available. And, as table 2 shows, a large proportion of firms use information relating to other financial products when making mortgage lending decisions.

Table 2: Lenders who offer products other than mortgages, %

	Offer this product?[1]	Use this information in mortgage application assessment?[2]
Current account	16	55
Credit card	12	71
Personal loan	17	60
Hire purchase loan	2	100

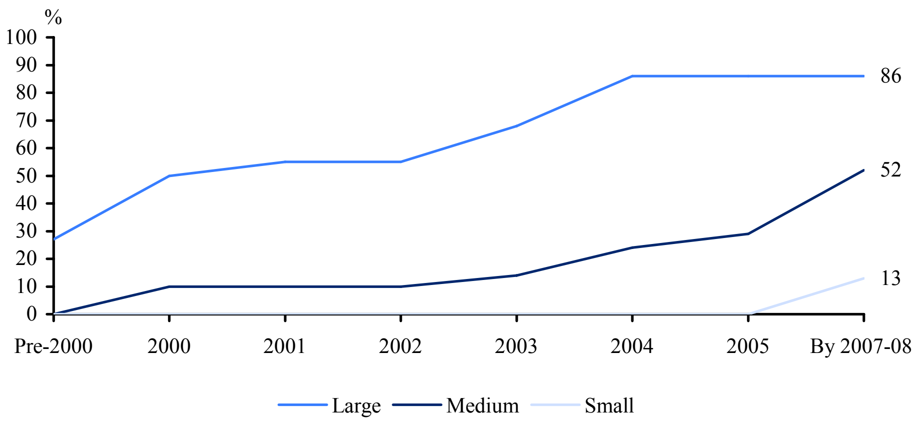
Source: Oxera questionnaire
Notes: 1 Percentages are calculated as a proportion of the total lenders. 2 Percentages are calculated as a proportion of the lenders that offer those products and use them in the calculation of credit scores

Market penetration of credit score models

The number of lenders with credit score models in place has increased over the past five years, from 22% in 2000 to 43% in 2005. This trend is likely to continue. 25% of respondents that currently do not have a credit score model in place indicated that they were developing one. Many lenders also indicated that they are considering the use of a credit score model. In the next 18–24 months, around 55% of all mortgage lenders are expected to employ a credit score model.

The market penetration of credit score models has differed by size of lender. 50% of large lenders were already using a credit score model in 2000 and the proportion has since risen to 86%. Looking ahead, none of the large respondents that do not currently use a credit score model intends to introduce one over the next couple of years. For medium-sized lenders, only 10% had a credit score model in place in 2000, but the proportion has risen quickly and currently stands close to 30%. Penetration of this segment is expected to continue, to above 50%, over the next few years. No small lenders had a credit score model in place at the end of 2005, but 13% expect to be using one within the next few years.

Chart 12: Use of credit score models by size of firm, %



Source: Oxera questionnaire

Bespoke approach for particular market segments

Applicants in certain market segments, such as sub-prime or first-time buyers, may have different characteristics and risk profiles. They may therefore require a bespoke credit score model.

50% of the lenders using a credit score model indicated that they have one or more bespoke credit score model in place. Large lenders are more likely to have a bespoke model: 60% of the large lenders that use a credit score model have a bespoke model in place, whereas only 29% of the medium-sized lenders that use a credit score model have a bespoke model.[11]

Of the lenders that use bespoke credit score models, 50% use them for sub-prime applications and 30% use them for first-time buyers. In addition, a few lenders have bespoke models for applicants for further advances and remortgages.

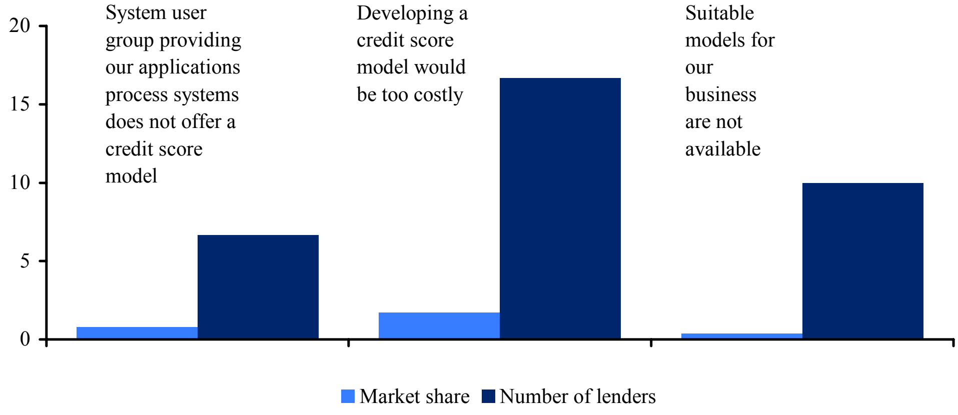
An alternative way of dealing with the different characteristics and risk profiles of distinct applicant groups is to modify the credit score model used for 'standard' applicants by changing the score card cut-off point, that is the way the credit score is interpreted. Cut-off points are typically set using marginal 'bad' loan rates. Lenders set a bad loan rate as an objective and then work back to determine the cut-off point compatible with this rate. Cut-off points may then be adjusted over time to align actual performance to predicted performance. Bad loan rates are set depending on the appetite for risk and the type of market segment. 18% of the lenders using credit reference agency data or credit score models indicated that they vary the cut-off point according to the type of market, with most doing so for sub-prime applications, first-time buyers and young borrowers.

Lenders were asked how frequently they redevelop their credit score models based on a new sample of applicants. 86% of lenders that have a credit score model have redeveloped their models at least once in the past six years and 78% have redeveloped their models within the past three years. Redevelopment timeframes vary between lenders. When asked when they had last redeveloped their model, the answers ranged from six years ago to within the last year. Existing models are recalibrated, as opposed to redeveloped, more frequently to ensure that they remain adequately predictive.

Reasons for not using credit score models

A number of lenders, primarily smaller lenders, do not have credit score models in place. When asked why they do not use a credit score model, respondents gave various reasons (see chart 13). 7% of those without a credit score model indicated that they obtain application process systems from a system user group of which they are a member and which has not yet introduced a credit score model. 18% indicated that developing a credit score model would be too costly, while 11% stated that credit score models appropriate for their business are not available. 40% gave 'other' reasons, for example, the unavailability of sufficient delinquent accounts for a statistically robust bespoke model, satisfaction with their current approach of using credit reference agency scores in combination with information on the use of other products held by the applicant, and a general preference for underwriting mortgages manually.

Chart 13: Reasons for not using a credit score model (%)

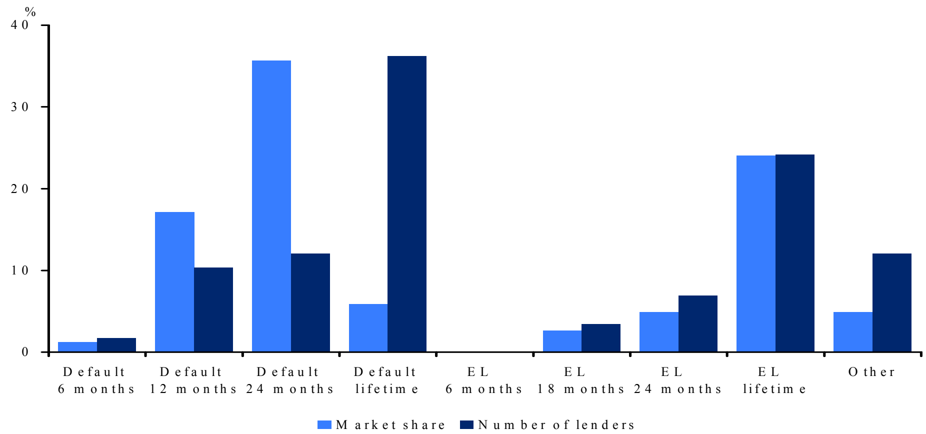


Source: Oxera questionnaire

What do lenders measure when assessing an application?

Respondents were asked what they measure when assessing an application. Chart 14 shows the results. In terms of number of lenders, 36% indicated that they measure default over lifetime, and 24% measure expected loss over lifetime. Multiple responses were allowed. Measured in terms of market share, 36% of respondents indicated that they measure default over 24 months and 24% that they measure expected loss over lifetime. This means that larger lenders are more likely to measure default over 24 months and smaller lenders to measure default over lifetime.

Chart 14: Calculations made before approving a loan, %



Source: Oxera questionnaire

It is useful to know whether what is measured by lenders is related to the type of underwriting or credit-scoring arrangement in place, or to lenders' Basel 2 risk measurement aspirations.

Almost 73% of lenders with manual processes in place measure default or expected loss over lifetime, while there is no consistent pattern for lenders with partly or fully automated processes. Their default or expected loss horizons vary from 12 months to lifetime.

There was no consistent pattern regarding what lenders try to measure by type of credit-scoring arrangement. A large proportion of lenders measure either default or expected loss over the lifetime of a loan.

The survey showed that 82% of the large lenders and 43% of the medium-sized lenders intend to use the retail IRB approach to capital adequacy under Basel 2. All other lenders intend to use the standardised approach. However, few lenders, if any, appear to use risk measurement tools calibrated to the Basel 2 definition of default adopted by the FSA of a loan falling six months in arrears within the next 12 months or the expected loss resulting from such a default.

Entering new market segments

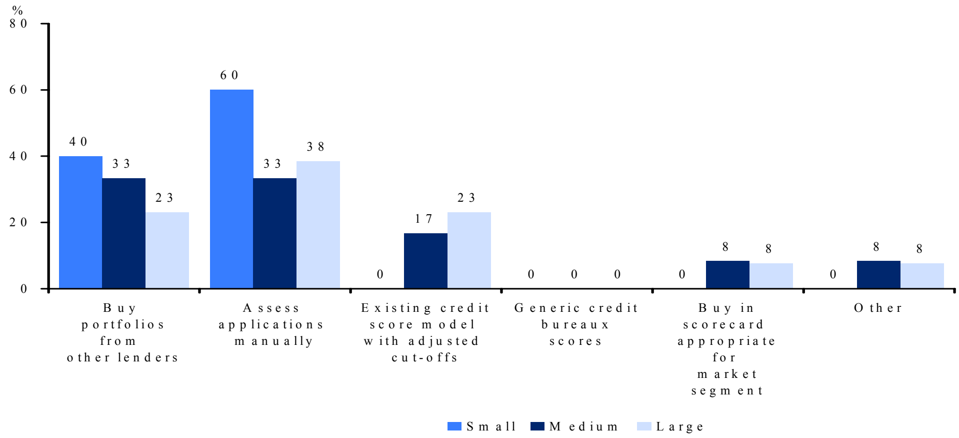
43% of survey respondents have entered a new market segment, such as self certification, sub-prime or the buy-to-let market in the last three years and a further 22% are considering doing so. Respondents were asked how they entered or intended to enter new market segments:

- by buying mortgage portfolios from other lenders;
- by assessing applications from new market segments manually;
- by using an existing credit score model, with or without adjusted score cut-offs; or
- by buying and implementing a score-card appropriate to the relevant market segment (a bespoke credit score model).

Of lenders which entered or are considering entering new market segments, 45% indicated that they assess applications in new market segments manually, 33% by buying mortgage portfolios from other lenders, that is with the risk already assessed, 15% by using the existing credit score model with adjusted score cut-offs, and 6% by buying in and implementing a credit score model appropriate to the market segment.

Small and medium-sized lenders typically enter new markets by buying new portfolios or by assessing applications manually, while large lenders tend to enter new market segments by using their existing credit score models with adjusted score cut-offs. 50% of large lenders and 50% of medium-sized lenders reported using existing credit score models with standard cut-off points combined with different policy rules which are applied manually (see chart 15).

Chart 15: How lenders enter new market segments, %



Source: Oxera questionnaire

Chapter 4

Affordability assessment

Introduction

It is an FSA requirement that lenders lend responsibility. Firms must be able to show that in the credit assessment account has been taken of the customer's ability to repay, including the impact of changes in the customer's circumstances and the impact of higher interest rates.

Among other things, Mortgage Conduct of Business (MCOB) rules introduced in October 2004 require lenders, as part of the pre-application process, to issue potential applicants with a detailed key facts illustration (KFI). This must illustrate to the borrower the cost of the specific mortgage product being considered and how the monthly repayment would change if interest rates were to rise by one percentage point.

Ability to repay assessments based on affordability models are also increasingly forming part of the toolkit used in the formal credit assessment process, either in conjunction with, or in place of, more traditional assessments and policy rules based on income multiples.

This section focuses on recent changes in the way lenders assess affordability and the drivers behind these changes.

In general, there are two ways in which lenders assess the affordability of a loan to an applicant. One is by applying income multiple policy rules. The other is by applying an affordability model. Some lenders use both techniques, applying one or the other as a cap for making the final decision on the loan amount to be granted.

Different ways of assessing affordability

Traditionally, lenders have applied income multiples to determine the maximum amount an applicant can borrow. The survey indicates that this is still the most common method, although the number of lenders with an affordability model in place has increased in the past three years, from 9% in 2003 to 48% in 2005. This trend is likely to continue. 40% of survey respondents that do not have an affordability model are currently considering using one.

Overall, 38% of the respondents apply rules based on both income multiple and affordability models, while 43% use only an income multiple and 16% use only an affordability model.

Respondents do not vary their approach to assessing affordability depending on the type of market, purpose of mortgage or business channel.

Large lenders are more likely to use affordability models than medium-sized and small lenders. The last column in table 3 shows the proportion of lenders than have an affordability model, some of which may also use income multiples. 68% of large lenders have an affordability model compared with 52% of medium-sized lenders and 38% of small lenders. A high number of large lenders use only an affordability model: 32% of large lenders have only an affordability model while for medium-sized lenders the number is 5% and for small lenders it is 8%.

Table 3: Method of affordability assessment, %

	Income multiples only	Affordability model only	Both income multiples and affordability model	Affordability model
Small	62	8	30	38
Medium	48	5	47	52
Large	32	32	36	68

Source: Oxera questionnaire

Lenders active in the sub-prime market are more likely to use an affordability model than lenders in the prime market (see table 4). This is not surprising as applications to sub-prime lenders market are more likely to be of high risk, requiring a more detailed assessment of whether the applicant can afford the mortgage.

Table 4: Affordability assessment and type of market, %

	Income multiples only	Affordability models only	Both income multiples and affordability models	Affordability model
Prime	44	17	39	56
Sub-prime	30	10	60	70

Source: Oxera questionnaire

Income multiples

Applying an income multiple means taking a multiple of the applicant's income to determine the maximum amount that the customer can borrow. This multiple could be applied to any measure of income—gross, net or disposable. Most lenders use two types of income multiple: standard and enhanced.

- Standard income multiples—these are commonly used for most applications. Standard income multiples for single applicants lie in the range of 3–4.5, with an average of 3.6.

Lenders often apply different multiples for single applicants and for joint applicants. The typical maximum for joint applicants is three times the joint income, or 3.5 times the income of the first applicant plus a single income multiple for the second applicant. Gross income is typically used. What is considered to be part of gross income, and the way components are weighted in the income multiples calculation, may vary between lenders. Gross income includes core wage and salary payments and may also include weighted values of overtime, bonus and commission income.

- Enhanced income multiples—these are sometimes used only for higher-quality applications and lie between 3.25 and 6. The definition of higher quality applications varies by lender. Examples of higher-quality cases identified in the survey include applicants with an income of more than around £40,000, LTVs of lower than 75%, and applicants with better credit scores.

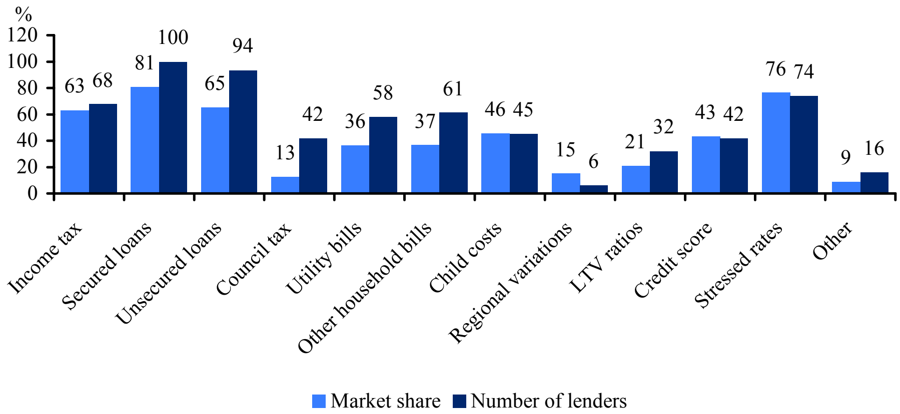
The majority of lenders surveyed use gross income in the income multiple assessment. Some lenders apply the multiple to net, that is after deducting income tax, or disposable or 'free' income, that is after deducting income tax and certain identified expenditures. Multiples based on net or 'free' income are similar in aim to affordability models (described in the next chapter). In other words they measure the part of an applicant's income that is available for servicing a mortgage.

Affordability models

An affordability model calculates the loan amount that an applicant can afford on the basis of an assessment of the main components of income and expenditure. Income and expenditure figures are often based on a combination of data provided by the applicant and data obtained from other sources, such as aggregated expenditure data from the Office of National Statistics.

The factors considered in lenders' affordability models are shown in chart 16. The majority of lenders take into account income tax, secured and unsecured credit commitments, utility bills and other regular household expenditures such as National Insurance, living expenses, house maintenance, school/nursery/childcare and child maintenance. Most lenders stress-test the mortgage application by increasing the interest rate or mortgage repayment costs. Interest rate increases of one or two percentage points are typically examined, depending on the type of mortgage and profile of the applicant. Interest rate stresses are not always applied to affordability calculations in the case of applications for fixed-rate mortgages.

Chart 16: Factors used in affordability models, %



Source: Oxera questionnaire

Reasons for introducing an affordability model

When asked why they introduced an affordability model, 97% of lenders replied that regulatory guidance (responsible lending) was the most important reason. As far back as 2000, the then Chairman of the FSA, Sir Howard Davies, stressed the importance of affordability models 'which review overall income and expenditure of the borrower, and the potential impact of changes in interest rates…'.[12]

In 2004, the FSA started to regulate mortgage lending. The rules explicitly state that mortgage providers must assess applicants' ability to repay.[13]

Two other important reasons for introducing an affordability model are that such models are considered a good predictor of default,[14] and that they enable lenders to provide higher-value mortgages. For example, if the mortgage application exceeds the standard or enhanced income multiple, the lender may apply an affordability model to assess the loan amount that the applicant could afford.

Using both affordability models and income multiples

Of the respondents that use both income multiples and an affordability model, 50% use income multiples as a way of cross-checking the results of the affordability model. If the application of the affordability model results in an income multiple that exceeds the standard or enhanced income multiple, the income multiple overrules the affordability model.

The other 50% first apply an income multiple and then, in some or all cases, an affordability model. For example, if the mortgage application exceeds the standard or enhanced income multiple, the lender may look at the applicant's income and expenditure in more detail to assess what loan amount the applicant could afford.

Affordability models and income multiples are not just used in combination. There are also a number of hybrids. For example, some lenders first deduct tax, secured and unsecured credit commitments, and possibly other regular expenditures, from gross income and then apply a multiple to net or 'free' disposable income.

A number of respondents also indicate that income multiples are determined on the basis of an analysis of what an average or typical applicant can afford. In other words, stressed interest rates and mortgage servicing costs are taken into account when setting income multiples.

Some lenders have recently introduced a matrix approach whereby a mortgage application is not necessarily declined if they exceed the standard income multiple. The loan amount and/or the term is changed accordingly to offer a mortgage that the applicant can afford to service.

Reasons for not introducing an affordability model

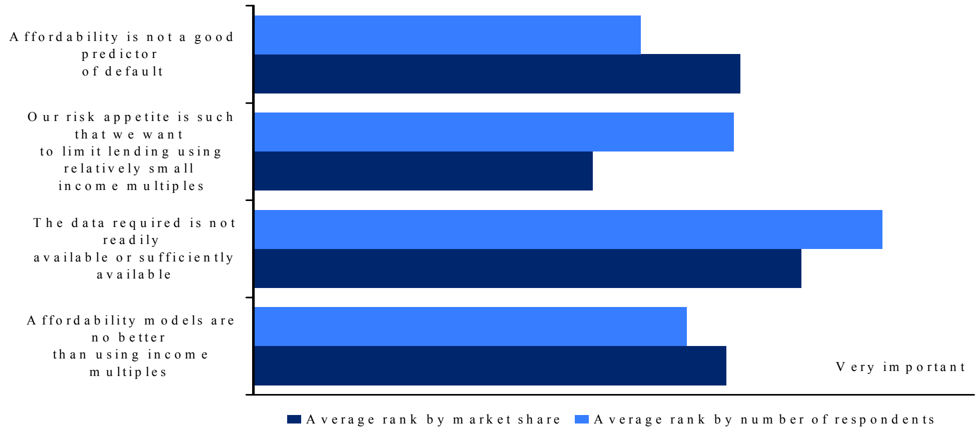
There are a number of reasons why respondents have not introduced an affordability model. These are shown in chart 17. Multiple responses were permitted.

Measured in terms of market shares, the lack of data required on which to build an affordability model was given as the most important reason. This was followed by respondents indicating that affordability was not a good predictor of default, that affordability models are no better than income multiples, and, particularly for smaller lenders, a desire to limit lending to relatively low income multiples.

Around 30% of respondents gave other reasons such as systems limitations, and that their income multiple is based on annual income after deducting the annualised value of other regular commitments, which is, in effect, an affordability model. The debate about the usefulness of affordability models continues, and some lenders prefer to wait and see before undertaking the investment of developing and implementing a model.

Some lenders indicated that they did not consider affordability models to be very useful, since they appear to give an indication of what an applicant can afford only at a particular point in time, but do not take into account developments in the medium or long term, such as changes in income and household composition.

Chart 17: How important were the following reasons for not introducing an affordability model?



Source: Oxera questionnaire

Market penetration of affordability models

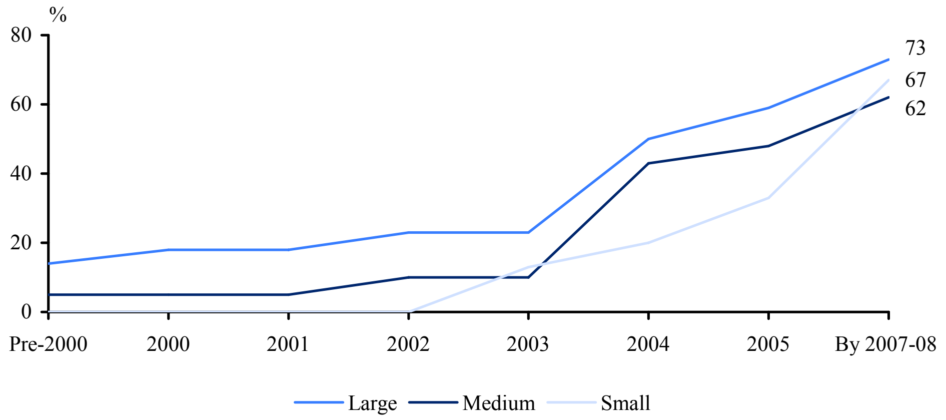
The number of lenders with an affordability model in place has increased over the past five years, from less than 10% in 2000 to nearly 50% in 2005. This trend is expected to continue towards 70% over the next couple of years with many lenders indicating that they are considering introducing one.

The timing of market penetration of affordability models has differed by size of lender, but has been much less diverse than for the introduction of credit score models. Nearly 20% of large lenders had an affordability model in place in 2000 and the proportion had risen to nearly 60% by the end of 2005. Penetration was particularly rapid in 2004, almost certainly driven by the introduction of mortgage regulation. The proportion is expected to rise to close to three quarters of large lenders over the next few years.

Only 5% of medium-sized lenders had an affordability model in place in 2000, but the proportion had risen to close to 50% by the end of 2005. As with large lenders, penetration was particularly rapid in 2004. Penetration among medium-sized lenders is expected to continue to rise to above 60% over the next couple of years.

No small lenders had an affordability model in place before 2003. Since then such models have been adopted by a third of all small lenders. The proportion is expected to rise to two thirds within the next few years, at which point penetration is expected to be broadly similar between lenders in all size bands.

Chart 18: Use of affordability models by size of firm, %



Source: Oxera questionnaire

Chapter 5

Property valuation

The research behind this report focuses on the tools and processes used in the credit assessment of the mortgage applicant, how these are changing and what is driving the changes. Underwriting/credit assessment typically consists of two stages:

- assessment of the applicant's ability to service and repay the loan applied for;
- assessment of the adequacy of the property being offered as security for the loan.

This section focuses on the second stage, particularly on the extent to which the assessment of the valuation of the property behind the loan is being automated.

Different ways of valuing property

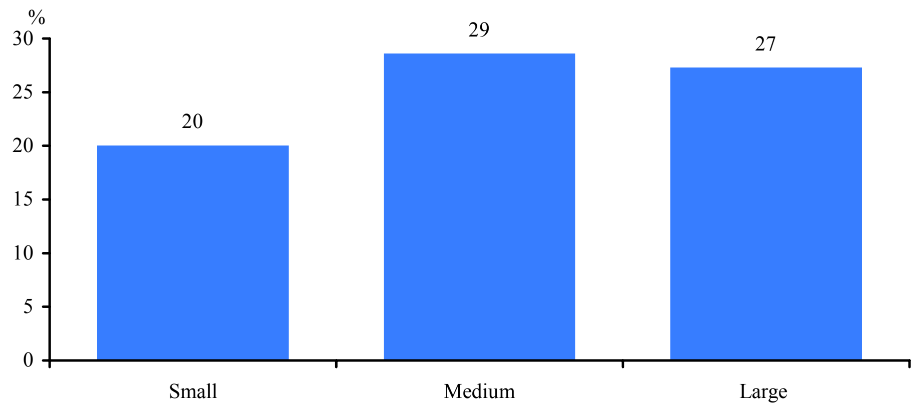
There are four ways to value the property in question offered as security in a mortgage application.

- Full physical valuation—an expert visits and values the property. Comments on the property that may be relevant are included in the report. The full property valuation technique is typically used for house purchase mortgages with medium-to-high LTVs.
- Drive-by valuation—the property is valued by assessing its outer boundary, without entering the property itself. Drive-by valuations are therefore less accurate but also less expensive than a full property valuation. They are typically used for remortgages with medium LTV.
- Desk-top approach (house-price index)—this involves valuing a property without visiting it, which could entail applying a house price index or a comparable property index to an earlier full physical or drive-by valuation. This method is typically used for further advances.
- Automated valuation model (AVMs)—for this approach, a computer model creates the property valuation. This valuation is used to estimate the current market value of a house based on various analytical methodologies and statistics. These statistics vary from one model to another. Generally speaking, they include prices of comparable houses in the neighbourhood, characteristics of the house itself, historical property price appreciation, etc.

26% of the survey respondents use AVMs for at least some of their property valuations. Large and medium-sized lenders are more likely to use AVMs than small lenders (see chart 19).

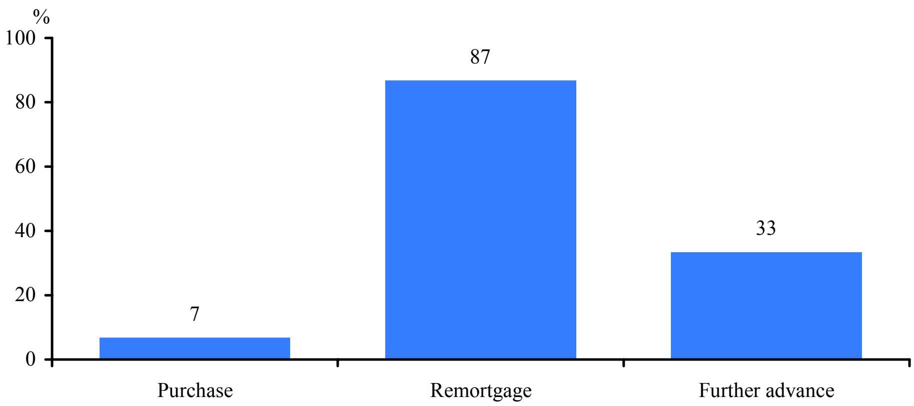
87% of lenders using an AVM do so for remortgages, 33% for further advances, and 7% for house purchase mortgages (see chart 20). In the case of remortgages, AVMs are typically used for mortgages with an LTV between 0% and 60%. In the case of further advances, AVMs are typically used for mortgages with an LTV between 0% and 70%.

Chart 19: Lenders who use AVMs, %



Source: Oxera questionnaire

Chart 20: Mortgages for which AVMs are used, %



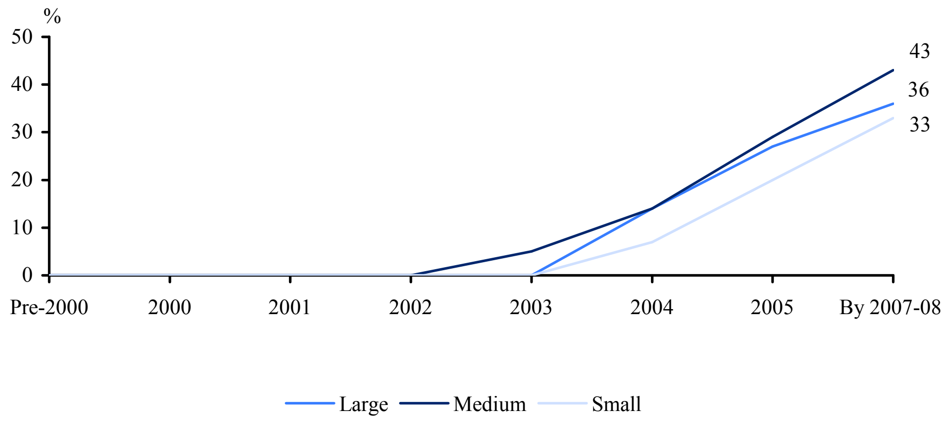
Source: Oxera questionnaire

Market penetration of AVMs

Only one respondent - a medium-sized lender - was using AVMs in 2003. By the end of 2005, a quarter of all lenders were using them and there was little difference by size of lender. Close to

30% of large and medium-sized lenders were using them and 20% of small lenders. Penetration is expected to continue over the next few years, with close to 40% of lenders using them by 2008. Again, penetration is expected to be broadly similar between lenders of differing sizes, with close to 35% of large and small lenders and 45% of medium-sized lenders using them by 2008.

Chart 21: Use of AVMs by size of firm, %



Source: Oxera questionnaire

Index of Tables and Charts

Endnotes

[1] Large lenders were defined as those with gross lending of more than £1 billion in their most recent financial year; medium-sized lenders as those with gross lending of more than £100 million but less than £1 billion; and small lenders as those with gross lending of £100 million or less.
[2] Lenders used their internal business definitions of 'prime' and 'sub-prime'. The generally accepted industry definition is that 'prime' refers to applicants with no or no significant adverse credit history and 'sub-prime' refers to applicants with a significant adverse credit history. 'Sub-prime' can be further divided into categories such as near-prime and light, medium, heavy and unlimited adverse, but these were not separately identified in this survey.
[3] Three application channels—branch, Internet and telephone—were treated as one category since they all involve the applicant contacting the lender directly. Similarly, intermediary and packager were treated as one category as they involve the applicant making contact with the lender through a third party. A consistent lower-level breakdown of sales channels was not generally available from lenders. An intermediary is a mortgage broker or adviser who locates the most appropriate mortgage for the borrower and arranges the mortgage on their behalf. A packager typically undertakes pre-loan processing and administration on behalf of lenders, and may also distribute products through intermediaries. Some intermediaries are also packagers.
[4] Recent gross lending means the gross mortgage lending by a respondent in its latest financial year as at the survey date.
[5] Securitisation involves selling the entitlement to the stream of cash flows from a pool of mortgage assets to an investor in return for a capital sum. The mortgages move off the originator's balance sheet, although the originator or a specialist mortgage servicing company will continue to service the mortgages for a fee. Servicing the mortgages involves collecting and distributing the cash flows and dealing with payment arrears. The risk attached to the mortgages transfers to the investor. Some lenders securitise because they specialise in mortgage origination and/or servicing and others to release capital tied up in holding assets on the balance sheet.
[6] AVMs provide a desk-based, as opposed to a physical, valuation, using recent physical valuations of similar properties in the local neighbourhood. A large number of comparative factors are taken into account, including type of property, year of build, construction method and materials, number and type of rooms, garage, garden and range of local services and amenities.
[7] A fully automated process means that decisions are taken by an automated system based on a set of rules. Typically these cover the underwriting policy rules, credit and affordability assessment decisions only, with the decision on the property valuation being taken manually at a later stage. The increasingly widespread use of AVMs for underwriting remortgages and further advances, however, means that these are increasingly being incorporated into automated decisioning systems. A partly automated process means that a number of the decisions are taken by an automated system, but may be referred for manual review.
[8] A referral is where the decision is neither accept nor reject, but that further manual input is necessary. This can occur where some combinations of policy rules are violated, but not sufficiently to warrant a rejection.
[9] The figures in the right-hand chart in chart 7 represent the actual proportions of gross lending in prime and sub-prime markets.
[10] A few lenders take scores from more than one credit reference agency.
[11] No small lenders use a credit score model.
[12] FSA website, Link to the Speech:
http://www.fsa.gov.uk/Pages/Library/Communication/Speeches/2000/sp66.shtml
[13] FSA (2004), 'Mortgage Conduct of Business (MCOB), Chapter 11, Responsible Lending'. Also see speech by John Tiner, FSA Chief Executive, May 6th 2004. Available at:
http://www.fsa.gov.uk/Pages/Library/Communication/Speeches/2004/SP176.shtml
[14] Whether affordability can help predict credit difficulties has been examined in the credit risk literature. On the basis of a comparison of the performance of credit score models with and without affordability measures, Wilkinson and Tingay conclude that affordability does add to the lending decision, albeit marginally. Tingay, J. and Wilkinson, G. (2002), 'The Use of Affordability Data: Does it Add Real Value?', *Credit Risk International*, May–June.

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