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The Bank of England *Credit Conditions Survey*

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Abstract

This paper contains the first detailed empirical examination of the information content of the Bank of England *Credit Conditions Survey* (*CCS*). The *CCS* asks a wide selection of questions of UK lenders relating to all aspects of bank credit provision. We examine the association between the survey responses and comparable official quantitative rates and lending growth data, and the extent to which the survey responses can help us to predict changes in those variables one quarter ahead. We find that many of the survey responses — especially those for household lending — are significantly associated with movements in the quantitative data. Similarly to the findings of equivalent surveys in the United States and euro area, we find that a subset of banks' survey expectations of credit conditions provide a statistically significant guide for predicting changes in credit spreads and lending growth one quarter ahead.

Key words: Bank lending survey, credit conditions survey, credit growth, credit spreads.

JEL classification: C23, E43, E51, E52.

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Summary

Credit conditions play an important role in the transmission of monetary policy. The tightening in credit conditions during 2008 and 2009, when lending growth fell and lending rates rose, reduced the impact of the loosening in monetary policy during this period. More recently, credit conditions have relaxed as the recovery has started to take hold.

The Bank of England's *Credit Conditions Survey* (*CCS*) is a survey of UK lenders, introduced in 2007 in order to provide a better understanding of developments in credit markets. The *CCS* has subsequently been used heavily by policymakers and economic commentators. It had three main aims:

- To provide a better understanding of developments in credit markets. As an example, it could be used to help explain whether the weakness in bank lending observed after 2008 reflected a tightening in the supply of credit, or a weakening in the demand for credit.
- To collect information on all the components of the cost of a loan. In particular, the *CCS* asks lenders for information on fees, non-price terms and quantity restrictions, each of which may be important in determining loan volumes.
- To provide an early steer on developments in credit conditions, by asking about lenders' expectations of developments three months ahead.

This is the first paper to provide a detailed econometric analysis of individual banks' responses to the *CCS*. We investigate two main questions: how well do the responses track movements in the official rates and lending data, and are they useful for predicting changes in credit spreads and lending growth one quarter ahead?

The first of these questions is important because some of the information on credit conditions collected in the *CCS* is otherwise unobserved. If the survey responses correspond closely to movements in the official quantitative data, where comparable data exist, this would give us some confidence that the survey responses are also informative about these unobservable movements in credit conditions. The second question should help us to determine whether or not banks' survey expectations contain additional information (over and above existing data) which is useful for predicting changes in credit conditions in the near-term.

We combine individual banks' responses from the *CCS* with bank-level micro data on lending growth and credit spreads. The use of individual bank data rather than aggregate data allows for an increased number of observations on which to perform the estimation, and allows us to relate changes in credit conditions to the same panel of banks over time.

We find that the survey responses match available official data from other sources. Over the period 2007 Q2-2013 Q2, many of the responses are significantly associated with changes in credit spreads and lending growth. But results vary by type of lending. The relationship between the responses and official data is strongest for household lending, and for headline or popular loan products. Responses relating to corporate lending are less-well correlated with the official

data, although this may be due in part to a lack of suitable official data with which to compare the responses.

In the second part of the analysis, we find that the *CCS* contains some predictive power for credit spreads and lending growth one quarter ahead, although results vary by type of lending. Changes in spreads on two-year fixed-rate mortgages can be partially explained by lenders' survey expectations of changes in spreads and default rates over the subsequent quarter. And survey expectations of looser credit availability and credit scoring criteria have some predictive power for lending growth in the subsequent quarter.

Overall, the results contained in this paper suggest that the *CCS* contains useful empirical information for policymakers with respect to developments in credit conditions. And while we have only investigated the relationship between the responses and quantitative data where comparable quantitative data exists, the results provide grounds for believing that the *CCS* gives a useful steer for aspects of credit conditions that are not otherwise observed. Nevertheless, the short sample period means that the results are necessarily preliminary and should therefore be treated with some caution.

1 Introduction

Credit conditions play a key role in influencing household and business behaviour. Tighter credit conditions, for example a reduction in credit availability, an increase in loan rates, or a tightening in non-price terms on loans, tend to depress household consumption and business investment and hence overall economic activity.

Credit conditions are also important in determining the effectiveness with which monetary policy can respond to economic shocks. When the Bank of England changes interest rates, the official interest rate – Bank Rate – is transmitted to other short-term wholesale money-market rates and subsequently to lending and deposit rates for borrowers and savers. But if credit conditions are impaired, for example during a financial crisis, these rates may not move by the amount of the change in Bank Rate. The effectiveness of monetary policy is therefore reduced.

The importance of credit conditions for the UK economy was highlighted by the financial crisis. Between the start of the crisis in 2007 and 2012, the stock of bank and building society lending fell by around 25% relative to its pre-crisis trend; the level of real GDP fell by over 15% relative to its pre-crisis trend over the same period (Barnett and Thomas, 2013). However, the sharp cuts to Bank Rate near the start of the crisis – from 5% in September 2008 to 0.5% in March 2009 – did not stimulate credit provision by as much as they could have done, since credit spreads increased at the same time.

Given their importance for economic activity, monetary policy makers need to understand developments in credit markets. The Bank of England *Credit Conditions Survey (CCS)* was introduced in 2007 Q2 in order to help monitor these developments. It is a quarterly survey of UK lenders, and collects information on developments in credit conditions over the preceding three months and expectations of future developments over the next three months.

One of the main aims of the *CCS* was to provide a better understanding of the factors causing developments in credit markets. For example, it is not possible to judge from the credit data alone the extent to which the weakness in bank lending observed after 2008 reflected a tightening in the supply of credit, or a weakening in the demand for credit.[1] During the financial crisis, the funding costs of lenders in the United Kingdom rose markedly relative to Bank Rate, which made it more expensive for them to fund new loans. But demand for credit also fell during the crisis, potentially due to a rise in spare capacity within firms, a reduction in expected demand, and concerns over job losses. Demand for credit may also have fallen in response to tighter credit supply conditions. The *CCS* asks respondents about the range of demand and supply factors that have driven movements in credit availability, and thereby helps to isolate the factors causing changes in the volume of bank lending.

The *CCS* was also designed to collect information on all the components of the cost of a loan. A range of quantitative indicators are available to help policymakers assess developments in credit conditions, including data collected directly by the Bank of England from UK monetary financial institutions (MFIs). These data include information on lending volumes, average

[1] For a detailed discussion of this issue, including the insights provided by the *CCS*, see Bell and Young (2010).

interest rates charged and write-offs on loans advanced. However, less information is available on additional costs such as fees and other non-price terms and conditions (such as loan to value ratio requirements) that may be equally important in determining loan volumes. The *CCS* therefore includes questions on fees, non-price terms and quantity restrictions. Finally, the survey aims to give an early steer on developments in credit conditions by asking about lenders' expectations three months ahead.

The responses from the *CCS* are frequently used to assist with economic analysis at the Bank of England. One example is the Bank of England's measure of credit spreads, described in Butt and Pugh (2014), which is used to assess the extent to which credit conditions have changed since the onset of the financial crisis and to form a forecast for changes in credit conditions. The *CCS* responses are used within the measure of credit spreads for businesses, in order to help compensate for a lack of suitable corporate interest rate data. In addition, banks' expectations for developments in credit conditions one quarter ahead provide a useful cross-check on the near-term profile of the Bank of England's projection of credit spreads.

This paper takes an econometric approach to evaluate how closely the responses are associated with the official lending and rates data, and the extent to which the *CCS* has met some of its original aims. In particular, we investigate whether it adds information to our existing data by providing a useful early steer on developments in credit markets.

In order to assess the information content of the *CCS,* we test the extent to which the responses correspond to the official quantitative rates and lending data. Since one of the aims of the survey was to fill gaps in the existing data rather than to collect data comparable to that which already existed, these are some of the few series for which we can apply this cross-check. If the responses correlate well with the official quantitative rates and lending data, this would give us more confidence that the survey is also informative about movements in credit conditions which we cannot otherwise observe.

The second part of the analysis investigates the extent to which the *CCS* is useful for predicting changes in credit spreads and lending growth over the next quarter, over and above the existing data on credit conditions. If the survey contains additional information to the existing data, this would suggest that the responses can provide a cross-check for policymakers when forecasting short-term developments in credit conditions.

We combine the individual bank *CCS* responses with official quantitative micro data on loan rates and lending volumes. These data form a bank-level panel, allowing us to relate changes in credit conditions to the same panel of banks over time, and permitting the use of bank-level fixed effects regressions to help identify the impact of the responses on future developments in bank lending growth and credit spreads. The use of individual bank data rather than aggregate data also expands the number of observations available for the analysis.

We find that, over the period 2007 Q2-2013 Q2, many of the survey responses correspond closely to movements in the quantitative data. The survey responses are significantly associated with changes in spreads on two-year fixed-rate mortgages as well as spreads on unsecured

products. The relationship is less pronounced for other loan rates, however, potentially reflecting lower product take-up, or – in the case of the corporate data – a lack of suitable rates data available for the analysis. We also investigate the relationship between the demand and supply responses (for example lenders' perceptions of changes in credit availability or credit scoring criteria) and quarterly lending growth. Results show that both the demand and supply responses are significantly associated with growth in gross household lending. These findings make us more confident that the survey responses for which there are no comparable quantitative data, for example measures of non-price terms, are similarly informative about movements in credit conditions.

Similar to the existing literature on international credit conditions surveys, we find that a subset of lenders' survey expectations are significantly associated with changes in credit spreads and lending growth in the subsequent period. For example, changes in spreads on two-year fixed-rate mortgages can be partially explained by lenders' survey expectations of changes in spreads and default rates over the subsequent quarter. And expectations of looser credit availability and credit scoring criteria have some predictive power for lending growth in the subsequent quarter.

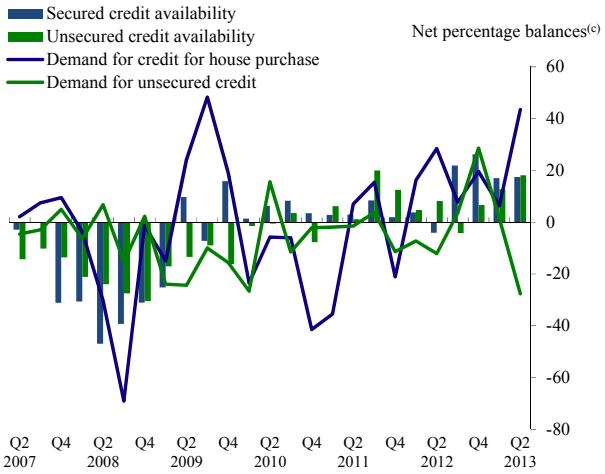
The paper is structured as follows. Section 2 provides a brief history of findings from the survey and describes the disaggregated *CCS* data in more detail. Section 3 contains a short review of the literature on international credit conditions surveys. Section 4 describes the econometric specification and the quantitative micro data used in the analysis. Section 5 contains the results for the comparison of the responses with the quantitative data on credit spreads; Section 6 contains the results for the comparison of the responses with the quantitative data on lending growth. A final section concludes.

2 The *Credit Conditions Survey*

2.1 A brief history of the survey findings

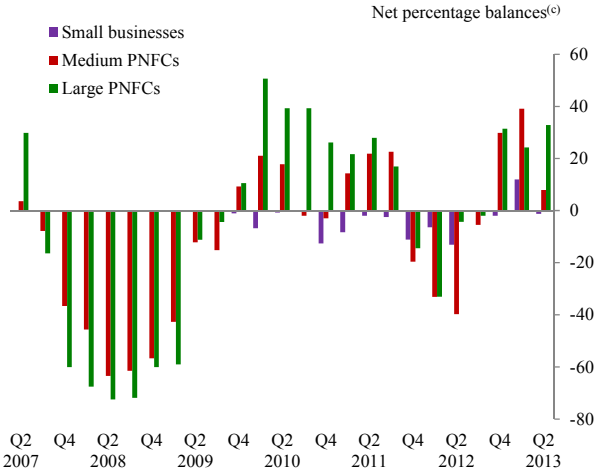
The *CCS* has been conducted quarterly since 2007 Q2 and so covers the period from the beginning of the financial crisis in 2007 Q3 and its aftermath. In the first eighteen months or so of the survey, there was a marked tightening reported in the availability of credit. That was reflected in the headline measures of availability, but also in other indicators, including credit scoring criteria, maximum loan to value ratios on mortgages, credit card limits, and maximum credit lines and collateral requirements on loans to businesses. That tightening was typically associated with higher credit spreads, and also increased fees/commissions. In part, the tightening in availability and increased cost of loans was likely to reflect a reduction in the perceived quality of credit – probably reflecting the weak economic outlook at the time, including increased unemployment and sharp falls in residential and commercial property prices – as evidence from the survey suggested increased default rates and lower recovery rates. But the survey suggested that other factors, related to the capacity of banks to supply credit, had also played a role, including reduced appetite for risk, changing market share objectives and tighter funding conditions. Demand for credit was reported to have weakened across many types of credit (Chart 1). But at least part of this decline was likely to have been driven by tighter credit availability (blue and green bars in Chart 1) and higher spreads over this period.

Chart 1 Credit availability and demand for household credit[(a)(b)]



(a) Net percentage balances are calculated by weighting together the responses of those lenders who answered the question.
(b) The questions asked are of the form 'Has the availability of credit which you provide to households become tighter or looser over the latest 3 months relative to the previous 3 months?' and 'How has the demand for lending from households changed over the latest 3 months relative to the previous 3 months?'.
(c) A positive balance indicates an increase in credit availability or demand.

Chart 2 Spreads over reference rates on lending to corporates by firm size[(a)(b)]



(a) Net percentage balances are calculated by weighting together the responses of those lenders who answered the question.
(b) The questions asked are of the form 'How have spreads over Libor (or Bank Rate) on approved new loan applications to businesses changed over the latest 3 months relative to the previous 3 months?'.
(c) A positive balance indicates that spreads have fallen such that, all else being equal, it is cheaper for companies to borrow.

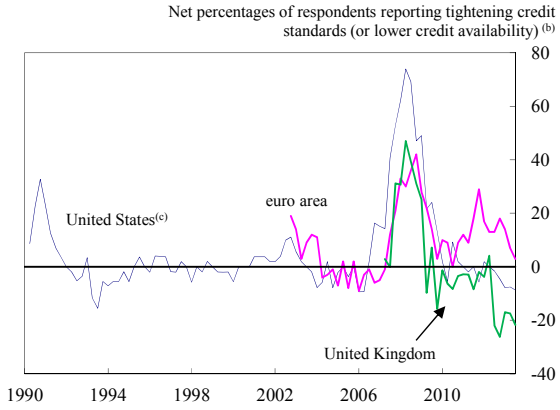
The second phase of the survey period, loosely between 2009 and mid-2011, was generally characterised by some relaxation in the tightness of credit conditions, but the extent to which that occurred appeared to vary across different products. For example, the *CCS* reported a marked improvement in credit spreads on loans to large businesses, but little improvement for small business loans (Chart 2). The reported changes in the headline availability balances and other indicators were similarly mixed. There were generally reported to be falls in default rates and losses given defaults.

From mid-2011 to the summer of 2012, the survey balances suggested some renewed deterioration in credit conditions. Although the availability balances remained relatively stable, there were signs of increased credit spreads and some tightening in non-price terms and conditions. The survey provides clues on the underlying source of that deterioration, with reports of tighter funding conditions and a deteriorating economic outlook. After the summer of 2012 credit conditions improved, partly the result of the launch of the Funding for Lending Scheme as well as an improvement in sentiment in the euro area.

The headline *CCS* balances have moved fairly closely with equivalent balances in other advanced economies. This can be seen in Charts 3 and 4, which show changes in credit standards or credit availability from the Fed *Senior Loan Officer Opinion Survey (SLO)*, ECB *Bank Lending Survey* and *CCS*. Given that common shocks are likely to have been important in driving credit conditions across the United States, euro area and United Kingdom over this period, the close co-movement between the surveys (the correlation coefficient between the *CCS* and two international surveys is 0.7 or greater in Charts 3 and 4) may suggest that the *CCS* is providing as good a steer on conditions as these two international surveys. The comparison

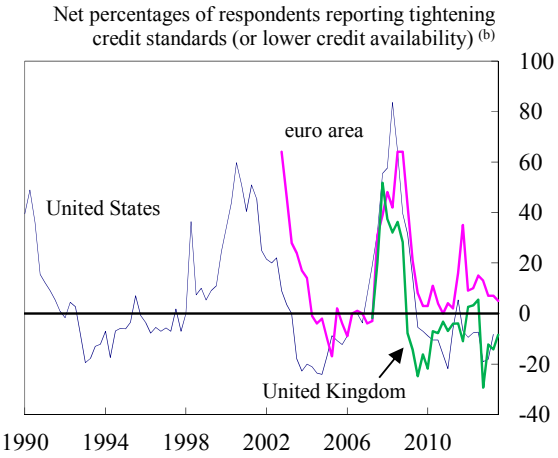
across the surveys may also help to place the *CCS* results in the appropriate historic context. Although the shocks affecting credit conditions might well have differed prior to 2007 across the three areas, a comparison of the balances suggests that the tightening in credit availability for mortgage lending seen during 2007-08 was unusually severe by historic standards, while that for corporates was less unusual.

Chart 3 Bank lending surveys: mortgage lending[(a)]



Sources: Bank of England, ECB and Federal Reserve Board.
(a) Bank of England *Credit Conditions Survey*, US *Senior Loan Officer Opinion Survey* and euro area *Bank Lending Survey*.
(b) The Bank of England *Credit Conditions Survey* question refers to changes in credit availability rather than credit standards, however both questions measure changes in credit supply. Credit availability balances are inverted.
(c) The net balance of respondents in the US *Senior Loan Officer Opinion Survey* reporting tightening standards for prime mortgage lending is used from the April 2007 survey onwards. Prior to April 2007 the balance is for aggregate mortgage lending.

Chart 4 Bank lending surveys: corporate lending[(a)]



Sources: Bank of England, ECB and Federal Reserve Board.
(a) Bank of England *Credit Conditions Survey*, US *Senior Loan Officer Opinion Survey* and euro area *Bank Lending Survey*.
(b) The Bank of England *Credit Conditions Survey* question refers to changes in credit availability rather than credit standards, however both questions measure changes in credit supply. Credit availability balances are inverted.

While it might have been possible to extract these key messages from a range of other data sources and market intelligence, monetary policy makers in the United Kingdom have nonetheless found the survey highly informative over this period, in addition to other surveys of companies and reports from the Bank's Agents. Collecting the information together systematically in one consistent survey has helped to draw out a coherent and consistent story across institutions and over time. That has been particularly helpful in aiding communication of key developments in credit conditions. As a result, the survey balances have been frequently cited in the Minutes of MPC meetings, the *Inflation Report* and the *Financial Stability Report,* and the results are often reported in the media.[2]

2.2 Description of the disaggregated CCS *responses*

The *CCS* is made up of three component questionnaires, covering the lending activities of UK banks, building societies and other (non-bank) specialist lenders in three separate markets: secured lending to households, unsecured lending to households, and lending to the corporate sector. Throughout this paper, we refer to this group of lenders as 'banks'. Initially, lending to

[2] In 2012 Q4, the Bank of England began collecting data in the *Bank Liabilities Survey,* designed as a complement to the *CCS*. The survey asks about banks' funding and capital conditions, as well as the cost of funding the flow of new loans, and therefore provides additional information on potential developments in credit conditions.

small businesses (SMEs) was largely covered in the unsecured lending to households survey, since banks had told the Bank of England that they managed loans to SMEs in this way. Since 2009 Q4, however, there has been a separate set of questions asking about credit conditions for small businesses.[3] The Bank publishes the aggregate results of the *CCS* each quarter.[4] Due to the confidential nature of the individual institution responses, disaggregate results are not published.

A total of around 30 lenders would typically be involved in the *CCS* each quarter: around ten to 15 lenders would respond to each of the three component questionnaires. Lenders with a market share in excess of 1% over the previous twelve months are included in the sample.[5] Individual lenders' responses are consolidated following mergers and acquisitions. For example, Halifax Bank of Scotland and Lloyds TSB appear as separate entities in the survey prior to their merger in 2009; subsequently (in the period examined in this paper) Lloyds Banking Group submitted one joint response.

The *CCS* asks banks about their perceptions of developments in credit conditions over the past three months and their expectations for developments over the next three months. Questions refer to changes in the value of new approved lending originated. Banks are given five options in responding, of the general form: "Much less", "A little less", "No change", "A little more", "Much more". Results are presented as aggregate net percentage balances.[6]

Table 1 contains descriptive statistics for the disaggregated *CCS* responses. The survey questions listed in Table 1 are the main ones used in the analysis that follows: credit availability, credit scoring criteria, credit demand, credit spreads, defaults and losses given default, for secured and unsecured loans to households and loans to private non-financial corporations (PNFCs). The statistics are reported for 2007 Q2 to 2013 Q2.

There is substantial variation in responses between questions and sectors. In many cases, the majority of banks' responses indicate that credit conditions had 'stayed the same'. In contrast, there have been very few responses indicating that conditions changed 'a lot'. This may not be surprising since the drivers of credit conditions and credit demand are likely to move fairly slowly in general. It is also possible that the 'stayed the same' bracket is wide and encompasses a range of small changes in credit conditions.

The amount of variation in responses varies by question and sector. Banks have reported that conditions have 'stayed the same' relatively more often for measures of credit supply and for

[3] Small businesses are defined as those with an annual turnover of under £1 million. Medium-sized corporates are defined as those with an annual turnover of between £1 million and £25 million. Large corporates are defined as those with an annual turnover of more than £25 million.
[4] The published survey data are available here: www.bankofengland.co.uk/publications/Pages/other/monetary/creditconditions.aspx.
[5] For the secured and unsecured household surveys, market shares are based on gross lending flows. For the corporate survey – due to data availability – the sample is based on shares in the stock of corporate loans.
[6] Calculated, for example, as the percentage reporting 'much more' (multiplied by 1) plus the percentage reporting 'a little more' (multiplied by 0.5) minus the percentage reporting 'a little less' (multiplied by 0.5) minus the percentage reporting 'much less' (multiplied by 1). Percentages reporting each category are calculated by weighting individual lenders' responses by their (time-varying) market share.

losses given default, than for credit demand or credit spreads. This may suggest that credit demand and spreads are faster-moving on average.

Table 1 Summary of disaggregated *CCS* responses[(a) (b) (c)]

Percentage of responses within each answer category

CCS indicators of credit supply[(d)]

	Household secured credit		Household unsecured credit		Corporate credit
	Availability	Credit scoring	Availability	Credit scoring	Availability
Decreased a lot	7	0	1	0	4
Decreased a little	16	4	19	9	15
Stayed the same	57	66	73	64	65
Increased a little	19	26	8	26	15
Increased a lot	2	4	0	1	1

CCS indicators of credit demand[(e)]

	Household secured credit		Household unsecured credit	Corporate credit		
	Demand for house purchase	Demand for remortgage	Demand	Demand from small firms	Demand from medium firms	Demand from large firms
Decreased a lot	12	10	3	6	6	5
Decreased a little	26	23	35	13	16	20
Stayed the same	31	37	38	63	63	52
Increased a little	25	20	19	17	15	21
Increased a lot	7	10	4	1	0	1

CCS indicators of credit spreads[(f)]

	Household secured credit	Household unsecured credit		Corporate credit		
	Spreads	Spreads on credit cards	Spreads on other loans	Spreads for small firms	Spreads for medium firms	Spreads for large firms
Decreased a lot	2	0	0	0	0	1
Decreased a little	27	12	23	2	21	27
Stayed the same	34	70	45	80	37	32
Increased a little	30	17	31	17	34	30
Increased a lot	7	1	1	1	8	11

CCS indicators of defaults[(g)]

	Household secured credit	Household unsecured credit	Corporate credit		
	Defaults	Defaults	Defaults for small firms	Defaults for medium firms	Defaults for large firms
Decreased a lot	0	0	0	0	0
Decreased a little	17	36	16	10	9
Stayed the same	48	37	59	57	68
Increased a little	30	26	24	30	19
Increased a lot	5	0	1	3	3

CCS indicators of losses given default[(h)]

	Household secured credit	Household unsecured credit	Corporate credit		
	Losses given default	Losses given default	Losses given default for small firms	Losses given default for medium firms	Losses given default for large firms
Decreased a lot	0	0	0	0	0
Decreased a little	11	13	8	5	6
Stayed the same	50	63	73	70	74
Increased a little	34	22	17	21	17
Increased a lot	5	1	1	4	2

(a) The sample period is 2007Q2 – 2013Q2; sample period for questions relating to small firms is 2009Q4-2013Q2.
(b) *CCS* responses are for questions relating to changes over the past three months. Responses are unweighted.
(c) Percentages may not sum to 100 due to rounding.
(d) The questions asked are of the form 'Has the availability of credit which you provide to households/businesses become tighter or looser over the latest 3 months relative to the previous 3 months?' and 'How have your credit scoring criteria for granting loan applications by households changed over the latest 3 months relative to the previous 3 months?'.
(e) The questions asked are of the form 'How has the demand for lending from households/businesses changed over the latest 3 months relative to the previous 3 months?'.
(f) The questions asked are of the form 'How have spreads (over Bank Rate/Libor/relevant swap rate) on approved new loan applications by households/businesses changed over the latest 3 months relative to the previous 3 months?'.
(g) The questions asked are of the form 'Has there been any change in the default rate on lending to households/businesses over the latest 3 months relative to the previous 3 months?'.
(h) The questions asked are of the form 'Has there been any change in Loss Given Default on lending to households/businesses over the latest 3 months relative to the previous 3 months?'.

3 International credit conditions surveys

This is the first published study to analyse the information content of the *CCS.* There are, however, a growing number of studies that perform a similar analysis using equivalent surveys from other countries.

In the United States, the Federal Reserve Bank's *Senior Loan Officer Opinion (SLO) Survey,* which has been running since 1967, has a similar format and coverage. That survey has been used empirically in a number of studies (for example Schreft and Owens, 1991, Duca and Garrett, 1995, Lown *et al,* 2000, Lown and Morgan, 2002 and 2006, Cunningham, 2006, Bassett *et al,* 2014). Many of these studies have found a significant link between banks' survey responses and measures of bank lending and output growth. Lown *et al* (2000) used macro data from the *SLO Survey* to investigate the relationship between commercial credit standards as reported in the survey, and economic output and loan growth. They found that tighter credit standards as reported by loan officers were associated with lower levels of output and commercial bank lending. Duca and Garrett (1995) found that the survey measure of lenders' willingness to offer consumer loans helped to predict both consumer lending and spending on durable goods. Cunningham (2006) found that responses were significant in explaining real economic activity, although responses were found to be less informative in explaining measures of performance in the banking sector. Some papers have investigated bias in banks' survey responses. For example Schreft and Owens (1991) found that banks appeared to be biased towards reporting tighter lending standards in the *SLO*, potentially because they perceived a risk of tighter regulatory scrutiny if they admitted to easier standards.

The European Central Bank (ECB) introduced its *Bank Lending Survey* (*BLS*) in 2003, and evidence suggests that it also contains useful information. For example, de Bondt *et al* (2010) used country-level panel regressions to find that the survey responses have predictive power for both credit and real GDP growth. Ciccarelli *et al* (2010) applied a VAR approach using both the *BLS* and *SLO* to assess the credit channel of monetary policy, whilst distinguishing between loan supply and demand factors. And Hempell and Sørensen (2010) exploited the more detailed responses from the *BLS* regarding the factors contributing to changes in credit standards, finding that both price effects and restrictions on loan size negatively affect loan growth.

A number of studies have made use of the individual bank responses to credit conditions surveys (for example Del Giovane *et al,* 2011, Blaes, 2011, Kuchler, 2012, Bassett *et al,* 2014). Del Giovane *et al* (2011), for instance, combined individual bank data from the *BLS* with micro data on loan quantities and prices for each bank to assess the role of supply and demand factors in developments in credit conditions. They found that the *BLS* indicators for both demand and supply conditions are statistically significant in explaining changes in some types of lending. Bassett (2013) used bank-level data from the *SLO* within a VAR framework to find that tightening shocks to credit supply lead to a substantial decline in real GDP and the capacity of firms and households to borrow from the banking sector.

The questions addressed in this paper are similar to those in the literature mentioned above, for example Del Giovane *et al* (2011) and de Bondt *et al* (2010) for the euro area, and Lown *et al*

(2000) for the United States. Similar to these papers, we examine the extent to which changes in credit conditions reported in the Bank of England's *CCS* are linked to future changes in loan volumes. Like them, we find that a subset of responses from the *CCS* is significantly associated with changes in future lending growth. But unlike the majority of these papers, we also examine the extent to which the *CCS* responses are linked to future changes in credit spreads.

Compared to the existing literature, we spend more time investigating the contemporaneous association between banks' *CCS* responses and the quantitative micro data. This is important for two reasons. First, since the survey asks about a range of credit conditions, some of which are otherwise unobservable, a high correlation between survey responses and quantitative data where such data are available would give us confidence that the responses are informative about movements we cannot observe elsewhere. And second, these findings should assist policymakers in interpreting the *CCS* responses, for example in helping to assess which loan products banks have in mind when reporting changes in credit spreads in the *CCS*.

Our econometric specification is similar to the approach used in Del Giovane *et al* (2011): we combine the individual bank responses from the *CCS* with micro data on lending volumes and loan rates. This allows us to relate the survey responses to developments in credit conditions for individual banks. One advantage this gives is the ability to control for factors specific to individual banks in order to isolate the explanatory power of the *CCS* for forecasting developments in credit conditions. It also increases the number of observations available for the estimation. Other papers, including Lown *et al* (2000), have used the aggregate survey data for time-series estimation, but this approach would not be possible for our analysis given the short time-series dimension available.

4 Methodology and data

The disaggregated *CCS* responses are combined with the quantitative micro data that feed into the aggregate official published data. This dataset forms an unbalanced panel of between eight and 14 banks,[7] over a sample period of 25 quarters (2007 Q2 – 2013 Q2). These banks accounted for between 60% and 90% of lending to the UK economy in 2013 Q2, depending on the type of lending. It is worth noting that the power of statistical tests may be limited, firstly due to the small size of the panel, and second because the sample period includes several large shocks to credit conditions which occurred over the crisis period. Once a longer time series becomes available, it is likely to become easier to identify significant relationships between the *CCS* and quantitative micro data.

4.1 Comparison of the CCS *responses with contemporaneous micro data*

Our first specification is designed to test the extent to which the *CCS* responses correspond to the quantitative micro data. As explained in more detail in Section 4.3, there are few series for which we can apply this type of cross-check, since the aim of the *CCS* was to fill gaps in the existing data rather than to collect data comparable to that which already existed. We therefore restrict the analysis to credit spreads and lending growth. Nevertheless, if the results show that

[7] This is smaller than the sample size of the *CCS* reflecting the availability of quantitative micro data.

the *CCS* responses correspond closely to the credit spreads and lending data, this would give us confidence that the remaining *CCS* responses – for which there are little corresponding quantitative data – are informative about developments in credit conditions.

The econometric specification is similar to that used in Del Giovane *et al* (2011). Regressions are estimated of the following general form:

$$\Delta Spreads_{it} = \alpha + \boldsymbol{\beta_1 CCS_{it}^{--}} + \boldsymbol{\beta_2 CCS_{it}^{-}} + \boldsymbol{\beta_3 CCS_{it}^{+}} + \boldsymbol{\beta_4 CCS_{it}^{++}} + \varepsilon_{it} \quad (1)$$

and

$$\Delta Lending_{it} = \delta + \boldsymbol{\gamma_1 CCS_{it}^{--}} + \boldsymbol{\gamma_2 CCS_{it}^{-}} + \boldsymbol{\gamma_3 CCS_{it}^{+}} + \boldsymbol{\gamma_4 CCS_{it}^{++}} + \epsilon_{it} \quad (2)$$

where $\Delta Spreads_{it}$ is the three month change in the individual bank spreads data for bank i that feed into the aggregate official published data; $\Delta Lending_{it}$ is the quarterly change in lending growth for bank i that feeds into the official aggregate data (see Section 4.3).

CCS_{it}^{--} is a vector of dummy variables that take the value of one where lenders reported that a given measure of credit conditions decreased 'a lot' over the latest three months relative to the previous three months, and zero otherwise. Similarly, the dummies for the other *CCS* vectors take the value 1 for the following responses: the measure of credit conditions decreased 'a little' (CCS_{it}^{-}), increased 'a little' (CCS_{it}^{+}) and increased 'a lot' (CCS_{it}^{++}), and zero otherwise. The dummy variable category for credit conditions having remained 'unchanged' is omitted.

The coefficients β_n and γ_n indicate the contemporaneous relationship between the *CCS* responses and changes in credit spreads or lending growth.[8] In other words the size of each coefficient should correspond to the average change in credit conditions that banks associate with each answer category in the *CCS*. If the responses correspond closely to the quantitative data, the coefficients β_n and γ_n should be significant and of the sign indicated in Table 2.

Table 2 Expected sign of *CCS* coefficients in Equations (1) to (4)

	Dependent variable: Credit spreads			
***CCS* variable**	Spreads	Defaults	Losses given default	Demand
Decreased	(-)	(-)	(-)	(-)
Increased	(+)	(+)	(+)	(+)
	Dependent variable: Lending growth			
***CCS* variable**	Availability	Credit scoring criteria	Demand	Defaults
Decreased	(-)	(+)	(-)	(+)
Increased	(+)	(-)	(+)	(-)

[8] It is possible that some *CCS* responses – for example changes in credit availability – may correspond to changes in lending growth with a lag. However Table A1 in Appendix B, which shows the correlation between the aggregate gross lending growth data and *CCS* responses for household credit conditions, suggests that the correlation with the contemporaneous *CCS* responses is similar, if not stronger, than the lagged responses.

The use of dummy variables rather than the raw *CCS* balances has the advantage of enabling identification of the marginal impact of reporting lower or higher spreads. And it does not constrain the relationship between the five possible answers reported in the *CCS* and the official data to be linear.[9] ε_{it} and ϵ_{it} are error terms assumed to be iid across banks.

Dummy variables indicating the quarter during which each survey was taken are included in all specifications, in order to control for any residual seasonality in the official data. Cluster-robust techniques are used to account for potential clustering of the error terms by bank, which would violate the OLS assumption of conditionally uncorrelated observations, and could result in inaccurate standard error estimation.

4.2 Testing the predictive power of the CCS *responses*

Equations (1) and (2) can help us to identify the contemporaneous relationship between the *CCS* responses and the quantitative micro data for credit spreads and lending growth. But the results tell us nothing about whether the responses contain information which is useful for predicting future credit spreads and lending growth, over and above the information contained in existing data. In order to assess whether the *CCS* responses contain information useful for predicting one-period-ahead changes in credit spreads or lending growth, we adjust Equations (1) and (2) as follows:

$$\Delta Spreads_{it} = \alpha_i + \boldsymbol{\beta_1 CCS\_decreased^e_{i,t-1}} + \boldsymbol{\beta_2 CCS\_increased^e_{i,t-1}} + \boldsymbol{\delta \Delta Spreads_{i,t-n}} + \boldsymbol{\gamma \Delta X_{t-1}} + u_{it} \quad (3)$$

and

$$\Delta Lending_{it} = \delta_i + \boldsymbol{\gamma_1 CCS\_decreased^e_{i,t-1}} + \boldsymbol{\gamma_2 CCS\_increased^e_{i,t-1}} + \boldsymbol{\sigma \Delta Lending_{i,t-n}} + \boldsymbol{\theta \Delta X_{t-1}} + \omega_{it} \quad (4)$$

The *CCS* vectors contain banks' expectations for developments in credit conditions in period t, reported in period t-1. Various *CCS* responses are contained within each vector, depending on the specification: more detail is contained in Sections 5 and 6. The expected sign of each of the *CCS* coefficients is shown in Table 2.

Given the additional regressors included in Equations 3 and 4 and the small panel size, we aggregate the 'decreased' and 'increased' *CCS* balances. $\boldsymbol{CCS\_decreased^e_{i,t-1}}$ is a vector of dummy variables that take the value of one where lenders expected a decrease in the relevant measure of credit conditions of either 'a lot' or 'a little' over the next three months; $\boldsymbol{CCS\_increased^e_{i,t-1}}$ is a vector of dummy variables that take the value of one where lenders expected an increase in the measure of credit conditions of either 'a lot' or 'a little' over the next three months. The 'unchanged' category is omitted.

[9] As a robustness check, we estimate ordered probit regressions for credit spreads with the discrete *CCS* response variables on the left hand side. Results are reported in Appendix B, Table A2. The pattern of significance is similar to the main results reported in Table 4.

$\Delta \mathbf{X_{t-1}}$ is a matrix of control variables from outside the survey that may affect credit spreads and lending growth. All such variables enter as three-month changes lagged by one quarter. The exact control variables used vary by specification, but include a reference rate – for example Bank Rate - as a minimum. Exogenous falls in Bank Rate would be likely to lead to an increase in lending volumes, in the first instance by reducing loan rates. The impact of exogenous changes in Bank Rate on credit spreads is less clear, and depends on the speed with which the changes are passed through to lending rates. We test other control variables, chosen using economic intuition, and include these in the final specification according to their statistical significance. Seasonal dummies are included in all specifications and standard errors are corrected for clustering by bank.[10]

Equations (3) and (4) are estimated using a fixed effects specification in order to control for factors specific to each bank that are fixed over time (α_i and δ_i). This technique allows us to exclude time-invariant bank-specific factors from the identification of the relationship between the *CCS* expectations and the dependent variable.

$\Delta \boldsymbol{Spreads_{i,t-n}}$ and $\Delta \boldsymbol{Lending_{i,t-n}}$ are vectors containing lags of the dependent variable. The inclusion of lagged dependent variables in a panel data model produces inconsistent estimates, as outlined in Nickell (1981). However, Nickell (1981) shows that the bias falls with the number of time periods included (and goes to zero as the number of time periods becomes infinite). Under bounded moments and weak dependence assumptions, the inconsistency is of order T^{-1}, where T is the number of time periods in the panel (Wooldridge (2002)). Since there are T=25 time periods included in our panel dataset, this suggests that the inconsistency should be fairly small.

Nevertheless, in addition to the standard fixed effects estimation, we estimate Equations (3) and (4) using the Arellano-Bond GMM estimator in a first-differenced model as a check on the robustness of the fixed effects results. The Arellano-Bond model works by instrumenting the differenced lagged dependent variables, for example $\Delta Spreads_{i,t-1}$ – which is correlated with the error term, $\Delta \varepsilon_{it}$, by construction – with additional lags of the dependent variable. $\Delta \varepsilon_{it}$ is uncorrelated with $\Delta Spreads_{i,t-k}$ for k≥2, so lagged dependent variables where k≥2 can be used as instruments. For consistent estimation, the Arellano-Bond specification requires that the error terms, ε_{it}, be serially uncorrelated. This requires that $\Delta \varepsilon_{it}$ be uncorrelated with $\Delta \varepsilon_{i,t-k}$ for $k \geq 2$. $\Delta \varepsilon_{it}$ will be correlated with $\Delta \varepsilon_{i,t-1}$ by construction. We test this assumption in the results which follow. In addition, the presence of multiple instruments allows us to run Hansen tests for overidentifying restrictions, the results of which are also reported in the following sections.

An additional issue arises because the fixed effects estimator imposes common slopes, thereby requiring the assumption that the coefficients are homogenous between banks. Pesaran and Smith (1995) suggest using the Mean Group estimator to overcome this problem. We do not investigate this estimator here since the relatively short time series dimension and unbalanced nature of the panel (some banks did not respond to the *CCS* for all the quarters in the sample), combined with the large number of explanatory variables in Equations (3) and (4), means that

[10] Seasonal dummies are not included in the Arellano-Bond specifications in order to reduce the number of explanatory variables included in these regressions.

there are insufficient degrees of freedom. However this could be a useful avenue for future research once more time periods become available.

4.3 Quantitative micro data

The aim of the first part of our analysis is to compare the *CCS* responses to the equivalent quantitative micro data. Given that the aim of the *CCS* was to fill gaps in the existing data rather than to collect data comparable to that which already existed, there are few series for which we can apply this type of cross-check. This section outlines the micro data that is most likely to provide a cross-check on the responses.

4.3.1 Credit spreads

The *CCS* asks banks to report how spreads on secured loans to households, unsecured loans to households and loans to businesses changed over the past three months. In principle banks could respond to the *CCS* based on 'quoted' rates (the rates banks charge to potential customers) or 'effective' rates (the realised rates on new loans). In practice, we consider that banks are more likely to respond based on changes in quoted rates, which represent the marginal cost of new credit, rather than considering changes in the composition of loans each quarter. The household rates data used in the analysis are therefore quoted rates data.

A range of rates data are available. We choose to examine a subset of the loan rates which are most representative of the range of products on offer. These include quoted rates for two-year fixed-rate mortgages, Bank Rate tracker mortgages, credit cards, £5,000 personal loans and £10,000 personal loans. Corporate rates data are not available in quoted rate form, and so we use data on effective rates for corporate lending, ie the realised rates on new loans. These data may suffer from measurement issues, however. [11] Appendix A contains further background information on the data.

Since the *CCS* responses refer to lending *spreads,* rather than to rates, we convert the micro rates data into spreads over reference rates. The estimated spreads are calculated over reference rates based on the guidance in the *CCS,*[12] as well as on discussions with the major lenders. Summary statistics for these spreads data are shown in Table 3.

[11] During 2009, the official data suggested that rates charged on loans to businesses fell sharply in marked contrast to aggregate rates data collected by the BIS and Bank of England for small and medium business lending, a range of survey evidence and reports to the Bank's Agents around the country. Discussions with the lenders suggest that in part that fall reflected quantity rationing by lenders, as they restricted lending to higher quality credits. Furthermore, some lenders reported that they were including historical loans in their data on new loan prices, because they were being contractually rolled over. It is likely that both of these factors pushed down the official rates series. In addition to these two issues affecting the data, data limitations mean that we use loan size as a proxy for loans to companies of different sizes (see Appendix A), which may also affect the results.

[12] For secured loans to households, lenders are asked to report the difference between the rate charged by the lender and the official Bank Rate/relevant swap rate. For unsecured loans to households, lenders are asked to report spreads over the official Bank Rate. For loans to businesses, lenders are asked to report spreads as the difference between the rate charged by the lender and the Libor rate for the same term. Calculating spreads over different reference rates (two-year fixed-rate mortgage and £10,000 personal loan spreads over Bank Rate, and credit card spreads over two-year swap rates) leads to little change in the significance of results. We calculate spreads on loans to businesses over 3-month Libor, but calculating over 6-month Libor makes little difference to the significance of results.

4.3.2 Lending volumes

The *CCS* does not ask lenders to report how lending growth has changed. But several survey questions may partially capture changes in lending. The main indicator of credit supply in the *CCS* is credit availability, defined in the survey as lenders' willingness and ability to supply credit, holding demand constant. Banks are also asked to report the extent to which credit availability has changed as a result of specific factors, including changes in the economic outlook, banks' market share objectives, funding conditions and risk appetite. In addition, the survey includes a question on changes in credit scoring criteria in the household secured and unsecured questionnaires.

Since the survey questions are based around changes in the value of new approved lending originated, we use the three-month on three-month growth rate of gross (new) lending as our main lending variable. However, gross lending data for PNFCs are available only from 2011, meaning that the sample period is too short to perform regression analysis. We therefore use the quarterly growth in the stock of PNFC lending, which also includes changes due to repayments. Appendix A contains further information on the lending data.

Table 3 presents summary statistics of the spreads and lending variables used in the subsequent analysis. Since the *CCS* takes place during the second month of each quarter, and asks respondents to consider changes relative to the previous three months, the quarterly micro data is constructed using monthly outturns so as to correspond to the timing of the *CCS* answering period.

Table 3 Summary statistics for credit spreads and loan data

	Observations	Mean	Std. Dev.	Min	Max
Spreads calculated from quoted rates (percentage points)					
2-year fixed-rate mortgage at 75% LTV ratio	247	1.7	1.0	-0.9	3.9
Bank Rate tracker mortgage at 75% LTV ratio	166	2.2	1.3	0.0	5.0
Credit card	209	14.3	3.5	3.2	19.4
£5,000 personal loan	160	8.3	4.1	0.3	17.2
£10,000 personal loan	178	5.7	2.4	0.3	10.1
Spreads calculated from effective rates (percentage points)					
Large loans to PNFCs (>£1m and <=£20m)	169	1.4	1.3	-0.9	6.2
Small loans to PNFCs (<=£1m)	186	3.0	2.7	-3.8	9.9
Quarterly lending volumes (£mn)					
Gross secured lending [(a)]	306	2946	3829	4	27493
Gross consumer lending [(a)]	310	2724	2718	9	8445
PNFC net lending	313	44	1060	-3287	7060

(a) The 3 month growth rate of gross secured and unsecured lending is volatile, partly because some of data is calculated from a small base, and so we adjust for outliers in the analysis by removing the highest and lowest 1% of observations.

5 Results: credit spreads

5.1 Comparison of the CCS *responses with contemporaneous data on credit spreads*

Secured spreads

Results from the estimation of Equation (1) suggest that banks' *CCS* responses correspond well to changes in spreads on a subset of loan products. Column (1) of Table 4 shows that responses for changes in spreads on secured lending are significantly associated with changes in spreads on two-year fixed-rate mortgages at 75% LTV. For example, reports of spreads having fallen 'a little' correspond to a 0.25 percentage point fall in spreads on two-year fixed-rate mortgages, compared to reports of spreads having remained 'unchanged'. And reports of spreads having fallen 'a lot' correspond to a 0.42 percentage point fall in two-year fixed-rate spreads.

The *CCS* spreads responses correspond less well to changes in spreads on Bank Rate tracker mortgages. Column (2) shows that responses for spreads having increased 'a little' are associated with a 0.22 percentage point rise in spreads on Bank Rate tracker mortgages, but the other coefficients in this column are insignificant. The lower significance of the results in column (2) compared to column (1) may be because there are relatively few Bank Rate tracker observations. It is also possible that banks respond to the *CCS* based on movements in rates on their most popular products. Data from Moneyfacts suggest that two-year fixed-rate mortgages formed around 42% of all fixed-rate products and around 28% of all mortgage products on offer between mid-2008 and mid-2013, while Bank Rate tracker products formed around 21% of products on offer over this period.

Table 4 Comparison of spreads between *CCS* responses and published data[(a)]

	Dependent variable: 3-month change in spreads						
VARIABLES	(1) 2yr fix mortgage	(2) BRT mortgage	(3) Credit cards	(4) 5k personal loan	(5) 10k personal loan	(6) Business loans £1-20m (*CCS* balances for large firms)	(7) Business loans up to £1m (*CCS* balances for medium firms)
CCS spreads[(b)]							
Decreased a lot	-0.42***					-0.06	
	(0.10)					(0.39)	
Decreased a little	-0.25**	-0.03	0.32	-0.24	-0.44***	0.04	-0.04
	(0.10)	(0.06)	(0.32)	(0.17)	(0.13)	(0.06)	(0.13)
Increased a little	0.30***	0.22*	0.48**	0.58*	0.64***	-0.09	-0.07
	(0.06)	(0.11)	(0.17)	(0.29)	(0.20)	(0.06)	(0.14)
Increased a lot	0.47*	0.11				0.03	0.47
	(0.24)	(0.16)				(0.15)	(0.34)
Constant	-0.01	0.08	0.26	0.05	-0.07	0.17*	0.34
	(0.05)	(0.05)	(0.18)	(0.20)	(0.13)	(0.09)	(0.22)
Observations	230	147	196	146	164	156	169
R-squared	0.19	0.10	0.05	0.12	0.22	0.06	0.05
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.
(b) The *CCS* spreads responses used in each column () refer to: secured spreads (1) and (2); credit card spreads (3); other unsecured spreads (4) and (5); spreads on loans to large firms (6); spreads on loans to medium-sized firms (7).

Unsecured spreads

Banks' *CCS* responses are significantly associated with changes in spreads on unsecured lending. The responses that indicate a rise in spreads of 'a little' on credit card loans are associated with a 0.48 percentage point rise in credit card spreads (column (3)), although responses indicating a fall in spreads are insignificant. And responses for spreads on other unsecured loans are significantly associated with a change in spreads on £10,000, and – to a lesser extent – £5,000, personal loans (columns (4) and (5)). Again, tentative intelligence from banks suggests that £10,000 loans have tended to have a higher take up than £5,000 loans, which could explain why responses appear to correspond best to £10,000 loans.

Corporate spreads

In contrast to the results for household lending, banks' responses for changes in spreads on corporate loans correspond poorly to changes in effective rate spreads on corporate lending (columns (6) and (7)). In part, however, this may reflect the data issues discussed in Section 4.3.1: corporate rates data are not available in quoted rate form, and the effective rates data may suffer from various measurement issues. It is possible therefore, that the responses give a better steer than the quantitative spreads data on the cost of corporate credit.

If banks' responses for rises and falls in spreads are symmetric, we would expect the coefficients for 'decreased a lot' and 'increased a lot', as well as 'decreased a little' and 'increased a little' to be of equal size and opposite sign. We use a Wald test for this hypothesis ($(\beta_1 + \beta_4 = 0)$ and $(\beta_2 + \beta_3 = 0)$). We find that the null hypothesis of equal-sized coefficients cannot be rejected, except in the case of spreads on credit card loans. And a Wald test for the equality of the individual bank fixed effects, when dummy variables for each bank are included in the regression, show that these fixed effects cannot be restricted to be equal. This suggests that banks do not all respond to the survey in the same way.

It is possible that banks have different perceptions of what constitutes 'no change' in credit spreads. We test for this possibility by including dummy variables for each bank in the regressions. Results from a series of Wald tests suggest that these dummy variables cannot be restricted to be equal, suggesting that banks do have varying perceptions of the width of the 'no change' bracket in the *CCS*.

Another possibility is that the significance of the relationship between the *CCS* responses and the quantitative data varies with banks' market share. In reality, changes in spreads by banks with larger market share will have a larger impact on the overall cost of credit than those with a small market share. In order to test whether or not the responses of those banks with a larger market share are more or less correlated with the quantitative data than the average reported in Table 4, we weight each observation by the relevant bank's share of gross lending (or share of the stock of lending in the case of lending to PNFCs) in each quarter. Results are reported in Table A3 in Appendix B. Interestingly, these results are a little less significant, suggesting that in the case of spreads, the largest banks' responses correlate less-well than the average with movements in the quantitative spreads data.

5.2 Prediction of credit spreads using the CCS *expectations responses*

Section 5.1 suggested that banks' *CCS* responses correspond well to a subsample of spreads. This section investigates the extent to which banks' expectations of credit conditions can help us to predict changes in credit spreads one quarter ahead, controlling for a variety of other factors.

Several of the *CCS* questions may contain information useful for predicting changes in credit spreads. Besides the spreads responses, we also investigate the *CCS* expectations for credit demand, defaults and losses given default.[13,14] If lenders fully incorporate all information available at time t about future changes in credit conditions into their expectations for changes in spreads, then no other *CCS* variables should contain additional explanatory power in Equation (3). However, if lenders do not fully incorporate all information into their spreads expectations, then other responses may contain additional predictive power.

As discussed in Section 4.2, the responses which indicate changes in credit conditions of 'a little' and 'a lot' are aggregated in order to reduce the number of explanatory variables in the regressions, given the small sample size. This means that a 'decrease' ('increase') in the relevant *CCS* variable (in Tables 5 to 7) is equivalent to a decrease (increase) of either 'a little' or 'a lot'.

Secured spreads

The first column of Table 5 shows that – under the fixed effects specification – banks' expectations for changes in spreads are associated with around a 0.2 percentage point change in spreads on two-year fixed-rate mortgages in the subsequent quarter. The spreads responses lose their significance when year dummies are included in column (2) and under the Arellano-Bond specification in column (3), but the results in these columns suggest that expected changes in defaults are significantly associated with changes in spreads in the subsequent quarter. The *CCS* expectations have a little less predictive power for changes in spreads on Bank Rate tracker mortgages (columns (4) to (6)). The lower significance compared to the coefficients for two-year fixed-rate mortgages may be due in part to the smaller number of observations, and the possibility that responses correspond best to spreads on the most popular mortgage products (see Section 5.1).

The dummy variables indicating the 2008 Q4 and 2009 Q1 cuts in Bank Rate are generally positive and significant, consistent with the fact that banks did not cut their lending rates by as much as the fall in Bank Rate (see for example Butt and Pugh (2014)), so that credit spreads widened. The coefficients for changes in reference rates are insignificant.

[13] The exact combination of *CCS* indicators used varies for each type of lending (secured, unsecured and corporate), according to the fit of the regression.
[14] See Button *et al* (2010) for a discussion of the factors affecting the price of new bank lending to households.

Unsecured spreads

Banks' expectations for spreads on unsecured lending have less predictive power than those for spreads on secured lending. Table 6 shows that the only significant results of the expected sign are for expected changes in spreads on £10,000 personal loans. An expected increase in unsecured spreads is associated with a 0.51 percentage point rise in spreads on £10,000 personal loans in the subsequent quarter under the fixed effects specification (column (7)), and 0.36 percentage points under the Arellano-Bond specification (column (9)).

Corporate spreads

Banks' expectations reported in the *CCS* have a very small amount of predictive power for effective rates on loans to businesses (Table 7). Columns (1) to (3) show that expectations of a decrease in demand for credit from large firms are associated with a 0.20 to 0.28 percentage point fall in loan spreads. Most other coefficients are insignificant.

Tests for symmetry of responses suggest that we cannot generally reject the hypothesis that banks' responses for an expected increase in spreads or other credit conditions are identical in magnitude to their responses for a decrease. Tables 5 to 7 also report the results of the Hansen and AR(2) tests, necessary for the Arellano-Bond regressions to be valid. The results from the Hansen tests suggest that we cannot reject the overidentifying restrictions in Tables 5 to 7 – in other words the instruments are valid, although the Hansen statistic of 1 in some specifications suggests that there may be too many instruments for the number of variables (see Roodman, 2006).[15] Tests for autocorrelation in the error terms (the AR(2) tests reported in the tables below) indicate that there is no further serial correlation in the error term at the 5% significance level after the correlation between ε_{it} and ε_{it-1} (except for the result in column (6) of Table 7, which is significant at the 10% level)

[15] The number of instruments is almost at a minimum for the specification, but the relatively large number of explanatory variables and small panel size mean this problem is difficult to avoid.

Table 5 Prediction of secured spreads using the *CCS* expectations balances

	Dependent variable: 3-month change in secured lending spreads					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	2 yr fix mortgage	2 yr fix mortgage	2 yr fix mortgage	Bank Rate tracker	Bank Rate tracker	Bank Rate tracker
CCS expected spreads (t-1)						
Decrease	-0.20***	-0.16	-0.13	-0.00	0.01	-0.19**
	(0.06)	(0.10)	(0.10)	(0.08)	(0.04)	(0.09)
Increase	0.24**	0.09	0.19	0.08	0.05	-0.08
	(0.09)	(0.09)	(0.14)	(0.10)	(0.07)	(0.18)
CCS expected defaults (t-1)						
Decrease	0.07	-0.19***	-0.17	0.06*	-0.03	0.11
	(0.07)	(0.05)	(0.12)	(0.03)	(0.04)	(0.13)
Increase	0.11	0.04	0.34*	0.18	0.14	0.17
	(0.07)	(0.10)	(0.18)	(0.11)	(0.14)	(0.16)
CCS expected losses given default (t-1)						
Decrease	-0.18	-0.02	-0.03	-0.34***	-0.14	-0.08
	(0.13)	(0.09)	(0.24)	(0.07)	(0.15)	(0.16)
Increase	-0.03	0.02	-0.06	0.06	0.15	0.24
	(0.08)	(0.10)	(0.10)	(0.11)	(0.09)	(0.18)
Y(t-1)	-0.28***	-0.49***	-0.04	-0.17**	-0.19**	-0.12
	(0.08)	(0.09)	(0.12)	(0.07)	(0.07)	(0.24)
Y(t-2)	-0.24***	-0.35***	-0.05	-0.10	-0.09	-0.78***
	(0.07)	(0.05)	(0.11)	(0.09)	(0.07)	(0.23)
Bank Rate (t-1)				-0.09		-0.15
				(0.14)		(0.16)
Two-year swap rate (t-1)	-0.24		0.11			
	(0.15)		(0.15)			
Bank Rate cut (2008 Q4)	1.31***		1.72***	0.70***		1.27***
	(0.16)		(0.25)	(0.22)		(0.42)
Bank Rate cut (2009 Q1)	-0.16		0.42	0.88***		0.82***
	(0.31)		(0.26)	(0.25)		(0.20)
Constant	-0.05	0.58***		0.02	0.31***	
	(0.05)	(0.15)		(0.08)	(0.08)	
Observations	201	201	187	114	114	100
R-squared	0.43	0.37		0.40	0.29	
Number of banks	13	13	12	11	11	11
Regression type	FE	FE	Arellano Bond	FE	FE	Arellano Bond
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	No	Yes	Yes	No
Year dummies	No	Yes	No	No	Yes	No
Hansen test			[0.56]			[1.00]
AR(2) test			[0.49]			[0.41]

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6 Prediction of unsecured spreads using the *CCS* expectations balances

	Dependent variable: 3-month change in unsecured lending spreads								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES	Credit cards	Credit cards	Credit cards	5k personal loans	5k personal loans	5k personal loans	10k personal loans	10k personal loans	10k personal loans
CCS expected spreads (t-1)									
Decrease	0.33**	0.57**	0.07	-0.27	-0.21	-0.08	-0.06	-0.12	-0.26
	(0.11)	(0.18)	(0.06)	(0.21)	(0.33)	(0.40)	(0.17)	(0.18)	(0.26)
Increase	0.16	0.01	0.35	0.01	-0.00	-0.46	0.51***	0.35	0.36**
	(0.30)	(0.35)	(0.28)	(0.09)	(0.20)	(0.30)	(0.07)	(0.20)	(0.17)
Y(t-1)	-0.03	0.08	0.03	-0.12***	-0.09	0.04	-0.03	-0.00	0.17
	(0.03)	(0.09)	(0.04)	(0.03)	(0.10)	(0.14)	(0.07)	(0.14)	(0.18)
Y(t-2)	-0.03	0.05	-0.03	-0.10	-0.26***	-0.09	-0.03	-0.27***	-0.07
	(0.04)	(0.07)	(0.06)	(0.10)	(0.06)	(0.09)	(0.07)	(0.08)	(0.07)
Bank Rate (t-1)	0.01		0.01						
	(0.16)		(0.19)						
Two-year swap rate (t-1)				0.08		0.56*	-0.07		0.45***
				(0.31)		(0.32)	(0.15)		(0.17)
Bank Rate cut (2008 Q4)	2.03***		2.00***	2.35***		1.88***	2.11**		1.05
	(0.43)		(0.40)	(0.52)		(0.53)	(0.75)		(0.75)
Bank Rate cut (2009 Q1)	1.74***		1.69***	2.00***		1.59***	1.66***		1.11***
	(0.43)		(0.36)	(0.56)		(0.34)	(0.33)		(0.35)
Constant	0.08	0.82***		0.31**	1.29***		-0.26	0.87***	
	(0.10)	(0.22)		(0.11)	(0.21)		(0.19)	(0.12)	
Observations	172	172	161	121	121	110	138	138	125
R-squared	0.44	0.14		0.29	0.20		0.38	0.32	
Number of banks	11	11	11	11	11	10	12	12	11
Regression type	FE	FE	Arellano Bond	FE	FE	Arellano Bond	FE	FE	Arellano Bond
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Year dummies	No	Yes	No	No	Yes	No	No	Yes	No
Hansen Test			[0.16]			[0.73]			[0.24]
AR (2) Test			[0.30]			[0.28]			[0.68]

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 Prediction of corporate spreads using the *CCS* expectations balances

	Dependent variable: 3-month change in corporate lending spreads					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Business loans £1-20m (*CCS* balances for large firms)	Business loans £1-20m (*CCS* balances for large firms)	Business loans £1-20m (*CCS* balances for large firms)	Business loans up to £1m (*CCS* balances for medium firms)	Business loans up to £1m (*CCS* balances for medium firms)	Business loans up to £1m (*CCS* balances for medium firms)
CCS expected spreads (t-1)						
Decrease	-0.13	-0.13	-0.17	-0.18	-0.13	-0.18
	(0.17)	(0.14)	(0.15)	(0.12)	(0.15)	(0.15)
Increase	-0.05	-0.02	0.19	-0.01	0.04	-0.11
	(0.13)	(0.14)	(0.25)	(0.17)	(0.19)	(0.14)
CCS expected demand (t-1)						
Decrease	-0.28**	-0.27**	-0.20*	0.13	0.28	-0.08
	(0.11)	(0.10)	(0.12)	(0.35)	(0.26)	(0.19)
Increase	-0.06	-0.09	-0.23	0.17	0.15	0.16
	(0.18)	(0.19)	(0.23)	(0.18)	(0.19)	(0.15)
CCS expected defaults (t-1)						
Decrease	0.00	-0.06	0.23	0.10	0.21	-0.16
	(0.13)	(0.18)	(0.27)	(0.24)	(0.31)	(0.19)
Increase	0.03	-0.04	0.11	0.08	0.06	-0.24*
	(0.14)	(0.13)	(0.15)	(0.25)	(0.27)	(0.13)
Y(t-1)	-0.53***	-0.58***	-0.42**	-0.30	-0.28	-0.30*
	(0.10)	(0.11)	(0.16)	(0.20)	(0.18)	(0.17)
Y(t-2)	-0.10	-0.13	-0.02	0.27	0.26	0.22
	(0.11)	(0.12)	(0.09)	(0.19)	(0.23)	(0.16)
Libor (t-1)	-0.17		0.05	-0.12		-0.16
	(0.14)		(0.10)	(0.10)		(0.14)
Bank Rate cut (2008 Q4)	-0.16		0.15	0.48		0.25
	(0.23)		(0.30)	(0.47)		(0.35)
Bank Rate cut (2009 Q1)	-0.20		0.15	0.98		0.67*
	(0.15)		(0.11)	(0.75)		(0.38)
Constant	0.34***	0.13		0.13	0.21	
	(0.05)	(0.13)		(0.13)	(0.18)	
Observations	134	134	125	143	143	131
R-squared	0.34	0.38		0.27	0.25	
Number of banks	8	8	8	9	9	9
Regression type	FE	FE	Arellano Bond	FE	FE	Arellano Bond
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	No	Yes	Yes	No
Year dummies	No	Yes	No	No	Yes	No
Hansen Test			[1.00]			[1.00]
AR (2) Test			[0.64]			[0.06]

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5.3 Implications

Section 5.1 showed that the changes in spreads reported in the *CCS* correspond closely to changes in spreads on a subset of loan products: primarily those for which there is likely to be a higher number of products on offer. The results in Table 4 suggest that the responses correspond better to spreads on household loans than loans to businesses. However, this is likely to be partly due to deficiencies in the corporate loan discussed in Section 4.3.1: the fact that the *CCS* corresponds closely to spreads on household loans gives us some confidence that it is also relevant for changes in corporate loan spreads.

Since the results suggest that the *CCS* spreads responses give a reasonably accurate indication of changes in the spreads charged on loans, they may be usefully employed within policy analysis. For example, the spreads responses are used within the Bank of England's overall measure of credit conditions (see Butt and Pugh, 2014), in order to compensate for a lack of suitable rates data for certain sectors of the economy.

Section 5.2 examined the predictive power of the *CCS* for changes in credit spreads one quarter ahead. The results showed that – although the responses are not informative in all cases – a subset of responses do contain additional information relative to the existing quantitative data, especially those for mortgage spreads. And since the estimation period contained several shocks which might not have been predictable, in particular at the start of the financial crisis and during the intensification of the crisis in the euro area in 2010, the finding of any significant results suggests that the *CCS* has useful information content.

6 Results: lending volumes

Section 5 compared the *CCS* credit spreads responses to the nearest equivalent quantitative spreads data, and assessed the predictive power of the *CCS* expectations for credit spreads in the following quarter. The aim of this section is a similar analysis for *CCS* data and loan volumes. As discussed in Section 4.3.2, however, this analysis is not so straightforward as for the spreads data, as the survey does not simply ask respondents how loan volumes have evolved and are likely to change. Instead, lenders are asked about developments in various factors that are likely to determine loan volumes, including changes in credit availability, credit scoring criteria, expected defaults and credit demand. Of course, that is not a limitation of the survey, rather it was by design: one of the aims of the survey was to help distinguish between changes in credit demand, supply and credit quality, in driving loan volumes. As a result, not only are we interested in the extent to which these survey responses have predictive power for loan volumes, but also whether the pattern of significance across the variables provides insights on the relative importance of the various underlying drivers. For example, a reduction in loan volumes may reflect any of: a tightening in credit supply, a fall in loan demand, a worsening in the quality of potential borrowers. One difficulty with this distinction, however, is that there is not a single survey question that isolates the supply of credit. The question on credit availability is probably closest to this concept – the guidance notes specify that lenders should report this independent of

changes in credit demand – but it is not clear whether this would also control for changes in credit quality.[16]

6.1 Comparison of the CCS *responses with contemporaneous data on lending growth*

Secured lending

Results from Equation (2) show that both the supply and demand responses from the *CCS* are significantly associated with the growth rate of gross secured household lending. Column (1) of Table 8 shows that, without controlling for changes in demand, an increase in the availability of secured credit of 'a little' is associated with an increase in the quarterly growth of gross secured lending of around 13 percentage points relative to the growth rate which would have been observed had banks reported that credit availability was unchanged. The large size of this coefficient reflects the use of the individual bank gross lending data, which has a standard deviation of 33 percentage points. We would be unlikely to observe such large changes if we had run the regressions using aggregate data, which is less volatile since growth rates are calculated over a larger lending base. The supply indicators continue to be significantly associated with quarterly gross lending growth once demand for credit is controlled for, although the size of the change in gross secured lending attributable to changes in availability falls to around nine percentage points in column (2).

Credit availability is not the only measure of supply in the *CCS* which is significantly associated with gross secured lending growth. Column (3) shows that a decrease (that is, a loosening) in credit scoring criteria of 'a little' is associated with around a 10 percentage point increase in gross secured lending, while an increase (that is, a tightening) in criteria of 'a lot' is associated with a reduction in gross secured lending growth of 35 percentage points. And the results in columns (4) to (8) show that various subcomponents of credit availability – in particular banks' market share objectives – are highly correlated with gross secured lending growth.

Banks' reports of changes in secured credit demand are also associated with growth in gross secured lending. Columns (2) to (9) show that, controlling for reported changes in credit supply, responses indicating a rise in demand for house purchase of 'a lot' over the past three months are associated with a 30-40 percentage point increase in gross secured lending growth. Since the *CCS* responses for credit demand as well as credit availability and credit scoring criteria enter significantly in the regression, this helps to confirm our expectations that these latter responses are capturing changes in credit *supply*, rather than, for example, changes in lending growth.

Controlling for changes in borrower quality – by adding the *CCS* responses for changes in defaults to the regression – does not improve the significance of the coefficients (column (9)). None of the *CCS* default coefficients are significant. This could suggest that movements in credit availability are already conditional on changes in borrower quality, or alternatively that movements in borrower quality have not been a significant factor in affecting secured loan

[16] The guidance notes are available here: http://www.bankofengland.co.uk/publications/Documents/other/monetary/ccs/credit-conditions-survey-guide.pdf

growth since 2007. The former would seem more likely given the sharp rise in unemployment and squeeze on real incomes since the financial crisis.

Although the absolute sizes of the coefficients for 'decreased a little' and 'increased a little', as well as 'decreased a lot' and 'increased a lot', vary in Table 8, results from a Wald test suggest that the null hypothesis that these responses are equal in size (i.e. $(\gamma_1 + \gamma_4 = 0)$ and $(\gamma_2 + \gamma_3 = 0)$) cannot generally be rejected. And when dummy variables for each bank are included in the regressions, results from Wald tests show that these cannot be restricted to be equal. Finally, Table A4 in Appendix B adjusts each regression to account for each bank's share of lending, however the overall significance of the results is little changed.

Unsecured lending

Similar to the results for gross secured lending, Table 9 shows that the *CCS* responses for both the availability of unsecured credit and demand for unsecured credit are significantly associated with growth in gross unsecured lending. For example, column (2) shows that a reduction in credit availability of 'a little' is associated with a five percentage point fall in gross unsecured lending growth, while an increase in credit demand of 'a little' is associated with around a three percentage point increase. Fewer of the *CCS* indicators are significant than in Table 8, however.

In contrast to the results for secured lending growth, a reported decrease in defaults on unsecured lending of 'a little' is associated with a two percentage point increase in gross unsecured lending growth, suggesting that the unsecured credit supply responses may not fully incorporate changes in borrower quality. The significance of the default indicators increases when the observations are weighted by banks' market share (Table A5, Appendix B).

Corporate lending

Results for lending to businesses (Table 10, columns (1) and (2)) suggest that a rise in corporate credit availability of 'a lot' is associated with around a 10 percentage point rise in quarterly lending growth to businesses. But many of the other *CCS* indicators are insignificant or of a counter-intuitive sign. Adjusting for lenders' market shares (results are shown in Table A6 of Appendix B) improves the significance of the results somewhat: for example, the *CCS* responses showing a rise in corporate credit demand become significant. This gives tentative evidence to suggest that the responses of banks with larger market share correspond more closely with changes in lending growth than the average reported in Table 10.

Although results for corporate lending growth are less significant than for household lending, this may reflect the fact that we are using the quarterly growth in the stock of lending rather than quarterly growth in gross lending (see Section 4.3.2). We are unable to test the relationship using gross corporate lending data, since these data have only been collected since 2011.

Table 8: *CCS* determinants of gross secured household lending growth

	Dependent variable: 3-month on 3-month growth in gross secured lending								
VARIABLES[(a)]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CCS supply indicator:	Availability	Availability	Credit scoring criteria	Availability: economic outloook	Availability: market share objectives	Availability: risk appetite	Availability: funding conditions	Availability: house price expectations	Availability
Decreased a lot	-7.49	-0.26			4.02		8.77	-9.34	0.28
	(10.043)	(11.700)			(12.377)		(6.699)	(9.159)	(13.751)
Decreased a little	-7.32	-4.68	10.35*	-1.06	-15.73**	-5.33	2.48	-1.34	-4.22
	(4.731)	(6.682)	(5.438)	(5.542)	(6.742)	(5.833)	(4.217)	(4.889)	(6.536)
Increased a little	12.59**	8.92*	-5.90	11.27	7.94**	-2.85	6.35	6.96	8.87*
	(5.137)	(4.839)	(4.492)	(9.788)	(3.458)	(4.953)	(3.805)	(4.648)	(4.695)
Increased a lot	70.08**	42.56**	-35.28***		33.02**		30.32***		42.81*
	(25.506)	(19.487)	(9.396)		(15.076)		(3.460)		(20.638)
CCS demand for house purchase									
Decreased a lot		-16.07	-13.53*	-17.61*	-17.02**	-16.48*	-19.73**	-15.55	-14.26
		(9.264)	(6.936)	(8.174)	(6.890)	(7.888)	(6.778)	(10.305)	(8.672)
Decreased a little		4.22	5.25	2.95	3.50	4.48	4.40	4.51	3.71
		(6.178)	(6.108)	(5.739)	(5.901)	(6.370)	(6.020)	(7.339)	(5.344)
Increased a little		5.21	7.45*	6.23	4.89	7.22	7.01	6.50	5.07
		(3.940)	(3.884)	(3.783)	(3.792)	(4.090)	(4.015)	(3.928)	(3.570)
Increased a lot		29.51**	40.15**	37.79**	29.58**	41.07**	40.29**	39.74**	29.47**
		(10.582)	(16.448)	(15.241)	(11.877)	(16.817)	(16.438)	(15.605)	(10.035)
CCS defaults									
Decreased a lot									
Decreased a little									5.00
									(7.912)
Increased a little									-0.65
									(3.941)
Increased a lot									-5.94
									(8.404)
Constant	-16.73***	-18.01***	-16.45***	-16.51***	-17.09***	-15.96***	-17.96***	-16.37***	-18.45***
	(2.724)	(3.570)	(2.859)	(3.141)	(3.306)	(3.061)	(3.460)	(2.822)	(4.252)
Observations	272	272	272	272	272	272	272	272	272
R-squared	0.205	0.262	0.254	0.241	0.265	0.238	0.243	0.240	0.267
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

Table 9: *CCS* determinants of gross unsecured household lending growth

	Dependent variable: 3-month on 3-month growth in gross unsecured lending							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES[(a)]								
CCS supply indicator	Availability	Availability	Credit scoring criteria	Availability: economic outloook	Availability: market share objectives	Availability: risk appetite	Availability: funding conditions	Availability
Decreased a lot	-61.90***	-58.21***			-58.05***	-65.14***	-56.56***	-56.68***
	(0.867)	(2.800)			(2.789)	(5.014)	(3.834)	(2.761)
Decreased a little	-4.76*	-5.10**	1.63	-2.70	-5.21**	-7.01**	-0.41	-4.48**
	(2.312)	(2.005)	(1.244)	(2.531)	(2.259)	(2.700)	(1.286)	(2.030)
Increased a little	2.63	2.38	-5.05*	3.77	0.86	1.91	3.61	2.05
	(1.856)	(1.819)	(2.429)	(2.689)	(1.585)	(1.120)	(2.520)	(1.806)
Increased a lot			-0.18					
			(2.008)					
CCS demand indicator								
Decreased a lot		-6.50	-12.76	-14.63	-6.53	-5.47	-8.28	-6.91
		(5.064)	(8.085)	(8.978)	(4.878)	(5.226)	(6.565)	(4.993)
Decreased a little		0.21	-0.72	-1.40	-0.19	-0.82	-0.71	0.10
		(0.829)	(1.096)	(1.347)	(0.970)	(1.195)	(0.966)	(0.873)
Increased a little		3.33*	3.39*	2.93*	2.39	4.34*	2.24	3.50*
		(1.789)	(1.765)	(1.574)	(1.756)	(2.017)	(1.411)	(1.784)
Increased a lot		1.80	1.34	2.01	1.10	1.78	1.23	1.74
		(1.322)	(1.221)	(1.569)	(1.431)	(1.125)	(1.619)	(1.351)
CCS defaults								
Decreased a lot								3.21
								(1.881)
Decreased a little								2.16**
								(0.946)
Increased a little								-0.70
								(1.299)
Increased a lot								-1.53
								(1.233)
Constant	-4.05**	-4.71**	-3.65**	-4.24**	-4.52***	-3.93***	-4.50**	-5.49***
	(1.539)	(1.582)	(1.591)	(1.645)	(1.495)	(1.269)	(1.497)	(1.581)
Observations	275	275	275	275	275	275	275	275
R-squared	0.270	0.292	0.135	0.114	0.281	0.247	0.268	0.301
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

Table 10: *CCS* determinants of corporate lending growth

	Dependent variable: Quarterly growth in stock of corporate lending								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES[a]									
CCS supply indicator[b]	Availability	Availability	Availability: economic outloook	Availability: sector-specific risk	Availability: market share objectives	Availability: market pressure from capital markets	Availability: risk appetite	Availability: funding conditions	Availability
Decreased a lot	0.52	0.27	3.01	7.64***	-2.22	-7.79***	3.68	-1.14	0.43
	(2.283)	(2.116)	(2.157)	(1.452)	(2.787)	(0.725)	(4.242)	(1.533)	(1.956)
Decreased a little	0.04	-0.16	0.09	-0.37	-2.53	-1.94	-1.53	-1.22	-0.34
	(1.329)	(1.441)	(1.640)	(0.981)	(1.773)	(1.452)	(2.062)	(1.610)	(1.457)
Increased a little	-1.52	-1.65	-2.45***	1.39	2.37	0.05	0.85	-1.85**	-1.84
	(1.174)	(1.214)	(0.734)	(1.913)	(1.544)	(1.628)	(1.977)	(0.727)	(1.264)
Increased a lot	10.70***	10.94***		2.30***	3.73***		-1.10		10.93***
	(0.578)	(0.643)		(0.673)	(0.728)		(1.946)		(0.744)
CCS demand indicator[b]									
Decreased a lot		0.16	-0.53	-1.22	0.46	1.09	-0.00	0.69	-0.49
		(0.937)	(1.349)	(0.946)	(0.789)	(1.164)	(1.194)	(0.844)	(0.874)
Decreased a little		1.19	0.76	1.32	1.25	1.50	1.66	1.39	0.89
		(0.919)	(0.867)	(0.820)	(0.868)	(0.912)	(1.202)	(0.902)	(0.818)
Increased a little		0.93	0.51	0.17	0.11	0.31	0.39	0.30	0.98
		(0.728)	(0.843)	(0.756)	(0.900)	(0.897)	(0.900)	(0.875)	(0.692)
Increased a lot									
CCS defaults[b]									
Decreased a lot									-1.10
									(0.964)
Decreased a little									0.78
									(0.996)
Increased a little									0.22
									(1.630)
Increased a lot									
Constant	-0.31	-0.57	-0.35	-0.65	-0.79	-0.63	-0.60	-0.45	-0.47
	(0.845)	(0.967)	(0.774)	(0.965)	(0.956)	(0.876)	(0.945)	(0.805)	(1.126)
Observations	244	244	244	244	244	244	244	244	244
R-squared	0.127	0.134	0.078	0.080	0.077	0.075	0.068	0.060	0.142
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in
*** p<0.01, ** p<0.05, *

(a) Blank cells indicate that there were too few observations to identify the coefficient.
(b) The CCS indicators for availability apply to all firm sizes. The CCS indicators for corporate demand and defaults are for medium-sized firms.

6.2 Prediction of lending growth using the CCS *expectations responses*

Section 6.1 suggested that both the supply and demand responses, as well as (in some cases) responses indicating changes in defaults, can help to explain lending growth in the same period. This section investigates whether the *CCS* expectations responses can help to predict lending growth one quarter ahead. Additional macroeconomic variables that may help to predict lending growth include house prices (for mortgage demand), household consumption (for unsecured household credit demand) and changes in reference rates. The responses which indicate changes in credit conditions of 'a little' or 'a lot' are aggregated in order to reduce the number of explanatory variables in the regressions, meaning that a 'decrease' ('increase') in the relevant *CCS* variable (in Tables 11 to 13) is equivalent to a decrease (increase) of either 'a little' or 'a lot'. Dummy variables indicating the crisis period (2007 Q4 to 2009 Q3) are included in all specifications.

Secured lending

The *CCS* responses for secured household credit conditions have some predictive power for growth in gross secured lending. Column (1) of Table 11 suggests that expectations of a decrease in credit availability are associated with a 14 percentage point fall in the growth of gross secured lending under the fixed effects specification. This is set against a standard deviation of 33 percentage points in the individual bank data for gross secured lending. And columns (4) to (6) of Table 11 show that a decrease (or a loosening) in credit scoring is associated with a substantial rise in growth of gross secured lending of between 19 and 30 percentage points, depending on the estimation technique used. In addition, under the Arellano-Bond specification, expectations of an increase in demand for house purchase are associated with around an eleven percentage point rise in that bank's gross secured lending growth in the subsequent quarter (columns (3) and (6)).

Changes in Bank Rate are insignificant, but rises in house prices are significantly associated with growth in gross secured lending in the subsequent quarter: a one percentage point rise in quarterly house price growth in period t-1 is associated with a five to seven percentage point rise in gross secured lending growth in period t.

Unsecured lending

Table 12 suggests that the *CCS* indicators have less predictive power for growth in gross unsecured lending. However, an expected decrease in credit availability reported in the *CCS* is associated with around a four percentage point fall in the quarterly growth rate of gross unsecured lending under the fixed effects specification (column (2)) and the Arellano-Bond specification (column (3)).

Corporate lending

Turning to the growth rate of lending to businesses in Table 13, the results show that an expected increase in corporate credit demand is associated with a 1.2 to 2.3 percentage point rise in quarterly lending to businesses in the subsequent quarter. And an expected decrease in credit availability, for both medium and large-sized businesses, is associated with around a 1.5 percentage point fall in quarterly lending growth under the fixed effects specification (columns (1), (4) and (5)). Most other *CCS* indicators are insignificant.

Testing to see whether the *CCS* expectations coefficients for an 'increase' and 'decrease' are equal in absolute size, we are unable to reject the null hypothesis at the 5% significance level that the coefficients are identical in size in most specifications. The exceptions are the coefficients for expected changes in credit scoring criteria for secured lending and the demand and defaults coefficients for corporate lending in some specifications.

The results of the Hansen tests for the Arellano-Bond regressions suggest that we cannot reject the overidentifying restrictions in Tables 11 to 13 – in other words the instruments are valid, although (as was the case in Section 5) the Hansen statistics of 1 in Table 13 suggest that there may be too many instruments for the number of variables (see Roodman, 2006).[17] Tests for autocorrelation in the error terms (the AR(2) tests reported in the tables below) indicate that there is no further serial correlation in the error term after the correlation between ϵ_{it} and ϵ_{it-1}.

[17] The number of instruments is almost at a minimum for the specification, but the relatively large number of right hand side variables and small panel size mean this problem is difficult to avoid.

Table 11 Prediction of gross secured lending growth using the *CCS* expectations balances

	Dependent variable: 3-month on 3-month growth in gross secured lending to households					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
CCS expected availability (t-1)						
Decrease	-14.39*	-12.95	-12.66			
	(8.02)	(8.93)	(14.74)			
Increase	1.92	0.55	-2.90			
	(3.17)	(2.60)	(4.75)			
CCS expected credit scoring (t-1)						
Decrease				30.11***	29.58***	18.69***
				(4.15)	(4.64)	(6.03)
Increase				-1.56	3.68	4.95
				(6.20)	(6.87)	(8.25)
CCS expected demand for house purchase (t-1)						
Decrease	3.00	2.77	-6.89	0.56	0.36	-7.53
	(7.13)	(8.10)	(6.60)	(6.59)	(7.64)	(6.06)
Increase	2.75	4.28	11.17**	2.73	4.52	10.87**
	(5.12)	(4.42)	(5.53)	(5.07)	(4.00)	(5.33)
Y(t-1)	0.09	0.12	0.13**	0.08	0.11	0.13**
	(0.12)	(0.11)	(0.07)	(0.12)	(0.11)	(0.05)
Y(t-2)	-0.34***	-0.30***	-0.42***	-0.35***	-0.32***	-0.43***
	(0.08)	(0.08)	(0.11)	(0.08)	(0.08)	(0.12)
House prices (t-1)	4.70**		6.67***	4.63**		6.05***
	(1.98)		(2.32)	(1.94)		(2.30)
Bank Rate (t-1)	0.92		0.93	1.23		3.03
	(7.22)		(6.55)	(8.71)		(6.19)
Constant	-5.49	-18.87		-4.80	-19.74	
	(4.70)	(12.19)		(4.45)	(13.00)	
Observations	211	211	186	211	211	186
R-squared	0.29	0.28		0.29	0.28	
Number of banks	13	13	13	13	13	13
Regression type	FE	FE	Arellano Bond	FE	FE	Arellano Bond
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	No	Yes	Yes	No
Year dummies	No	Yes	No	No	Yes	No
Hansen test			[0.50]			[0.52]
AR(2) test			[0.29]			[0.45]

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12 Prediction of gross unsecured lending growth using the *CCS* expectations balances

	Dependent variable: 3-month on 3-month growth in gross unsecured lending to households					
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
CCS expected availability (t-1)						
Decrease	-3.10	-3.61*	-3.70**			
	(1.94)	(1.84)	(1.50)			
Increase	0.68	1.00	0.68			
	(1.09)	(1.13)	(1.18)			
CCS expected credit scoring (t-1)						
Decrease				-0.02	-0.34	1.45
				(1.20)	(1.15)	(2.02)
Increase				-0.98	-0.99	-0.82
				(1.29)	(1.34)	(1.10)
CCS expected demand (t-1)						
Decrease	-3.03	-2.45	1.67	-3.31	-2.83	1.43
	(2.76)	(2.20)	(2.34)	(2.56)	(1.99)	(2.42)
Increase	0.69	0.48	2.80	0.37	0.13	2.27
	(1.62)	(1.51)	(1.77)	(1.45)	(1.38)	(1.76)
CCS expected defaults (t-1)						
Decrease	1.29	2.05	-0.78	1.27	1.85	-1.07
	(1.42)	(1.39)	(1.37)	(1.34)	(1.36)	(1.46)
Increase	-0.73	0.09	-0.46	-1.01	-0.38	-1.42
	(1.38)	(1.76)	(1.38)	(1.38)	(1.87)	(1.84)
Y(t-1)	0.07	0.06	0.11	0.07	0.06	0.11
	(0.07)	(0.07)	(0.09)	(0.07)	(0.07)	(0.08)
Y(t-2)	-0.20**	-0.21**	-0.22**	-0.19**	-0.20**	-0.21*
	(0.07)	(0.07)	(0.11)	(0.07)	(0.07)	(0.11)
Bank Rate (t-1)	-0.28		0.10	-0.53		-0.15
	(1.83)		(1.04)	(1.82)		(1.03)
HH consumption (t-1)	-0.56		-1.33	-0.47		-1.37
	(0.60)		(1.06)	(0.61)		(1.11)
Constant	-2.20**	-24.38		-2.21**	-23.93	
	(0.98)	(21.81)		(0.93)	(22.04)	
Observations	217	217	191	217	217	191
R-squared	0.20	0.25		0.19	0.23	
Number of banks	14	14	14	14	14	14
Regression type	FE	FE	Arellano Bond	FE	0	0
Robust	Yes	Yes	Yes	Yes	0	0
Quarter dummies	Yes	Yes	No	Yes	0	0
Year dummies	No	Yes	No	No	0	0
Hansen Test			[0.62]			[0.59]
AR (2) Test			[0.40]			[0.50]

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13 Prediction of corporate lending growth using the *CCS* expectations balances

	Dependent variable: Quarterly growth in stock of PNFC lending					
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Medium firms *CCS* balances	Medium firms *CCS* balances	Medium firms *CCS* balances	Large firms *CCS* balances	Large firms *CCS* balances	Large firms *CCS* balances
CCS expected availability (t-1)						
Decrease	-1.45*	-1.32	-0.79	-1.57**	-1.52*	-0.93
	(0.72)	(0.78)	(1.56)	(0.67)	(0.82)	(1.45)
Increase	1.10	1.15	0.11	0.78	0.83	-0.61
	(1.32)	(1.33)	(0.92)	(1.08)	(1.15)	(0.76)
CCS expected demand (t-1)						
Decrease	0.59	0.36	1.36	1.86	1.71	1.96
	(0.88)	(0.86)	(1.29)	(1.80)	(1.69)	(2.16)
Increase	2.03**	1.91**	2.28*	1.17*	1.26*	1.67***
	(0.78)	(0.64)	(1.19)	(0.59)	(0.65)	(0.49)
CCS expected defaults (t-1)						
Decrease	0.01	0.05	1.29	2.87	3.38	6.32*
	(0.42)	(0.49)	(0.92)	(2.18)	(2.34)	(3.35)
Increase	-0.37	-0.19	-0.63	-0.28	-0.17	0.15
	(0.65)	(0.62)	(0.68)	(0.69)	(0.76)	(0.83)
Y(t-1)	0.03	0.01	0.15**	0.02	0.02	0.14**
	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.07)
Y(t-2)	0.41***	0.40***	0.50***	0.37***	0.36***	0.42***
	(0.07)	(0.07)	(0.11)	(0.06)	(0.07)	(0.11)
Bank Rate (t-1)	-1.68		1.35	-0.61		1.67
	(1.47)		(1.69)	(1.77)		(1.99)
Libor (t-1)	1.93		-1.07	0.98		-1.41
	(1.13)		(1.28)	(1.65)		(1.90)
Nominal business investment (t-1)	0.07		0.04	0.05		0.01
	(0.07)		(0.05)	(0.05)		(0.03)
Constant	1.02*	0.74		0.38	1.05	
	(0.55)	(1.14)		(0.55)	(0.97)	
Observations	212	212	201	212	212	201
R-squared	0.26	0.26		0.28	0.29	
Number of banks	11	11	11	11	11	11
Regression type	FE	FE	Arellano Bond	FE	FE	Arellano Bond
Robust	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	No	Yes	Yes	No
Year dummies	No	Yes	No	No	Yes	No
Hansen Test			[1.00]			[1.00]
AR (2) Test			[0.24]			[0.20]

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6.3 Implications

Section 6.1 showed that the *CCS* responses for changes in both credit supply and credit demand are significantly associated with changes in lending growth in the same period. These results provide several useful insights for policymakers. First, they assist in the interpretation of the *CCS* balances: for example, since both supply and demand indicators are significant, the results suggest that credit availability (or credit scoring criteria) is a measure of credit supply rather than, for example, a direct measure of lending growth. And second, the results give preliminary evidence that changes in both credit supply and demand have been important in driving changes in lending between 2007 and 2013, although they do not tell us anything about the time period over which each of these factors has been most important.

The findings from Section 6.2 suggest that a subset of the *CCS* responses contain information (over and above the existing quantitative data) for predicting lending growth one quarter ahead. The literature which examines the information content of the ECB *Bank Lending Survey* and US *Senior Loan Officer Survey* (for example de Bondt *et al*, 2010, Del Giovane *et al*, 2011, Lown *et al*, 2000) has also tended to find that surveys of credit conditions have significant predictive power for lending growth. There are differences between the specification in this paper and those mentioned above, however, which may help to explain some of the difference in results. For example, some papers have used fewer lags of the dependent variable within the regression specification.

As mentioned in Section 5.3, the estimation period contained several shocks which might not have been predictable - in particular at the start of the financial crisis and during the intensification of the crisis in the euro area in 2010. Once a longer time period of data is available, it may become easier to identify the relationship between the *CCS* expectations responses and subsequent changes in lending. It is also worth bearing in mind that Section 6.2 tests the predictive power of the *CCS* for changes in lending growth rather than changes in credit availability or demand. This means that we should not dismiss the possibility that the *CCS* expectations are good predictors of changes in other aspects of credit conditions, whether or not they help to predict changes in lending growth.

7 Conclusion

This paper makes a first econometric assessment of the information content of the Bank of England *Credit Conditions Survey*. We find that – based on quantitative micro data for credit spreads and lending growth – many of the survey responses are significantly correlated with movements in the official data. Results vary by type of lending, however. For example, responses for changes in spreads correspond best to spreads on ‘headline’ or popular loan products.

We find that banks’ expectations for developments in credit conditions reported in the *CCS* have predictive power for credit spreads and lending growth in the next quarter, although statistical significance varies across specifications. For example, an expected increase or decrease in

secured spreads reported in the *CCS* corresponds to around a 0.2 percentage point change in spreads on two-year fixed-rate mortgages in the subsequent quarter. And survey expectations of looser credit availability and credit scoring criteria have some predictive power for lending growth in the subsequent quarter.

The econometric tests in this paper are limited in scope due to a lack of variables with which to compare the *CCS,* and a short sample period. This means that the analysis does not examine all of the aspects of the *CCS* which have proved useful for policymakers since the survey began in 2007. These include the wide range of additional indicators of credit conditions included in the survey, such as various non-price terms, which form important components of the absolute cost of a loan. Nevertheless, the evidence reported here for variables where there is a natural comparator give grounds for believing that the *CCS* provides a useful steer for aspects of credit conditions that are not otherwise observed.

Appendix A: Other data sources

Series		Data (source)	Description
Spreads[18]	Secured	Quoted rates and Bank Rate (BoE); two-year swap rates [Bloomberg]	Quoted rates used include Bank Rate tracker and two-year fixed products at 75% LTV ratio.
	Credit cards	Quoted rates and Bank Rate (BoE)	Quoted rates on credit cards.
	Other unsecured	Quoted rates and Bank Rate (BoE); 2-year swap rates [Bloomberg]	Quoted rates (£10,000 and £5,000 personal loans).
	Corporate	Effective rates (ER form, BoE); 3- and 6-month Libor [Bloomberg]	As a proxy for the rates charged to large companies, we use loans of greater than £1 million and less than or equal to £20 million. As a proxy for loans to medium-sized companies, we use loans of less than £1 million. For both sets of loans, we use loans with an initial fixation period of less than or equal to one year. That is because these are the loan types for which the most data are available.
Lending	Gross secured	IS and MM forms (BoE)	Sterling lending secured on dwellings by UK monetary financial institutions and other lenders to UK individuals.
	Gross unsecured	IC and IO forms (BoE)	Sterling unsecured lending by monetary financial institutions and other lenders to UK individuals. Consumer credit consists of credit card lending and other loans and advances. Data exclude student loans and overdrafts.
	Net corporate	BE form (BoE)	Lending by UK medium financial institutions to private non-financial corporations. Data cover lending in both sterling and foreign currency, expressed in sterling. Quarterly growth rate calculated from true quarterly flows.

[18] Many lenders withdrew their quoted rates in 2008 Q4 as Bank Rate was cut sharply. Where that is the case, we linearly interpolate between the rates in 2008 Q3 and 2009 Q1 to create an artificial observation for 2008 Q4.

Appendix B: Additional results

Table A1 Correlations between aggregate gross lending growth and aggregate *CCS* balances

	Q-o-Q growth of new secured lending		
Time period of *CCS* responses	Credit Availability	Credit scoring criteria	Credit demand
0	0.72	0.73	0.62
-1	0.74	0.62	0.48
-2	0.79	0.56	0.33
-3	0.53	0.53	0.14
-4	0.38	0.23	-0.05

	Q-o-Q growth of new unsecured lending		
Time period of *CCS* responses	Credit Availability	Credit scoring criteria	Credit demand
0	0.74	0.77	0.22
-1	0.78	0.54	-0.05
-2	0.69	0.35	0.05
-3	0.58	0.04	-0.14
-4	0.46	0.05	-0.10

Table A2 Ordered probit regressions of *CCS* spreads responses against quantitative spreads data

	Dependent variable: *CCS* spreads responses						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	secured	secured	credit card	other unsecured	other unsecured	large firms	medium firms
3-month change in 2yr fix mortgage spreads	1.04***						
	(0.223)						
3-month change in BRT mortgage spreads		0.49**					
		(0.201)					
3-month change in credit card spreads			0.07				
			(0.079)				
3-month change in 5k personal loan spreads				0.26**			
				(0.109)			
3-month change in 10k personal loan spreads					0.60***		
					(0.096)		
3-month change in business loans (£1-£20 million)						-0.09	
						(0.091)	
3-month change in business loans (up to £1 million)							0.07
							(0.104)
Observations	216	133	183	137	155	142	148
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3 Comparison of spreads between *CCS* responses and published data – *adjusting for market share*

	Dependent variable: 3-month change in spreads						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES[a]	2yr fix mortgage	BRT mortgage	Credit cards	5k personal loan	10k personal loan	Business loans £1-20m	Business loans up to £1m
CCS spreads[b]							
Decreased a lot	-0.45***					-0.37	
	(0.059)					(0.209)	
Decreased a little	-0.23**	-0.09	0.26	-0.47*	-0.51*	-0.00	-0.29
	(0.097)	(0.119)	(0.481)	(0.253)	(0.253)	(0.057)	(0.244)
Increased a little	0.27***	0.12	0.37	0.39	0.67**	-0.05	-0.34
	(0.075)	(0.167)	(0.235)	(0.352)	(0.221)	(0.055)	(0.245)
Increased a lot	0.30	-0.03				-0.05	0.42
	(0.249)	(0.133)				(0.149)	(0.411)
Constant	0.02	0.06	0.43**	0.27	0.01	0.15***	0.71
	(0.043)	(0.055)	(0.140)	(0.220)	(0.148)	(0.029)	(0.467)
Observations	216	133	183	137	155	142	148
R-squared	0.229	0.101	0.063	0.147	0.234	0.058	0.080
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

(b) The *CCS* spreads responses used in each column () refer to: secured spreads (1) and (2); credit card spreads (3); other unsecured spreads (4) and (5); spreads on loans to large firms (6); spreads on loans to medium-sized firms (7).

Table A4 *CCS* determinants of gross secured household lending growth – *adjusting for lenders' market shares*

	Dependent variable: 3-month on 3-month growth in gross secured lending								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES[a]									
CCS supply indicator	Availability	Availability	Credit scoring criteria	Availability: economic outloook	Availability: market share	Availability: risk appetite	Availability: funding conditions	Availability: house price expectations	Availability
Decreased a lot	-20.72*	-15.62		-1.92	-12.61		-5.72	1.75	-15.09
	(11.150)	(12.451)		(4.277)	(10.682)		(8.387)	(4.633)	(12.764)
Decreased a little	-6.63	-6.55	10.36***	-5.17	-9.32*	-3.87	2.61	-4.79*	-6.94
	(4.202)	(5.865)	(3.300)	(3.954)	(4.494)	(2.945)	(2.616)	(2.418)	(5.797)
Increased a little	6.25	2.66	-9.37**	4.52	5.44*	-4.10	6.95	-0.16	1.95
	(3.556)	(3.499)	(3.220)	(5.974)	(2.630)	(7.281)	(4.965)	(2.253)	(3.245)
Increased a lot	31.83*	15.10	-32.19***				27.05***		11.49
	(16.200)	(15.152)	(8.101)				(4.001)		(15.491)
CCS demand for house purchase									
Decreased a lot		-15.90**	-12.12**	-17.18**	-17.92**	-18.07**	-16.94**	-19.08**	-10.68**
		(6.912)	(5.073)	(6.745)	(5.970)	(5.879)	(6.211)	(7.502)	(4.627)
Decreased a little		-3.00	-2.83	-3.87	-3.47	-3.43	-2.45	-3.04	-2.00
		(3.839)	(3.970)	(3.758)	(3.921)	(3.895)	(4.874)	(4.260)	(3.555)
Increased a little		3.60	4.39	3.02	2.24	3.46	3.84	3.16	5.59
		(5.322)	(5.376)	(5.174)	(5.916)	(5.744)	(5.939)	(5.498)	(4.395)
Increased a lot		17.55**	19.65***	19.44***	14.76**	20.68***	19.12***	19.32***	18.68**
		(6.513)	(6.153)	(5.359)	(5.402)	(5.575)	(5.441)	(5.390)	(6.211)
CCS defaults									
Decreased a lot									
Decreased a little									-2.83
									(2.921)
Increased a little									-4.14
									(4.444)
Increased a lot									-27.56***
									(4.656)
Constant	-14.27***	-13.32***	-12.38***	-12.59***	-13.27***	-12.51***	-14.69***	-12.66***	-12.46***
	(1.823)	(2.864)	(3.194)	(2.691)	(3.303)	(2.907)	(4.001)	(2.951)	(3.675)
Observations	235	235	235	235	235	235	235	235	235
R-squared	0.229	0.293	0.331	0.282	0.299	0.279	0.285	0.281	0.330
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

Table A5 *CCS* determinants of gross unsecured household lending growth – *adjusting for lenders' market shares*

	Dependent variable: 3-month on 3-month growth in gross unsecured lending							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES[(a)]								
CCS supply indicator	Availability	Availability	Credit scoring criteria	Availability: economic outloook	Availability: market share	Availability: risk appetite	Availability: funding conditions	Availability
Decreased a lot	-58.97***	-57.75***			-57.58***	-68.11***	-57.25***	-56.13***
	(0.746)	(1.316)			(1.354)	(2.738)	(1.466)	(1.774)
Decreased a little	-2.17	-2.35*	1.73	-1.48*	-2.20	-2.78	-1.65**	-1.77
	(1.274)	(1.238)	(1.297)	(0.793)	(2.126)	(1.604)	(0.656)	(1.157)
Increased a little	1.93	1.78	-2.38**	2.57	0.59	1.13	0.93	1.43
	(1.585)	(1.453)	(0.931)	(3.220)	(1.602)	(1.496)	(2.188)	(1.506)
Increased a lot			0.77					
			(1.158)					
CCS demand indicator								
Decreased a lot		-1.68	-2.38	-2.98	-1.77	-1.48	-2.03	-1.97
		(2.534)	(2.960)	(3.297)	(2.460)	(2.527)	(2.791)	(2.350)
Decreased a little		-0.02	-0.38	-0.58	-0.24	-0.40	-0.49	0.25
		(0.744)	(0.630)	(0.772)	(0.868)	(0.757)	(0.748)	(0.574)
Increased a little		2.37**	2.06*	2.38**	1.92*	2.50*	2.10**	2.74**
		(1.022)	(0.959)	(0.860)	(1.019)	(1.174)	(0.853)	(1.222)
Increased a lot		0.69	0.27	1.06	0.65	0.80	0.71	0.73
		(0.819)	(0.784)	(0.786)	(1.052)	(0.912)	(1.048)	(0.731)
CCS defaults								
Decreased a lot								3.88***
								(0.998)
Decreased a little								1.75*
								(0.867)
Increased a little								-1.01
								(1.132)
Increased a lot								-3.82***
								(0.540)
Constant	-2.21***	-2.53***	-1.90***	-2.32***	-2.39***	-2.36***	-2.31***	-3.34***
	(0.536)	(0.412)	(0.533)	(0.423)	(0.425)	(0.358)	(0.376)	(0.808)
Observations	234	234	234	234	234	234	234	234
R-squared	0.235	0.263	0.138	0.118	0.244	0.194	0.238	0.301
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

Table A6 *CCS* determinants of PNFC lending growth – *adjusting for lenders' market shares*

	Dependent variable: Quarterly growth in stock of corporate lending								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
VARIABLES[a]									
CCS supply indicator:	Availability	Availability	Availability: economic outloook	Availability: sector-specific risk	Availability: market share	Availability: market pressure from capital markets	Availability: risk appetite	Availability: funding conditions	Availability
Decreased a lot	0.54	-0.42	3.09*	5.75***	-2.89	-8.14***	3.63	0.36	-0.47
	(1.947)	(1.967)	(1.668)	(1.243)	(2.944)	(1.001)	(4.052)	(1.480)	(1.939)
Decreased a little	0.50	-0.45	2.40**	1.55*	-2.43	-0.22	0.46	1.47	-0.72
	(0.572)	(1.070)	(0.853)	(0.836)	(2.340)	(0.885)	(1.477)	(1.293)	(1.161)
Increased a little	-0.20	-0.48	-0.70	0.15	1.00	2.44	0.17	-0.99	-0.82
	(0.587)	(0.400)	(0.624)	(1.002)	(0.664)	(1.887)	(1.048)	(0.977)	(0.551)
Increased a lot	10.54***	11.04***		2.71***	3.88***		-1.34		11.21***
	(0.630)	(0.489)		(0.723)	(0.420)		(1.962)		(0.607)
CCS demand indicator[b]									
Decreased a lot		1.18	-0.51	0.16	1.20***	1.76***	0.55	0.35	0.49
		(0.705)	(0.777)	(1.041)	(0.384)	(0.554)	(1.151)	(0.587)	(0.778)
Decreased a little		2.10	0.87	1.21	2.06	2.02	1.83	2.24	1.82
		(1.746)	(1.354)	(1.334)	(1.543)	(1.427)	(1.993)	(1.572)	(1.558)
Increased a little		1.53***	1.33***	1.15***	1.25***	1.50***	1.30***	1.35***	1.35***
		(0.270)	(0.288)	(0.321)	(0.325)	(0.253)	(0.209)	(0.319)	(0.326)
Increased a lot									
CCS defaults[b]									
Decreased a lot									
Decreased a little									-0.18
									(0.441)
Increased a little									0.97
									(0.849)
Increased a lot									0.66
									(1.527)
Constant	-0.34	-0.95**	-1.25**	-0.86**	-1.05**	-1.38**	-0.94*	-1.22**	-1.05
	(0.319)	(0.414)	(0.487)	(0.381)	(0.402)	(0.549)	(0.468)	(0.547)	(0.607)
Observations	219	219	219	219	219	219	219	219	219
R-squared	0.049	0.098	0.135	0.094	0.080	0.119	0.070	0.086	0.111
robust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

(a) Blank cells indicate that there were too few observations to identify the coefficient.

(b) The CCS indicators for corporate demand and defaults are for medium-sized firms.

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