The Impact of Supply Constraints on Bank Lending in the Euro Area – Crisis Induced Crunching?

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Abstract

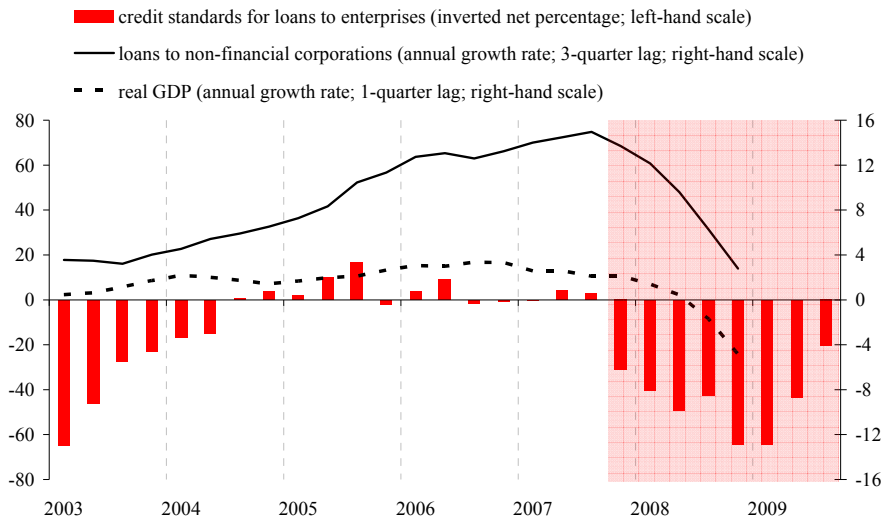
Aggregate loan development typically hinges on a combination of factors that impact simultaneously on the demand and the supply side of bank lending. The financial turmoil starting in mid-2007 had detrimental consequences for banks' balance-sheets, cost of funds and profitability, thus weighing negatively on their ability to supply new loans. This paper examines the impact of supply constraints on bank lending in the euro area with a special focus on this turmoil period. The empirical evidence presented suggests that banks' ability and willingness to supply loans affects overall bank lending activity in general and has done so particularly during the financial crisis. Applying a cross-country panel-econometric approach using a unique confidential data set on results from the Eurosystem's bank lending survey allows us to disentangle loan supply and demand effects. We find that even when controlling for the effects coming from the demand side loan growth is negatively affected by supply-side constraints. This applies both for loans to households for house purchase and, in particular, for loans to non-financial corporations. We furthermore provide evidence that the impact of supply-side constraints, especially related to disruptions to banks' access to wholesale funding and their liquidity positions, was reinforced since the eruption of the financial crisis.

[1] Suggestions by Jörg Breitung are gratefully acknowledged. We would like to thank Benoît Mojon for providing useful comments. All views expressed are those of the authors and do not necessarily represent those of the ECB or the Eurosystem.

1. Introduction

The banking sector has been at the centre of the ongoing financial storm. Indeed, the headwinds hitting banks in the euro area and beyond have led to a sharp decline in bank profitability and eroded their capital cushions. Furthermore, the financial crisis led to disruptions in banks' access to wholesale funding, their ability to securitise assets and put severe pressure on their liquidity positions. Overall, these developments have imposed serious strains on banks' balance sheet position and consequently have forced many banks to readjust their balance sheets and potentially impaired their ability to provide the non-financial private sector with funds for spending and investment.[2] For instance, in recent quarters a substantial decline in the real annual growth rate of loans granted to euro area non-financial corporations has been observed (see Chart 1). As in past episodes, the drop in the growth of loans has coincided with, and may largely have been caused by, the sharp deterioration of economic activity. However, owing to the unprecedented shocks hitting the financial sector during the 2007-9 financial crisis, it cannot be ruled out that a supply-induced reduction of lending has likewise contributed to amplifying the downturn in the wider economy; as for example indicated by the significant tightening of banks' credit standards since mid-2007.

Chart 1: Lending to non-financial corporations in the euro area
(annual percentage changes and net percentages)



Source: ECB and Eurostat.

[2] Bank financing constitutes the most important source of external financing for households and non-financial corporations. Bank lending is a particularly important source of financing in the euro area, where bank loans have accounted for around 85% of the total external financing of the private sector in recent years. For further details on the importance of bank financing in the euro area financial system, see the articles entitled "The role of banks in the monetary policy transmission mechanism" and "The external financing of households and non-financial corporations" in the August 2008 and April 2009 issues, respectively, of the ECB Monthly Bulletin.

The extent to which bank balance sheet constraints have contributed to the slowdown in lending is ultimately an empirical question. It is, however, rather difficult to identify the supply and demand effects that underlie credit developments, especially as shifts in demand and supply often occur simultaneously and both have an impact on bank lending rates and credit volumes which depending on the situation may pull in the same direction. Empirically, it is therefore challenging to identify supply effects using aggregate time series. For that reason, individual bank-specific characteristics are often used in the empirical literature to identify factors that directly influence the supply of loans, while demand for loans is typically assumed to be independent of the situation of individual banks and to rather depend on macroeconomic factors.[3] In addition to using such micro-based evidence, cross-country panel econometric approaches have been used by exploiting the cross-section variation to identify the importance of shocks to loan supply in explaining loan developments.[4]

In this paper, we also make use of a country-panel econometric approach. However, in contrast to the previous studies (cited above), we furthermore make extensive use of the responses to the ECB bank lending survey for the euro area, which include information on euro area banks' assessments of loan supply and demand conditions and which thus allows for a potential identification of supply-side effects also at the more aggregate euro area level.

Not only does the bank lending survey distinguish between loan demand and loan supply (the latter being broadly reflected in the reported changes in credit standards), it also contains detailed information about the underlying factors related to banks' decision to supply credit. These include competitive pressures (from banks and non-banks), banks' perceptions of risks related to the customer balance sheets, such as regarding the general economic outlook, collateral values as well as company and industry-specific perspectives, and finally constraints related to banks' own balance sheets. The latter factors, as taken from the bank lending survey, can be interpreted as "pure" credit-supply effects since they focus exclusively on factors inherent to the respective banks[5], whereas the factors referring to banks' risk perception concern rather the borrowers' balance sheet situation and might be endogenously

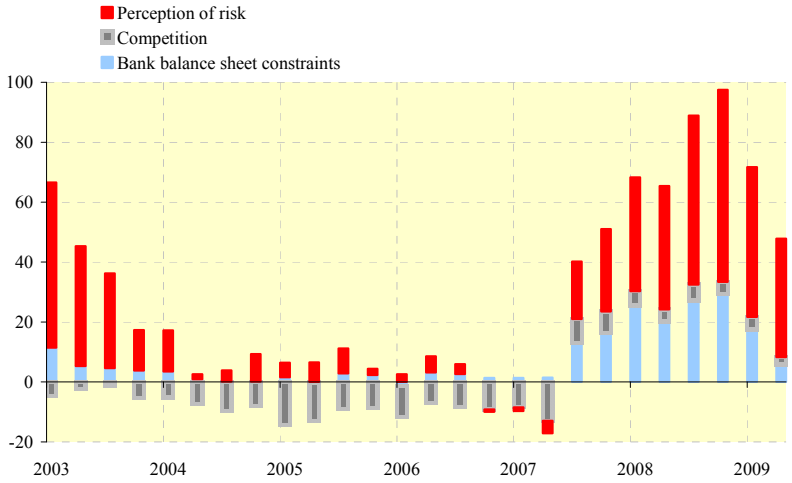
[3] See e.g. Peek and Rosengren (1995), Kashyap and Stein (2000), Ashcraft (2003), Chatelain et al. (2003), Ehrmann et al. (2003), Gambacorta and Mistrulli (2004), Kishan and Opiela (2000, 2006), Ashcraft and Campello (2007), Den Haan et al. (2009), Altunbas et al. (2009).

[4] See e.g. Driscoll (2004), Cihak and Brooks (2008) and Cappiello et al. (2009).

[5] Reference is made to the following factors that are deemed to contribute to a tightening of credit standards: "costs related to bank's capital position", "bank's ability to access market financing" and "bank's liquidity position" in the case of loans to non-financial corporations, and to "cost of funds and balance sheet constraints" in the case of housing loans, each measured as a net percentage (i.e. the percentage of banks reporting a contribution to the tightening of credit standards by the respective factor minus the percentage of banks reporting a contribution to the loosening of credit standards).

related to loan demand-side factors.[6] As observed in Charts 2 and 3, factors related to banks' balance sheet positions are reported as having contributed to a considerable degree to the observed net tightening of credit standards in certain periods, most notably during the financial crisis erupting in mid-2007.

Chart 2: Factors contributing to the tightening of credit standards on loans to non-financial corporations in the euro area
(net percentages)



Sources: Eurosystem's Bank lending survey and ECB calculations.

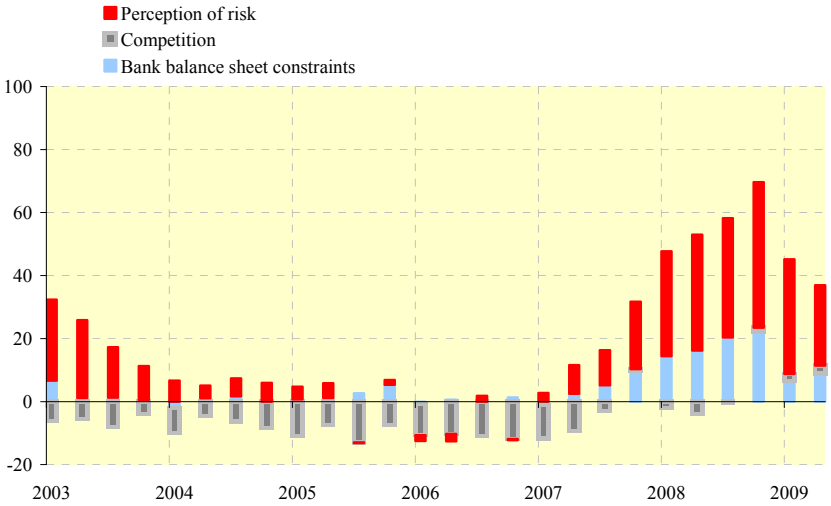
Notes: The "perception-of-risk" factor refers to the "industry and firm-specific outlook", the "expectations regarding general economic activity", and the "risk on collateral demanded"; the "competition" factor refers to competition from "other banks", "non-banks" and "market financing" respectively; the "balance-sheet-constraints" factor refers to "costs related to banks capital position", "banks' ability to access market financing" and "banks' liquidity position". The net percentages reported for the three groups of contributing factors are simple averages of the underlying factors listed above.

From a monetary policy perspective, it is important to know whether developments in aggregate loans to the non-financial private sector are driven by changes in the demand for loans or by changes in the supply of loans. Indeed, the tools and actions that monetary policy-makers may need to employ can differ substantially, depending on whether the central bank aims to affect the loan supply, loan demand or both. In addition, it is important to identify the underlying source of a shock to the supply of loans. The response of monetary policy may differ substantially if banks reduce loans (and/or tighten credit standards) because the creditworthiness of borrowers has deteriorated, or because they cannot finance themselves in the market. In the first case, a reduction of policy rates would encourage aggregate demand and raise collateral values leading to an increase borrowers' net worth and would eventually enhance the willingness of banks to lend. In the second case, providing the necessary liquidity

[6] In the terminology of the literature of the monetary policy transmission mechanism one can think of the "bank balance sheet constraints" factors as belonging to the bank lending channel (or narrow credit channel), while the "perception of risk" factors pertain to the balance sheet channel (or broad credit channel) and potentially also to the recently coined "risk-taking channel" of monetary policy transmission (see e.g. Borio and Zhu (2008) and ECB (2008).

to banks would enable them to satisfy the demand for loans of profitable firms and creditworthy households.

Chart 3: Factors contributing to the tightening of credit standards on loans to households for house purchase in the euro area
(net percentages)



Sources: Eurosystem's Bank lending survey and ECB calculations.

Notes: The "perception-of-risk" factor refers to "housing market prospects" and the "expectations regarding general economic activity"; the "competition" factor refers to competition from "other banks", "non-banks" and "market financing" respectively. "Bank balance sheet constraints" refer to the factor "cost of funds and bank's balance sheet constraints". The net percentages reported for the three groups of contributing factors are simple averages of the underlying factors listed above.

Furthermore, gauging the interaction between monetary policy and the supply of loans becomes particularly important during crisis periods when the banking sector is under pressure and the loan supply is hit by adverse shocks. In such cases, it is crucial for the central bank to have a sound knowledge of the implications of monetary policy actions aiming at putting banks in a position to fulfil their role as financial intermediaries for the real economy. Such policy actions can range from adjustments to key policy rates to a number of so-called "non-standard" measures.[7]

Against this background, the focus of this paper is to identify the importance of bank balance sheet constraints in determining loan developments while at the same time controlling for the impact coming from the demand side and other factors affecting banks' lending behaviour, such as their overall risk perceptions and their risk-taking behaviour.

[7] Non-standard monetary policy measures comprise, *inter alia*, the provision of funding liquidity to banks via full allotment liquidity operations, the widening of the related collateral framework or an extension of the maturity of liquidity operations, as well as the acquisition of bank assets or (securitised) bank debt. In addition, they might extend to the direct supply of funds to the real economy via the purchase of debt issued by the private non-financial sector or by providing funds to intermediate state-sponsored banks that act as a catalyst for the extension of credit to small and medium-sized enterprises.

We find that supply-side constraints in a narrower sense, more specifically "costs related to banks' capital position", "banks' ability to access market financing", and "banks' liquidity position" to be particularly important in the case of corporate lending. They have a significant negative impact on the growth rate of banks' lending to non-financial corporations, even after controlling for various demand-side factors (including the banks' perceptions of demand, as also reported in the bank lending survey).[8] The estimates with respect to loans to non-financial corporations suggest that a net tightening of credit standards on account of the banks' cost of capital would result in some decline in the quarterly growth rate of bank lending to non-financial corporations. Furthermore, higher industry and firm-specific risk perceptions by banks, as taken from the bank lending survey, impact negatively on overall bank lending to non-financial corporations even when controlling additionally for changes in loan demand as perceived by the banks participating.

In the case of lending to households for house purchase, the impact of "pure" supply-side constraints is likewise found, although the effects are somewhat less pronounced than for corporate loans. In addition, there seems to be stronger evidence for a primarily demand-driven development, particularly when explicit information on loan demand is included.[9] Furthermore, as regards recent developments in the period of turmoil, the tightening of credit standards for housing loans, displayed in Chart 3, indicates that there was less pressure on the development of housing loans from the supply side than in the case of loans to non-financial corporations.

In the second part of the paper, we then document the impact of supply-side constraints during the financial crisis. Our findings suggest that strains on banks' liquidity positions and their access to market financing contributed significantly to the slowdown in lending. This was also confirmed by banks' replies to a set of turmoil-related questions where since the third quarter of 2007 the large majority of euro area banks reported that disruptions in their access to market funding and in their ability to transfer credit risk had significantly contributed to the net tightening of credit standards. The efforts of the ECB (and other central banks) during the financial crisis to help reignite the money and capital markets and to help alleviate the scarcity of liquidity should also be seen against the background of these findings. These efforts, in combination with the substantial recapitalisation of national banking sectors, should have mitigated the strains on euro area banks' balance sheets and enabled them to start lending again once loan demand picks up.

While some previous (mainly US-based) studies have applied the information contained in the bank lending survey (in the case of the US, in the Senior Loan Officer Opinion Survey), to

[8] This finding is in line with the findings of studies exploring the importance of capital on banks' lending decisions, as cited in footnote 3.

[9] In addition to GDP growth and changes in housing prices.

our knowledge, in parallel with Ciccarelli et al. (2009), we are the first to explicitly distinguish between the underlying factors driving credit standards in the identification of loan supply and demand.[10] In addition, this paper is also the first to empirically exploit the information contained in the financial crisis-related "ad hoc" questions included in the consecutive rounds of the ECB bank lending survey since the third quarter of 2007.

The paper is organised as follows: First, the data and the empirical approach are described and the results for the baseline estimations of the impact of bank supply-side factors on loan growth are presented in Section 2. Second, the importance of these factors during the 2007-9 financial crisis is explored in Section 3. Finally, Section 4 concludes.

2. Empirical approach

In order to identify supply constraints on banks' lending activity it is crucial to try to disentangle demand and supply-side related determinants of overall lending. The data source key to our endeavour in this direction is information from the Eurosystem's Bank Lending Survey (BLS, henceforth) for the euro area which was introduced in 2003 and is conducted at a quarterly frequency.[11] These data – although qualitative by nature – could be characterized as best information available on changes in the supply of bank loans in the euro area.[12]

In the survey, reporting banks reply to a set of questions on the credit standards that they apply to loans to enterprises (including both small and large enterprises) and to households (loans for house purchase and consumer credit, respectively). Apart from the general questions on the extent to which banks have changed their credit standards in comparison with the previous quarter and how they expect to change them in the next quarter, the survey also includes questions related to the factors that contribute to changes in the standards, such as banks' risk perception, bank balance sheet constraints and competitive conditions, as well as questions related to how lending terms and conditions have been changed. In addition, banks are asked to report how they perceive the demand for loans (from enterprises and households respectively) to have developed in the previous quarter. Furthermore, non-standard questions are occasionally included in the survey on an ad hoc basis, with the aim of covering specific (structural and cyclical) developments in euro area credit markets that are

[10] US-based studies using the Senior Loan Officer Opinion Survey in explaining loan developments and GDP are Berger and Udell (2004), Lown and Morgan (2006), Bayoumi and Melander (2008) and Swiston (2008). For the euro area, empirical studies using the bank lending survey have been conducted by Hempell (2007a-b), De Bondt et al. (2009), Maddaloni and Peydró (2009), Ciccarelli et al. (2009).

[11] Similar surveys were already conducted by the Federal Reserve (Senior Loan Officer Opinion Survey) and the Bank of Japan. More recently, bank lending surveys have also been introduced by other central banks within the EU.

[12] For general information on the BLS see Berg, Van Rixtel, Ferrando, de Bondt, and Scopel (2005).

not captured by the standard questionnaire.[13] The qualitative replies are aggregated to net percentages which are calculated as the difference between the sum of the percentages of banks replying to have "tightened considerably" and "tightened somewhat" and the sum of the percentages of banks reporting to have "eased somewhat" and "eased considerably".[14]

The sample currently consists of 118 reporting banks covering the 16 euro area countries;[15] however, for our empirical assessment we include 11 of the 12 countries participating since the start of the survey.[16] The sample banks are selected in such a way as to produce a fair representation of the euro area banking sector, taking into account differences in the banking structures across countries. Overall, the surveyed banks cover around half of all the loans granted by Monetary Financial Institutions (MFIs) to the non-financial private sector in the euro area. The sample covers the period from the beginning of the survey in early 2003 referring to the fourth quarter 2002 up until the July 2009 survey round referring to the second quarter of 2009.

Evidently, for an empirical analysis the BLS data set is limited by the relatively short time horizon. To somewhat circumvent this limitation, we take advantage of the cross-country variations as the macroeconomic environment in the different national economies varies substantially and follows different cycles. First of all, we include country-specific the quarterly growth rate of loans by MFIs to non-financial corporations and to households for house purchase, respectively, as the dependent variables. Furthermore, changes in the logarithm of real GDP, the 10-year government bond rate, inflation (HICP) and the change in the logarithm of nominal housing prices for loans to non-financial corporations and housing loans, respectively, enter as country-specific explanatory variables. Moreover, we include the overnight rates (EONIA) for the euro area.

Taking advantage of these cross-country differences, within a panel framework, we analyse the development of the two loan categories with respect to the macroeconomic variables and using additional information taken from the BLS, which helps overcoming the problem of identifying loan supply and demand. Furthermore, the survey information allows for a closer distinction of specific supply-side factors of lending. More precisely, we use information on the impact of "banks' cost of capital", their "access to market funding" as well as their "liquidity position" on the tightening of credit standards for loans to non-financial corporations. For housing loans, by contrast, only one aggregate variable on "banks' cost of

[13] For instance, various ad hoc questions concerning the impact of the financial crisis on bank lending conditions have been included since the October 2007 survey round (see Section 3.2 for more details).

[14] Similarly, for questions related to loan demand, net percentages are calculated as the difference between the sum of the percentages for "increased considerably" and "increased somewhat" and the sum of the percentages for "decreased somewhat" and "decreased considerably".

[15] Owing to mergers and other structural changes in the national banking sectors, the sample of banks has changed since the inception of the survey in 2003. The entry of new euro area countries has also led to an increase in the number of reporting banks over the years.

[16] We exclude Luxembourg due to loan data there being determined to a high degree by non-domestic factors.

funds and balance sheet constraints" is available. The impact of these variables on lending, we consider to be "pure supply-side" effects. Moreover, the survey provides more detailed information on risk-related factors; that is on how "expectations of economic activity" and "firm or industry-specific outlook" for corporate loans or "housing market prospects" for housing loans affect the tightening of their credit standards applied to the respective loan categories.

Applying a feasible general least squares (FGLS) estimator correcting for panel specific autocorrelations to our panel data set, we use the following estimation specification to explain the quarterly growth rate of loans to non-financial corporations:

$$\begin{aligned}\Delta loans_{i,t} = {} & \alpha + \beta_0 \Delta \ln GDP_{i,t-3} + \beta_1 gov.b.yield_{i,t-2} + \beta_2 \Delta HICP_{i,t-4} + \beta_3 EONIA_{t-1} \\ & + \gamma_0 BLSdemand_{i,t} + \gamma_1 BLSconstrfactor_{i,t-3} + \gamma_2 BLSriskfactor_{i,t-1} \\ & + countrydum_i + \sum_{k=1}^{3} \rho_k seasonaldum_k + \varepsilon_{i,t}\end{aligned}$$

(For housing loans instead of inflation (*ΔHICP*) the growth rate in residential property prices is included (*Δln houseprices*).)

As this is a static approach, which only corrects for panel autocorrelation, we check the robustness of our results by applying a dynamic panel framework using the Least Squares Dummy Variables Corrected estimator as suggested by Bruno (2005) which allows for the inclusion of a lagged endogenous variable despite the small cross section of the data set.[17]

In our specification for the loans to non-financial corporations (see Table 1), we subsequently include the different constraint-related factors holding one risk factor (here "expectations on overall economic activity") constant (see Table 1, column 1-3) to gauge their individual importance. Here, "banks' cost of capital" renders not only the highest coefficient, but also the highest statistical significance. Including all three at once (column 4) indicates their relative importance, with only the bank capital variable being statistically significant and having by far the highest coefficient. This finding does not change when additionally including the related BLS-demand variable (column 5) or an additional risk variable ("firm or industry specific risk"), see columns 5-6. Finally, as regards the choice of risk variables "expectations on economic activity" turn statistically insignificant when including the more specific risk variable (columns 6-7). This leads us to our baseline specification, represented in column 8 of Table 1, including "banks' cost of capital" as a factor related to "pure" supply-side effects and "firm and industry specific risk". Both coefficients are highly statistically significant and also robust to the application of the Least Squares Dummy Variables

[17] Standard dynamic panel estimators (e.g. such as suggested by Arellano-Bond and related estimators) are not applicable to these type of data sets.

Corrected estimator by Bruno (2005) mentioned before. Moreover, as regards their economic significance, the estimates suggest that a 10 percentage point increase in the factor "banks' cost of capital position" contributing to a tightening of credit standards would roughly result in a 0.2 percentage point decline in the quarterly growth rate of loans to non-financial corporations. At the same time, a 10 percentage point increase in the factor "firm and industry-specific risk" would render a 0.1 percentage point decrease.[18]

Table 1: Determinants of quarterly growth rates in bank lending to non-financial corporations

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	dln GDP $_{i, t-3}$	.247 (.013**)	.251 (.012**)	.291 (.004***)	.251 (.014***)	.261 (.016**)	.236 (.031**)	.233 (.031**)	.231 (.032**)
	demand for loans to enterprises (BLS) $_{i, t}$					.010 (.002***)	.009 (.004***)	.009 (.005***)	.009 (.004***)
factors contributing to tightening of credit standards (BLS)	**banks' cost of capital** $_{i, t-3}$	-.026 (.000***)			-.024 (.001***)	-.024 (.001***)	-.023 (.001***)	-.023 (.000***)	-.023 (.000***)
	access to market financing $_{i, t-3}$		-.016 (.005***)		-.003 (.718)	-.001 (.879)	-.001 (.880)		
	banks' liquidity situation $_{i, t-3}$			-.017 (.013**)	.001 (.919)	.001 (.868)	.001 (.938)		
	expectations economic activity $_{i, t-1}$	-.009 (.002***)	-.010 (.002***)	-.012 (.000***)	-.009 (.007***)	-.006 (.050)	.00004 (.994)	-.001 (.909)	
	firm/industry specific outlook $_{i, t-1}$						-.011 (.056*)	-.010 (.067*)	-.010 (.004***)
	Eonia $_{t-1}$	1.052 (.000***)	1.059 (.000***)	1.075 (.000***)	1.049 (.000***)	1.039 (.000***)	1.021 (.000***)	1.021 (.000***)	1.019 (.000***)
	10 year gov bond yield $_{t-2}$	-.1.045 (.000***)	-.1.058 (.000***)	-.1.051 (.000***)	-.1.036 (.000***)	-.930 (.000***)	-.930 (.000***)	-.924 (.000***)	-.924 (.000***)
	inflation $_{i, t-4}$	.362 (.033**)	.380 (.030**)	.411 (.019**)	.354 (.039**)	.380 (.023**)	.396 (.017**)	.407 (.014**)	.409 (.014**)
	constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes
	Wald χ^2	295.83***	254.35***	262.04***	298.57***	363.41***	368.14***	367.19***	366.37***
	# observations					264			
	countries					11			

"pure" supply side effects

*Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively*

Turning to the loans to households for house purchase (see Table 2), we obtain a baseline specification, represented in column 6, including "banks' cost funds and balance sheet constraints" as the factor related to "pure" supply-side effects and "housing market prospects" related to the banks' risk perceptions. Both coefficients are statistically significant, however, not fully robust to the application of the Least Squares Dummy Variables Corrected estimator by Bruno (2005) indicating some potential instability over the sample period (see Section 3.1 for more details).[19] As regards their economic significance, the estimates suggest that a 10 percentage point increase in the factor "banks' cost funds and balance sheet constraints" contributing to a tightening of credit standards would again roughly result in a 0.2 percentage point decline in the quarterly growth rate of loans to non-financial corporations. At the same

[18] For descriptive statistics on the data employed see Table 5 a) in the Annex.

[19] Both coefficients are slightly insignificant with p-values obtained from applying boot-strapped standard errors in the range of 10-11%.

time, a 10 percentage point increase in the factor "housing market prospects" would render a slightly lower decrease.

Table 2: Determinants of quarterly growth rates in bank lending to private households for house purchase

		(1)	(2)	(3)	(4)	(5)	(6)	
	dln real gdp t $_{i, t-3}$	.462 (.004***)	.434 (.004***)	.329 (.035**)	.418 (.008***)	.346 (.026**)	.348 (.025**)	
	dln nom. houseprices $_{t\ i, t-4}$	.458 (.000***)	.400 (.000***)	.422 (.000***)	.440 (.000***)	.452 (.000***)	.454 (.000***)	
	demand for housing loans (BLS) $_{i, t}$ **(BLS-net percentages)**					.018 (.000***)	.018 (.000***)	
factors contributing to tightening of credit standards (BLS)	**costs of funds and balance sheet constraint** $_{i, t-5}$	-.036 (.003***)			-.031 (.012**)	-.021 (.079*)	-.021 (.064*)	**"pure" supply side effect**
	expectations economic activity $_{i, t-4}$		-.024 (.001***)		-.007 (.429)	-.003 (.764)		
	housing market prospects $_{i, t-4}$			-.027 (.000***)	-.020 (.021**)	-.015 (.055*)	-.017 (.016**)	
	Eonia $_{t-1}$	-1.129 (.000***)	-1.201 (.000***)	-1.130 (.000***)	-1.276 (.000***)	-.627 (.002***)	-.612 (.000***)	
	10 year gov bond yield $_{t-2}$	-1.046 (.003***)	-.931 (.011**)	-.855 (.014**)	-.739 (.046**)	-.576 (.091*)	-.590 (.075*)	
	constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	
	Wald χ^2	187.55***	184.08***	188.64***	225.98***	290.44***	291.61***	
	# observations	240						
	countries	11						

*Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively.*

The impact of loan demand as proxied by the respective BLS questions is highly statistically significant for both loan categories and also robust to the alternative estimation approaches applied. Apart from the impact of the other macro variables included and to a large extent attributable to the demand-side of loan developments, our estimates suggest that an additional 10 percentage point decrease in this variable results in a decline of the respective quarterly growth rates of around 0.1 percentage point for corporate loans and 0.2 for housing loans.[20]

3. Focus on the Financial Crisis

As already stressed in the introduction, the financial crisis has led to severe losses for the euro area banking sector and has forced many banks to replenish their capital buffers. At the same time, it put substantial strains on banks' access to funding and their liquidity positions. The crisis, thereby, has had a major impact on the central parameters of the supply-side in bank lending.

[20] For descriptive statistics on the data employed see Table 5 b) in the Annex.

3.1 Comparing crisis and pre-crisis bank lending

To assess whether this impact can also be traced empirically despite the limited amount of observations available for the turmoil period, we employ the empirical approach described in section 2 addressing different supply-side factors determining bank lending to non-financial corporations and households as a benchmark. In order to identify potential changes in the empirical relevance of the different factors before and during the crisis period, we interact these factors subsequently with a "crisis" dummy and a "non-crisis" dummy, which differentiates the period before and since 2007 Q3.

As displayed in Table 3, for bank lending to non-financial corporations the impact of factors contributing to a tightening of lending standards seems to have increased during the crisis. This is indicated first of all by higher net percentages observed on the respective BLS sub-question during the turmoil period (see Chart 2 in section 1) and by higher coefficients for the turmoil period. More specifically, for "banks' cost of capital" both interacted variables for the crisis and non-crisis period are statistically significant.[21] By contrast, for "access to market financing" and "banks' liquidity position", the variables turn out to be insignificant for the non-crisis period although no further bank constraint variables had been included.[22] This could serve as an indication, that these variables had no, or very limited relevance for bank lending to non-financial corporations in the pre-crisis period. Finally, borrowers' risk as reflected by the industry or firm-specific outlook is significant in both periods albeit the coefficient is higher for the crisis period.

In sum, despite the short sample available for the crisis period, we find for all factors, except for the access to market financing[23], the interacted crisis variables to be statistically significant pointing to supply-side factors having had a special impact during the crisis period, particularly when considering the substantially higher values observed for these variables during this period. Moreover, the size of the coefficients has been larger for all four factors during the crisis period, albeit statistically significantly only for "banks' liquidity positions". This lack of significance might, however, owe to some extent to the very small number of observations available for this sub-period.

[21] This finding is also robust to employing dynamic estimation methodologies like the Least Squares Dummy Variables Corrected estimator by Bruno (2005) (see section 3 for some details) which includes a lagged endogenous variable and particularly corrects for the bias of the fixed effects panel estimator and allows for a dynamic specification despite a small cross-section (and unbalanced panels – albeit not the case in this specification).

[22] However, for access to market financing also the crisis period has not been significant when applying the Least Squares Dummy Variables Corrected estimator mentioned before.

[23] Here, the significance was not robust to the application of the alternative Least Squares Dummy Variables Corrected estimator.

Table 3: Determinants of quarterly growth rates in bank lending to non-financial corporations – differentiating between pre-crisis and crisis periods

		benchmark equation	crisis dummy	(1)	(2)	(3)	(4)
factors contributing to tightening of credit standards (BLS)	banks' cost of capital$_{i, t-3}$	-.023 (.000***)	crisis	-.030 (.000***)			-.023 (.000***)
			non-crisis	-.018 (.007***)			
	access to market financing$_{i, t-3}$		crisis		-.017 (.010**)		
			non-crisis		-.004 (.666)		
	banks' liquidity situation$_{i, t-3}$		crisis			-.030 (.001***)	
			non-crisis			-.005 (.647)	
	firm/industry specific outlook$_{i, t-1}$	-.010 (.004***)	crisis	-.010 (.007***)	-.011 (.003***)	-.012 (.001***)	-.013 (.002***)
			non-crisis				-.008 (.104)
	demand for loans to enterprises (BLS) $_{i, t}$	.009 (.004***)		.008 (.008***)	.009 (.006***)	.009 (.020**)	.009 (.006***)
	dln real GDP $_{i, t-3}$	.231 (.032**)		.225 (.037**)	.244 (.023**)	.263 (.017**)	.225 (.037**)
	Eonia$_{t-1}$	1.019 (.000***)		1.018 (.000***)	1.018 (.000***)	1.028 (.000***)	1.031 (.000***)
	10 year gov bond yield $_{t-2}$	-.924 (.000***)		-.881 (.000***)	-.930 (.000***)	-.934 (.000***)	-.857 (.000***)
	inflation $_{i, t-4}$	.409 (.014**)		.363 (.014**)	.412 (.018**)	.398 (.018**)	.377 (.027**)
	constant; seasonal and country dummies	yes		yes	yes	yes	yes
	Wald χ^2	366.37***		375.38***	327.52***	369.73***	370.94***
	# observations	264			264		
	countries	11			11		

"pure" supply side effects

*Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively. –The cut-off date for crisis/non-crisis interaction terms is: 2007Q3. – Benchmark equation taken from Table 1, column 8.*

Also, for bank lending to households for house purchase the impact of factors contributing to a tightening of credit standards seems to have changed during the crisis, as displayed in Table 4. This change and increase in importance is again already indicated by higher net percentages observed on the respective BLS sub-question during the turmoil period (see Chart 4 in section 1). Moreover, for banks' "cost of funds and balance sheet constraints" it seems the impact has become more immediate, as in the pre-crisis period this variable entered only with a lag of five quarters whereas for the crisis period this large lag has been insignificant (see Table 4, column 1) but a shorter lag of three quarters proved to be statistically significant (column 2).[24] The size of the coefficient is slightly lower for the crisis period; however, the difference is by far not statistically significant. Somewhat striking are the findings for the impact of borrowers' risk on banks' lending to private households for house purchase: the pre-crisis variable turns out to be completely statistically insignificant while the crisis period

[24] However, the pre-crisis period is not significant when applying the Least Squares Dummy Variables Corrected estimator by Bruno (2005) mentioned before.

is clearly statistically significant;[25] moreover, the difference in coefficients is statistically significant. This finding supports the notion that up until the beginning of the crisis risk-related factors to have played only a minor role for housing loans in the euro area as a whole. To some extent it also support findings of a risk-taking channel being at work particularly in lending for house purchase as recently along with increased risk perceptions lending conditions in terms of collateral and loan-to-value ratios seemed to have tightened substantially in the euro area.[26] In addition, it seems to clearly indicate that the borrowers' balance-sheet position (that is, the value of their house and thereby their collateral) has substantially gained in relevance for housing loans during the crisis with housing markets plummeting in several member states.

Table 4: Determinants of quarterly growth rates in bank lending to private households for house purchase – differentiating between pre-crisis and crisis periods

		benchmark equation	crisis dummy	(1)	(2)	(3)	
factors contributing to tightening of credit standards (BLS-net percentages)	costs of funds and balance sheet constraint $_{i, t-5}$	-.021 (.064*)	crisis	-.006 (.732)	-.029+ (.024**)	-.021 (.064*)	"pure" supply side effects
			non-crisis	-.034 (.033**)	-.034 (.041**)		
	housing market prospects $_{i, t-4}$	-.017 (.016**)	crisis	-.020 (.007***)	-.017 (.016**)	-.023 (.021**)	
			non-crisis			.00002 (.999)	
	demand for housing loans (BLS) $_{i, t}$	.018 (.000***)		.019 (.000***)	.017 (.000***)	.017 (.000***)	
	dln real GDP t $_{i, t-3}$	.348 (.025**)		.349 (.025**)	.292 (.025**)	.326 (.037**)	
	dln nom. houseprices $_{i, t-4}$	.454 (.000***)		.459 (.000***)	.415 (.000***)	.415 (.000***)	
	Eonia$_{t-1}$	-.612 (.000***)		-.571 (.000***)	-.666 (.001***)	-.613 (.000***)	
	10 year gov bond yield $_{t-2}$	-.590 (.075*)		-.605 (.068*)	-.526 (.109)	-.683 (.045**)	
	constant; seasonal and country dummies	yes		yes	yes	yes	
	Wald χ^2	291.61***		290.37***	305.30***	287.62***	
	# observations	240			240		
	countries	11			11		

*Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively. – The cut-off date for crisis/non-crisis interaction terms is: 2007Q3. – Benchmark equation taken from Table 2, column 6. – + n column (2) indicates a reduction in the time lag from 5 to 3 quarters for the crisis period.*

Overall, there are strong indications for supply-side factors to have gained in importance for lending to private households for house purchase in the crisis period, while they seem to have been rather negligible in the pre-crisis period.

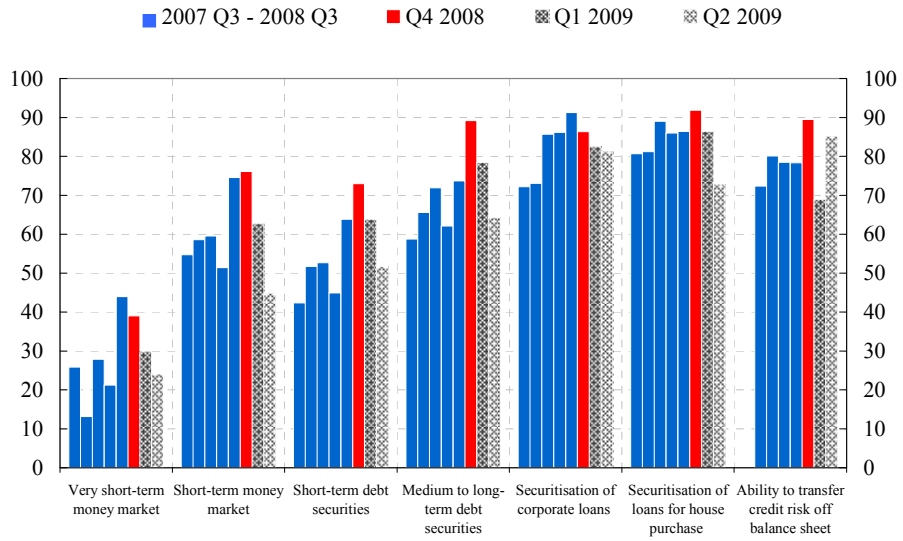
[25] This finding is also robust to employing the Least Squares Dummy Variables Corrected estimator by Bruno (2005).

[26] See results on question 11 from the bank lending survey of the Eurosystem.

3.2 Supplementary survey evidence for supply-side constraints during the crisis period

An additional path to trace the impact of supply-side constraints on bank lending during the crisis period is offered by information from the BLS on supplementary turmoil-related "ad hoc"-questions. In order to gauge in more detail the impact of the financial market turmoil experienced since mid-2007 on euro area banks, the bank lending survey was augmented by several "ad hoc" questions. Particularly as regards banks' market access to wholesale funding, these questions address in considerable detail the potential impact of the turmoil on banks' lending decisions in terms of quantities and prices than included. This information has served as supplementary evidence to the results obtained from the regular questions – particularly those on the factors contributing to a tightening of credit standards (see also Chart 1). Adding the information derived from the "ad hoc" questions as explanatory variables to the empirical model described in Section 2 can add further insight as to how the impact of supply-side constraints changed during the financial crisis. In the following, we first briefly describe the aggregate results on these "ad hoc" questions and then summarize our tentative empirical findings for lending to non-financial enterprises as well as to private households for house purchase.

Chart 4: Access to wholesale funding over the past three months
(percentages of banks reporting hampered market access)



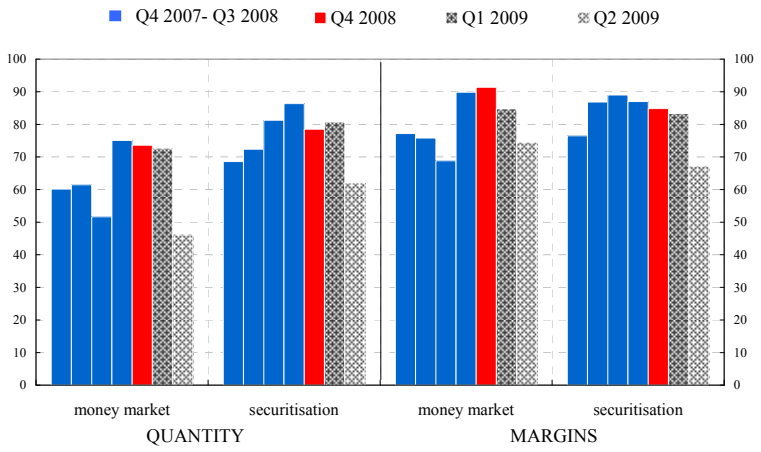
Source: Eurosystem's bank lending survey, ad hoc question no. 111.
Note: The percentages were calculated by adding up the responses indicating "considerable" and "some impact" on market access.

Regarding access to market funding, banks reported particular difficulties in transferring credit risk and securitising loans, as well as in refinancing themselves by issuing medium to long-term debt securities, although a certain degree of easing has been observed in the most

recent quarters (see Chart 4). As regards funding via money markets, the strains on very short-term refinancing have eased substantially – in line with the Eurosystem's liquidity-provision measures – in the last few quarters, whereas short-term funding – despite some alleviation – remained impaired in the second quarter of 2009 for close to half of the reporting banks.

For most of the affected banks, the impact on their lending activity was reflected in margins, as well as in quantities. However, the impact on loan margins of hampered access to money markets, debt securities and other markets overall was stronger than that on the lending volume supplied (see Chart 5, panel (a)). At the same time, hampered access to securitisation seems to have impacted equally on the prices and volumes of loans extended, according to the responses of banks participating in the survey (see Chart 5, panel (b)).

Chart 5: Impact on lending (quantities and margins) of hampered access to wholesale funding over the past three months
(percentages of banks reporting hampered access to respective markets)



Source: Eurosystem's bank lending survey, ad hoc question no. 112.
Note: The percentages were calculated by adding up the responses indicating "considerable" and "some impact" on the quantity or margin respectively.

To further assess the impact of supply-side constraints on bank lending during the crisis period, we therefore include this supplementary information from the BLS ad hoc questions on the impact of banks' market access to wholesale funding on bank lending at the country level as additional explanatory variables in our empirical model.[27] The first tentative results obtained are of course subject to the particularly short time period for these observations starting only in the third quarter of 2007. Moreover, as already discussed in section 3.1, there are strong indications for a change in relationships particularly as regards supply-side factors during the crisis which have to be born in mind when interpreting the results. Turning first to loans to non-financial corporations (see Table 6 in the Annex), we find indications that

[27] For descriptive statistics on the data employed see Table 5 c) in the Annex.

hampered access to all wholesale markets displayed in Chart 4 – apart from the very short-term money markets – to have put a strain on banks' lending activity.[28] Moreover, as regards the extent to which the influence of the hampered wholesale market access on banks' lending has worked either through loan quantities or through the prices offered on the loans (Chart 5), our tentative results point to price rather than volume effects. This particularly seems to hold for the impact of hampered access to securitisation markets on banks' pricing of loans.[29]

For loans to private households for house purchase (see Table 7 in the Annex), our first tentative findings suggest that hampered access to all wholesale market segments included in the ad hoc questions had a constraining impact on lending.[30] Furthermore, the results indicate these effects to have not only had an impact on the pricing but also on the quantities of loans offered. However, also these results come with some qualifications as the baseline model proved to be less robust to the inclusion of these additional variables than in the case of the loans for non-financial corporations. More precisely, the variables on "banks' cost of funds and balance sheet constraints" as well as on the "housing market prospects" tended to become slightly or completely statistically insignificant. This, in turn, stresses our findings in section 3.1 on the instability of these variables across the pre-crisis and crisis periods and the related increase in importance of supply-side constraints for housing loans during the crisis period.

4. Conclusions

Applying a cross-country panel-econometric approach using a unique confidential data set on results from the Eurosystem's bank lending survey, which allows for disentangling loan supply and demand effects, this paper has provided evidence that factors related to banks' balance sheet positions have a non-negligible influence on the growth of loans to firms and households in the euro area. It was furthermore documented that the impact of supply-side effects on lending, to non-financial corporations in particular, increased substantially since the outbreak of the financial crisis in the second half of 2007 which resulted in severe pressures on euro area banks' liquidity and capital positions and their access to wholesale funding. To further test this empirically, we made use of the replies to the set of "turmoil-related" ad hoc questions introduced in the bank lending survey. We believe that we are the first to employ this information in an empirical analysis. The results suggest that especially the disruptions in

[28] This result, however, is qualified by the fact that these findings are not robust when using employing the Least Squares Dummy Variables Corrected estimator by Bruno (2005) and might therefore only serve as first indication.

[29] Here, the impact of hampered access to securitisation on prices was also robust when employing the Least Squares Dummy Variables Corrected estimator by Bruno (2005).

[30] The findings were not only highly significant for the results using the FGLS estimator as displayed in Table 6 but also significant when using employing the Least Squares Dummy Variables Corrected estimator by Bruno (2005).

the money and capital markets and to the banks' ability to securitise and to transfer credit risk off-balance sheet negatively influenced lending by euro area banks since the start of the financial crisis. These findings hence provide support for the "non-standard" policy measures taken by the ECB since the outbreak of the crisis, such as the provision of funding to the banking system via its long-term full allotment liquidity operations, the broadening of the list of eligible collateral, and the purchase of euro-denominated covered bonds.

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Annex

Table 5: Descriptive statistics

a) loans to NFCs

		mean	std	min	max
	loan growth (NFCs)	2.31	2.25	-2.97	9.11
	growth in real GDP $_{t-3}$	0.57	0.79	-2.29	6.71
(net percentages)	**demand for loans to enterprises (BLS)$_{t}$**	-1.03	34.01	-100	75
	banks' cost of capital (BLS)$_{t-3}$	10.92	18.74	-25	100
	access to market financing (BLS)$_{t-3}$	7.98	20.83	-50	100
	banks' liquidity situation (BLS)$_{t-3}$	5.01	15.05	-33.3	80
	expectations economic activity (BLS)$_{t-1}$	20.63	36.55	-80	100
	firm/industry specific outlook (BLS)$_{t-1}$	27.28	33.41	-25	100
	Eonia$_{t-1}$	2.76	0.9	1.06	4.27
	10 year gov bond yield $_{t-2}$	4.02	0.45	3.04	5.17
	inflation$_{t-4}$	1.92	0.88	0.21	5.04

countries 11 **no. obs.** 264
sample period 2003Q3-2009Q2

b) housing loans

		mean	std	min	max
	loan growth (housing - HHs)	2.37	2.8	-18.66	10.93
	growth in real GDP $_{t-3}$	0.61	0.79	-2.29	6.71
(net percentages)	**demand for housing loans (BLS)$_{t}$**	-8.68	48.89	-100	100
	banks' cost of funds and balance sheet constraints (BLS)$_{t-5}$	2.83	12.11	-66.67	80
	expectations economic activity (BLS)$_{t-4}$	9.8	21.7	-40	100
	housing market prospects (BLS)$_{t-4}$	9.57	24.21	-40	90
	Eonia$_{t-1}$	2.82	0.92	1.06	4.27
	10 year gov bond yield $_{t-2}$	4.03	0.46	3.04	5.17
	growth in nom. houseprices $_{t-4}$	1.44	1.71	-8.9	6.24

countries 11 **no. obs.** 240
sample period 2004Q1-2009Q2

c) ad hoc questions

		mean	std	min	max
(net percentages)	**very short-term money market$_{t-3}$**	23.5	22.5	0.0	100.0
	short-term money market$_{t-3}$	52.1	27.7	0.0	100.0
	short-term debt securities (e.g. certificates of deposit or commercial paper)$_{t-3}$	42.5	27.3	0.0	100.0
	medium to long-term debt securities (incl. covered bonds)$_{t-4}$	55.3	25.1	0.0	100.0
	securitisation of housing loans$_{t-4}$	35.7	23.8	0.0	80.0
	securitisation of corporate loans$_{t-3}$	37.8	28.0	0.0	90.0
	ability to transfer credit risk off balance sheet$_{t-3}$	25.4	22.3	0.0	80.0
	<u>money / debt markets</u>: quantity$_{t-4}$	43.9	23.5	0.0	100.0
	price$_{t-4}$	55.1	24.9	0.0	100.0
	<u>securitisation</u>: quantity$_{t-3}$	37.0	28.3	0.0	100.0
	price$_{t-4}$	38.3	28.3	0.0	100.0

countries 11 no.obs. 55 (44)
sample period 2008 Q2(Q3) - 2009 Q2

Table 6: Determinants of quarterly growth rates in bank lending to non-financial corporations – including variables from BLS-ad hoc questions on crisis specific impact of <u>hampered access to funding markets</u> on bank lending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
dln GDP $_{i, t-3}$	.231 (.032**)	.230 (.033**)	.215 (.046**)	.214 (.048**)	.222 (.040**)	.215 (.048**)	.220 (.044**)	.222 (.039**)	.220 (.041**)	.227 (.035**)	.207 (.053*)	
demand for loans to enterprises (BLS) $_{i, t}$	.009 (.004***)	.009 (.008***)	.008 (.011**)	.008 (.017**)	.008 (.009***)	.008 (.009***)	.009 (.006***)	.008 (.008***)	.008 (.016**)	.008 (.009***)	.008 (.010**)	
very short-term money market$_{i, t-3}$		-.010 (.202)										"pure" supply side effects
short-term money market$_{i, t-3}$			-.009 (.046**)									
short-term debt securities (e.g. certificates of deposit or commercial paper)$_{i, t-3}$				-.012 (.034**)								
medium to long-term debt securities (incl. covered bonds)$_{i, t-3}$					-.010 (.041**)							
securitisation of corporate loans$_{i, t-3}$						-.010 (.085*)						
ability to transfer credit risk off balance sheet$_{i, t-3}$							-.013 (.085*)					
money/debt markets: quantity								-.007 (.252)				
price									-.010 (.053*)			
securitisation: quantity										-.007 (.330)		
price											-.019 (.005***)	
banks' cost of capital$_{i, t-3}$	-.023 (.000***)	-.022 (.000***)	-.022 (.000***)	-.022 (.000***)	-.021 (.000***)	-.022 (.000***)	-.022 (.000***)	-.022 (.000***)	-.021 (.000***)	-.022 (.000***)	-.020 (.000***)	
firm/industry specific outlook$_{i, t-1}$	-.010 (.004***)	-.009 (.017**)	-.008 (.044**)	-.008 (.049**)	-.008 (.041**)	-.008 (.031**)	-.009 (.028**)	-.009 (.021**)	-.008 (.032**)	-.009 (.016**)	-.008 (.043**)	
Eonia$_{t-1}$	1.019 (.000***)	1.018 (.000***)	1.037 (.000***)	1.036 (.000***)	1.000 (.000***)	.986 (.000***)	1.017 (.000***)	1.011 (.000***)	1.006 (.000***)	1.020 (.000***)	.972 (.000***)	
10 year gov bond yield $_{t-2}$	-.924 (.000***)	-.903 (.000***)	-.864 (.000***)	-.854 (.000***)	-.849 (.000***)	-.886 (.000***)	-.878 (.000***)	-.886 (.000***)	-.868 (.000***)	-.905 (.000***)	-.845 (.000***)	
inflation $_{i, t-4}$	.409 (.014**)	.394 (.017**)	.369 (.026**)	.367 (.027**)	.332 (.049**)	.336 (.051*)	.365 (.029**)	.363 (.035**)	.332 (.051*)	.380 (.026**)	.286 (.093*)	
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Wald χ^2	366.37***	373.02***	378.12***	380.92***	380.60***	378.82***	383.37***	369.30***	377.91***	372.86***	392.93***	
# observations						264						
countries						11						

*Note: Dependent variables are quarterly growth rates of bank lending to non-financial corporations by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively. – Variables on ad hoc questions are available for the period 2007Q3 – 2009 Q2. – Benchmark equation (column 1) taken from Table 1, column 8.*

Table 7: Determinants of quarterly growth rates in bank lending to private households for house purchase – including variables from BLS-ad hoc questions on crisis specific impact of <u>hampered access to funding markets</u> on bank lending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
dln GDP $_{i, t-3}$	.348 (.025**)	.308 (.044**)	.275 (.074*)	.267 (.084*)	.299 (.056*)	.263 (.073*)	.258 (.094*)	.304 (.054*)	.263 (.087*)	.287 (.063*)	.290 (.063*)	
demand for loans to enterprises (BLS) $_{i, t}$	.018 (.000***)	.015 (.000***)	.014 (.000***)	.014 (.000***)	.014 (.000***)	.013 (.000***)	.012 (.000***)	.014 (.000***)	.013 (.001***)	.014 (.000***)	.015 (.000***)	
very short-term money market$_{i, t-3}$		-.036 (.000***)										
short-term money market$_{i, t-3}$			-.024 (.000***)									
short-term debt securities (e.g. certificates of deposit or commercial paper)$_{i, t-3}$				-.031 (.000***)								
medium to long-term debt securities (incl. covered bonds)$_{i, t-3}$					-.023 (.000***)							
securitisation of loans for house purchase$_{i, t-3}$						-.035 (.000***)						
ability to transfer credit risk off balance sheet$_{i, t-3}$							-.054 (.000***)					
money/debt markets: quantity								-.022 (.001***)				
price									-.026 (.000***)			
securitisation: quantity										-.033 (.000***)		
price											-.029 (.000***)	
costs of funds and balance sheet constraint $_{i, t-5}$	-.021 (.064*)	-.015 (.183)	-.018 (.118)	-.019 (.101)	-.013 (.264)	-.015 (.199)	-.016 (.142)	-.016 (.176)	-.015 (.180)	-.013 (.263)	-.013 (.258)	
housing market prospects $_{i, t-4}$	-.017 (.016**)	-.012 (.086*)	-.010 (.136)	-.010 (.158)	-.008 (.239)	-.008 (.213)	-.008 (.192)	-.011 (.102)	-.008 (.232)	-.009 (.179)	-.008 (.231)	
Eonia$_{t-1}$	-.612 (.000***)	-.656 (.001***)	-.653 (.001***)	-.687 (.000***)	-.654 (.001***)	-.680 (.000***)	-.820 (.000***)	-.720 (.000***)	-.695 (.000***)	-.696 (.000***)	-.656 (.001***)	
10 year gov bond yield $_{t-2}$	-.590 (.075*)	-.612 (.060*)	-.498 (.119)	-.490 (.131)	-.505 (.126)	-.447 (.168)	-.466 (.129)	-.465 (.152)	-.500 (.120)	-.475 (.139)	-.471 (.148)	
dln nom. houseprices $_{i, t-4}$	.454 (.000***)	.350 (.000***)	.358 (.000***)	.327 (.000***)	.360 (.000***)	.322 (.000***)	.304 (.000***)	.371 (.000***)	.329 (.000***)	.348 (.000***)	.359 (.000***)	
constant; seasonal and country dummies	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Wald χ^2	291.61***	373.02***	344.43***	344.44***	330.89***	321.57***	415.35***	338.91***	349.84***	331.09***	326.55***	
# observations						264						
countries						11						

"pure" supply side effects

*Note: Dependent variables are quarterly growth rates of bank lending to private households for house purchase by country (BSI statistics) for 2003Q3 to 2009Q2. FGLS panel regressions including seasonal dummies and country dummies, errors corrected for panel-specific autocorrelation. – BLS variables in net percentages by country. *,**,*** reflect a statistical significance at the level of 10%,5% an 1%, respectively. – Variables on ad hoc questions are available for the period 2007Q3 – 2009 Q2. – Benchmark equation (column 1) taken from Table 2, column 6.*