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is there a bias in the Bank Lending Survey?

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ESTIMATING THE EFFECTS OF A CREDIT SUPPLY RESTRICTION: IS THERE A BIAS IN THE BANK LENDING SURVEY?

by Andrea Nobili * and Andrea Orame**

Abstract

In this paper we test for the potential bias in the estimated contribution of a supply restriction on lending to enterprises, as captured by the assessment of credit standards provided by the banks participating in the Eurosystem Bank Lending Survey (BLS banks). For Italy, we combine the information provided by the relatively small panel of large banking groups participating in the Eurosystem survey with the replies obtained from the non-overlapping and wider group of banks participating in the Regional Bank Lending Survey (non-BLS banks) carried out by the Bank of Italy. We find evidence of a limited upward bias in the estimated contribution of a tightening in credit standards from using the information for the BLS-only banks. This outcome mainly reflects a lower estimated sensitivity of lending growth to the considered indicators of a supply restriction for the non-BLS banks. The Eurosystem Bank Lending Survey, therefore, continues to be a timely and important source of information over the credit cycle for policymakers.

JEL Classification: G21, E51, E58.

Keywords: supply of credit, banks, Eurosystem BLS, Regional Bank Lending Survey.

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1. Introduction¹

In the last five years the global financial crisis and the sovereign debt crisis in the euro area have severely affected the dynamics of credit to the private sector. Notwithstanding the wide range of monetary policy measures, the contraction of credit continues and is one of the major obstacles to the recovery of economic activity. Understanding the extent to which the decline of credit is due to a tightening of banks' credit standards or reflects a lack of demand is a crucial issue for policymakers, as the appropriate policy responses may differ depending on the causes of the negative credit developments.

A large amount of empirical literature has used aggregate information for both the lending survey and credit developments to disentangle the contributions of demand and supply. See Berg et al. (2005), de Bondt et al. (2010), Hempell and Kok-Sorensen (2010), Ciccarelli et al. (2010), and Maddaloni and Peydrò (2013) for empirical works based on the Eurosystem Bank Lending Survey (henceforth BLS). Schreft and Owens (1991), Lown et al. (2000), Lown and Morgan (2006), Cunningham (2006), Bayoumi and Melander (2008), Swiston (2008), and Basset et al. (2012) have provided empirical contributions using the Federal Reserve's Senior Loan Officer Opinion Survey.²

Del Giovane et al. (2011) combined bank-level qualitative information from the BLS with micro-data on loan quantities for the Italian banks participating in the survey and found evidence that credit supply conditions, as captured by the BLS indicators, are significant in explaining the dynamics of lending to enterprises in Italy during the financial crisis. A similar approach has since been used in Del Giovane et al. (2013) and in empirical works for other euro-area countries (see van der Veer and Hoerberichts, 2014, for the Netherlands, and Labonne and Lamè, 2014, for an application to French data).

The supply indicators based on survey data are available to policymakers in advance of banks' balance sheet information, are not subject to major revisions and can therefore be used intensively for policy analysis. Del Giovane et al. (2011) used their estimated equations to perform counterfactual exercises in order to evaluate the contribution of the supply restriction on the decline

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² More broadly, our paper is also related to the work done on the bank lending channel during the crisis, especially the papers using micro data from Credit Registry and banks' balance sheet information to identify credit supply shocks. See Albertazzi and Marchetti (2010), Bonaccorsi di Patti and Sette (2012) and Bofondi et al. (2013) for empirical studies in the case of Italy and Khwaja and Mian (2008), Jimenez et al. (2012) for other countries.

of credit during the global financial crisis in Italy. However, they pointed out that these estimated effects did not necessarily hold for the entire banking system, as the panel of Italian banks participating in the BLS (henceforth BLS banks) comprises a relatively small number of intermediaries, mainly large banking groups, which reported a larger reduction in the growth rate of loans to enterprises than other banks, especially in the most acute phases of the financial crisis.

The estimates for the supply effects obtained with the BLS-only banks might represent an upper bound of the effect for the entire banking system for two specific reasons. First, the supply restrictions might have been more diffuse for BLS banks than for the rest of the system, consistently with the view that large banks have been more exposed to financial tensions. Second, the estimated sensitivity of lending dynamics to the supply conditions, as captured by the survey indicators, may be greater for BLS banks than for banks not participating in the BLS (henceforth non-BLS banks). Each of the banks interviewed answers the same questions about credit standards and provides a qualitative assessment of supply conditions. However, credit standards reflect bank-specific internal guidelines or loan approval criteria, which may result in different interpretations of the same questions and in a different estimated effect on the hard data.

Del Giovane et al. (2011) argued that the Regional Bank Lending Survey (henceforth RBLS) could provide useful and complementary information in the case of Italy. In the RBLS, which has been conducted twice a year by the Bank of Italy since the end of 2008, banks are indeed required to provide their qualitative assessment of the role of supply and demand factors in affecting credit developments. The questions are very similar to the main ones asked in the BLS. The RBLS has been carried out for a relatively short time period; nevertheless, it provides a high number of observations since it involves a much larger number of banks, including smaller ones, covering almost the whole of the Italian banking system.³

In this paper we address the potential bias stemming from use of the BLS-only information by considering the replies given by the large number of banks participating in the RBLS. More specifically, we apply the econometric approach proposed by Del Giovane et al. (2011) to disentangle the contribution of demand and supply factors to credit developments for both BLS and non-BLS banks. We are able to evaluate whether the bias reflects a different distribution of the

³ Del Giovane et al. (2011) noticed that in the period considered in their paper (the fourth quarter of 2008 and the end of 2009) the indicators of supply conditions for medium-to-large banks and for small banks obtained from this survey did not differ significantly, while a more marked worsening of demand conditions was reported by the former. As shown in our paper, this was not the case when considering a longer sample period comprising the sovereign debt crisis.

supply restriction between BLS and non-BLS banks, or a different estimated sensitivity of lending dynamics to the indicators of supply conditions in the two panels of banks.

As noted in previous papers, a general caveat, which applies to our study as to any other analysis based on survey data, is that the quality of the results depends on the truthfulness of the respondents' answers. In the case of lending surveys, banks, as regulated institutions, may have an incentive to report tighter policies than those actually implemented if they fear that the information could be exploited for supervisory purposes. By contrast, in a crisis period, banks may be exposed to public criticism and political pressure, and be pointed at as being responsible for harming the economy, and thus may have an incentive to portray their policies as less restrictive than they actually are.

2. The data

This section provides information on the data used in the paper and some descriptive statistics. For BLS banks we use mainly data for the panel of Italian banking groups participating in the Eurosystem BLS, which has been conducted since the fourth quarter of 2002 on a quarterly basis and involves 11 banking groups (for further details see Del Giovane et al., 2011). Overall, the outstanding amount of loans to enterprises granted by the banking groups in the BLS corresponds to around 66 per cent of the credit provided by the entire Italian banking system.

As for the control group of intermediaries (non-BLS banks), we use the non-overlapping portion of banks participating in the RBLIS (and not indirectly in the BLS), which has been conducted by the Bank of Italy on a half-yearly basis since the end of 2008. Overall, the RBLIS has been carried out on an unbalanced panel of 439 Italian banks over the period from the first semester of 2009 to the first semester of 2014. These intermediaries cover about 85 per cent of the total credit provided by the Italian banking system to enterprises. The information obtained from the first round of the RBLIS has been dropped from the panel, as it involved only a small number of banks and referred to the last quarter of 2008 instead of the entire semester.

In Table 1 we compare the number of intermediaries included in both the RBLIS and the BLS and provide a breakdown according to banks' business activity. The control group is particularly large and heterogeneous. Indeed, in the RBLIS, we can deal with 370 non-BLS banks, of which most are mutual banks. It must be noted, however, that most of the single intermediaries belonging to the banking groups involved in the BLS also participate in the RBLIS on an individual basis. In

particular, in the RBLs we have alternative information on supply and demand conditions for 69 BLS banks (most of which are listed banks) that can be used in the empirical analysis.

As for the construction of the dependent variable (the growth rate of loans to enterprises), the RBLs is carried out at the individual-bank level, meaning that the corresponding half-yearly growth rates of loans to enterprises are computed using non-consolidated bank-level data taken from the Bank of Italy's supervisory reports. The Eurosystem BLS instead addresses banking groups, implying that the corresponding quarterly growth rates are computed using the consolidated balance sheet items. In both cases, loans include repurchase agreements and non-performing loans, and are adjusted for the effects of securitization, reclassifications and other variations not due to transactions, notably mergers and takeovers. In the case of the RBLs, enterprises also include producer households.

It must be noted that the use of individual balance sheet information usually implies much more noise in the data. In Table 2 we report some descriptive statistics for the change in loans to enterprises for the two datasets used in the analysis. As for BLS banks, we observe that the standard deviation computed on the empirical distribution for the individual data is triple that of the distribution for the group-level information. In general, the dataset on an individual basis has more observations characterized by exceptional and maybe not genuine variations in the dependent variable, which may require accurate identification and treatment of the outliers when performing the estimated regressions for lending dynamics.

Figure 1 reports the annualized half-yearly growth rates of bank loans to enterprises for both our panels of banks and the overall Italian system. The pattern of credit dynamics for the banks in the two panels is very similar to that for the system as a whole, with no systematic differences over time. However, banks participating in the BLS reported a larger reduction in the growth rate of loans to enterprises, especially in the most acute phases of the financial crisis. As for the most recent developments, the contraction in lending is progressively attenuating for BLS banks, while sharpening slightly for the other banks.

3. Was the diffusion of the supply restriction different across BLS and non-BLS banks?

In this Section we provide a descriptive analysis to evaluate whether the supply restriction was distributed differently between banks participating in the BLS and those that do not. In Figure 2 we show the “net percentage” of banks that reported a tightening of credit standards, namely the difference between the number of banks reporting a tightening and those reporting an easing. In the

case of BLS banks, we report the supply and demand indicators stemming from both the BLS and the RBLs. For sake of comparison, we compute for each semester the simple average of the quarterly values recorded in the Eurosystem BLS.

Interestingly, for non-BLS banks we observe a more widespread restriction in credit supply over the entire sample period, with the exception of the peak of the sovereign debt crisis, as opposed to a smaller diffusion of banks reporting a reduction in loan demand. Based on this descriptive evidence, one would expect a downward bias of the estimated effect of a supply restriction on lending dynamics for the entire banking system from the use of only the Eurosystem BLS information.

It should be noted that, for BLS banks, the supply indicator computed on the RBLs information (the dashed red line) is, on average, lower than that observed in the Eurosystem BLS, with a marked discrepancy at the peak of the sovereign debt crisis. In general, we might expect the quality of the responses to be higher in the Eurosystem BLS than in the RBLs because the former has been conducted for a much longer period of time than the latter. However, an alternative explanation is that banks respond to the questionnaire on an individual basis in the RBLs, but via the holding company of the banking group in the Eurosystem BLS. This implies that the loan officer of the holding company, when providing a qualitative evaluation of the supply conditions for the entire banking group in the BLS, automatically extends its subjective assessment to all individual banks belonging to the group. If such a case, we should not observe any intra-group dispersion in the evaluation of supply conditions. To explore this issue, we compute the intra-group coefficient of variation for each BLS banking group and consider its average value across groups. Interestingly, as reported in Table 3, the average intra-group coefficient of variation is not null, also in the light of the relatively large number of individual banks belonging to BLS banking groups. We make a comparison with the dispersion characterizing the replies provided by the individual non-BLS banks. As expected the intra-group dispersion for BLS banks is lower. Therefore, it is unlikely that the intra-group heterogeneity may affect our main results.

In the following section we offer an evaluation of the information content of each survey regarding lending dynamics for BLS banks and compare the results stemming from regressions based on group-level information and information on an individual basis.

4. Heterogeneity in the estimated effect of a supply restriction on lending dynamics

In this Section we assess the information content of the survey indicators for the dynamics of loans to enterprises and evaluate whether the estimated effect of credit supply conditions on lending dynamics is different between banks participating in the BLS and banks that do not. For the former we perform an update of the estimates by Del Giovane, Eramo and Nobili (2011), while for the latter we are the first to evaluate part of the information content of the RBLS indicators.

4.1 Methodology

We carry out an econometric analysis on the information content of BLS and RBLS indicators for developments in loans to enterprises by estimating panel regressions of the following form:

$$\Delta loans_{(i,t)} = c + \alpha_i + \tau_t + \beta_1 Demand_{(i,t)}^{incr} + \beta_2 Demand_{(i,t)}^{decr} + \phi_1 Supply_{(i,t)}^{ease} + \phi_2 Supply_{(i,t)}^{tight} + \varepsilon_{(i,t)}$$

where the dependent variable is the annualized growth rate of lending granted by bank i to enterprises in the semester t . *Demand* and *Supply* indicate, respectively, the corresponding indicators of demand and supply conditions obtained from the BLS or, alternatively, from the RBLS. The surveys provide *qualitative* information on credit supply and demand. For supply conditions, banks can choose among the following responses: 1=“eased considerably”; 2=“eased somewhat”; 3= “broadly unchnaged”; 4=“tightened somewhat”; 5=“tightened considerably”. For demand, banks can choose among the following assessments: 1=“decreased considerably”; 2=“decreased somewhat”; 3= “broadly unchnaged”; 4=“increased somewhat”; 5=“increased considerably”. Figure 3 reports their empirical distribution for BLS and RBLS banks.

This qualitative information is used in the empirical investigation following the approach proposed by Del Giovane et al. (2011). In particular, $Demand_{(i,t)}^{incr}$ and $Demand_{(i,t)}^{decr}$ are defined as vectors of dummy variables, indicating, respectively, whether banks reported an increase/decrease in demand. $Demand_{(i,t)}^{incr}$ includes two dummies that take the value 1 if bank i at time t reported that firms’ demand increased “considerably” and “somewhat”, respectively, and zero otherwise. $Demand_{(i,t)}^{decr}$ includes two dummies that take the value 1 if bank i at time t reported that firms’ demand decreased “considerably” and “somewhat”, respectively, and zero otherwise. A similar structure applies to the supply indicators. $Supply_{(i,t)}^{tight}$ includes two dummies that take the value 1 if bank i at time t reported that credit standards applied to firms had been tightened “considerably” and “somewhat”, respectively, and zero otherwise. $Supply_{(i,t)}^{ease}$ includes two dummies that take the

value 1 if bank i at time t reported that credit standards had been eased “considerably” and “somewhat”, respectively, and zero otherwise.

The choice of dummy variables – rather than single variables for each indicator – helps to capture non-linearity in the estimated relations between the dependent variable and the regressors, which may be particularly significant in the case of the supply indicators. Both the supply and the demand indicators may enter with the contemporaneous or lagged value. The lag order was chosen on the basis of the fit of the regression.

The coefficient c is a general constant term and α_i are a set of bank-specific fixed effects to control for unobservable characteristics affecting both credit supply and demand,. The diagnostic tests do not provide clear-cut signals concerning the choice of fixed versus random effect estimator. However, we prefer to rely on the more conservative approach and hence use the fixed effect estimator. Finally, τ_t are a set of time dummies. The inclusion of time-specific fixed effects in the regression may be tricky as the structural interpretation of the results becomes less clear-cut. Del Giovane et al. (2011) found that time dummies mostly capture demand conditions related to the macroeconomic situation that change over time and affect all banks equally. However, time dummies may also absorb the influence of supply factors that affect bank loans equally across banks, e.g. a macroeconomic downturn that leads to a generalized increase in credit risk or a surge in sovereign risk that affect banks’ balance sheet conditions (Del Giovane et al., 2013). Eventually, time dummies also help in removing seasonal patterns from the dependent variable. Standard errors are adjusted for clustering across banks, which can be considered a more conservative approach when evaluating the statistical significance of the estimated coefficients.

4.2 BLS versus non-BLS banks

In this Section we assess the information content of the survey indicators for the dynamics of loans to enterprises and evaluate whether the estimated sensitivity of credit supply conditions to lending dynamics is different between banks participating to the BLS and banks that do not. For the former we perform an update of the estimates by Del Giovane et al. (2011) based on quarterly data from the BLS as well as regressions based on half-yearly information from the replies of individual banks to the RBLs. For the latter, only the information from the RBLs can be used in the analysis. The results for the estimated regressions are presented in Table 4. For the sake of comparison between estimated coefficients based on quarterly data and those obtained using half-yearly observations, the dependent variable is expressed in annualized terms.

We first discuss the estimated coefficients for the BLS banks based on quarterly data, which are reported in column (a). The results corroborate most of the previous findings in Del Giovane et al. (2011). In particular, the relationship between lending dynamics and the BLS supply indicators is highly asymmetric. The estimated coefficients suggest that responses of “tightened considerably” by all banks in the panel would be associated (with a one quarter lag) with a reduction in the q-o-q rate of growth of loans of more than 6.0 percentage points on an annual basis with respect to the growth rate that would have been observed in the same quarter had all banks left their credit standards unchanged. The effect of a “tightened somewhat” change in credit standards is also highly significant and very similar in magnitude. A Wald test suggests that we cannot reject the null hypothesis that “tightened somewhat” and “tightened considerably” are equal in magnitude. The coefficient for the “eased somewhat” dummy is not significant. No “eased considerably” response was never recorded in the quarterly BLS.

As to demand conditions, the various BLS indicators are not statistically significant. Like Del Giovane et al. (2011), we find that the role of the BLS demand factors declines considerably as time dummies are introduced in the estimated regression, reflecting the effect of the economic recession on credit demand. On the contrary, the magnitude of the estimated effects for BLS supply indicators is only marginally affected.

In column (b) we report the results of the same regression estimated over the period 2009-14 using the RBLS information for supply and demand conditions. The fit of the model worsens considerably and it seems difficult to detect significant estimated coefficients, especially for the supply indicators. In any event, the magnitude of the estimated effects for the variables capturing a tightening in credit standards is, in annualized terms, much smaller than that obtained with the quarterly BLS information. We checked whether the differences in the estimated coefficients were due to the use of a different and shorter sample period. In column (c) we report the estimated coefficients obtained by estimating regression (a) only over the period between the first quarter of 2009 and the second quarter of 2014. However, the estimated sensitivity of lending dynamics to the supply restriction is very similar to that obtained with the longer sample period, albeit with a higher uncertainty because of the limited number of observations. Based on this evidence we consider specification (a) the benchmark regression for BLS banks. In column (d) we present an alternative regression in which we assign the evaluation of the holding bank to all other banks belonging to the same banking group. The fit of the model dramatically worsens as also shown by the wrong signs for some indicators. Based on this evidence, specification (a) remains the best performing one.

We now discuss the estimated regression for non-BLS banks. Column (e) suggests that the RBLS indicators have significant explanatory power for the dynamics of loans to enterprises. The relationship between lending growth and the supply indicators is confirmed to be highly asymmetric. Only the variables capturing a “tightening” of credit standards enter significantly and with the expected sign; this finding is particularly interesting given that, unlike BLS banks, non-BLS banks have more frequently reported an easing of credit standards.

The estimated coefficients indicate that responses of “tightening considerably” by all banks in the panel would be associated with an immediate reduction in the half-yearly rate of growth of loans of about 1.6 percentage points on an annual basis, compared with the growth rate that would have been observed in the same semester had all banks left their credit standards unchanged. The estimated coefficients for a tightening with the “somewhat” qualification is about -1.2 percentage points. Therefore, the estimated sensitivity of lending dynamics to a supply restriction, as captured by the RBLS indicators, is about one-third of that estimated for BLS banks. Both the “eased somewhat” and the “eased considerably” dummy are not statistically significant, with the latter exhibiting an unexpected sign. Considering the different data frequency (half-yearly data in the RBLS as opposed to quarterly data in the BLS), the speed of transmission of the supply tightening appears to be similar for BLS and non-BLS banks as using the Eurosystem BLS data the effect is recorded with a lag of no more than one quarter.

As to demand conditions, both variables capturing “increased” and “decreased” demand are significantly related to credit dynamics, notwithstanding the inclusion of the time dummies, and the estimated effects are in general larger than for BLS banks. It is interesting to assess the different estimated coefficients for the “somewhat” and the “considerably” modalities. We do not find significant differences for the “decreasing” indicator while the estimated effect is tripled for the “considerably” modality when the “increasing” indicator is considered. An increase in demand with the “somewhat” qualification is associated with an increase in the contemporaneous half-yearly growth rate of loans of about 3.0 percentage points on an annual basis. A decrease in demand leads to a decline in the same rate of growth of about 1.2 percentage points on an annual basis.

All in all, we have evidence that the estimated sensitivity of lending dynamics to a supply restriction is larger for BLS banks than for non-BLS banks. As for the interpretation of this outcome, we acknowledge that it might reflect a different view of the concept of a tightening in credit standards for BLS and non-BLS banks.

4.3 Including the effects of the level of credit standards

It is worth noting that an alternative approach could be to include the cumulative levels of the BLS and RBLS indicators, rather than the indicators themselves. This definition would indeed be more consistent with a literal reading of the RBLS questions and answers, an important aspect that was pointed out by Del Giovane et al. (2011) in their discussion of the information content of the BLS. Given that the initial level of credit standards when the RBLS was launched is unknown, and that the BLS is a qualitative survey, accumulating changes in order to derive the current level of credit standards may be misleading. In addition, accumulating changes in credit standards to derive their level is particularly difficult owing to the fact that reported changes tend to exhibit a bias towards “tightening”, implying that cumulative changes have an upward trend.

Del Giovane et al. (2011) showed that the inclusion of the cumulative indicators provides unclear results or worsens the fit of the equations, arguing against following this alternative specification. On the contrary, a recent contribution for Dutch banks suggests that both versions of the BLS indicator have information content for business lending (see van der Veer and Hoerberichts, 2013). Finally, the April 2014 questionnaire of the euro-area BLS included, for the first time, an ad hoc question on the current level of credit standards as compared with the levels that have prevailed between the first quarter of 2003 (i.e. when the survey was launched) and the current level. Interestingly, in the first quarter of 2014, around 60 per cent of banks assessed their current level of credit standards for loans to enterprises as being tighter than the midpoint of the range of credit standards since 2003, but not at the maximum level. Moreover, as already noted, credit standards reflect bank specific guidelines, which may result in different interpretation of the same questions between BLS and non-BLS banks. This implies that the issue of the interpretation of the questions remains challenging and needs to be evaluated by means of econometric analysis.

To investigate this issue, we include both the cumulative level of credit standards and the cumulative level of demand as additional variables in the regressions. Results are reported in Table 5 and suggest that neither the level of demand nor the level of credit standards have marginal information content for lending dynamics. The same results are obtained by replacing the overall supply indicator with two interaction terms: one between the level of credit standards and a dummy for tightenings, and one interacted with a dummy for easings. This is true for both BLS and non-BLS banks.

5. Assessing the contribution of the supply restriction to the decline in lending

In this Section we assess the estimated contribution of the supply restriction on the dynamics of loans to enterprises for the entire banking system and offer an evaluation of the bias stemming from the use of the BLS-only information.

To this end, we perform an assessment exercise for both BLS and non-BLS banks. The estimated effects for the entire banking system are simply computed as the weighted average of the effects obtained for BLS and non-BLS banks with the weights reflecting the respective loan market share. The simulation is carried out using the estimated coefficients reported in columns (a) and (e) of Table 4 and the results are reported in Table 6.

If all BLS banks had left their credit standards unchanged from the first semester of 2009 to the first of 2014, the annualized growth rate of loans to enterprises would have been higher, on average, by 1.5 percentage points. In cumulative terms, the stock of loans to enterprises would have been higher by about 8.0 percentage points. This value is computed by weighting each bank according to its share in the total outstanding amount of loans issued by all banks in the panel. The corresponding effects for the non-BLS banks are estimated to be, respectively, -0.2 and -2.2 percentage points. The negative effect of the supply restriction on the growth rate of loans to enterprises for the entire banking system is estimated to be, on average, -1.0 percentage points, while the cumulative effect on the outstanding amount is about -6.0 percentage points.

These results suggest that the upward bias in the estimated effect of a supply restriction on the dynamics of loans to enterprises based on the BLS-only information is, on average, limited (0.5 percentage points on an annual basis). This outcome is due to the lower estimated sensitivity of lending dynamics to changes in credit standards for non-BLS banks. In cumulative terms, however, the upward bias in the estimated effect for the stock of loans would be 2.0 percentage points over the entire sample period, albeit heavily concentrated in the most acute phases of the crisis.

It is interesting to assess whether our results also reflect the fact that in computing the contributions of the credit supply we are weighting the effects according to banks' market share. On the right-hand side of Table 7 we report the simulated effects obtained without weighting the banks according to their market share (i.e. the same weight $1/N$ is assigned to each intermediary, where N is the number of banks). The results suggest that weighting the banks is not crucial. The bias from the use of the BLS-only information remains limited.

6. Conclusions and policy implications

In this paper we have provided evidence that, in the case of Italy, the estimated effect of a supply restriction on the short-term dynamics of loans to enterprises, as captured by the BLS indicators, is characterized by an upward but limited bias. Although the implications in terms of the estimated effect on lending dynamics over the entire period of the crisis are not negligible, the results all in all suggest that the BLS, albeit based on a relatively small panel of intermediaries, provides timely and useful information to policymakers about credit supply conditions for the entire Italian banking system.

The wide cross-section of the RBLS, however, can be particularly useful for the assessment of the supply conditions in specific segments of the Italian credit market, which can be important for financial stability purposes. Banks participating in the survey are more heterogeneous in their business activities, and thus in their balance sheet positions, than in the BLS. Unlike the BLS, the RBLS also provides disaggregated information on supply and demand conditions in different geographical areas and distinguished by sector of economic activity. We plan to evaluate the heterogeneity in the bank lending channel along these important dimensions in future research.

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TABLES AND FIGURES

Table 1. Number of intermediaries

	Banks according to their business model			
	Listed	Cooperative	Mutual	Total
	<i>Individual banks in the RBLS</i>			
non-BLS banks	92	25	253	370
BLS banks	66	3	0	69
Total	158	28	253	439
	<i>Banking groups in the BLS</i>			
	8	3	0	11

**Table 2. Descriptive statistics for
annualized changes in loans to enterprises
(percentage points)**

Statistics	BLS banks	BLS banks	non-BLS banks
	group-level data	individual data	individual data
	03q1-14q2	09h1-14h1	09h1-14h1
Minimum	-42.4	-42.1	-59.0
1%	-18.3	-24.9	-18.1
5%	-11.0	-12.5	-9.7
10%	-8.1	-9.6	-7.2
25%	-4.4	-5.5	-3.2
50%	1.1	-0.5	1.5
75%	8.2	4.7	7.2
90%	18.3	10.7	14.1
95%	23.4	15.7	20.1
99%	38.8	39.5	49.9
Maximum	62.5	460.3	903.1
Mean	2.8	1.2	3.6
Std. Deviation	11.5	22.5	23.3
Observations	351	577	3555

Notes: the table reports the summary statistics for the empirical distribution of annualized changes in loans to enterprises. For BLS banks we report the summary statistics based on quarterly group-level data as well as for half-yearly individual-level data. For non-BLS banks only, the summary statistics based on half-yearly individual-level data are reported.

**Table 3. Dispersion of banks' evaluation of credit supply conditions:
BLS vs. non-BLS banks**

	Average intra- group coefficient of variation for BLS banking groups	Number of individual banks in the banking groups			Coefficient of variation of non-BLS banks
		Average	Maximum	Minimum	
2009h1	0.17	11.92	21	4	0.22
2009h2	0.17	12.56	22	4	0.21
2010h1	0.11	12.42	22	4	0.20
2010h2	0.08	12.54	22	2	0.21
2011h1	0.14	12.25	21	4	0.23
2011h2	0.14	12.83	22	4	0.25
2012h1	0.14	13.27	22	2	0.22
2012h2	0.09	11.43	19	2	0.21
2013h1	0.10	10.86	18	2	0.22
2013h2	0.10	10.90	18	2	0.22
2014h1	0.11	11.10	18	2	0.20

Notes: Banks' replies about the evaluation of credit supply conditions are coded as described in Section 4.1.

Table 4. Regressions for the growth rate of loans to enterprises

Dependent variable: annualized growth rate of lending in period t					
Sample of banks:	BLS banks	BLS banks	BLS banks	BLS banks	non-BLS banks
Type of information:	group-level data	individual data	group-level data	individual data	individual data
Sample period:	03q1-14q2	09h1-14h1	09q1-14q2	09h1-14h1	09h1-14h1
	(a)	(b)	(c)	(d)	(e)
Changes in credit demand					
Increased "considerably"		21.31 *			11.25 ***
		(11.31)			(1.81)
Increased "somewhat"	1.74	1.54	-0.14	-7.33 ***	3.09 ***
	(1.08)	(1.47)	(0.35)	(1.70)	(0.63)
Decreased "somewhat"	0.50	-3.46 ***	0.02	-3.02 *	-1.19 ***
	(0.30)	(1.19)	(0.37)	(1.53)	(0.44)
Decreased "considerably"	1.48	-2.88	-0.01	-2.93	-0.66
	(2.72)	(2.23)	(0.99)	(3.27)	(0.62)
Changes in credit standards					
Tightened "considerably"	-6.27 ***	-4.00	-6.21	1.35	-1.61 **
	(1.56)	(6.95)	(4.46)	(2.62)	(0.73)
Tightened "somewhat"	-6.20 ***	-1.61	-4.86 **	-3.54 ***	-1.17 ***
	(1.78)	(1.14)	(2.04)	(1.25)	(0.40)
Eased "somewhat"	6.51	-2.06	9.07	3.73 **	0.93
	(4.42)	(1.80)	(5.92)	(1.47)	(0.99)
Eased "considerably"					-11.99
					(8.95)
Bank fixed effects	yes	yes	yes	yes	yes
Time fixed effects	yes	yes	yes	yes	yes
Observations	340	577	176	577	3170
Banks	11	68	8	68	353
R-squared	0.47	0.18	0.41	0.15	0.20

Notes: All variables are included with contemporaneous values except for the variables capturing changes in credit standards in specification (a) and (c), which are included with a 1-period lag. Column (d) has the same specification of column (b) but we assign the replies provided by the holding bank to all other banks belonging to the same group. Robust standard errors, clustered by bank, in parentheses. Statistical significance: *** 1%, **5%, *10%.

Table 5. Regressions for the growth rate of loans to enterprises including the cumulative level of supply and demand conditions

Dependent variable: annualized growth rate of lending in period t				
	BLS banks		non-BLS banks	
	03q1-14q2 (a)	03q1-14q2 (b)	09h1-14h1 (c)	09h1-14h1 (d)
Level of credit standards	0.42 (0.42)		1.40 (1.19)	
Level of credit standards*Tightening		-0.24 (0.64)		-0.14 (0.21)
Level of credit standards*Easing		-3.44 (2.83)		0.61 (1.00)
Level of credit demand	-0.11 (0.21)	-0.09 (0.22)	0.67 (0.62)	0.66 (0.62)
Changes in credit demand				
Increased "considerably"			10.65 *** (1.92)	10.58 *** (1.92)
Increased "somewhat"	1.55 (1.16)	1.30 (1.21)	2.43 ** (1.00)	2.42 ** (1.00)
Decreased "somewhat"	0.11 (1.13)	-0.05 (1.07)	-0.53 (0.57)	-0.52 (0.57)
Decreased "considerably"	1.07 (3.12)	1.15 (3.13)		
Changes in credit standards				
Tightened "considerably"	-6.42 *** (1.65)	-8.20 ** (2.73)	-3.10 ** (1.43)	-1.46 ** (0.75)
Tightened "somewhat"	-5.90 ** (1.89)	-6.33 *** (1.99)	-2.66 ** (1.29)	-1.05 *** (0.43)
Eased "somewhat"	7.02 (4.11)	9.23 ** (4.11)	1.02 (0.99)	0.48 (1.13)
Eased "considerably"			-11.43 (8.42)	-12.57 (9.08)
Bank fixed effects	yes	yes	yes	yes
Time fixed effects	yes	yes	yes	yes
Observations	340	176	3170	3170
Banks	11	11	353	353
R-squared	0.47	0.47	0.20	0.20

Notes: All variables are included with contemporaneous values except for the variables capturing changes in credit standards in specification (a) and (b), where they are included with a 1-period lag. Robust standard errors, clustered by bank, in parentheses. Statistical significance: *** 1%, **5%, *10%.

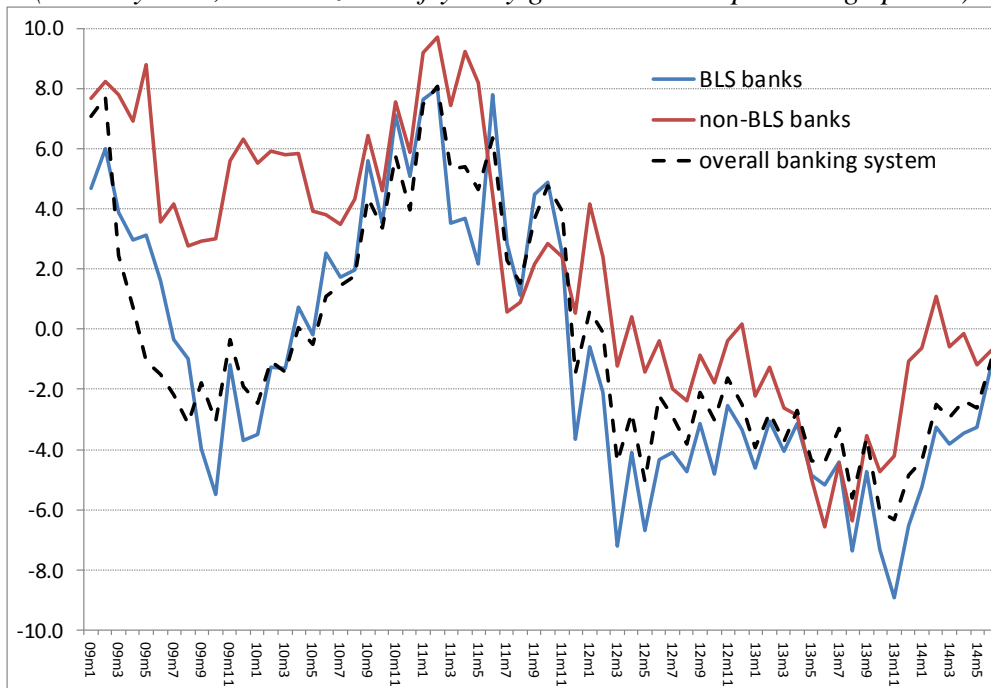
Table 6. Estimated contributions of the supply restriction to the annualized half-yearly growth rate of loans to enterprises
(percentage points)

	using a weighting scheme			not using a weighting scheme		
	banks in the BLS	banks not in the BLS	all banks	banks in the BLS	banks not in the BLS	all banks
2009h1	-4.6	-0.2	-3.1	-4.3	-0.5	-3.0
2009h2	-1.0	-0.2	-0.7	-1.2	-0.4	-0.9
2010h1	-0.2	-0.1	-0.2	-0.4	-0.3	-0.4
2010h2	-1.0	-0.1	-0.7	-1.2	-0.3	-0.9
2011h1	-0.9	-0.3	-0.7	-0.8	-0.6	-0.7
2011h2	-1.6	-0.3	-1.1	-2.3	-0.6	-1.7
2012h1	-3.4	-0.2	-2.3	-3.5	-0.5	-2.5
2012h2	-1.4	-0.2	-1.0	-2.0	-0.4	-1.4
2013h1	-0.5	-0.3	-0.4	-0.8	-0.5	-0.7
2013h2	-1.2	-0.2	-0.8	-1.6	-0.4	-1.2
2014h1	-0.4	-0.1	-0.3	-0.8	-0.2	-0.6
average	-1.5	-0.2	-1.0	-1.7	-0.4	-1.3
cumulative	-8.1	-2.2	-6.2	-9.4	-2.3	-7.1

Notes: “Using a weighting scheme” means taking into account the relative importance of each intermediary in the system, as captured by the fraction of the outstanding amount of loans to enterprises granted by the single intermediary over the total issued by all banks in the panel; “not using a weighting scheme” means assigning the same weight to each intermediary ($1/N$) where N is the number of intermediaries. For “all banks” the estimated effects are computed summing up the effects for “BLS banks” and “non-BLS banks”.

**Figure 1. Loans to non-financial corporations:
BLS vs. non-BLS banks**

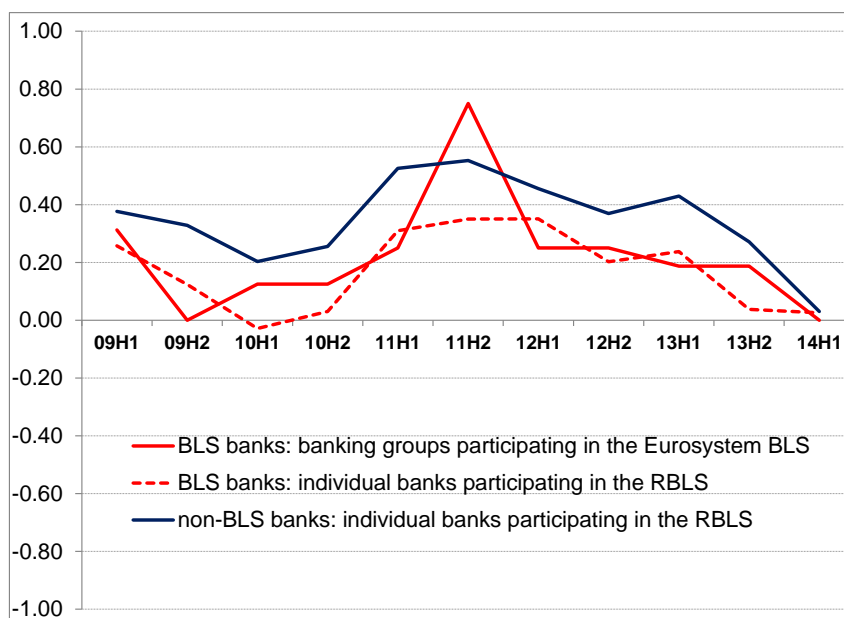
(monthly data; annualized half-yearly growth rates in percentage points)



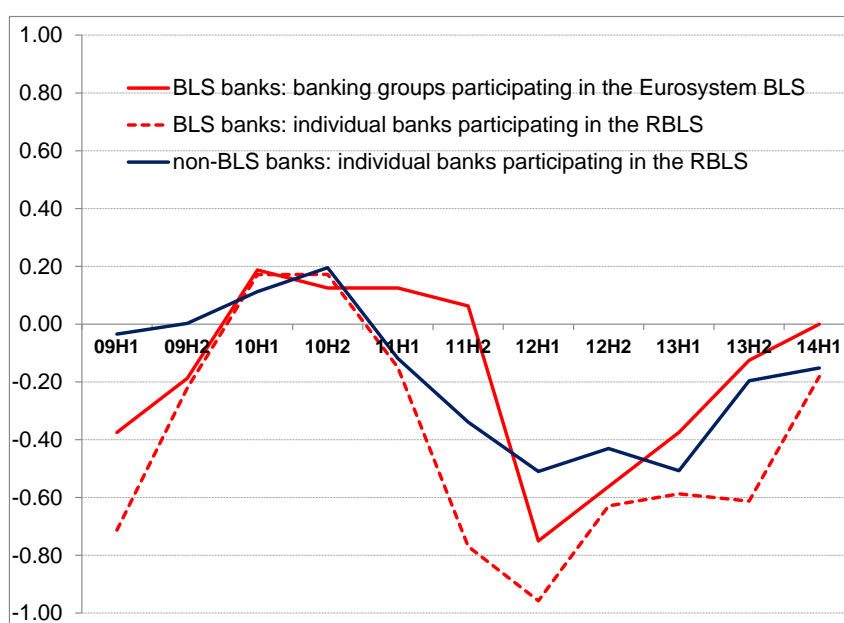
Source: Authors' calculations based on Bank of Italy data.

**Figure 2. Indicators of supply and demand conditions:
BLS vs. non-BLS banks**
(half-yearly data; “net percentages”)

a) Supply indicators



b) Demand indicators

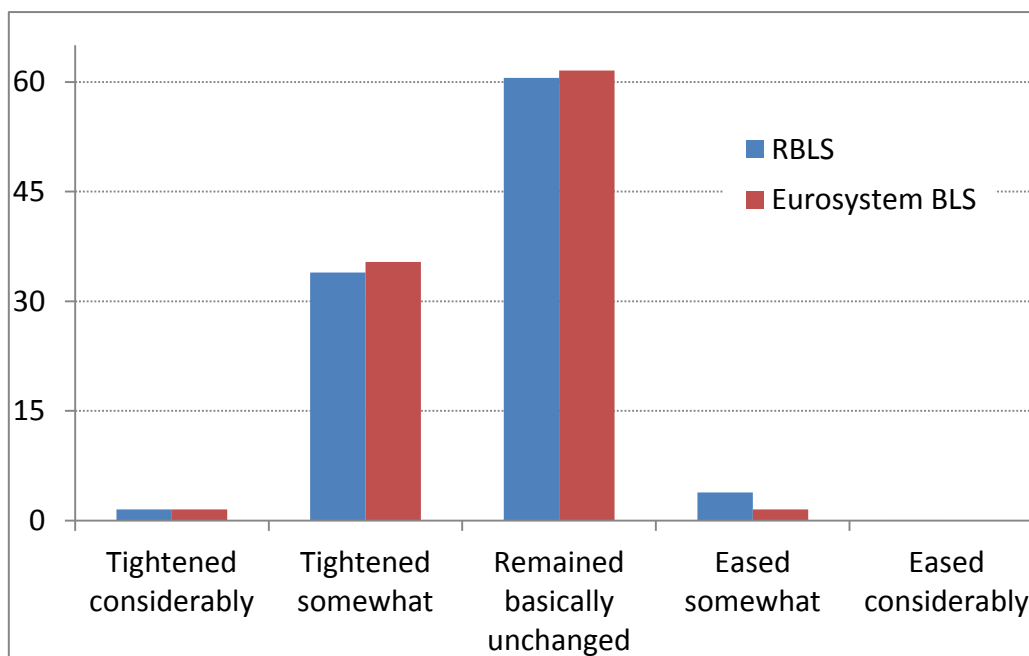


Source: Authors’ calculations based on Bank of Italy data.

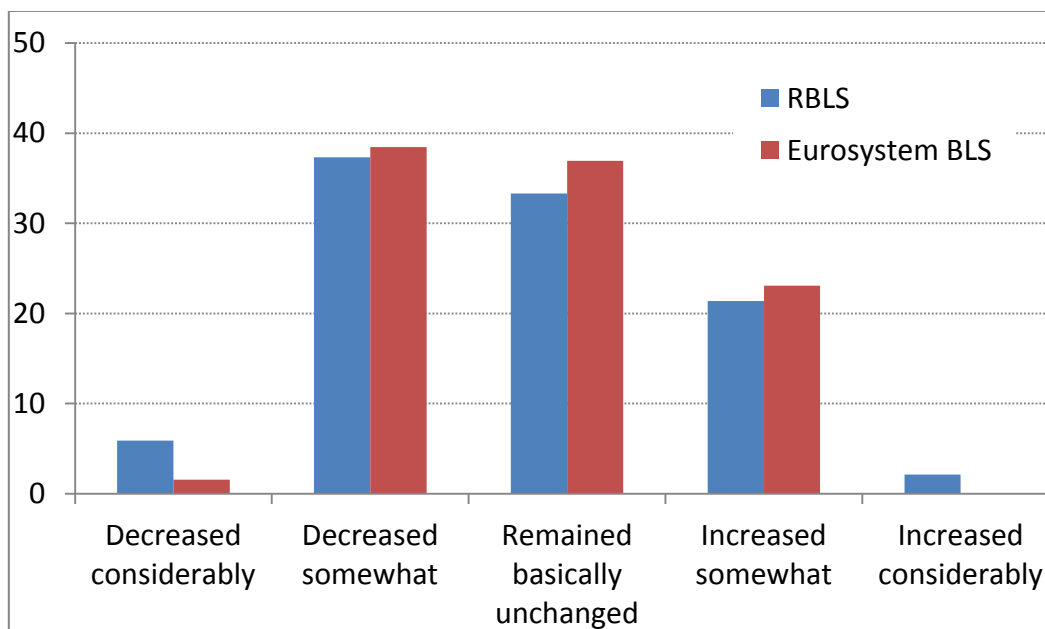
Notes: Positive (negative) values of the supply indicators reflect a supply tightening (easing); positive (negative) values of the demand indicators reflect an increase (decrease) in demand. The supply and demand indicator for “banking groups in the BLS” are simple averages of quarterly values.

Figure 3. Empirical distributions of banks' replies for supply and demand conditions: BLS vs. RBLS
(half-yearly data; frequency of responses, percentages with respect to total)

a) Supply conditions



b) Demand conditions



Source: Authors' calculations based on Bank of Italy data.

Notes: The empirical distributions are computed on the basis of half-yearly data for the period 2009h1-2014h1. For Eurosystem BLS we consider simple averages of quarterly data.