

Notes on Financial Stability and Supervision

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Do high levels of NPLs impair banks' credit allocation?¹

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1. Introduction and main conclusion

Recently, various commentators have argued that high NPL stocks can limit banks' lending ability, impairing the monetary policy transmission mechanism.²

This note looks at some facts on the relationship between NPLs and credit growth, and summarizes some recent empirical results, casting doubts on this thesis. In a nutshell, it seems to have no strong foundation, either on theoretical or on empirical grounds.

NPLs are relatively opaque, difficult to value, and therefore illiquid; also, they typically do not yield a steady return; thus, other things equal, banks with large NPL holdings are less profitable, and pay a risk premium on capital and liquidity markets. Indeed, the Single Supervisory Mechanism has taken various steps to foster a reduction of NPLs, with very good results. This note argues that the current debate on NPLs features many reasons to reduce the stock of NPLs in banks' balance sheets, but that not all of them are well-grounded ones.

1 I wish to thank for useful comments Piergiorgio Alessandri, Marcello Bofondi, Luisa Carpinelli, Alessio De Vincenzo, Inés Drummond, Fergal McCann, Fabio Panetta, Enrico Sette. Any errors are my own.

2 For instance, the European Stability Mechanism argues that "Excessive post-crisis NPL stocks curtail banks' lending capacity" (2015 Annual report, p. 42). M. Obstfeld recently stated that "... the NPLs stock remains high, and NPLs limit new lending, are themselves a source of credit crunch." (Presentation of the October 2017 IMF WEO). D. Nouy recently argued that "... NPEs keep banks from providing loans to the economy, which is unfortunate at a time when the economy needs to recover." ("Regulatory and supervisory responses in Europe to the current financial environment" speech at the High-level meeting on global and regional supervisory priorities, Basel, 18 October 2017).

2. NPLs and credit growth: is there a theory?

There is no theory directly relating NPL stocks and credit growth.

I could not find any theoretical paper laying out an explicit direct causal channel between volumes of NPLs and the credit allocation mechanism. The ECB Bank Lending Survey (a survey on credit conditions among the main euro-area banks) offers useful insight into this issue.³ Banks are asked inter alia to rank the following drivers of their decision to tighten/ease credit supply: cost of funds and balance sheet constraints (sub-items: capital position; ability to access market financing; liquidity position); risk perception of borrowers (sub-items: general economic situation and outlook; industry or firm-specific situation and outlook; risks associated with collateral); pressure from competition (sub-items: from other banks; from non-banks; from market financing); risk tolerance. Interestingly, the list of these factors does not include a high incidence of NPLs as a possible determinant of credit supply, confirming that the effect of this factor is indirect.

The link between NPLs and credit is indirect.

As acknowledged in the BLS survey questionnaire, NPL stocks can influence the credit supply indirectly, via a cost of funds/capital channel: NPLs are opaque and difficult to value, hence a bank saddled with high NPL levels will be perceived as relatively risky, and may experience difficulties accessing liquidity and capital markets. A separate channel is that the yield on NPLs is typically zero (when an interest is received it typically goes out to increase provisions). Other things equal, these mechanisms will be reflected in a bank's lending supply. The argument is correct, but it works only if the bank is perceived as weak. Either channel, may be dampened, or neutralized altogether, if the bank is sufficiently profitable and/or capitalized. Furthermore, this argument is not specific to NPLs: similar problems should be experienced by a bank that is heavily exposed to assets with similar features (high opacity and valuation uncertainty, low liquidity and yield, such as certain Level 2 and Level 3 assets)⁴, or that has some other publicly known important weakness (e.g. governance).

High NPLs can also induce higher lending.

Furthermore, weak balance sheets could in principle induce banks to lend more, rather than less, following a “gamble for resurrection” type of logic. Risk shifting has been identified as a key incentive for banks to invest in risky bonds during the European sovereign debt crisis;⁵ high NPLs could in principle create a similar incentive for banks to increase the overall supply of (potentially but not necessarily misallocated) credit to firms.

Zombie lending and NPLs are two related but separate problems.

Much of the support to the view that a high stock of NPLs can impair the credit allocation mechanism originates from Japan's lost decade. The idea is that banks trying to keep “zombie firms” afloat will be prevented from lending to healthy firms, misallocating credit and generating negative consequences on economic growth.⁶ However, the focus of this literature is on ailing firms, and not on NPLs per se.

3 See https://www.ecb.europa.eu/stats/ecb_surveys/bank_lending_survey/html/index.en.html.

4 See Roca, Potente et al, “Risks and challenges of complex financial instruments: an analysis of SSM banks”, Banca d'Italia Occasional papers, no. 417, December 2017.

5 See for instance Acharya V.V., and Steffen S., 2015, “The “greatest” carry trade ever? Understanding eurozone bank risks”, *Journal of Financial Economics*, 115(2), 215-236; Altavilla C., Pagano M. and S. Simonelli, 2017, “Bank Exposures and Sovereign Stress Transmission”, *Review of Finance*, 21(6), 2103-2139; and Farhi E. and J. Tirole, “Deadly Embrace: Sovereign and Financial Balance Sheets Doom Loops”, *Review of Economic Studies*, forthcoming.

6 See e.g. Caballero, Hoshi and Kashyap 2008, *Zombie Lending and Depressed Restructuring in Japan*, *American Economic Review* 2008, 98:5, 1943-1977.

NPLs include loans to borrowers that are still a going concern and can, if properly managed, go back to a performing status, as well as loans to firms in bankrupt, that are no longer active. While in principle there is a market for both types of NPLs, de facto most transactions so far have involved loans to gone concern borrowers (bad loans, or “sofferenze” in Italian jargon). In this market, buyers typically acquire a stake in a judicial or extra-judicial insolvency procedure, and make money by specializing in the recovery process, which generally involves acquiring, restructuring and selling the collateral. Getting banks to sell NPLs to bankrupt firms does not free them from ailing firms.

Getting rid of zombies can kill ailing but solvent firms.

Selling NPLs pertaining to ailing firms would eliminate the zombie lending problem. However, since sources of external finance alternative to banks are still underdeveloped in the EU, the NPL sale could trigger the bankruptcy of all ailing firms – the zombies as well as the firms with a potential to recover. Evidence available at the Bank of Italy suggests that a non-negligible share of NPLs granted to ailing (but not yet bankrupt) firms goes back to performing status after some time.

In sum, the literature on zombie lending can hold lessons for the NPL problem, but addresses a distinct phenomenon. How to maximize the share of ailing firms that go back to performing status is a key policy issue, which goes beyond the purpose of this note. However, good NPL policies should be about maximizing the “cure rate”, not about getting rid of NPLs at all costs.

Getting rid of NPLs absorbs profits, or capital.

A version of the argument used by advocates of fast reduction of the NPL stock is that NPLs consume capital, reducing banks’ ability to lend.⁷ This argument overlooks the fact that NPLs sales on the market – de facto the only way to effect a rapid reduction of the stock – typically takes place at prices that are much lower than the book value.⁸ This generates a loss that more than offsets the positive effect on capital ratios generated by the reduction of RWAs. This mechanism applies, with due qualifications, to banks employing the standard method as well as to those under IRB. Thus, NPLs sales – rather than NPL stocks – could weaken the supply of credit.

In sum, the link between NPLs and credit dynamics is an indirect one, working through the negative effects of NPLs on profitability, and on the cost of liquidity and capital. While these effects are sufficient to warrant the current strong policy focus on NPL reduction, a serious theoretical analysis of the relationship between NPLs stocks and credit dynamics seems missing. The empirical evidence, to which we turn next, is also relatively scarce, and does not provide clear-cut conclusions.

7 For instance, Aiyar et al. argue that “High NPLs tie up bank capital that could otherwise be used to increase lending, reduce bank profitability, and raise funding costs, thereby dampening credit supply” (A Strategy for Resolving Europe’s Problem Loans, IMF Staff discussion note, 2016).

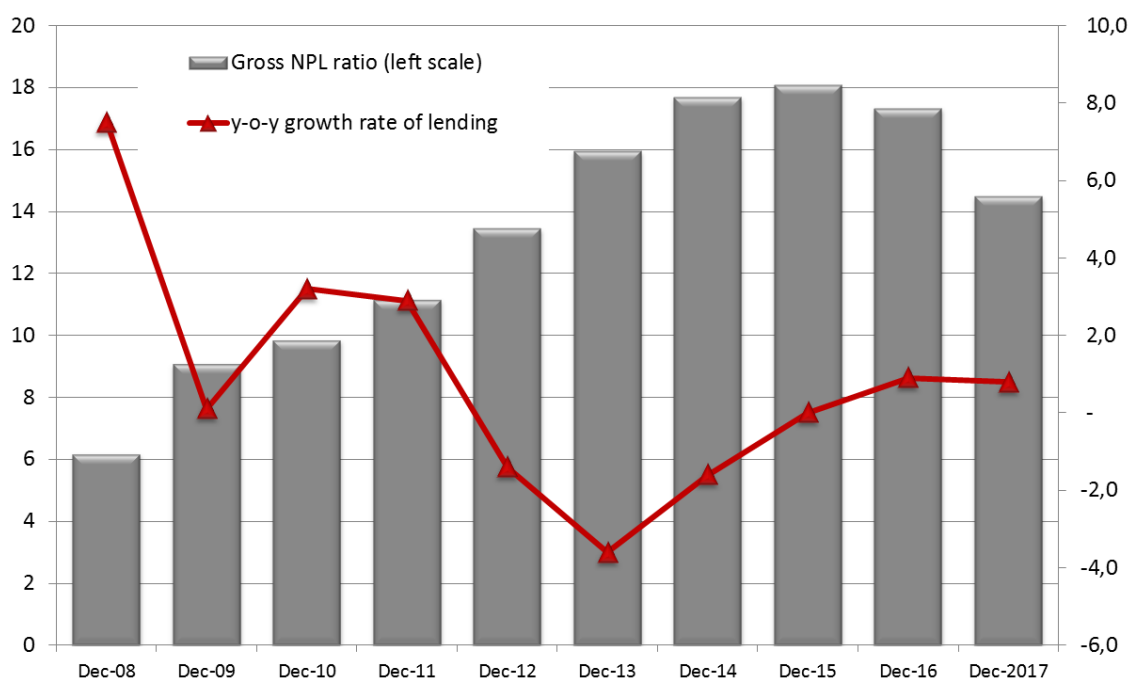
8 This happens for various reasons and does not imply that book values are inflated. See Ciavoliello et al., “What’s the value of NPLs?” Bank of Italy, Notes on Financial Stability and Supervision, No. 3, 2016; Ciocchetta et al., “Bad loan recovery rates”. Bank of Italy, Notes on Financial Stability and Supervision, No. 7, 2017.

The negative correlation between NPLs and credit growth can be spurious.

3. Some graphical evidence

The stock of NPLs of Italian banks began to increase with the global recession, in 2008-09, and peaked in 2015 (Fig. 1). In 2016-2017 the trend reversed, reflecting the cyclical improvement and several large sale operations. The figure also shows a coarse negative correlation between the stock of NPLs and the growth rate of credit to the private sector (households and non-financial firms) over the 2008-2016 period. However, such correlation does not warrant conclusions about causality. Identification is a key issue: NPLs rise in countries and periods where economic activity, and hence credit, stagnates or contracts.

Figure 1 – NPLs of Italian banks and bank lending to the private sector
(share of NPLs over outstanding loans; growth rate of bank lending; percentage points)



Source: Bank of Italy.

Note: Data for 2017 are provisional. The private sector includes households and non-financial firms.

Credit contraction could be driven by weak demand, in turn caused by reduced investment opportunities during the downturn; alternatively, it could be due to a physiological supply shift due to the deterioration in borrowers' creditworthiness.

Credit growth clearly reflects demand factors ...

Figure 2 relates credit growth over the 2008-2017 period (the same data as in figure 1, displayed here at a higher frequency) to two proxies of credit demand. Panel (a) looks at an indicator computed from the Bank Lending Survey (BLS). Participating banks are asked to assess changes in the demand for credit by the private sector, relative to the previous quarter. The answers are aggregated in a diffusion index, which expresses the net percentage of banks that declare they are facing an increase

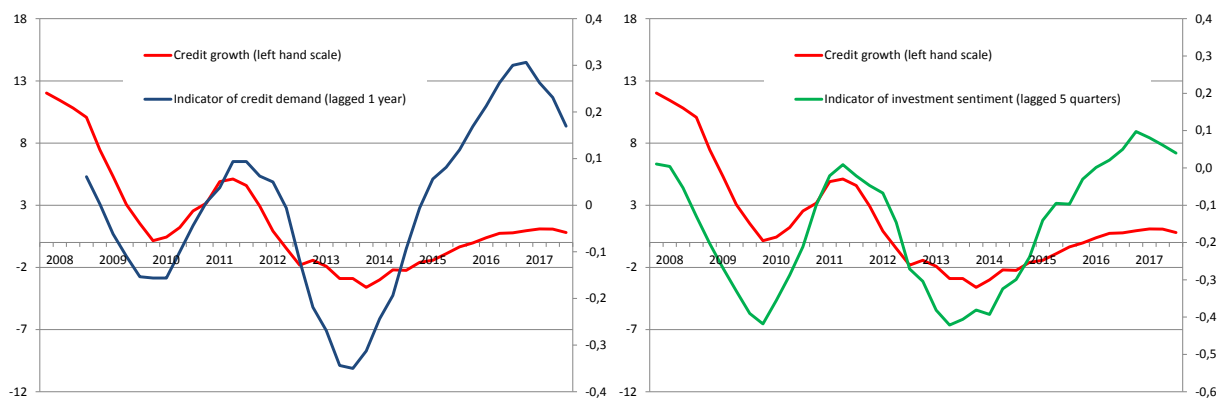
or a decrease in demand. Thus, positive (negative) values of the index indicate a perceived increase (decline) in credit demand.

Figure 2 – Credit growth and indicators of credit demand by the private sector

(y-o-y growth rate in percentage points; diffusion indexes)

(a) Indicator of credit demand from the BLS

(b) Indicator of firms' investment sentiment



Source: Bank of Italy for credit growth; Bank Lending Survey (BLS) for the indicator in panel (a); survey on inflation and growth expectations (Banca d'Italia-Sole 24 Ore) for the indicator of investor sentiment in panel (b).

Note: The indicator of credit demand in panel (a) is a diffusion index. It is computed as the number of banks which declare an increased demand for credit minus the number of those which declare a decline, as a ratio to the total number of banks participating in the Bank Lending Survey, and therefore it represents the banks' own assessment of credit demand by the non-financial private sector. The indicator of investment in panel (b) is also a diffusion index, giving the net share of firms who perceive an improvement (+) or a deterioration (-) of conditions for investing. Five-quarters centered moving averages for each indicator are shown.

... such as investment sentiment of non-financial firms...

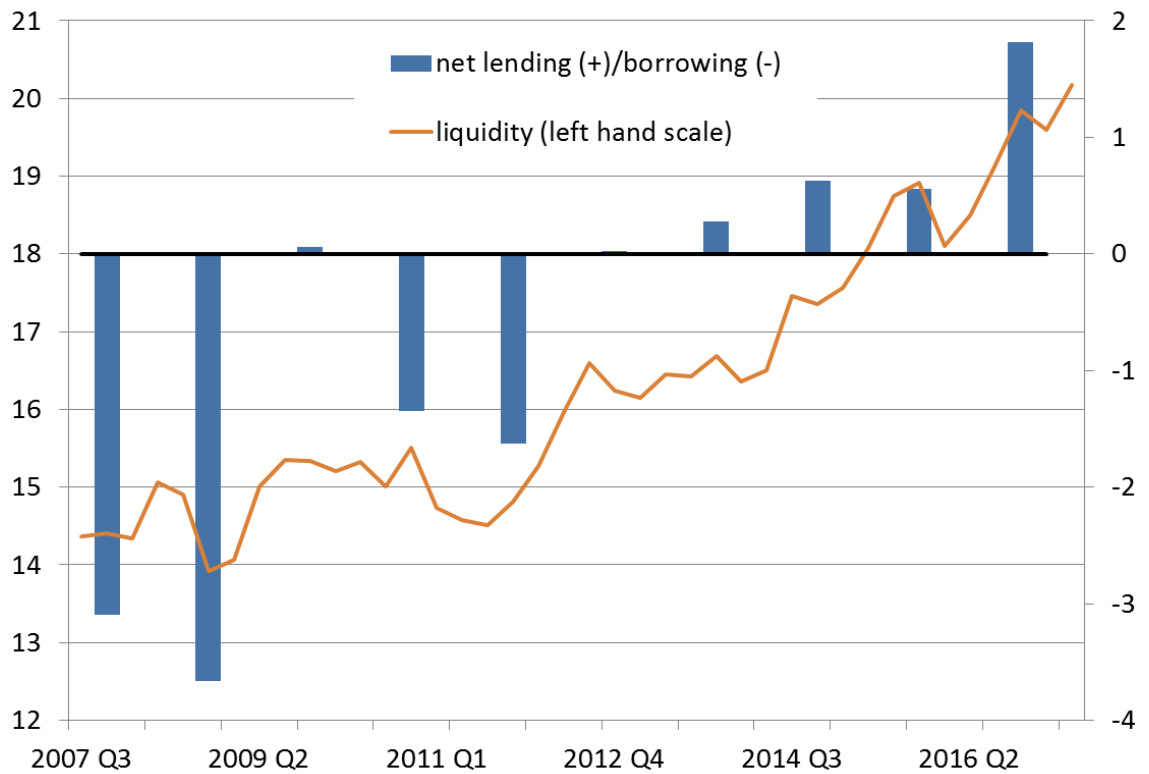
Panel (a) clearly shows a positive correlation between the BLS indicator of credit demand and credit growth. Note that the demand indicator is lagged: its movements lead credit growth by about one year. Panel (b) reports an alternative proxy of credit demand, a diffusion index derived from a survey among non-financial firms, that are asked the question: “In your perception, relative to the previous quarter, conditions for investing have improved, remained broadly stable or deteriorated?”. In this case as well, strong comovements between firms' investment sentiment and credit growth emerge. In this case as well, the indicator leads credit expansion, suggesting that investment dynamics are a determinant of credit growth.

... and their ample liquidity position.

Yet another indication that credit growth is likely driven by demand factors is presented in fig. 3. The figure reports the net financial position of Italian non-financial firms over the crisis period. The sector was a net debtor until 2012, and then moved to a strong creditor position in subsequent years. The figure also shows that a measure of firms' liquidity (cash and deposits) recorded a steady growth over the period, from 14 to 20 percent of GDP. These facts suggest that in recent years non-financial firms decided to reduce borrowing also because investment opportunities were modest and they were awash with cash.

Figure 3 – Liquidity and net financial position of non financial firms

(percentage points, as a ratio to GDP)



Source: Bank of Italy.

Summing up, this evidence is in line with the hypothesis that demand factors have played an important role in explaining the subdued credit growth observed in Italy in recent years.

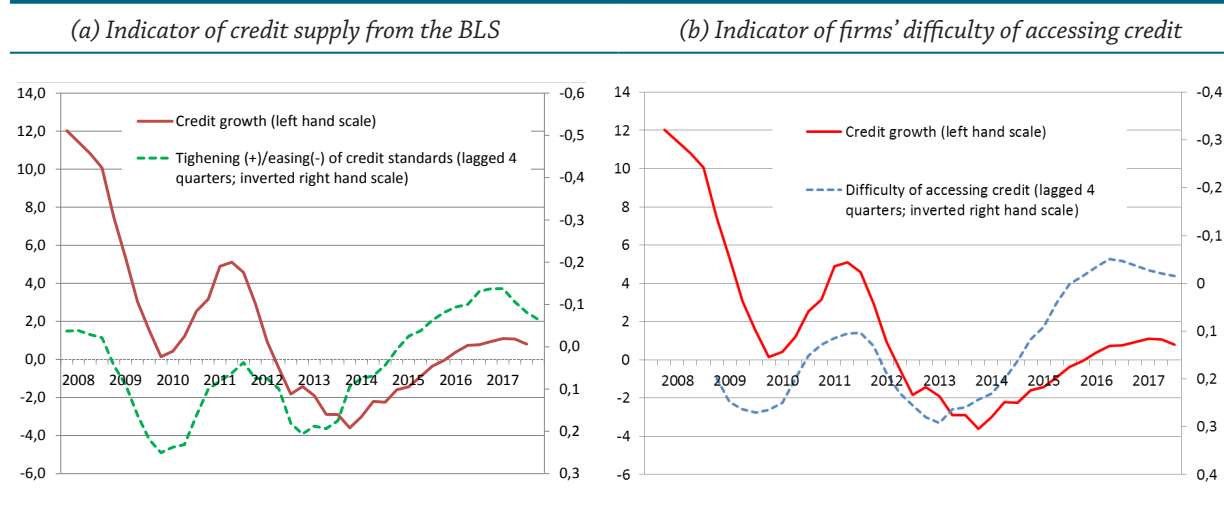
Credit dynamics also reflects supply factors.

What about supply factors? A measure of supply conditions is available in the BLS. Respondent banks are required to tell whether they tightened, leaved unchanged or loosened their conditions for access to credit, relative to the previous quarter. The usual diffusion index gives the net percentage of banks that implemented a tightening (positive values of the index), or a loosening (negative values) of credit conditions. The indicator is in fig. 4.a, together with the time series of credit growth already seen in previous figures. The indicator leads credit growth by 4 to 6 quarters; it indicates that, in the banks' view, supply conditions have been gradually loosened since 2012, and have been very easy in a historical perspective for the last two-three years. This stands in sharp contrast with the fact that the stock of NPLs peaked in these very years.

Figure 4.b reports an alternative indicator of credit supply, derived from a survey among non-financial firms conducted by ISTAT (the Italian central statistical office). Firms are asked whether their access to bank credit has

become more difficult, unchanged or easier, relative to the previous quarter. The usual diffusion index is then computed. This indicator is important because it allows to check the evidence stemming from the BLS, which could be biased (in their answers to the survey, banks could blame weak demand for slow credit growth, to hide their restrictive credit policies). The behavior is very similar to the supply indicator in panel (a). In particular, two results are confirmed: first, turning points in credit growth are anticipated by about 4 quarters, with the exception of the last one; second, credit conditions have been historically easy in the last two-three years.⁹

Figure 4 – Indicators of difficulty of accessing bank credit by the private sector
(percentage points; diffusion indexes)



Source: Bank of Italy for credit growth. Bank Lending Survey (BLS) for the indicator in panel (a). ISTAT for the indicator in panel (b).
Note: The BLS indicator in panel (a) is a diffusion index (see footnote to figure 2). The Difficulty of accessing credit in panel (b) is also a diffusion index (number of firms that declare increasing difficulties of accessing bank credit, minus the number of those perceiving easier conditions, as a ratio to the overall number of firms in the sample), obtained via a sampling survey among non-financial firms. Five quarters centered moving averages of both indexes are shown.

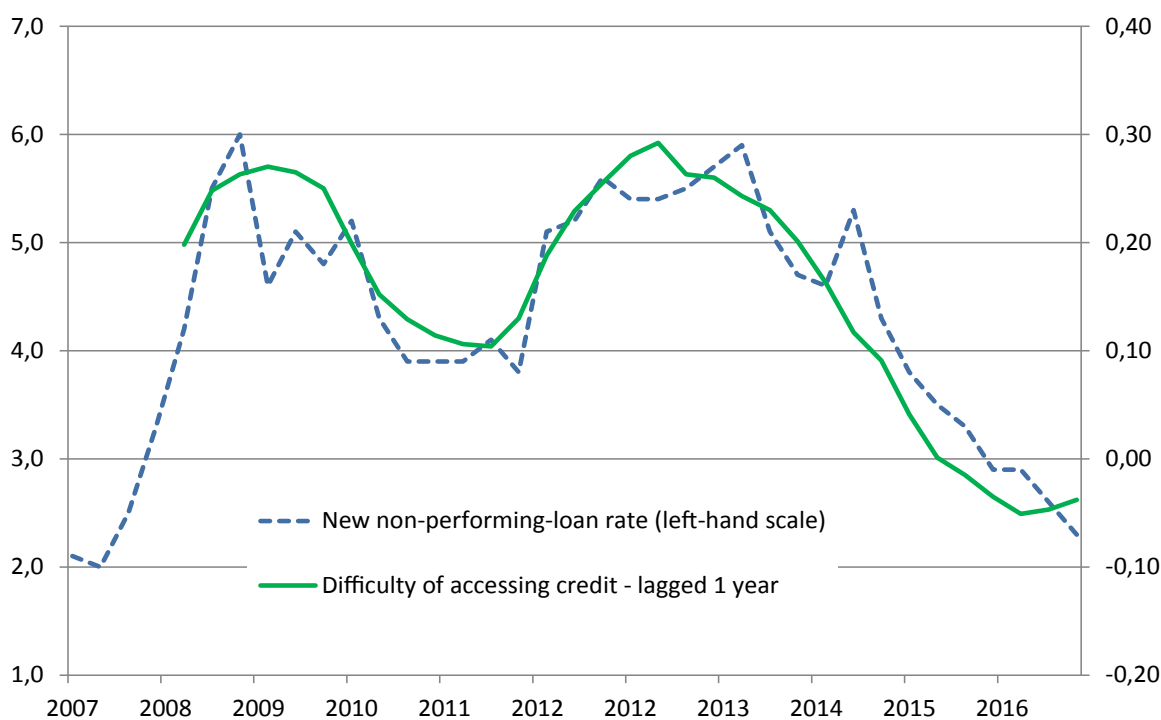
Overall, figures 2 through 4 suggest that demand as well as supply factors play an important role in determining credit dynamics, and that in recent years Italian banks have radically loosened credit conditions. This does not square well with the view that a high stock of NPLs impairs access to credit. Comparison with figure 1 shows that there is no positive correlation between the indicator of credit tightness and the stock of NPLs. The stock peaked in 2015-2016, at a time when firms' perceived lending constraints were at a historical minimum.

⁹ A breakdown of the ISTAT indicator by firm sector and size is available in the Bank of Italy Economic Bulletin (see e.g. issue no 4, 2017, box on pp. 32-33). Altogether, the trends in the various sectors are similar. Difficulties in accessing credit are relatively more pronounced in the construction sector, and among small firms; they have been at historically low levels for all size classes since 2015. A breakdown by firm's condition is not readily available; however, evidence in several recent issues of the Bank of Italy Financial Stability Report suggests that more vulnerable firms still face relatively strong difficulties in accessing credit (most bank credit goes to the less risky firms; see e.g. issue no. 2, 2016, box "Firms financial vulnerability and the allocation of credit"). Incidentally, this suggests that zombie lending is not a key problem.

Credit rationing leads new NPLs by about 1 year.

Fig. 5 relates the indicators of difficulty to access credit (displayed in figure 4.b in inverted scale) to the flow of new NPLs. Strong comovements between lagged lending constraints and the flow of NPLs are readily apparent. The lag is about one year, as for previous indicators. In other words, the figure indicates that the percentage of firms declaring difficulties in accessing credit is an excellent leading indicator of the flow of NPLs. The correlation between the two series is 0.83. This evidence is not consistent with the view that NPLs – stocks or flows – play a causal role in the credit supply mechanism. An interpretation of figure 5 could be the following: seeing a deterioration (improvement) in the economic outlook, banks begin to tighten (loosen) credit conditions; about a year later, as the economy deteriorate/improves, the flow of NPLs follows suit.¹⁰

Figure 5 – NPL flow and difficulty of accessing bank credit by non-financial firms
(percentage points; diffusion index)



Source: ISTAT for the indicator of difficulty of accessing bank credit. Bank of Italy for the new NPL rate.

Note: The new NPL rate is computed as the ratio between the value of new loans entering the NPL status in a given quarter and the stock of loans at the beginning of the quarter, annualized. See footnote to figure 4 for the Difficulty of accessing credit.

Summing up, this evidence is not in line with the view that a high stock of NPLs can impair banks' capacity to issue credit to the economy. Instead, it suggests that difficulties in accessing credit by non-financial firms are a powerful leading indicator of the flow of new NPLs.

¹⁰ This interpretation begs the issue of reverse causality (the tightening could per se exacerbate the downturn), which would deserve a thorough analysis.

The relationship NPL stocks-credit growth is not well-established empirically either.

4. A (very partial) summary of some recent econometric evidence

The empirical literature on the relationship between NPLs and credit dynamics is not overly developed. Accornero et al. study the influence of NPLs on the supply of bank credit to non-financial firms.¹¹ They review several papers on the issue and argue that identification problems are pervasive. To address these problems they employ an extensive dataset on borrower-level loans in Italy between 2008 and 2015, using time-varying firm fixed effects to control for shifts in demand and changes in borrower characteristics. They find that, although the exogenous emergence of new NPLs and higher provisions can reduce the supply of credit, the NPL ratios *per se* have no impact on the banks' lending behavior. In particular, firms with active relations with more than one bank were treated in the same way by their lenders irrespective of their NPL ratios. The negative correlation between NPL ratios and credit growth in the authors' data is mostly generated by changes in firms' conditions and contractions in their demand for credit. These results square well with the graphical evidence in fig. 5. Since the impact of exogenous NPL shocks is mainly channeled by the reduction in profitability associated to higher provisions, this analysis also confirms that liquidating NPLs at prices that are significantly below their face values could by itself weaken the supply of credit.

Eber and Minoiu¹² try to exploit the Comprehensive assessment of European banks launched with the creation of the Single supervisory Mechanism to gauge the effect of increased supervisory scrutiny on loan books. They show that in reaction to the Comprehensive assessment banks deleveraged, but that most of the adjustment took place via a reduction in securities. Evidence of a contraction in lending is found only when they resort to the syndicated loan data, and limited to banks with very low capital ratios. This evidence is in line with my a priori that what matters is banks' strength, rather than NPLs *per se* (although the two may well be positively correlated).

Recent evidence about zombie lending is in Schivardi et al.¹³ Using a unique data set that covers almost all bank-firm relationships in Italy in the period 2004-2013, they find that, during the Eurozone financial crisis under-capitalized banks were less likely to cut credit to non-viable firms, and that credit misallocation increased the failure rate of healthy firms and reduced the failure rate of non-viable firms. Nevertheless, the adverse effects of credit misallocation on the growth rate of healthier firms were negligible, and so were the effects on Total Factor Productivity (TFP) dispersion. This goes against previous influential findings which, according to the authors, can be explained, once more, by identification issues. Note that in this case as well the key bank variable is capitalization, not the level of NPLs.

11 M. Accornero, P. Alessandri, L. Carpinelli and A. M. Sorrentino, "Non-performing loans and the supply of bank credit: evidence from Italy", Bank of Italy, Occasional papers No. 374, March 2017.

12 M. Eber and C. Minoiu, "How Do Banks Adjust to Stricter Supervision?", unpublished manuscript available at https://www.norges-bank.no/contentassets/49b4dce839a7410b9a7f66578da8cf74/papers/eber_minouiu_stress_test.pdf

13 F. Schivardi, E. Sette and G. Tabellini, "Credit misallocation during the European financial crisis" Bank of Italy, Working papers No. 1139, September 2017.