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by G. Cappelletti*, A. De Socio*, G. Guazzarotti*, E. Mallucci**

Abstract

We analyse the impact of the financial crisis on the structure and the dynamics of the Italian interbank market, focusing on monthly bank assets and liabilities data between January 2007 and December 2010. The analysis is developed using an ad hoc dataset based on supervisory reports. The data contain nominative information, which allow us to identify different reporting entities and counterparts. We distinguish between intra-group and extra-group transactions, domestic and foreign counterparties, secured and unsecured positions, and short and long-term loans. We also analyse the relationships between large, medium and small groups and characterize the direction of funds between the group's parent companies and the other banks in the group.

JEL Classification: G21, C23, C24.
Keywords: interbank market, financial crisis.

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1. Introduction [1]

The aim of this paper is to shed some light on the structure and the dynamics of interbank funding in Italy focusing on monthly data between January 2007 and December 2010. The focus of the analysis is on stocks (assets and liabilities) and not on market transactions. We use supervisory reports sent by Italian banks to the Bank of Italy.2 These data contain nominative information, which allow us to identify different reporting entities and counterparts. The analysis is developed using an ad hoc dataset which accounts for some discontinuities caused by a methodological break in supervisory reports. This allows to assess the impact of the crisis considering both trends that affected the entire market and trends that affected only specific market segments.

Since the outbreak of the financial turmoil the interbank market has been at the centre of the attention of both policy makers and researchers. The market is one of the main channels for monetary policy transmission and a major source of contagion among financial institutions. Liquidity on this market depends on the credit worthiness of its participants, especially for unsecured loans. During the crisis the combination of liquidity hoarding by lenders and the perception of a "stigma effect" for borrowers reduced the role of the market as a source of funding for banks.

The main facts shown in the analysis are the following. First, despite the positive trend of the pre-crisis period came to a halt, during the crisis there was no drastic fall of the overall lending and borrowing activity in the Italian interbank market. Second, while activity between banks belonging to the same group rose significantly, extra-group positions declined. Third, we observe a drop of bilateral positions, both domestic and foreign, secured and unsecured, which was partly compensated by an increase in positions *vis-à-vis* a central counterpart. Fourth, although foreign bilateral assets and liabilities declined, foreign intermediaries continued to provide funding through foreign branches and subsidiaries of

[1] We are especially grateful to Giorgio Gobbi, Marcello Bofondi, Massimiliano Affinito, Vincenzo Cavazzino and Stefano Nobili. The views expressed in this paper are those of the authors and do not necessarily reflect the opinions of the Bank of Italy.

[2] Data from supervisory reports are also used by Mistrulli (2007) and Iazzetta and Manna (2009), who analyse the connections between banks, and by Affinito (2011), who studies whether the existence of interbank relationships attenuated the impact of the turmoil.

Italian banks and through central counterparts. Fifth, net foreign funding of large groups dropped during the most intense phase of the financial crisis and recovered thereafter. On the contrary, during the whole period small banks received liquidity from abroad and lent to other domestic banks; in particular, Italian subsidiaries of foreign banks continued to borrow from their parent companies. Finally, parent companies of major groups, which used to borrow from abroad and lend to other banks of the group, during the crisis reduced significantly their role as provider of intra-group liquidity and their net position became negative.

The structure of the paper is as follows. The second section presents the main characteristics of the Italian interbank market. The third section describes the dataset. The fourth analyses the impact of the crisis on interbank balance sheet positions, distinguishing between assets and liabilities. We focus on the riskier segments of the market in order to assess the effects of the turmoil where we expect them to be more evident. In particular, we concentrate on extra-group positions and further decompose the extra-group segment between domestic and foreign counterparties and between secured and unsecured loans. We also analyse the evolution of positions by maturity. Section 5 characterizes the direction of funds between different types of intermediaries. We analyse the relationships between large, medium and small groups, also distinguishing between foreign and central counterparts. The sixth section focuses on the 5 largest Italian groups and analyses separately positions held by the group leader and those accounted for by the other banks of the group. Section 7 concludes the paper and sums up the main evidences obtained with the analysis.

2. The Italian interbank market

2.1 Instruments and markets

The interbank monetary market allows banks to exchange short-term funds between each other through different financial instruments. The money market instruments used by Italian banks are deposits, repurchase agreements (repos) and certificates of deposits. At the end of 2010 deposits represented more than 80% of total interbank positions, of which 1/3 had overnight maturity. Repos accounted for slightly less than 20% of the total, certificate of deposits were a negligible fraction of the total. A broader definition of the relationships on the interbank market includes also derivative contracts, but we are not able to include them in our analysis since they are off balance sheet instruments.[3]

Instruments can be either traded on regulated markets or over-the-counter (OTC). In Italy an important electronic broker for unsecured deposits is the e-MID, which is supervised by the Bank of Italy.[4] Other relevant regulated markets are the MTS-general collateral and the MTS-special repo, segments of the MTS market where banks exchange repos based respectively on a (standardised) General Collateral or a specific collateral agreed by the counterparties.

Transactions are either conducted on a bilateral basis (like OTC and e-MID transactions) or through a central counterpart. In Italy the main central counterpart is *Cassa Compensazione e Garanzia* (CC&G), a clearing house funded in 1992, now belonging to the London Stock Exchange Group. CC&G operates in a number of regulated markets, such as the MTS. The presence of a central counterpart reduces counterparty risk, ensuring at the same time the anonymity of transactions.

While OTC transactions and operations with a central counterpart ensure anonymity with respect to other market participants, transactions on the e-MID are transparent, meaning that the identity of counterparts is known. During the crisis the perception of a high "stigma effect" led borrowers to prefer anonymous markets over transparent ones; as a consequence the role of the e-MID in the interbank market decreased significantly. Since the beginning of the crisis the share of very short term transactions (overnight, tomorrow-next and spot-next) on the e-MID over the sum of e-MID and OTC transactions dropped from 2/3 to 1/3.[5]

The contraction of interbank transactions made the Bank of Italy intervene with the creation in February 2009 of the *Mercato Interbancario Collateralizzato* (MIC), with the aim to foster recovery on the interbank circuits minimizing counterparty and liquidity risks.

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[3] See European Central Bank (2008) for an analysis that includes future and option markets in the Eurozone interbank market.

[4] Angelini, Nobili, and Picillo (2010) used e-MID data to evaluate the impact of the crisis on this market.

[5] See Bank of Italy (2010).

Transactions on this market are anonymous and are guaranteed by a central counterpart (the Bank of Italy until December 2010, the CC&G thereafter).[6]

Our dataset allows us to have a comprehensive picture of the whole interbank market. We observe banks' balance sheet positions in deposits, repos and certificates of deposits, resulting from transactions executed on both regulated markets (such as e-MID, MTS, and MIC) and OTC markets. Data include both secured and unsecured instruments and transactions conducted either with a central counterpart or *vis-à-vis* other banks.

2.2 The structure of the market

Table 1 shows the structure of the interbank market before and after the crisis reporting both assets and liabilities. The overall interbank activity is divided between intra-group and extra-group operations; the latter are then broken down between positions *vis-à-vis* domestic, foreign and central counterparts, as well as between secured and unsecured transactions. This partition of the market is used in the following sections to analyse the impact of the crisis on interbank relationships.

The table shows that in the interbank market most transactions take place between banks belonging to the same group. Moreover, the role of the intra-group segment increased during the crisis, probably because it is less sensitive to counterparty risk. In particular, the share of intra-group assets over total interbank exposures grew from 65% in January 2007 to 70% in October 2010.

Foreign transactions make up for a significant part of the market. Following a period characterized by a tendency towards a greater internationalization[7], the role of foreign counterparts declined somewhat during the crisis. In the e-MID transactions by foreign intermediaries grew considerably up to 2007, when they reached a share of 60%, and dropped drastically afterwards. Similarly, our data show that from 2007 to 2010 assets

[6] Since January 2011, the MIC has been substituted by the new-MIC, a segment of the e-MID where the role of the Bank of Italy as a central counterpart is replaced by that of the CC&G. For a description of the MIC and the new-MIC see Bank of Italy (2010).

[7] See European Central Bank (2008).

towards foreign counterparts dropped from around 50% to 40% of total extra-group balance sheet positions.

Table 1

Interbank assets and liabilities (1)

	Assets				Liabilities			
	January 2007		October 2010 (2)		January 2007		October 2010 (2)	
	billions of euros	%	billions of euros	%	billions of euros	%	billions of euros	%
Intra-group	347	*65*	437	*74*	406	*63*	531	*66*
of which:								
foreign branches and subsidiaries	36	*10*	28	*6*	111	*27*	110	*21*
Extra-group	191	*35*	157	*26*	241	*37*	279	*34*
of which:								
central counterparts	10	*5*	32	*20*	11	*5*	83	*30*
domestic counterparts	80	*42*	58	*37*	90	*37*	73	*26*
foreign counterparts	101	*53*	67	*43*	140	*58*	122	*44*
secured	102	*53*	58	*37*	60	*25*	133	*48*
unsecured	89	*47*	99	*63*	181	*75*	146	*52*
Total	538	*100*	594	*100*	647	*100*	810	*100*

Source: Bank of Italy - Supervisory reports.
(1) Balance sheet positions include only money market instruments (deposits, repurchase agreements and certificates of deposits). (2) We report data as of October 2010 because of a discontinuity in the data in November 2010, caused by a merging operation within a major group.

The weight of central counterparts (CC&G and the Bank of Italy) in the interbank market used to be negligeable before the crisis. However, it increased rapidly thereafter during the last two years, going from 5% to 20% of total extra-group assets. In the same period, the share of secured assets decreased (from 50% to almost 40%) while that of secured liabilities rose (from 25% to almost 50%).

The activity on the interbank market is quite concentrated. The role played by the main banks mirrors their weight in the Italian banking system. The top 5 groups (Unicredit, Intesa-San Paolo, Monte dei Paschi di Siena, Banco Popolare, and Unione di Banche Italiane) represents around 65% of total positions, more than 90% of intra-group transactions, and about 50% of transactions with foreign counterparts. Their role consolidated during the crisis.

3. Data source

We use data from banks' supervisory reports. Reports are compiled monthly by all Italian banks and contain a snapshot of banks' balance-sheet composition at the end of the reporting month. We extract data for assets and liabilities towards other banks or central counterparts that are recorded separately from assets and liabilities towards customers, central banks and other entities. We include only money market instruments, specifically deposits, repurchase agreements and certificates of deposits, regardless of the market where the transaction has taken place.

We consider positions of all Italian banks, with the exception of Italian branches of foreign banks.[8] Italian banks controlled by foreign groups are instead included and their transaction with foreign banks belonging to the same group are classified as extra-group. The dataset includes positions *vis-à-vis* all bank counterparts, both domestic and foreign, as well as operations through a central counterpart, which allow us to control for indirect connections between banks.

Assets and liabilities towards other banks are reported either identifying different counterparts ("nominative data") or aggregating across them ("anonymous data"). Whenever possible we use nominative data, which provide a comprehensive picture of the connections across banks.

Data from supervisory reports display a discontinuity between November 2008 and December 2008, due to a methodological break in data collection methods. There are two main sources of discontinuity. First, nominative positions towards foreign branches of Italian banks started to be recorded only after November 2008. Second, a new classification of maturities and instruments was adopted. To compare data before and after the December 2008 break, using most of the available information at the nominative level, we had to rely on anonymous data for all positions with foreign banks until November 2008.

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[8] Italian branches of foreign banks are excluded as reporting entities, but included as counterparts.

4. The impact of the financial crisis on interbank assets and liabilities

Figure 1 (panel A) shows that at the end of 2008 the liabilities of Italian banks versus the Eurosystem increased drastically, reflecting the generalized search for liquidity that characterized the system after the failure of Lehman Brothers. The effect was only partly absorbed during the following year. In this section we will analyse how this liquidity shock affected other interbank positions.

Figure 1 (Panel B) shows that the crisis interrupted the positive trend that characterized interbank balance sheet positions in the previous period; however, it also shows that the crisis did not cause any drastic fall in the overall interbank lending activity, even during the most acute phase of the turmoil. Between January 2007 and December 2008 both assets and liabilities rose by 18%, from about 540 to 630 billions and from 650 to 770 billions of euros, respectively. Thereafter, both remained stable or decreased slightly. An exceptionally high value was reported in October 2008, caused by a single extraordinary liquidity operation which took place between two banks of a large banking group; a large drop was instead reported in November 2010, reflecting an intra-group merging operation.

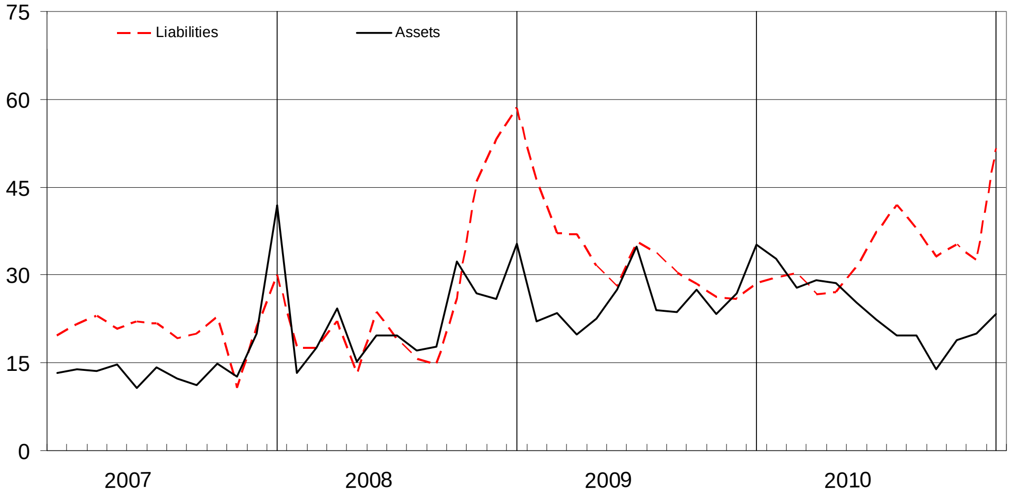
As only Italian banks are included as reporting entities, when we aggregate assets and liabilities positions between Italian banks are netted away while those between Italian and foreign banks are not. Therefore, the mismatch between assets and liabilities measures the net position of Italian banks towards foreign counterparties.[9] Figure 1 (Panel B) shows that Italian banks were net borrowers from abroad: the difference between assets and liabilities was negative throughout the period and fell from around -120 billions at the end of 2007 to -230 billions in December 2010. Foreign net positions are composed by an intra-group part (Italian banks' positions *vis-à-vis* their foreign branches or subsidiaries) and an extra-group one (exposures towards foreign banks and Italian branches of foreign banks). Extra-group net positions also include those *vis-à-vis* central counterparts, which can be different from zero for the part related to foreign intermediaries. The contribution and the dynamics of each of these three components of foreign net funding will be analyzed separately in the following sections.

[9] Differences between assets and liabilities may be also due to minor discrepancies in reported cross positions.

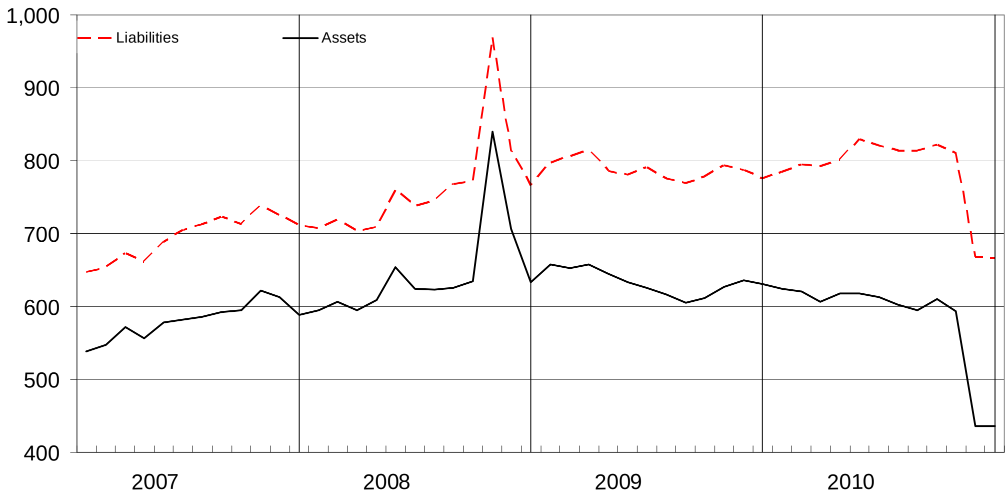
Figure 1

Italian banks' assets and liabilities (billions €)

Panel A: Positions versus the Eurosystem



Panel B: Interbank positions



Source: Bank of Italy - supervisory reports.
Note: Balance sheet positions include only money market instruments (deposits, repurchase agreements and certificates of deposits). In panel B the differences between assets and liabilities are due to net positions *vis-à-vis* foreign banks and to discrepancies in reported cross positions. The high value in October 2008 is caused by a single extraordinary liquidity operation; the drop in November 2010 is caused by a merging operation within a major group.

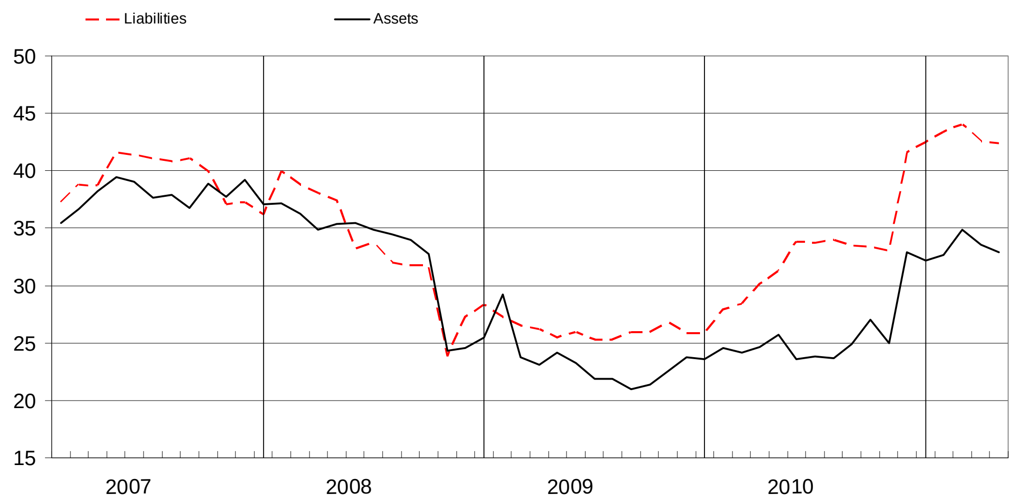
In order to better assess the effects of the financial turmoil on interbank funding we now turn to disaggregated data. Specifically, we analyse the impact of the crisis on those segments of the interbank market which are more exposed to counterparty risk. We start with extra-group positions and then we further decompose this segment between positions *vis-à-vis* foreign and domestic counterparties, secured and unsecured loans, overnight and longer-term instruments.

4.1 Intra-group versus extra-group positions

We expect that the financial turmoil had a stronger impact on the extra-group segment of the interbank market, that is on transactions between banks not belonging to the same group. The extra-group segment is generally more exposed to counterparty risk than the intra-group one, as it is more sensitive to problems of asymmetric information. However, one should consider that extra-group exposures include also positions with central counterparts, specifically the CC&G and the Bank of Italy (on the MIC), for which there is practically no counterpart risk.[10]

Figure 2

Extra-group share of total positions (per cent)



Source: Bank of Italy - supervisory reports.
Note: The low value in October 2008 is caused by a single extraordinary liquidity operation; the jump in November 2010 is caused by a merging operation within a major group.

[10] Positions on the MIC and those involving the CC&G are considered extra-group transactions because of the anonymity of the counterparty.

Figure 2 plots the shares of extra-group assets and liabilities over the sum of intra and extra-group positions. The first fact to observe is the prevalence of the intra-group segment, which includes both positions with domestic banks and those with foreign branches and subsidiaries. Intra-group positions averaged around 450 billions over the sample period, as opposed to 200 billions of extra-group ones. As we will see in section 6, the size of the intra-group segment reflects the prevailing role of the major groups on the Italian interbank market.

Second, the figure shows that the shares of extra-group assets and liabilities declined sharply between 2008 and mid-2009, from around 40% to 25%, and started to increase again at the end of 2009. The decline in extra-group positions is presumably a consequence of the sharp increase in counterparty risk during the crisis, given that extra-group relationships are riskier than intra-group ones.[11]

Figure 3 (panel A and B) shows separately assets and liabilities for both intra-group and extra-group positions. Coherently with our expectations, the decline in the share of extra-group positions is due both to the increase of intra-group volumes and to the decrease of extra-group ones. In the next section we will see that within the extra-group segment, the fall of bilateral operations was partly compensated by the rise in positions with central counterparts.

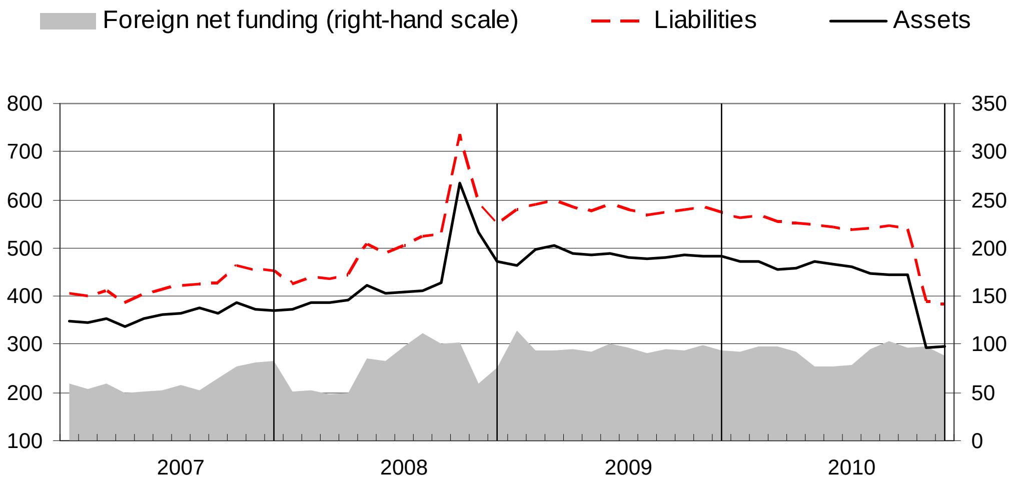
Extra-group lending and borrowing displayed some differences in their dynamics. On the one side, liabilities show significant reductions just after the main events of the crisis: its beginning (August 2007), Bear Sterns failure (March 2008), Lehman Brothers failure (September 2008). On the other side, assets started to decline only in the second half of 2008. More interestingly, in 2010 while assets remained at relatively low levels liabilities recovered, reaching volumes similar to those prevailing before the crisis. In section 4.2 we will see that the positive trend of liabilities in 2010 is mainly due to the increase in secured borrowing from central counterparts. This trend suddenly stopped in May 2010, possibly in connection with tensions on the public debt of some European countries.

[11] Data presented in tables and figures are not corrected for mergers and acquisitions, but we checked that the drop is not explained by such operations. We controlled for mergers and acquisition by using the compositions of groups as of the end of the sample period.

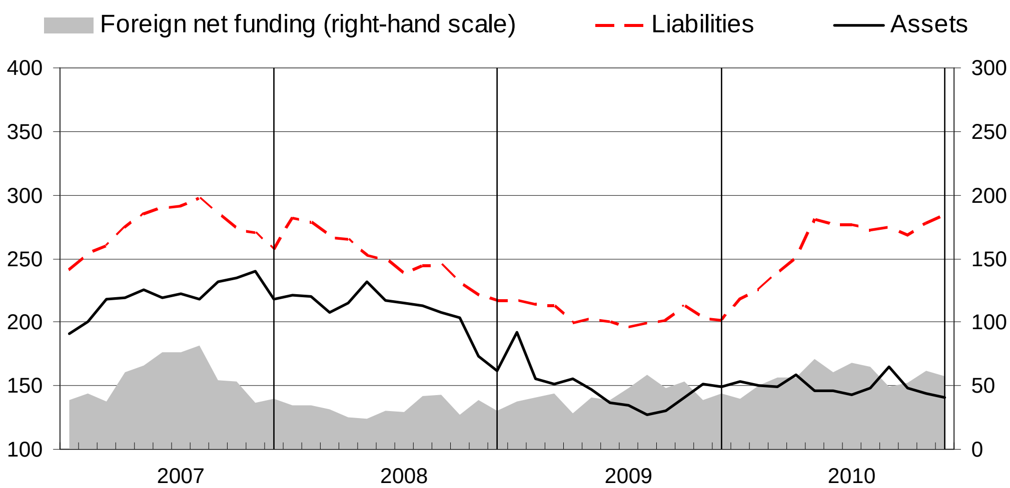
Figure 3

Intra and extra-group positions (billions €)

Panel A: Intra-group



Panel B: Extra-group



Source: Bank of Italy - supervisory reports.

Note: The difference between assets and liabilities differs from "foreign net funding" because it also includes discrepancies in reported cross positions. In panel A, the high value in October 2008 is caused by a single extraordinary liquidity operation; the jump in November 2010 reflects a merging operation within a major group.

Figure 3 also shows net funding from foreign branches and subsidiaries (panel A) and that from banks belonging to foreign banks (panel B). We observe that Italian banks borrowed heavily from both type of foreign counterparts. However, while funding from foreign branches and subsidiaries increased starting from the beginning of the crisis and remained stable during the second half of 2010, borrowing from other foreign banks reduced initially, until the end of 2008, and increased in the following period.

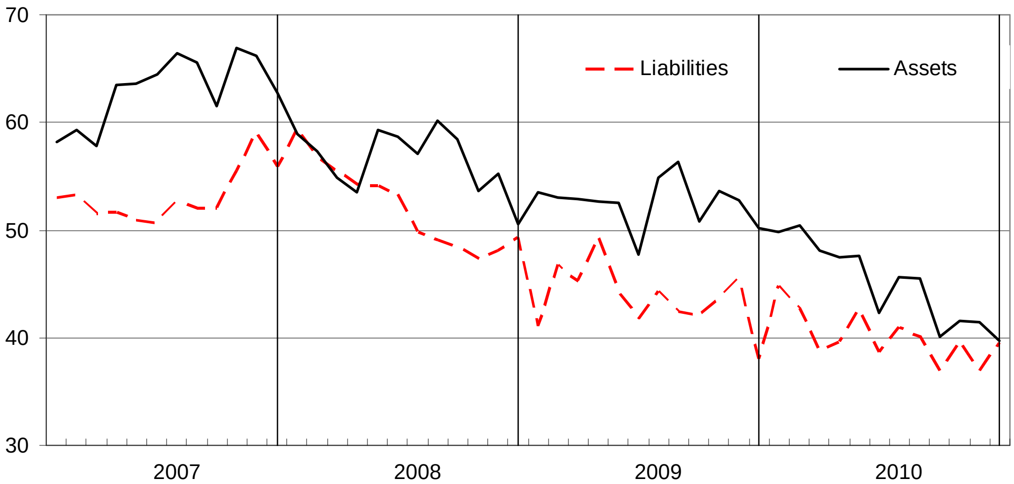
4.2 Domestic, foreign and central counterparts

This section analyses the relation between the Italian banking system and foreign counterparts and checks how it has evolved since the outbreak of the financial turmoil. We expect the impact of the crisis to be more evident when transactions with foreign counterparties are analysed as they imply higher counterparty risk.

We focus exclusively on the extra-group segment, which, as we have just seen, is the area of the market that has suffered the crisis the most. Relationships of Italian banks with their foreign branches and subsidiaries are therefore excluded. We will come back to them in section 5, when we will analyse intra-group funding in a greater detail.

Figure 4

Share of foreign over total extra-group positions (per cent)



Source: Bank of Italy supervisory reports.

Figure 4 shows the shares of foreign lending and borrowing over the sum of domestic, foreign and central counterpart transactions. As expected, the crisis had a major impact on both foreign assets and liabilities. It interrupted a tendency towards a greater internationalization that had characterized the interbank market in the previous years. The shares of foreign lending and borrowing dropped respectively from about 50% and 60% at the beginning of 2007 to around 45% in December 2010.

Figure 5 (panel A through C) compares assets and liabilities *vis-à-vis* domestic, foreign and central counterparts. Interestingly, we see that the crisis affected negatively both domestic and foreign positions. Domestic positions fell from 100 billions euro, just before the failure of Lehman Brothers, to 50 billions at the end of 2009 (Figure 5, panel A). Foreign transactions were hit earlier than domestic ones: lending towards foreign counterparties decreased from about 125 billions in the first quarter of 2008 down to 50 billions in August 2009; during the same period, borrowing from foreign counterparts declined from just around 160 to 100 billions (Figure 5, panel B).

The drop in bilateral positions (both domestic and foreign) was compensated by a significant increase in central counterpart transactions (Figure 5, panel C). The role of central counterparts rapidly soared since June 2008 − with an acceleration after March 2009 − mitigating the impact of the financial turmoil on the extra-group segment. Aggregate volumes exchanged with CC&G in May 2010 were fifteen times bigger than in November 2007. Positions on the MIC grew steadily from the beginning of operation until May 2010, when they stabilized. Since the first month of its opening MIC volumes increased up to twelve times.

The growth of central counterparts reflects the willingness of lenders to attenuate counterparty risk as well as the preference of borrowers for anonymous transactions over transparent ones. More and more transactions have been executed through a central counterpart in order to avoid the "stigma effect" which characterized the market during the crisis.[12]

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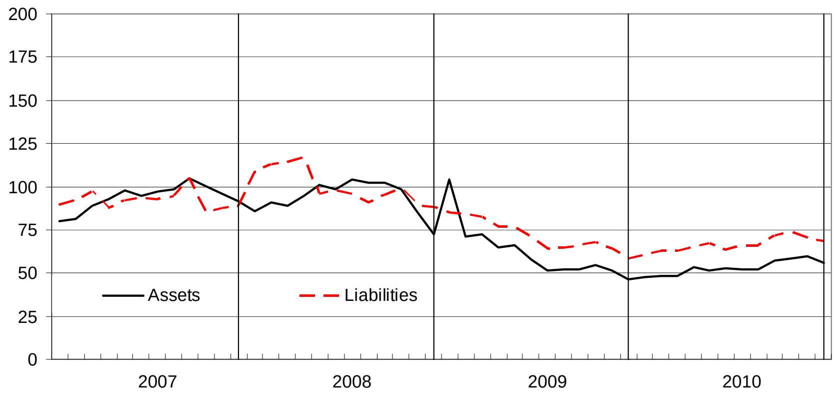
[12] The increase in transactions with a central counterpart also reflects the possibility, since November 2009, of using a central counterpart for overnight repo contracts as well.

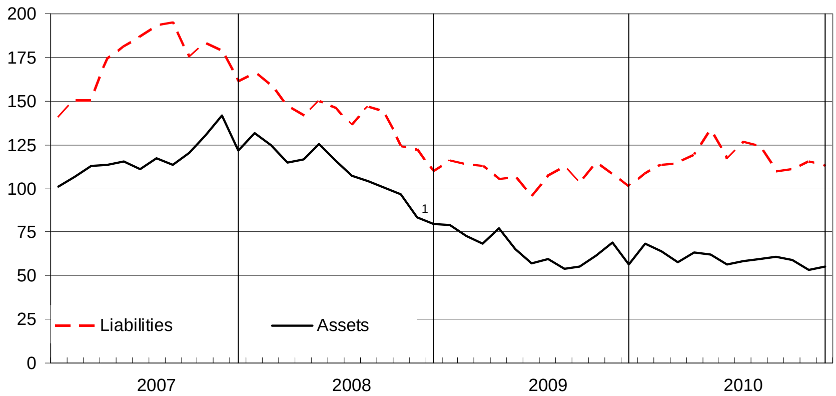
Figure 5

Extra-group volumes: domestic, foreign and central counterparts (billions €)

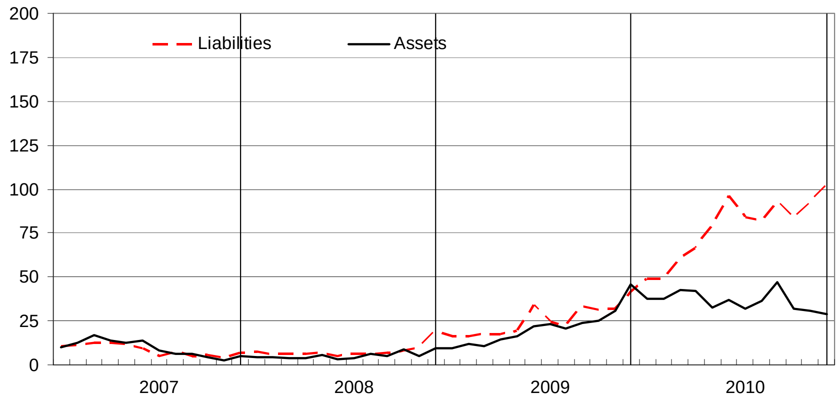
Panel A: Domestic counterparts



Panel B: Foreign counterparts



Panel C: Central counterparts



Source: Bank of Italy - supervisory reports.
Note: In panel A the differences between assets and liabilities are due to discrepancies in reported cross positions, in panel B and C to net positions *vis-à-vis* foreign banks.

Though foreign bilateral positions declined during the crisis, foreign banks continued to play a significant part in the interbank market. The difference between assets and liabilities *vis-à-vis* foreign counterparts shows that after the reduction in the first part of the crisis bilateral net borrowing rose again in 2009, as the worst effects of the turmoil were fading away and stabilized in the second half of 2010 (Figure 5, panel B). At the same time, a complete evaluation of the contribution of foreign banks should take into account that: i) since the end of 2009 foreign intermediaries lent to domestic banks also by taking positions with the central counterparts (Figure 5, panel C); ii) foreign branches and subsidiaries increased their role as provider of liquidity at the intra-group level (Figure 3, panel A).[13]

4.3 Secured versus unsecured positions

A priori, it is not clear how the crisis should have impacted on secured funding. Secured instruments have costs and benefits. From the lender's perspective, they are less exposed to counterparty risk than unsecured ones, as they involve the pledge of a collateral; from the borrower's perspective, they bear lower interest rates but, at the same time, require the immobilization of assets. Therefore, on the one side increasing counterparty risk might have boosted the use of collateralized transactions, on the other side higher cost of collateral might have favoured the recourse to unsecured instruments.

The increase in intra-group transactions we documented in section 4.1 can be seen as an attempt to reduce the recourse to costly secured borrowing. The share of secured operations over total intra-group ones is in fact quite low (about 20%) compared to that in the extra-group segment. To better assess the effects of the crisis on collateralized transactions, in this section we restrict our attention to extra-group lending and borrowing. Figure 6 shows that the shares of secured positions over the sum of secured and unsecured ones decreased or remained stable in the first part of the crisis and increased rapidly − especially liabilities − after the failure of Lehman Brothers (from 20%-30% to 45%).

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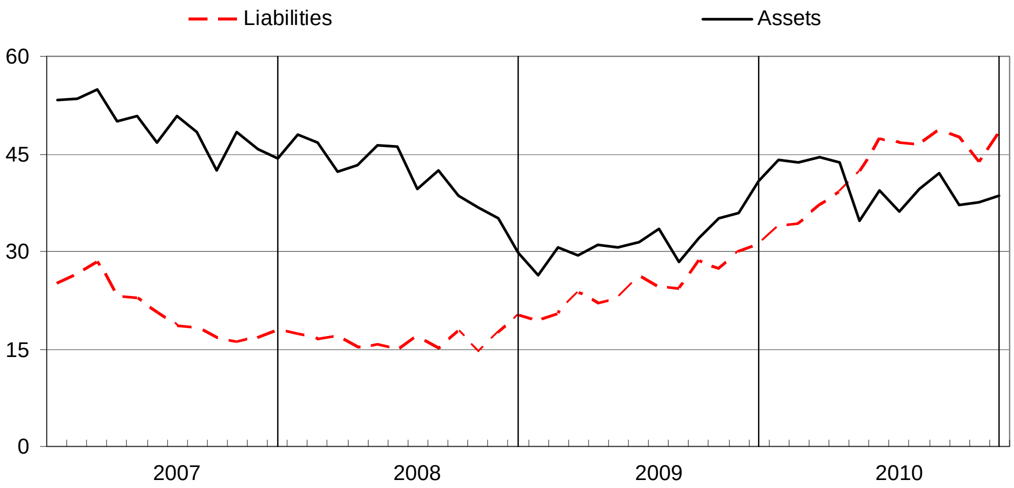
[13] Balance sheet positions of Italian banks *vis-à-vis* foreign branches and subsidiaries were quite stable over time (around 160 billion) and the share over the whole market increased from 27% in January 2007 to 32% in September 2009; it decreased back to 26% in 2010.

Figure 6

Share of secured over total extra-group positions (per cent)



Source: Bank of Italy - supervisory reports.

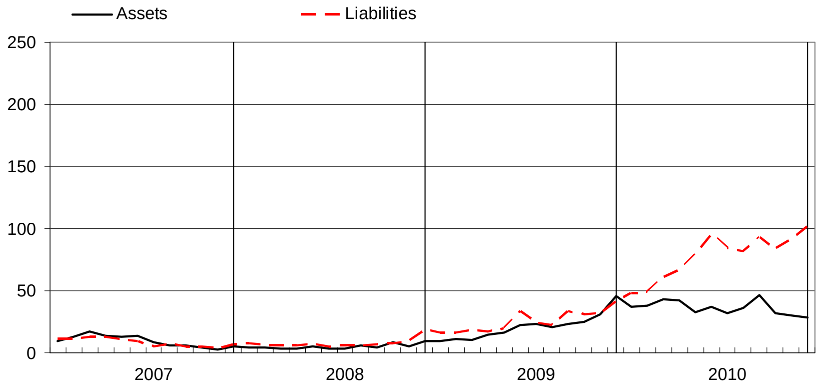
The increase in secured operations was probably not driven by a generalized search for security, following the perception of higher counterparty risk, but more specifically by the preference for anonymous transactions over transparent ones. This can be seen from Figure 7 (panel A through C). While operations with central counterparts increased, bilateral collateralized positions (repos) actually declined or remained stable. The portion of secured assets accounted for by the CC&G and the MIC rose from just above 10% in the last quarter of 2008 to just below 60% in October 2010.

If we focus on bilateral collateralized positions, excluding central counterparts, we see that the dynamics of assets and liabilities are somewhat mixed (Figure 7, panels B and C). On the liability side, Italian banks reduced unsecured borrowing, but continued to obtain funding through collateralized transactions. In particular, unsecured liabilities reduced from about 250 to 150 billions, while secured ones remained stable, at around 40. On the asset side, instead, the contraction was far more pronounced for secured (from 100 to 25 billions euro) rather than unsecured operations (from 125 to 100 billions).

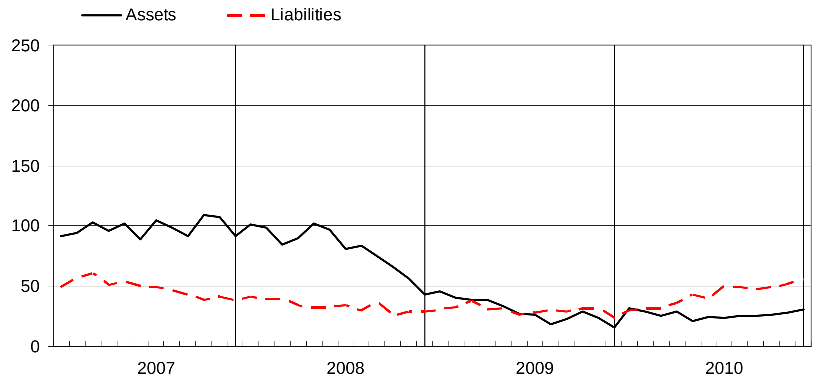
Figura 7

Secured versus unsecured extra-group positions (billions €)

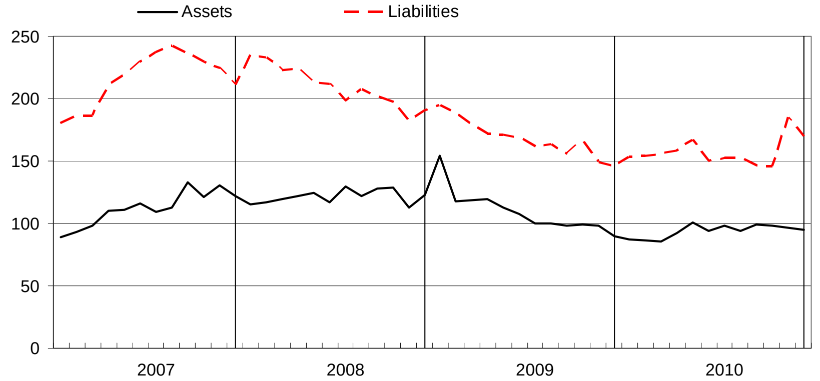
Panel A: Central counterparts



Panel B: Secured bilateral



Panel C: Unsecured



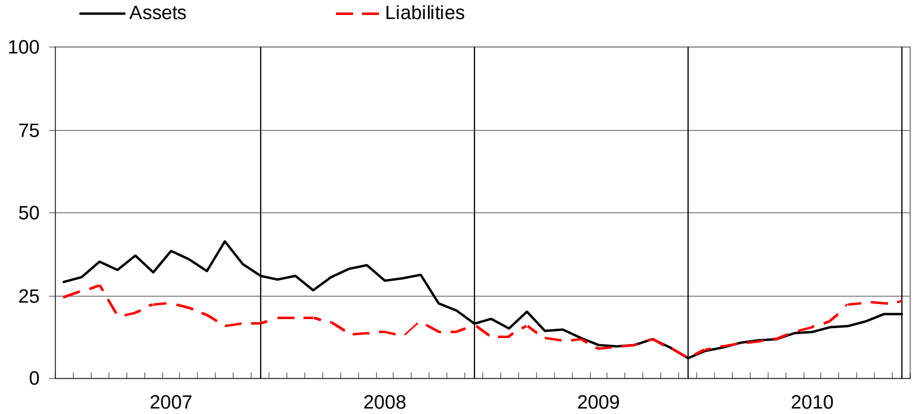
Source: Bank of Italy - supervisory reports.

Note: The differences between assets and liabilities are due to net positions *vis-à-vis* foreign banks and to discrepancies in reported cross positions.

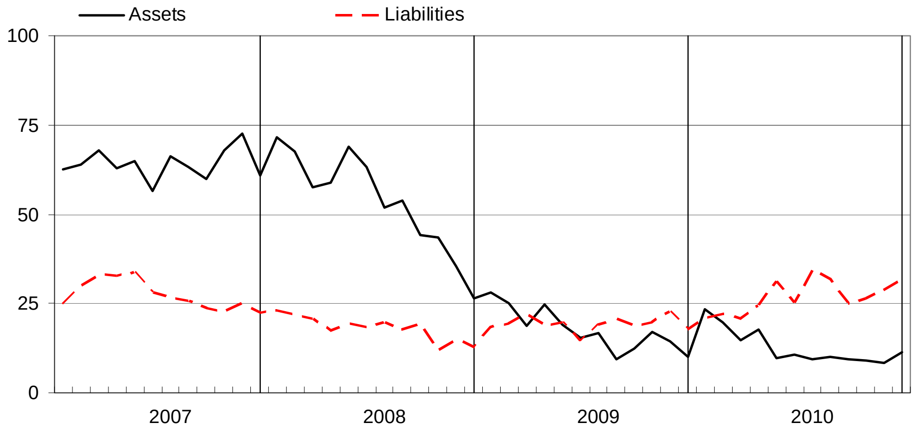
Figure 8

Secured bilateral positions: domestic and foreign counterparts (billions €)

Panel A: Domestic counterparts



Panel B: Foreign counterparts



Source: Bank of Italy - supervisory reports.
Note: The differences between assets and liabilities are due to discrepancies in reported cross positions for domestic counterparts (panel A) and to net positions *vis-à-vis* foreign banks for foreign counterparts (panel B).

The decline in the most acute phase of the crisis in both secured and unsecured bilateral operations is mostly explained by transactions with foreign counterparts. In the most acute phase of the turmoil, as the price of counterparty risk rose, Italian banks reduced foreign transactions more than domestic ones, because the former were perceived as riskier. As Italian banks used to borrow unsecured and lend secured *vis-à-vis* foreign counterparts, the contraction affected mostly unsecured liabilities and secured assets. Figure 8 (panel A and B) focuses on secured transactions and plots separately foreign and domestic positions.

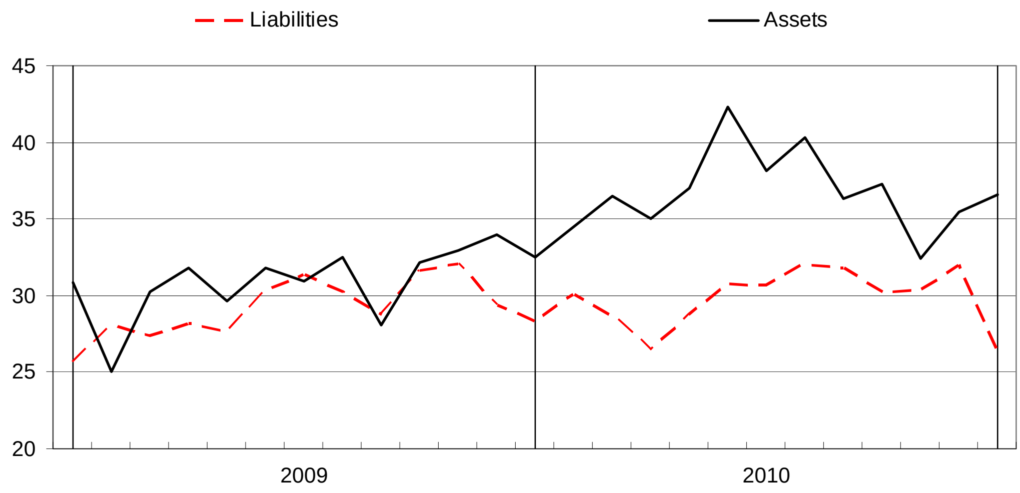
We see that although secured assets declined for both domestic and foreign counterparts, the drop was much more pronounced for the latter.

4.4 Interbank positions by maturity

In this section the maturity breakdown of extra-group positions is analyzed. We focus on deposits, which is the only instrument for which we have a detailed and consistent maturity information since December 2008.

Figure 9

The share of overnight or sight deposits over total deposits (per cent)



Source: Bank of Italy - supervisory reports.

Deposits are the most common instrument for interbank borrowing and lending. They accounted on average for 70% of extra-group positions during our sample period and for more than 90% of intra-group volumes. About 30% of the deposits have very short maturities (overnight or sight deposits).

We expect funding with longer maturities to react more sharply to the crisis, given the higher liquidity risk implied by long term transactions. Figure 9 shows that the share of deposits with very short maturities over total interbank deposits increased during the crisis. In particular, from December 2008 the share of overnight and sight deposits rose from about 25% to a peak of 40% in May 2010 for assets, while moved around 25-30% for liabilities.

5. Net funding relations by group size and domicile of the counterparts

In this section we analyse the direction of funding in the interbank market. The objective is to describe how liquidity moves across different types of banks and to check whether the structure of such relationships has suffered significant alterations. We restrict our attention to lending and borrowing transactions that take place between banks that do not belong to the same group, which is the market segment that experienced a significant contraction during the most critical phases of the crisis (see section 3.1). Intra-group net positions are instead analyzed in section 6.

As a first step banks are grouped in to 3 categories according to their size: "large banks" (UniCredit, Intesa Sanpaolo, Monte dei Paschi di Siena, Banco Popolare, and Unione di Banche Italiane), "medium size banks", and "small banks". We also divide counterparties between domestic, foreign, and central counterparts and distinguish domestic counterparts according to the three size classes specified above.[14]

All types of banks had negative net positions for most of the period and borrowed mainly from foreign banks. Overall, the financial turmoil has not severely impaired the ability of the Italian banking system to obtain liquidity on the international markets.

During the crisis large banks reduced net funding, that remained at relatively low levels until the end of 2009. In 2010, they increasingly borrowed from foreign banks and central counterparts; these inflows were only partly offset by lending to other domestic banks. The overall net position decreased in the first half of 2010 and stabilized thereafter. Medium size banks received liquidity from both foreign intermediaries and domestic small banks; in 2010 they also borrowed from large banks. Net funding from abroad of medium size banks decreased during the most acute phase of the turmoil and rose back starting in the second half of 2009; net funding from domestic banks remained basically unchanged. Small banks borrowed increasingly from abroad and provided liquidity to other domestic banks, mainly medium size banks. Foreign borrowing by medium and small size banks is mainly due to Italian subsidiaries obtaining funds from their foreign parent companies.

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[14] Banks that do not belong to any conglomerate are considered bank groups composed by one entity only. The classification into size classes is built upon that adopted by the Bank of Italy. Large banks belong to major

6. Funding relations within major bank groups

So far intra-group funding was excluded from the analysis. Here intra-group relations are studied to describe liquidity flows across banks of the same group. Attention is restricted on the 5 largest Italian groups (UniCredit, Intesa Sanpaolo, Monte dei Paschi di Siena, Banco Popolare, and Unione di Banche Italiane).

These groups give a comprehensive insight of intra-groups dynamics, given their dimensions and their relevance for the interbank market. During the period under analysis the largest five groups together held on average almost 65% of all interbank positions. The two most active groups accounted for about a half of total positions, while the remaining three groups account for about 15%. Their overall share in the extra-group segment oscillated around 30%; that in the intra-group was around 90%. These banks also played a central role in transactions with foreign counterparties. In October 2010 about 40% of extra-group assets and liabilities *vis-à-vis* foreign intermediaries was concentrated in the hands of the top five groups.

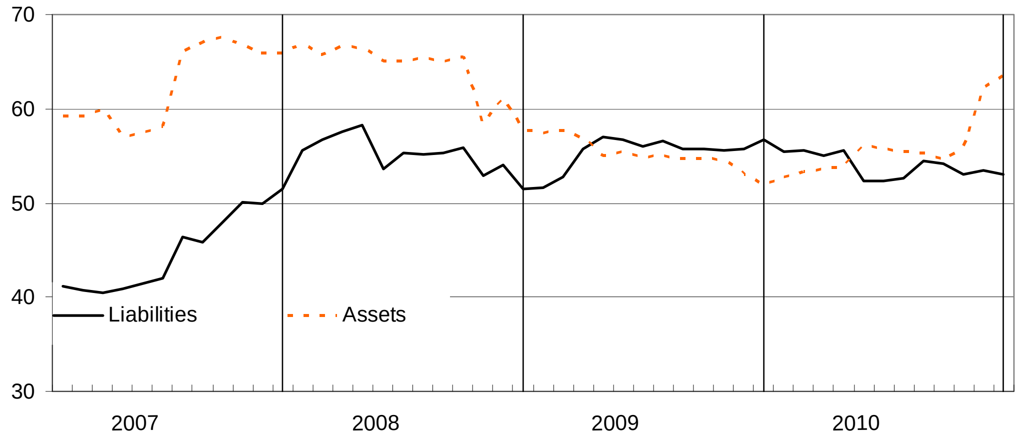
Figure 10 shows the average share of assets and liabilities held by group leaders (the group's parent companies) in the intra-group and extra-group segments. Interbank positions appear quite concentrated in the balance sheets of group leaders. In the intra-group segment the average share of liabilities held by group leaders increased during the first months of the crisis, from 40% to over 55%, and remained stable thereafter; the share of assets instead declined from around 65% to 55%. In the extra-group segment the share of both assets and liabilities experienced a drastic increase (from 40% to 65%).

Italian groups. Medium size banks include groups and independent banks with total assets ranging between €21,532 and €182,052 millions, small banks banks those with total assets les than €21,531 millions.

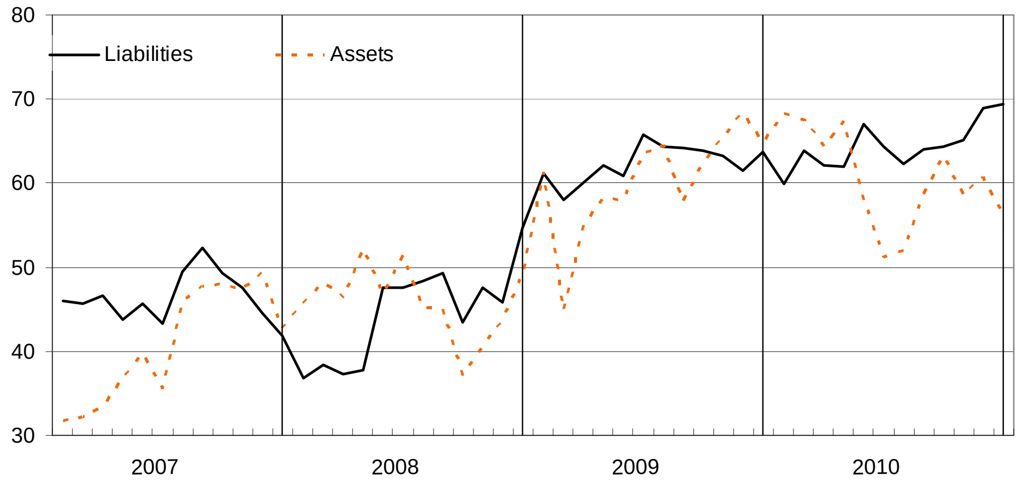
Figure 10

Average group leader share of intra-group and extra-group positions (per cent)

Panel A: Intra-group



Panel B: Extra-group

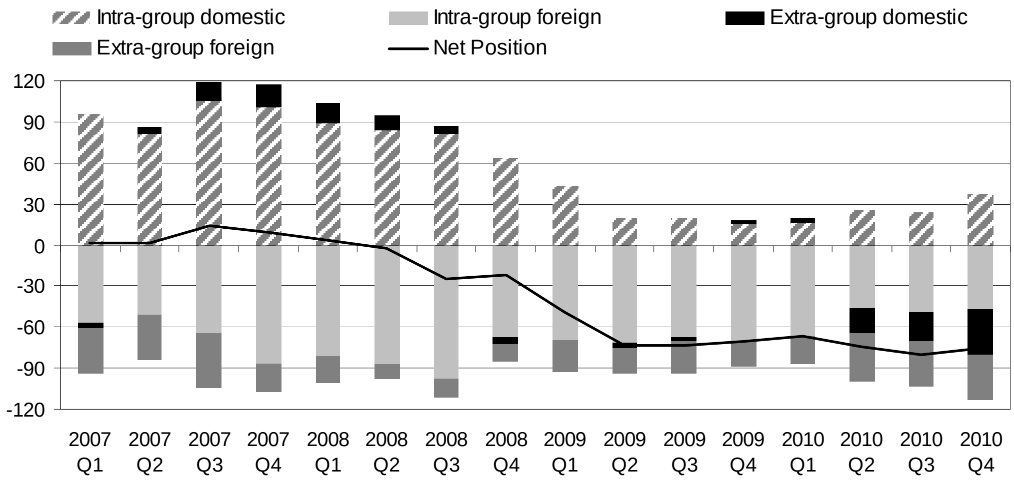


Source: Bank of Italy - supervisory reports.
Note: Data refer to the top 5 Italian groups.

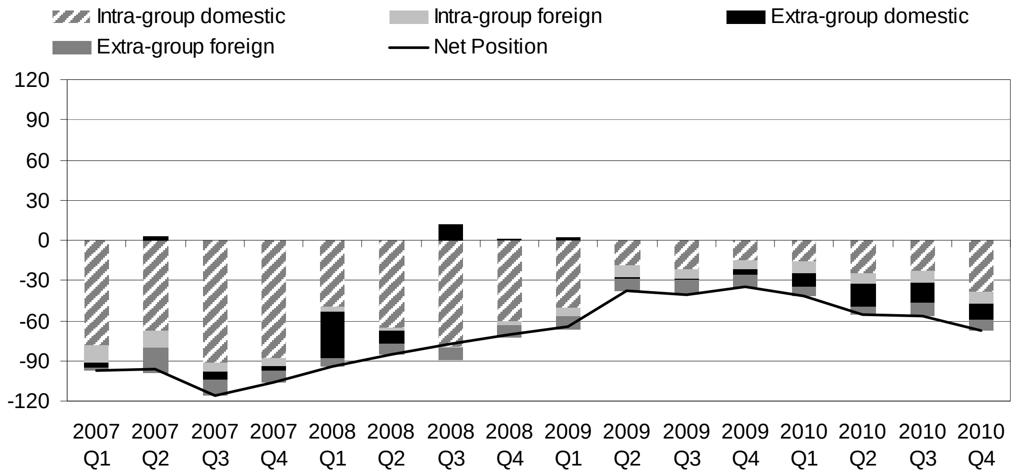
Figure 11

Average net positions of the group leaders
and of other banks of the group (billions €)

Panel A: Group leaders



Panel B: Other banks



Source: Bank of Italy - supervisory reports.
Note: Quarterly averages of monthly data. Monthly data are averages across the 5 top Italian groups. Differences between net positions of group leaders versus other domestic banks of the group in panel A and B are due to discrepancies in reported cross positions.

Figure 11 shows quarterly net positions of group leaders and other banks *vis-à-vis* different types of counterparties. In particular, counterparties are divided in four classes: other domestic banks belonging to the same group, foreign branches or subsidiaries of the group, other domestic banks not belonging to the group, and foreign banks. The picture allows to analyse the dynamics of intra-group funding relationships. We find the following patterns. Group leaders borrowed mainly from foreign branches and subsidiaries of the group and to a lesser extent from other foreign banks. At the same time they almost exclusively lent to other banks of the group, while net positions *vis-à-vis* other domestic groups were modest.

During the crisis the role of the group leader changed significantly, as it ceased to be the reference entity for the funding of the group. In particular, starting from the second half of 2008 we observe a sharp decline of the leader’s net lending to other banks of the group. This change was only partially offset by a decline in net borrowing from foreign banks and produced a worsening of the leader’s net position; this turned deeply negative in the second part of 2008 and remained at low levels thereafter.

7. Conclusions

The paper uses banks’ balance sheet assets and liabilities in order to analyse how the crisis impacted on interbank funding relationships. To this purpose we use an *ad hoc* database which solves some methodological discontinuities in supervisory reports.

The analysis shows that the crisis had a clear negative impact on interbank funding, though there was no drastic fall in the overall interbank activity. In particular, we observe that interbank balance sheet positions shifted towards safer segments, like the intra-group segment, relations with central counterparts, and short-term instruments.

During the crisis there was a massive increase in volumes exchanged within groups. This increase (about 230 billions from the beginning of 2007 to October 2010) was caused principally by the two largest Italian groups that are responsible for more than the 65% of the overall intra-group volumes. At the same time, the financial turmoil hit strongly the extra-group segment of the market which is characterized by higher counterparty risk.

The decline in extra-group total positions conceals some important changes in their composition. First of all, bilateral positions dropped, while those with central counterparties increased. The “stigma effect” which characterized the markets during the crisis period caused borrowers to prefer transactions executed through a central counterpart over bilateral ones. At the same time, as counterparty risk rose, both secured and unsecured assets declined. Italian banks reduced bilateral operations with foreign counterparts, perceived as riskier, more than those with domestic ones.

While bilateral positions declined during the crisis, foreign banks continued to play a significant part in the interbank market. Net funding from foreign intermediaries through bilateral positions declined until 2008 and recovered thereafter. Net borrowing through central counterparts increased until the end 2010 and reduced in the following months. Net inflows from foreign branches and subsidiaries surged during the first part of the crisis and stabilized starting from 2009.

We characterize the direction of funds between different types of intermediaries: domestic versus foreign banks, small versus large groups. The analysis shows that during the crisis large and medium size banks reduced the absorption of liquidity from abroad. At the same time, Italian subsidiaries of foreign groups continued to obtain funds from their parent companies abroad.

Finally, the analysis of intra-group relationships highlights the role of the group’s parent company. Group leaders mainly borrowed from their foreign branches and subsidiaries and lent to other banks of the group. We show, however, that during the crisis group leaders reduced significantly their role as provider of intra-group liquidity.

The analysis conducted so far shows the potential of data from supervisory reports in studying the developments of the interbank funding. Nominative data are extremely valuable as they make possible to track all interbank connections between Italian credit institutions. At the same time, data exhibit some limitation. First, there is a methodological discontinuity which need to be addressed. Second, information about financial instruments and maturities are often not sufficiently detailed. Instruments are grouped into macro areas that make difficult, for instance, to discern between liquidity management instruments and credit lines.

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