Research Report

Strategic and operational integration of Collateral Management

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Key Findings

Background

The market scenario characterised by the recent financial crises and ever-increasing regulatory pressure are leading banking institutions of the whole system to review their Collateral Management policies.
The ways of managing this particular form of security have over time undergone profound changes. From a simple passive logic where collateral performed a Back Office administrative function, we have moved to a more responsive and proactive logic, which includes trading to a greater extent, along with liquidity management.
It seems clear that brokers will always be forced to optimise the Collateral available to them, both from a strategic and an operational point of view.
For these reasons, the present study has set out to analyse the state of this skill within the Italian banking market (50% of the total assets of the Italian banking system) relating to the various approaches of Collateral Management, and estimating any eventual changes (2016E).

Strategic optimisation

The strategic optimisation of Collateral is the ability of an intermediary to effectively and efficiently manage collateralised assets. Optimisation is particularly understood as being:

- Quantity, variability and type of collateralised assets
- Asset optimisation in the strictest sense

In respect of these two aspects it is noted that the most commonly used instruments in collateralisation operations are Government Securities (44.4%) and cash (19.4%). Moreover, Government Securities, in terms of re-use of assets received as collateral, constitute the brokers' preferred solution (94.2%). It does not appear that this situation will change drastically in 2016. The most commonly used and re-used assets remain Government Securities (33.75% and 86%), even if these percentages are decreasing while a preference for covered back bonds and ABS is increasing.
The ability to have a real-time view of the available collateral used is a very strategic aspect and most brokers estimate the total value of collateralised assets in an integrated manner between the Finance Area and Treasury Area.
As regards the forms of participation, the Bilateral Agreement remains the solution which brokers most often turn to. The trend however seems to be that this management style is falling with the use of a Tri-party Agent becoming more prevalent (from 12.38% to 31.12%).

Operational optimisation

Operational optimisation is understood as the level of standardisation, integration and automation of operational processes for Collateral management.

One of the most important aspects is related to the provision within the broker's organisational structure of a Collateral Management *Service Desk*. In fact, for the institutions that are equipped with a dedicated *Service Desk*, there are greater benefits to be had in terms of an integrated view of the areas of collateralisation and the end use of the assets. 62.5% of the brokers would tend to adopt this solution.
All of those in the sample possess an information system relating to Collateral Management. However, those systems vary when it comes to development and integration. In fact, the main constraints of achieving operational optimisation are, for 56.25% of the sample, attributable to poor integration and efficiency of the information systems and to the complexity of the monitoring systems.
In addition, important future changes are expected as regards implementing systems that provide for integrated collateral requirements with liquidity management. All the brokers are in fact moving in this direction.

Strategic and operational strategy.

In relation to these two fields of analyses (strategic optimisation and operational optimisation), it has been possible to identify different models of collateral approach. This has allowed us to identify, in the current situation, 3 *behavioural clusters*:

- the "Manual", characterised by a very high level of strategic optimisation - though modest in size - compared to the level of operational optimisation.
- The "Efficient", characterised by a higher level of strategic optimisation than operational optimisation, with a bigger gap between the two compared to the previous *cluster*
- The "Structured", characterised by a proportionally higher level of operational optimisation compared to the corresponding level of strategic optimisation.

In reference to the future outlook, it is understood that 62.5% of the brokers will change their condition. The new *clusters* resulting from the change will look like this:

- The "Efficient", for whom a proportional improvement is expected both in terms of strategic and operational optimisation
- The "Value Creators", for whom an improvement is expected in terms of a more marked operational optimisation compared to the previous *cluster*
- The "Conservatives", for whom no particular developments are expected in the process of Collateral optimisation

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Preface

(by Professor Giovanni Petrella)

Increased perception of credit risk and regulatory initiatives like EMIR (European Market Infrastructure Regulation) have lead operators to making greater use of collateral as a way to mitigate counterparty risk. Recent analysis conducted by ESMA (European Securities and Markets Authority) predicts a demand for collateral in 2014 equal to around 6,500 billion Euros, which represents a 60% increase on the figure of around 4,000 billion Euros in 20011.

At the same time, firstly the reduction in the issuing of asset-backed securities following the 2007-2008 crisis and then the sovereign crisis in Europe in 2011 have reduced the availability of securities as collateral with a high rating. The same analysis carried out by ESMA predicts a supply of collateral, including that of "almost high-quality" collateral, to be around 12,600 billion Euros in 2014, an increase of 10% compared to 11,800 billion Euros in 2012.

For the moment, any scarcity of collateral has not been noticeable in absolute terms, considering the amount of excess supply compared to current demand. A divergent trend is however evidenced in rates of variation of collateral supply and demand. While predicting a noticeable stabilisation in the growth of demand for collateral, in part due to structural breaks, a rate of growth in demand clearly superior to the rate of growth of supply suggests a condition of collateral scarcity in years to come.

Given the contextual conditions just outlined, an increase in the range of assets used as means of protection is foreseeable, and in part has already been observed with the recent actions of the European Central Bank. This results in a more significant role for Risk Management in Collateral Management. Potential exposure estimations of a certain position are more complex when it is necessary to bear in mind the volatility and the liquidity risk associated with non-standard assets that may be acceptable as collateral.

Compared to other risk mitigation techniques, collateral has a number of relative advantages in terms of its transferability, liquidity and availability of a market price, but also involves complex elements relating to the options available when choosing a particular type of collateral for transactions.

Optimisation of the Collateral Management process rests on an efficient management of information on passive collateral and on the potentially available collateral, a resource which is to be valued in terms of access to credit both in optimisation terms and funding terms. At the same time, management of active collateral enables both management of counterparty

[1] ESMA Report on Trends, Risks and Vulnerabilities, n. 1, 2013.

risk and, where possible, availability of receipt of a loan operation(re-use). Collateral therefore influences both Risk Management and liquidity management, operating as a credit risk mitigation tool in credit relations and facilitating the supply of liquidity in treasury management.

In conclusion, Collateral Management is therefore a very important subject both at present and in the future for the many reasons outlined above. Other than the exceptional responses owing to the crisis, the new regulations make the issue even more relevant in the long-term. The research undertaken by CeTIF aims to identify best current practices of Collateral Management and to outline possible scenarios for their development. I consider that, given the strong operating characteristics and the significant interrelationships that involve different aspects of management by a financial broker, it represents a valid support, both in terms of formation and a strategic reflection on a current and relevant subject.

1. Introduction and research objectives

1.1. Background

The market environment and increasing regulatory pressures are leading banking institutions in the whole system to review their Collateral Management policies

Recently, Collateral Management has been assuming an increasingly important role within the financial world in terms of trading activities on the derivatives markets, of funding policies and liquidity management. In the current climate, which is characterised by widespread distrust on the financial markets, collateral in the form of *cash* or financial instruments indeed provides the financial institutions with guarantees about the successful outcome of existing operations.

From 2008 until now, we have witnessed a transformation in the use of collateral from being a simple instrument for bilateral negotiations in OTC derivatives markets to being a necessary solution for supporting funding policies. One need only think of the refinancing operations[2] promoted between 2010 and 2011 by the European Central Bank and of the collapse of non collateralised (unsecured) trades, whether on the EMID market or *over the counter* [3] trades.

The financial crisis of the last few years also induced the Regulators to seek solutions for mitigating systemic risk, and protecting and making financial markets more transparent. In fact, in the next few years, three new regulations will be endorsed by the financial systems around the world: the Dodd-Frank Act, EMIR and Basel III. These regulations - the main effects of which will be analysed in the coming sections - will contribute to increasing demand for collateral, which is estimated by the IMF at a value of somewhere between 2 and 4 trillion dollars.

From a passive logic, we have progressed to a proactive logic of Collateral management where strategic and operational optimisation become central.

The context of the markets on the one hand and increasing regulatory pressures on the other are forcing the banking institutions to abandon a passive form of Collateral Management in favour of a more responsive and proactive approach. Collateral Management is evolving (at different speeds for each nation in question) from an administrative back office function to a function that integrates and broadly includes trading and liquidity management.

[2] Of the 1000 trillion financed by the EU, 250 trillion were assigned to Italy.
[3] For consultation purposes, see the Report on Financial Stability (no.5) published in April 2013 by the Bank of Italy.

Brokers will therefore be increasingly forced to optimise the collateral available to them and to identify the best practices in order to better manage the assets in their portfolios.

This optimisation, however, cannot exclusively involve strategic management of the assets, but must also be aimed at organisation as a whole. The existence of a Collateral Management *Service Desk* and the support of integrated and standardised information tools are some of the aspects on which brokers should focus their attention. IT architecture, if adequate and suitably integrated, can in fact represent a strategic lever for improving management and optimisation of the available assets.

A preliminary investigation on Collateral Management promoted by CeTIF in 2012 however showed that, despite the fact that Collateral is assuming a key role in the European context, the road towards integration among the different areas of the bank still seemed to be rising. The research has in fact shown how Collateral Management is rather separate between the different areas, that a single person responsible was not also present and that the processes were poorly integrated.

The research aimed to understand what to date has been the level of integration among asset optimisation processes and the efficiency of IT architectures in support of Collateral Management for the Italian banking institutions. It also provides a future perspective for 2016.

Based on the regulatory background on the one hand and the market background on the other, and on the basis of the above mentioned open research points, CeTIF carried out a second study with the aim of answering the two research questions outlined below:

1. *What is the current level of integration in Collateral Management in banks operating in Italy?*
2. *How will banks change their ways of approaching Collateral Management in the next 3 years?*

1.2. Research Methodology

In order to provide answers to the above questions, CeTIF, between May and September 2013, involved 11 financial brokers operating in Italy (who represent around 50% of the activities of the Italian banking system) in an observatory called: *"Collateral Management: strategic choices and transformation projects"*

The research activities provided for the parallel use of two different methods:

A. The focus group may be defined as a "Qualitative surveying technique, which involves discussion amongst a small group of people and one or more moderators, focused on a particular subject to be investigated in depth" (Corrao 2000, p.25). With this technique the participants are led to discuss and to interact with one another in order to exchange experiences and viewpoints, and to develop their own observations on the basis of common experiences. In the research period there were two focus groups, in which representatives of the 11 institutions took part.

In particular, professionals have been selected who work exclusively with the Treasury, in Back Office Derivatives and in Collateral Management. The choice of the panel of banks followed the "criteria of variety" (see the combination of banks and different professionals working for them) in order to allow different and contrasting positions (Krueger 2000) to come to light and to make the research more valuable. Meanwhile, the choice of the participants followed the "criteria of uniformity", which provides for including people with similar characteristics within one group (Morgan 1998, Greenbaum 1998).

B. An online questionnaire completed by 8 brokers [4]which allowed them to identify the Collateral Management integration models which they currently use. This qualitative-quantitative questionnaire consists of 42 questions including multiple-choice and written questions on an agreement scale (the Lickert 1-7 scale). The survey was carried out by the CeTIF research team in collaboration with a few institutions that took part in the research.

CeTIF coordinated all the research activities and the responses, overseeing the aspects of scientific method, and developing the contents of the meetings and the information gathered.
Tasgroup contributed to the research activities by providing its distinctive expertise, conveying the project experiences gained by its own customers and taking part in the meetings by entering into the spirit of the discussion.

This document is structured as follows: Chapter II presents the results of the questionnaire and the positions of the brokers within the "Collateral Management integration model". Chapter III, in addition to presenting the predicted position in 2016, highlights the dynamics of change and the main levers of development (both in terms of asset management and in operational terms). Finally, Chapter IV will draw conclusions from the survey and will highlight additional research methods.

[4] Of the 11 brokers that took part in the focus groups, 3 were unable, for reasons of internal policy, to provide the required data.

2. Collateral integration models: the current situation

The current situation of the brokers who represent 50% of the Italian banking system activities was ascertained through the Collateral integration model, where it was possible to identify the various type of management approach.

2.1 Introduction to the Collateral Management integration model

In order to achieve the research objectives shown in the previous chapter, CeTIF has developed a placement quadrant named "*Collateral Management integration model*" (see Figure 1).

Figure 1: *Collateral Management* integration model

Source: *CeTIF 2013*

This model takes into account two dimensions:

- The *optimisation level* of the *assets* (horizontal axis), understood as the ability of the broker to effectively and efficiently manage the collateralised assets

- The *integration level* of the *operations* (vertical axis), defined as the standardisation, integration and automation level of the operational processes for Collateral management.

As shown in Figure 1, from the integration of the two dimensions there are four different approaches that emerge which are as follows:

BASIC MANAGEMENT: A passive approach to Collateral management characterised by poor attention to assets optimisation and of "manual" operational processes[5]

ENHANCED: A proactive approach to Collateral Management which is not structurally supported by systems and procedures that guarantee a greater operational efficiency.

INTEGRATED: A mainly responsive and operationally-efficient approach to Collateral, as supported by standardised operational processes and by integration of advanced information systems.

OPTIMISED: A proactive approach to Collateral Management which guarantees generating value effectively and efficiently.

The *level of asset optimization* is a function of:

- The range of the collateralised *assets*
- The ability to offer Collateral Management services to third parties
- The use of different forms of participation
- The existence of a policy of lending from its own customers
- The reuse of the received assets as collateral
- The degree of complexity of the optimisation algorithm

The *operation level* is measured by the following variables:

- The existence of a designated Collateral Management *service desk*
- The existence of a dedicated Collateral Management information system
- The existence of forecasting systems for the securities
- The level of specialist Collateral Management skills
- The organisational difficulties of Collateral Management
- The level of software coverage.

The rest of the chapter is structured as follows: Section 2.2 presents the main aggregated findings in respect of the *optimization level*. Section 2.3, meanwhile, contains the aggregated data relating to the *operation level*. Section 2.4 concludes the chapter by presenting the position of 8 brokers within the placement quadrant.

[5] This meaning is given in the organisational theories in respect to production technologies. In particular, see Charles Perrow " A Framework for the Comparative Analysis of Organizations", American Sociological Review 32 (1967).

It is possible to understand optimisation of Collateral within a dual perspective, which on the one hand analyses the type, variability and amount of collateralised assets and on the other hand optimisation of the assets in the strictest sense.

2.2 Optimisation level: evidence from the *survey*

The need to be able to parameterize the state-of-the-art, in an Italian context, of the Collateral optimisation process, derives from the attempt to stem inefficiencies within Collateral Management. These inefficiencies may be internal: connected to the typical organisational structure and business model used by the brokers, or external: concerning the number of different service providers which the institutions turn to.

The optimisation process in Collateral Management can be analysed from two perspectives:

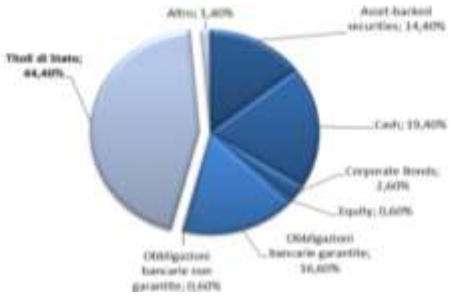
- The amount, type and variability of the collateralised assets
- Optimisation of the assets in the strictest sense

Amount, type and variability of the collateralised assets

The ability to use a wide range of assets for liquidity management and to cover the derivatives margins is, within the model, a determining factor. By analysing the average percentage of the collateralised assets it can be noted that Government securities and cash are the most widely-used form of security. Thanks to their high liquidity, government securities are used in various fields of funding operations, such as refinancing operations with the Eurosystem, *repo* etc. - Meanwhile cash is used for margining in derivatives.

In support of these findings, a recent study [6] by the International Swap and Derivatives Association (ISDA) shows the predominance of assets such as cash and government securities that make up 91.1% of the total collateral received and 97.1% of pledged collateral.
Finally, ABS and covered back bonds should not be forgotten with respective percentages of 14% and 16% of the total.

Figure 2: Percentage of assets utilised in the total *Collateral* used: 2013



(Government securities: 44.4%, ABS: 14.4%, Cash: 19.4%, Covered back bonds 16.6%, uncovered back bonds: 0.6%)

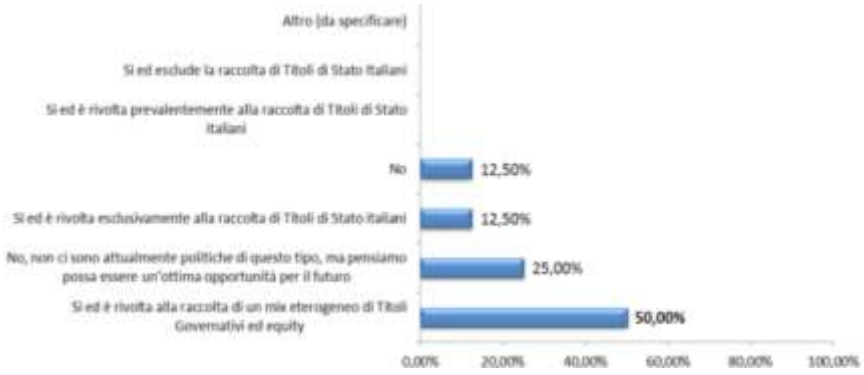
Source: *CeTIF 2013*

[6] ISDA Margin Survey 2013

Among the instruments used for liquidity management and for covering derivatives margins, cash and government securities appear to be the preferred solution. 62.5% of the brokers use policies of borrowing securities for financing liquidity.

The propensity of brokers to turn to lending policies for clients in order to finance liquidity collection has returned among the various parameters used in order to assess the optimisation level of the assets. The operation of Securities Lending sees the transfer of ownership of a certain amount of securities by a lender (the client) to a subject provider (the broker), who, on a given date, is required to return instruments of the same type of loaned securities, in addition to the payment of a fee as remuneration for the availability of the securities. As can be seen from Figure 3, only one of the 8 institutions does not use nor does it intend to use this sort of policy in the future. While in 62.5% of cases policies of this type are implemented, albeit with a differing degree of diversification.

Figure 3: Use of securities lending

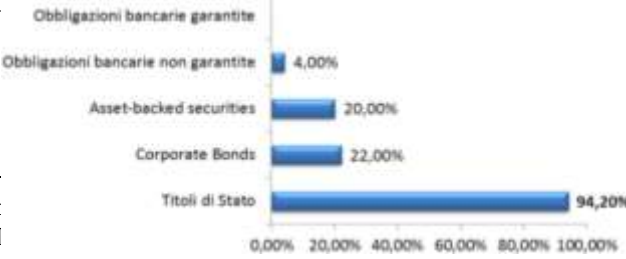


(Other [to be specified] - Yes and excludes funding of Italian government bonds - Yes and is mainly oriented towards funding of Italian government bonds - No, 12.5% - Yes and is totally oriented towards funding of Italian government bonds, 12.5% - No, there are currently no policies of this type, but we think it may be an excellent opportunity for the future, 25% - Yes and is oriented towards funding of a mixture of government bonds and equity, 50%)

Source: *CeTIF 2013*

The possibility of optimising the available assets was also measured by the attitude of the broker in using the received collateral. The reuse - *rehypothecation* - consists of using the securities provided by the collateral giver for other operations[7]. The survey shows that 60% of the sample reuses collateral and almost all of the reused securities are government securities. Following with around 20% are corporate bonds and ABS.

Figure 4: The reuse of assets: 2013



[7] For … nd others. (2010), WP/…

(Covered back bonds - uncovered back bonds - ABS - Corporate Bonds - Government bonds)

Source: *CeTIF 2013*

Such an outcome probably depends on the type of access to the market in which to utilize asset re-use.
In the case of Italy, the high percentage of government securities that are reused are a result of two factors: on the one hand, a domestic market which deals solely with government securities, and on the other, the portfolio make-up. If the study were to be extended to the European player, percentages for other asset categories would be higher, both for the markets that accept other securities (for example Eurex Repo) and for the different portfolio make-up.

Asset optimisation in the strictest sense

An important element of analysis that has been considered was the ability of brokers to be able to estimate the total value of the collateralised assets in an integrated fashion between Finance and the Treasury and the possibility of having, therefore, an integrated view of current assets undertaken as collateral. The survey shows that around 60% of the sample is effectively able to provide this estimate (see Figure 5) and that there is a connection between the existence of a dedicated collateral *service desk* and the possibility to estimate the value of the outstanding collateral.
This finding is particularly significant and encouraging. One of the most critical aspects of the optimisation process, in fact, is the ability to possess a real-time view of the used and available Collateral.
In order to achieve a satisfactory optimisation level of the collateralised assets and the assets that will be used as collateral, every broker should have every element of integrated data available to them. This rather ambitious objective is indeed a real challenge, given the complexity, variety and amount of information relating to collateral: eligibility, *haircuts*, market data, and concentration limits must be able to be clearly identifiable, as they contribute to feeding the collateral optimization algorithm.

One of the most critical elements for the optimisation process is the ability of having a real-time view of the used and available collateral. Around 60% of the brokers estimate the total value of the collateralised assets in an integrated way between the area of Finance and the Treasury.

Figure 5: Ability to estimate collateral assets in percentages

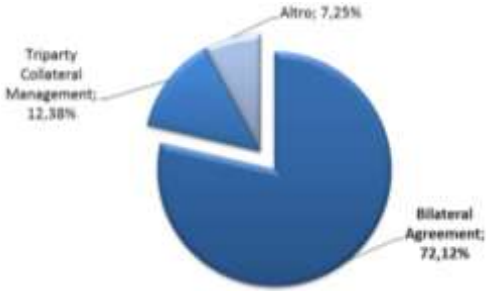
(Yes, but only separately for the area of Treasury and Finance, 37.5%. No, integrated between area of Treasury and Finance, 62.5%)

Source: *CeTIF 2013*

In terms of optimisation of the used assets, the model has rewarded greater use of *Tri-party* Collateral Management. Among the main motivations that lead brokers to prefer the *Tri-party Agent* than other forms of Collateral Management are the ability to obtain optimal distribution of collateral and complete outsourcing in managing all administrative aspects related to the contract and to collateral.
The results on the use of this form of participation (12.38%) are rather in line with evidence obtained in 2012 with a use of bilateral until now representing 72% of the total.

Among the forms of participation, the Bilateral Agreement remains the most popular among brokers. The ability to offer Collateral Management services to third parties is a business opportunity that brokers would like to strive towards.

Figure 6: Forms of participation on the collateralised total: 2013



Source: *CeTIF 2013*

The ability to best optimise the assets portfolio, through targeted strategic, organisational and technological choices, can reflect on the ability of the broker to offer Collateral Management services for other institutions.
It seems clear, however, that systems integration and standardisation of processes are two major levers for this type of activity.
More specifically, the level of integration and standardisation of a potential broker should be so high as to guarantee them not only effective and efficient internal management of collateral, but also enable them to offer this service to third parties.
The survey shows that 50% of the sample considers the possibility of utilizing this services as a business opportunity but, to date, only one broker of the sample stated that they have already gone down this road.

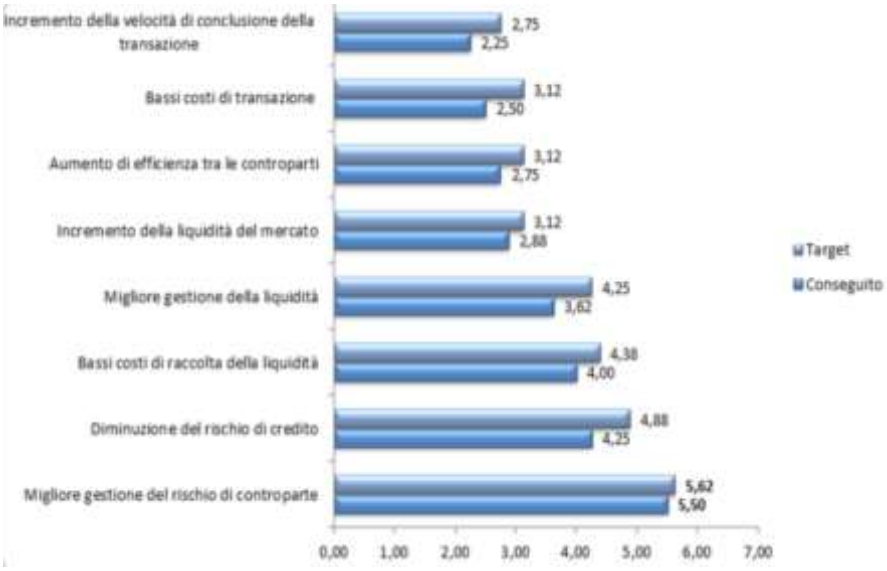
Figure 7: Provision of Collateral Management services for other institutions

(Yes, our level of integration and standardisation allows us to have access to these new business opportunities, 12.5%. No, our level of integration and standardisation is not sufficient to maintain a type of business like this, 37.5%. No, but we are assessing this opportunity for the future, 50%)

Source: *CeTIF 2013*

One of the other variables to be considered for measuring the collateral optimisation level is the level of benefits gained through the use of Collateral Management policies. As one might expect, better counterparty risk management, along with reducing credit risk, is the main objective which the panel wishes to strive towards. As shown by Figure 8, the brokers generally manage to meet their objectives when it comes to a particular target set by the institutions themselves.

Figure 8: Level of benefits owing to collateral management policies



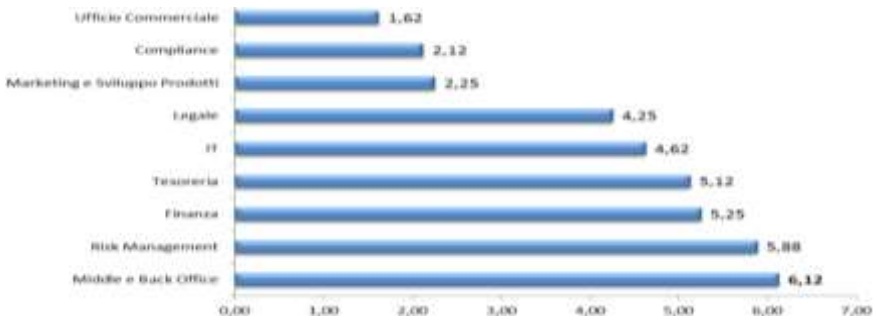
(*Increase speed of completing transaction - low transaction costs - increasing efficiency among counterparties - increase market liquidity - better management of liquidity - low costs of funding liquidity - lowering credit risk - better management of counterparty risk)*

Source: *CeTIF 2 013*

So that collateral management may lead to satisfying results in terms of efficiency, the brokers must not only use their own portfolio optimally, but also minimize the funding cost. They must mitigate the risk of their role as cash giver and as much as possible reduce operating costs. While all that is true, it is also essential that offices such as the Treasury, the Back Office and Risk Management interact daily with Collateral Management activities.
All that has just been stated is perfectly in line with the evidence emerging from the survey (Figure 9): Middle and Back Office, Risk Management, Treasury and Finance are the structures that are mostly involved during

Collateral Management activities, with an average intensity greater than 5 (on a min-max scale of 1-7).

Figure 9: The level of involvement between Collateral Management activities and banking structures (min-max scale of 1-7)



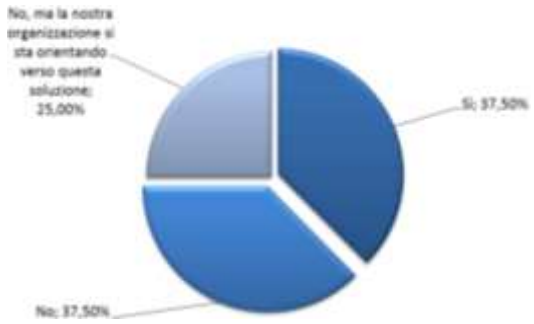
Source: *CeTIF 2013*

2.3 The level of integration of the operations: evidence found

The first discriminant used to assess the level of *operation* of the integration model concerns the existence of a dedicated *Service Desk* exclusive to Collateral Management.
Analysis of the collected data shows that just 37.5% of the institutions today makes use of an office which is exclusively dedicated to Collateral Management.
However, it is useful to point out that 25% of the sample is moving in this direction. Despite the *service desk* still not being active at an operational level, the organisation within it has already prepared all of the tools necessary for enacting one.

Figure 10: Existence of a *Collateral Management service desk*

Provision of a collateral management desk allows for many different advantages, in terms of an integrated vision of the fields of collateralisation and the function of the assets. Only 37.5 of the brokers are not moving towards this



(*No, but our organisation is moving towards this solution, 25%)*

Source: *CeTIF 2013*

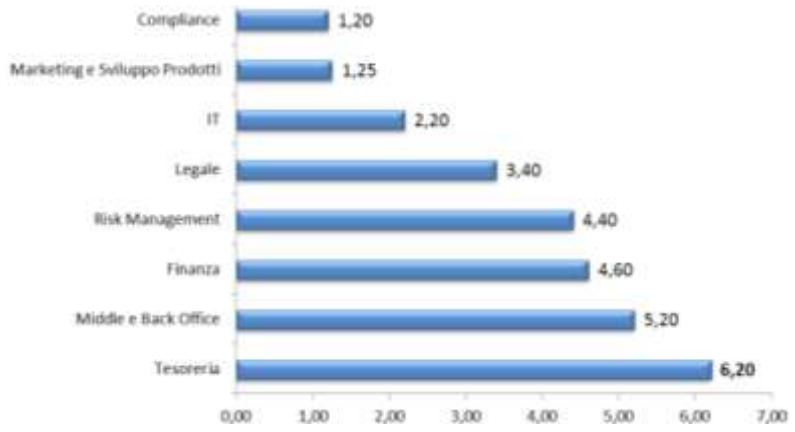
As has been mentioned in the previous section, the benefits of a dedicated *service desk* are shown both in the ability to possess an integrated overview of the fields of collateralisation and the function of the assets, and the possibility of reusing *assets* received as collateral. In the first case it is shown that 80% of the sample that has an integrated overview of the two fields also possesses a collateral *service desk*. In the second case, meanwhile, all the brokers that reuse the received collateral are equipped, or are equipping themselves to be able to have a dedicated Collateral Management office within their organisational structure.

All that has been stated thus far shows the significant key role played by a Collateral Management *service desk*. It is for this reason that brokers should be equipped with this structure of extended specialised skills in as many areas of the bank as possible, in light of the great complexity of collateral management and of the different fields that are involved in this activity.

It clearly emerges from the research that the skills of the *service desk* are mainly concentrated in the area of the treasury (of which the offices normally form a part), in the *Middle* and *Back Office*, in Finance and in *Risk Management*.

There are fewer skills relating to the legal sphere (where there should probably be investment), to IT, Marketing and to Compliance.

Figure 11: Level of specialised skills of the Collateral Management *service desk* (min-max scale from 1-7)



Source: *CeTIF 2013*

The ability to predict a possible shortage of liquidity is crucial for effective and efficient Treasury management. This predictive ability on the one hand and the existence of collateral management policies on the other, would allow banks to have sufficient collateral available to cover liquidity shortages. In light of the above, it is important that a broker has a predictive model for the *collateral* service desk, integrated with liquidity management models[8]. In this regard, analysis of the sample shows how this can effectively represent an important opportunity and thus, all of the participants possess or are preparing to possess ever- improving forecasting systems.

Figure 12: Existence of a provisional model for an integrated *service desk* with liquidity management

(No, but our institution recognises the advantage and is moving towards provision of a provisional integrated model, 60%. Yes, even if integration is not maximum and there may be opportunities for improvement, 40%)

Source: *CeTIF 2013*

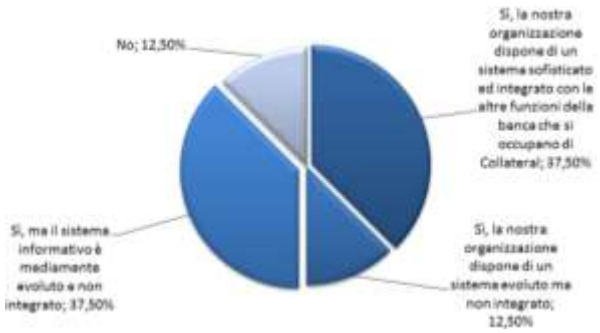
The *level of operation* has been measured in relation to the existence of an information system dedicated to Collateral Management. While it seems that only one broker does not possess a dedicated system, all the other

[8] On the subject of forecasting systems for liquidity management see an interesting piece of work by A.K. Sinha (2013) "Liquidity Risk Management and Big Data: A New Challenge for Banks, Infosys Labs Briefings, Vol. 11, no. 1

institutions possess an information system with a different degree of integration and sophistication.
From collaborating the data it appears that such a system does not necessarily mean that there is a Collateral Management *service desk*. For these brokers it would seem that the existence of a dedicated information system, with different levels of development and integration, is the sufficient condition for managing collateral.

All brokers possess an information system, albeit with different levels of development and integration, connected to collateral management.

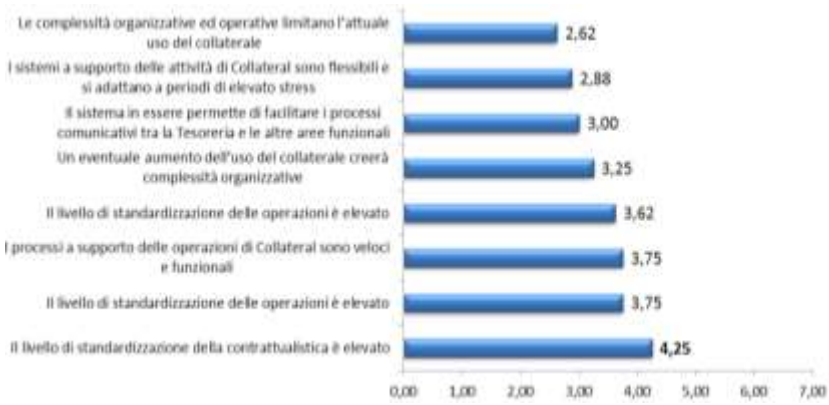
Figure 13: Existence of a dedicated information system



Source: *CeTIF 2013*

Figure 14 shows the average degree of agreement on the panel in regards to a few statements on organisational optimisation.
There emerges a certain lack of flexibility and adaptability for heightened periods of stress for collateral activity support systems (a score of 2.88 out of 7), which, moreover, would seem to hinder the communicative processes between the Treasury and other functional areas (a score of 3 out of 7).
Brokers should also focus their attention on support processes of collateral operations that are not rapid and do not function well, with a level of standardisation for which there is ample room for improvement.

Figure 14: Degree of agreement: organizational optimization



(Organisational and operational complexities limit current collateral use - systems in support of collateral are flexible and adaptable to periods of high stress - The existing

system allows us to facilitate communication between the Treasury and other functioning areas - any increase in collateral use will create organisational complexity - the standardisation level of operations is high - the processes in support of collateral operations and fast and functional - the standardisation level of the operations is high - the standardisation level of contracting is high)

Source: *CeTIF 2013*

2.4 Positioning of brokers in the Collateral Management integration model

Data analysis has allowed us to identify the following behavioural *clusters*:

Brokers tend to form in three groups, whose common factor is a similar relationship between the size of the integration model. 65% of the panel positions itself in line with the "Base Management" quadrant section.

Figure 15: *Collateral Management* integration model

Source: *CeTIF 2013*

One aspect worthy of attention is the fact that more than 65% of the panel is in a situation of substantial "advantage" in terms of collateral strategies and optimisation methods compared to that of the *operations*.

In fact, as has just been stated it appears perfectly coherent with the results shown in the previous section. The road towards total coverage at a level of operational systems and support processes of Collateral Management activities still seems a long way off.

While on the one hand it is true that a not insignificant percentage of the panel place themselves in the quadrant segment of a base level of collateral optimisation, and with a low degree of *operations*, on the other it is also true that there are many factors to be considered and that these may somehow explain this type of situation. Belonging to a banking group and therefore being subject to the will of the parent company, the size of the single institution or even the business strategy that is adopted, can be some of the reasons that give rise to this phenomenon.

This representation would seem to quite faithfully describe the state of the art of the Italian market. In fact, the research participants highlighted the

fact that the positioning of the different brokers is attributable to each typical internal banking structure.

In any case, it is interesting to note that there are 3 possible behavioural types, where the common factor would seem to be represented - for each behavioural *cluster* - by the similar relationships between the two dimensions of the model.

- **The "Manual":** A *cluster* composed of brokers with very high optimisation level of collateral in proportion to the corresponding *operation* level
- **The "Effective":** *Cluster* characterised by a high level of *optimisation* compared to the corresponding *operation* level, with a bigger gap between the dimension levels compared to the previous *cluster*
- The "**Structured**" *cluster* formed of brokers characterised by an *operation* level proportionally greater than the optimisation level.

3. Expected developments in integration of collateral

The centrality of this issue, regulations coming into force in the coming months and the particular daily market context suggest that Collateral Management will gradually assume an increasingly important role within the global financial scenario.
For this reason, in a perspective of development and of increasing use of this particular form of security, it was decided to fix research towards an analysis of future trends relating to the collateral integration process.
There will be two main objectives of this section. Firstly, the regulatory framework will be discussed and there will be a summary of the impacts of the regulations on the Collateral Management process. Secondly, possible developments in terms of Collateral Management approach in the short-medium term will be identified, replicating the Collateral Management integration model used in the previous section, with projected data until 2016.

3.1. Collateral Management development scenarios in light of new regulations

Developments in Collateral Management activities must come to terms with three regulations that will shortly be implemented on the global financial markets. These include the Dodd Frank Act, EMIR (for the OTC derivatives market in the US and Europe respectively) and Basel III.
The terms on which these regulations will impact on Collateral Management activities are widely discussed by all stakeholders of the financial market and speculation has been growing for a while as to what the consequences of these new regulations may be. The new regulations' objectives and expected impacts in the field of collateralisation activities are shown below.

The *Dodd-Frank Act* and *EMIR* are two reforms - proposed by the *Securities and Exchange Commission* (SEC) of the US and the *European Securities and Markets Authority* (ESMA) respectively - with the objective of regulating the financial markets in order to mitigate system risk [9] and to increase the transparency of derivatives[10]. For OTC derivatives both regulations involve centralised

[9] De Larosière Report (2012)
[10] G20 in Pittsburgh (26.09.2009)

clearing requirements for certain classes of derivatives, reporting on trading and organisational and procedural requirements for CCPs [11] and for the trade repositories.
What is the effect on collateral management? This issue is still subject to much debate and can be summarised in a few points.
Firstly, with the introduction of CCPs initial margins will increase and the range of assets for collateral will be restricted (higher quality assets will be increasingly sought after). The effects of these two impacts is immediate: there will be an increase in demand for collateral and consequently the cost of collateral will increase. In addition, brokerage of the CCP will involve an increase in the number of margin calls during period of high market volatility.
Secondly, impacts occurring at an organisational level should be considered. Considering the fact that some trades will be carried out with CCPs and others on a bilateral basis, brokers will be forced to operate with different work-flows depending on the trade with a subsequent increase in organisational complexity.
It seems clear that optimisation of collateral is a crucial factor for the success of the brokers working with derivatives. In particular, those who will be able to efficiently manage margins on different types of trades will be able to gain a competitive advantage over other players. Efficiency in this case is understood as the broker's ability to better manage an increase in costs associated with the clearing requirements and tightening of asset-eligibility criteria in compliance with the regulatory requirements on liquidity.

With a consultation paper entitled "Strengthening the Resilience of the Banking Sector" known to all as Basel III, Bank of International Settlements at the end of 2010 presented its recommendations for strengthening the international regulatory structure on capital and liquidity, with the aim of promoting a more robust banking system. The objective of this regulatory scheme is to *"strengthen banks' ability to absorb shocks arising from financial and economic stress, whatever their origin, thus reducing the risk of contagion from the financial sector in the real economy" (BIS 2010).*

3.2. Transformation strategies

Through data analysis carried out on a prospective basis, it has been possible to identify a few development trends which are summarised in the following points:

1. **A change in the make-up of the collateralised *assets* is expected, but government securities remain the most widely used assets.** Specifically, there is a slight reduction in the use of government securities as collateral (from 44.4% to 33.75%) compared to an increase in the use of cash (from 19.4% to 24.75%), the use of covered back bonds (+2%), and ABACO instruments (+4%).

[11] Capital requirements are also outlined for CCPs

In light of this situation, significant changes are expected relating to use of securities lending, to the expansion of collateral services to other institutions and to the implementing of predictive systems for securities requirements integrated with liquidity management.

2. **Despite an increased use of a Tri-party Agent, the Bilateral Agreement remains the preferred form of participation:** Tri-party Collateral Management would seem to assume an increasingly important role in the future, as there is an increasing use of it equal to 18.74% (from 12.38% to 31.12%). Bilateral, remaining the main form, is on the decrease by almost 20 percentage points (from 72.12% to 53.38%).

3. **A growing propensity for the use of securities lending as an instrument for financing liquidity is estimated.** The strategic significance of this instrument, useful in finding new sources of security, may be sensed by an increased use. Almost all of the sample (87.5%) in fact will make use of this activity in 2016.

4. **An expansion of financial business is expected, with an extension in offering collateral services to third parties:** by 12.5% for the current situation, we progress to 62.5% in the future. This may be attributed to an improvement and consolidation of existing processes and Collateral Management activities.

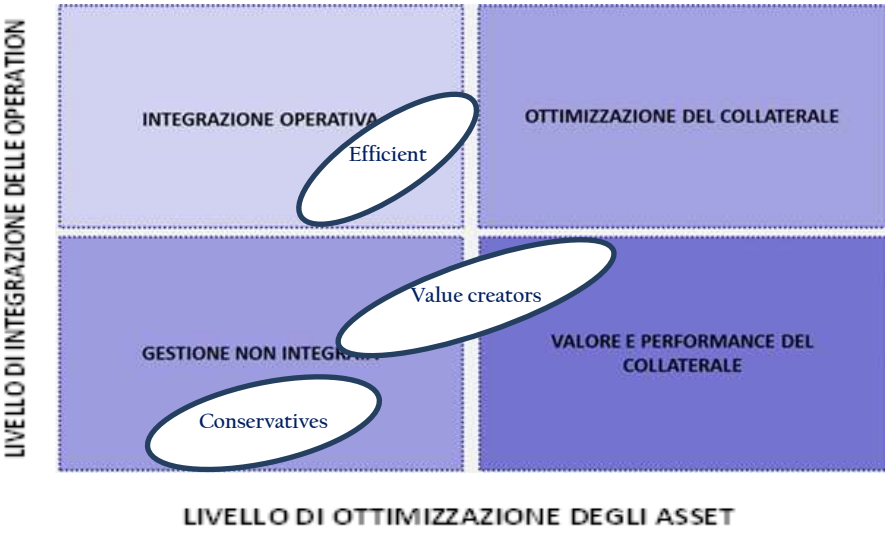
5. **In the reuse (*rehypothecation*) of collateral, government securities are still preferred, but there is also an increase in secured instruments:** on this aspect, there are no substantial changes in the percentage of reuse of government securities but there is an increased in covered back bonds (from 0% to 28%) and ABS (from 20% to 40%).

6. **It is estimated that almost all brokers will be equipped with a collateral management *service desk*:** The progressive situation shows how more than half of the sample (75%) will be equipped with a dedicated Collateral Management *service desk* in 2016, while 25% of the brokers state that they will be unequipped.

7. **It is understood that brokers will implement forecasting systems that provide for securities being integrated with liquidity management:** this detail seems to be the most significant. In fact, the entire panel states that it will be equipped with a forecasting system of this type in the future, albeit with different degrees of development and integration.

From the resulting data the following placement quadrant emerges:

Figure 16: Transformation strategies 2016E



Source: *CeTIF 2013*

Estimates relating to approaches to Collateral Management progressively show that brokers' positioning is divided within three new clusters. 37.5% of the panel does not change its situation in 2016.

What especially emerges from the placement quadrant is that all the brokers that predict that their conditions will change compared to their current situation intend to invest whether in *asset* optimisation or in terms of *operations*.
Despite this development expected for both aspects, it would seem that brokers are proportionally more inclined to target their efforts towards a better structuring of systems and of operational processes in support of Collateral Management activities. Of the brokers who anticipate a change (62.5%), 80% of them register greater movement on the ordered *operations* compared to the x-axis (optimisation).

Not surprisingly, in view of future projects (albeit considered in the short-medium term), there is no broker in the "collateral optimisation" quadrant.
A possible reason for this finding is attributable to the fact that, compared to big European players, the Italian financial institutions have been overseeing the issue for less time. Therefore it is difficult to find an Italian player as a best performer in absolute terms.
If one considers, moreover, that use of the collateral for funding policies is the result of the effects of the recent financial crisis that has broken down trust between brokers, one may conclude that the path towards full integration and optimisation of activities is still some way off.
In any case, once again, evidence emerging from the research allows us to identify three behavioural types, with the common denominator still being the relationship between the scope of optimisation and operations. The following classes of transformation strategies emerge from the research:

- **The "Efficients"**: they display similar behaviour relating to development expectations of Collateral Management integration policies, recording the same average level of effort for both aspects.
- **The "Value Creators":** have, on average, the same development trends. Their growth trajectory is characterised by a greater

investment in IT architecture aimed at improving operations integration compared to the previous cluster

- **The "Conservatives":** belonging to this group are the institutions that, given their situation and the current means at their disposal, do not intend to follow a path of development. Within this *cluster*, however, there is one broker whose behaviour is *anomalous*. In fact there are no substantial changes expected for this group relating to their current situation and therefore, in terms of development they do not follow the trend of the competitors of the original cluster.

3.3. Drivers for efficient Collateral Management (by Dr. Romaniello of UniCredit)

In a market context which is very different to the past, banks are faced with and will increasingly be faced with greater collateral needs on the basis of different security schemes (*frameworks*) and different areas of use: central banks, CCPs and regulatory purposes.

In the operational management of these, the treasury plays an important role as end-users of assets for managing typical risks of banking activity, the most important being liquidity risk.
While during the 2007-2009 financial crisis and the 2010-present sovereign debt crisis, the central banks have always assumed a role of a lender of last resort to the European banks, safeguarding the impact on the real economy, the role of the CCP has become crucial on the securities markets. It has allowed investors to continue to distribute liquidity on the markets, by moving counterparty risk from the bilateral to the CCP itself.

The systemic role connected to activities carried out by the CCP on the markets is raising a whole series of reflections on the subject of risk management and therefore subsequent impacts on the market.
Operating through a central counterparty means not impacting on capital, having a very low impact on credit lines and especially the security of closing outstanding transactions.
Rendering Collateral Management more efficient means making an optimal use of the securities portfolio, minimising funding costs, ensuring access to liquidity, mitigating the role of liquidity investor and minimising operational risks. Optimisation takes place through active collaboration in 4 operational areas: treasury (business area), back office securities (operational control), risk management (risk mitigation), and accounting (for reporting purposes).
Collateral can be used in three areas: access to liquidity of the central bank, financing of the portfolio and derivatives.
Access to the central bank requires a careful assessment of eligibility criteria, while financing of the portfolio requires a careful assessment of the markets and therefore of the amounts on that market for repurchase transactions.
With an unsecured funding market no longer active on longer maturities, the repurchasing market has been and still is an essential source of fundraising for the banks.

3.4. Levers for improving Collateral Management operations (TasGroup)

Significant regulatory developments (EMIR, Basel III), along with the transformation which the European market has been subject to (CSDR, T2S, Harmonisation, Banking Union), have transformed the tasks of the Treasury within the bank, now calling for a role as the real financial nerve centre of the institute.

In order meet the needs of external stakeholders (including supervisory bodies), investors, counterparties and internal demand (CDA, business units…) a new intelligence is required for the functions of the Treasury:
to ensure optimal portfolio use, have access to liquidity, to reduce funding costs, market and operational risks. They require new monitoring capacities and use of assets, like the ability to view financial risk in a comprehensive manner across the portfolio.

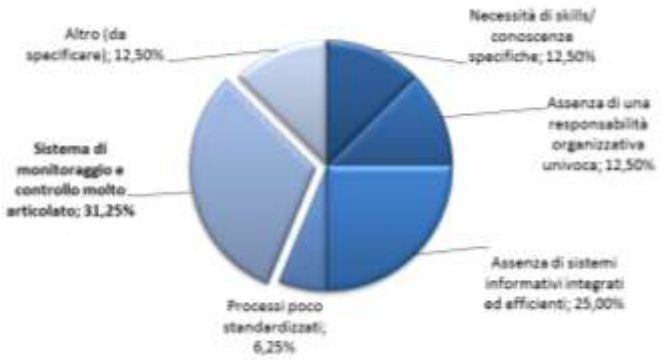
The market environment that preceded the current financial crisis (sufficient liquidity, different awareness in considering counterparty risk, capital requirements lower than present ones, no obligation for derivatives clearing OTC,…) and the subsequent lack of being able to meet similar needs, have in the past lead to reaching tailored, adequate solutions for managing a profoundly different functional set from what is required today.
Details emerging from the sample provided some significant evidence in relation to the operation:

- Institutions that have established a dedicated Collateral Management *service desk* are still a minority (37.5% of the sample)
- Only part of the institutions (37.5% of the sample) is satisfied with the dedicated Collateral Management information systems
- Generally the level of integration of the various functions and the effectiveness of the operational processes constitutes an area for improvement.

These findings are consistent with the development phase that the use of collateral is experiencing in the banks for all the reasons outlined above.

The same participants of the survey identified the main organisational constraints in the development of effective Collateral Management which are summarised in the chart below.

Figure 16: Major organisational constraints for effective *collateral* management



(Other [to be specified]: 12.5%, monitoring system and very developed controls: 31.25%, poorly standardised processes: 6.25%, need for skills/specific knowledge: 12.5%, lack of uniform organisational responsibility: 12.5%, Lack of integrated and efficient information systems: 25%)

Source: *CeTIF 2013*

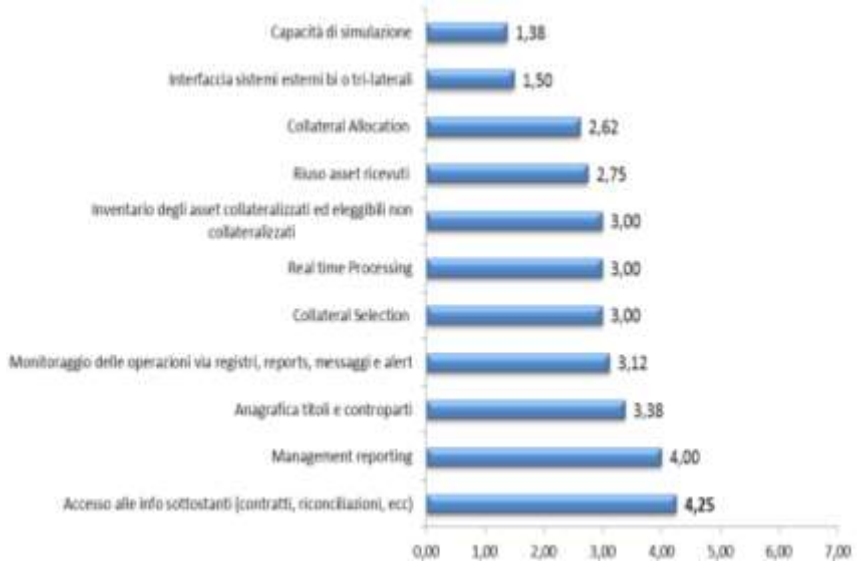
According to these findings the levers for improving Collateral Management operations are therefore those that allow the illustrated constraints to be overcome:

- Dissemination of the necessary skills
- Organisational definition of processes and persons responsible
- Improvement of information and control systems

Considering that the lack of integrated and efficient information systems and connection of monitoring systems represent more than half of the complex constraints (56.25%), it seems that improvement of these aspects is crucial for improving operations.

More specifically it is possible to consider what gaps may be filled with the use of Information Technology by considering the following graphic, which represents the self-assessment of coverage of certain processes and functions typical of Collateral Management.
Considering the score given between 1 to 7, one notes how few processes reach a level of satisfaction that would ideally be at least equal to 3.5.

Figure 17: Degree of coverage of the items below



(Simulation capacity - interface external system bi or tri-lateral - Collateral Allocation - Reuse of assets received - inventory of collateralised assets and non-collateralised eligible assets - Real time Processing - Collateral Selection - Monitory of operations via registers, reports, messages and alerts - Registering securities and counterparties - Management reporting - Access to the above information [contracts, reconciliation, etc.])

Source: *CeTIF 2013*

They are typical systems processes (*Real time processing*, external systems interface, monitoring, records) or processes which are difficult to achieve without adequate IT support (Simulation, Allocation, Reuse, Inventory and Selection). In detail:

- The ever expanding world of assets that are used for collateral requires the ability to manage more complex records, managing golden records among data provided by different vendors
- Collateral selection and allocation require continual analysis of portfolios, functions, counterparties and eligibility rules for always using the most economical assets
- Variations in ratings and prices produce effects on eligibility and exposure of securities that must be managed in real time
- The potential for different asset classes, functions, custodians or CSD may be expressed only on the condition of having a completed and updated inventory of the available assets.
- Monitoring is increasingly targeted towards forecasting, so it is not enough to know about any critical situations as early as possible with messages and alerts but they must also be prevented.

The Collateral Management processes and organisation can be effectively improved with an effective IT support, which is a typical lever for operating integration of new and developing processes.

Still according to the survey, the operators' choice of future business is targeted towards an expansion of services and overcoming existing constraints:

- they want to increase the use of the tri-party agent, of repurchasing contracts and other collateralisation forms compared to the current, more concentrated situation on central bank pooling.
- In some cases (50%) they do not manage to provide Collateral Management services to their clients due to inadequate integration and standardisation.

In this sense, IT does not just support improving operations but also enables new business opportunities through a better integration of Collateral Management with the bank.

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