

**CHANGES IN ORGANISATIONAL ARCHITECTURE AND SMALL BUSINESS  
LENDING POLICY: THE CASE OF BANK ACQUISITIONS**

**GHASSEN BOUSLAMA**  
*Associate Professor*

[ghassen.bousslama@reims-ms.fr](mailto:ghassen.bousslama@reims-ms.fr)

**Reims Management School**  
59, rue Pierre Taittinger - BP 302  
51061 Reims Cedex  
Tel. : 03 26 77 47 47 - Fax : 03 26 04 69 63

# **CHANGES IN ORGANISATIONAL ARCHITECTURE AND SMALL BUSINESS LENDING POLICY: THE CASE OF BANK ACQUISITIONS**

## **Abstract**

This article aims to analyse the effects of changes in organizational architecture resulting from bank acquisitions on small business lending policy. The study focuses on the organizational mechanisms that direct the credit decisions of loan officers, namely the allocation of decision rights, evaluation mechanisms and remuneration systems. Our analysis of responses from a questionnaire sent to loan officers in acquired banks shows several significant relationships between these three mechanisms of organizational architecture and financial and commercial policies for small business lending.

**Key words:** acquisitions; small business lending; Organizational architecture; bank-SME relationship.

**JEL:** G21; G34; G32

## **Introduction**

Small-and medium-size enterprises (SME's) are strongly dependent on bank loans and any change in this sector would have direct effects on their finances. The results of empirical studies analysing the impact of bank mergers and acquisitions vary depending on the type of acquisition, the size of the organisations concerned, the organisational complexity of the consolidated banks, the size of the sample studied and the econometric tool chosen. These studies focused on the volume of SME lending show negative, positive or insignificant results. However, most of this work offers no convincing explanations and concentrates exclusively on the volume of loans granted by the consolidated banks. It rarely studies other variables of the loan contract (guarantees, interest rates etc.) or the overall Bank-SME relationship (relationship lending or standard loans).

Previous work has made it clear that small business lending needs to be relationship lending, to reduce the problem of informational opacity which is a feature of this kind of firm. The nature of a long-term relationship facilitates the collection of soft information that is required for efficient decision making (Berger and Udell, 2002). Studies have also shown that small banks, with flexible structures well adapted to collecting soft information, have an advantage in this (Stein, 2002) compared with large, organisationally complex banks. There is then a significant link between the organisational characteristics of a bank and the way it finances SMEs (Berger et *al.*, 2005b; De Haas et *al.*, 2010; Beck et *al.*, 2011; Ongena and Sendinez-Yüncü, 2011).

Any change in the organisational structure of the bank is liable to affect the cost of dealing with specific information and thus to affect the nature of the bank-SME relationship. In this sense, banking consolidation operations, by causing organisational changes, can have a significant impact on the volume of SME lending and condition the nature of the relationship. A study of these consequences must necessarily be based on an analysis of the organisational

mechanisms that regulate small business lending decisions. Interaction between the different hierarchical levels involved in the decisional process also needs to be studied, in particular so as to assess the efficiency of these mechanisms in the specific area of the bank-SME relationship.

Despite the large amount of research dealing with the primordial role of relationship lending for opaque SMEs as opposed to standard financing, very little of it looks at the bank-SME relationship from an organisational point of view. Similarly, although recent research into the link between the bank's organisational form and the nature of the bank-SME relationship opens up new possibilities for investigation, it does not explain this satisfactorily. Overall, this work does not enable us to assess the effects of organisational changes on small business lending policies.

This study is part of the current of research dealing with the effects of banking consolidations on SME financing. However, unlike other research, our work analyses changes in the organisational mechanisms that regulate lending decisions. When banks join together, they undergo important organisational changes. These transform not only bank-borrower relationships, but also the relationships between the different actors in the decision making process. An intra-organisational analysis of the responsibilities and motivation of the staff involved in this decisional process can help to find an answer to the question of the impact of changes in the bank's organisation on small business lending.

The lending decision is analysed in this article as an investment choice on the part of the acquired bank. However, "*whether in strategic or in economic-financial terms, the analysis of investment seems henceforth inseparable from organisational structure*" (Charreaux, 2001, p.73). Thus we take an organisational approach in the sense that in our analysis of investment, and in particular SME lending, we take into account human and organisational aspects. We pay particular attention to agency theory, which attempts to explain investment decisions

through the behaviour of individuals and their ability to produce and exchange the information necessary to make good decisions.

Our organisational approach highlights the role of the mechanisms that make up the organisational architecture as determining small business lending policy. In this context, the theory of organisational architecture, which explains the investment policy of organisations, provides a theoretical framework that clarifies our research question (Jensen & Meckling, 1995). Indeed, the organisational mechanisms that regulate lending decisions, in other words the attribution of decision-making rights, assessment systems and incentive schemes, are liable to evolve in a situation of bank consolidation. This evolution can have consequences on SME lending processes.

Our article attempts to measure the impact of organisational architecture and its changes following bank acquisitions on operational, commercial and financial small business lending policies. Our analysis will concentrate in particular on the components of organisational architecture that frame the decision-making process at junior level, especially client loan officers. These staff members are in direct contact with SME clients and only they have the soft information necessary for good decision-making. They are also best placed to observe organisational changes that affect SME lending processes.

We have organised our article as follows. The first section will deal with the theoretical framework that will enable us to analyse the impact of SME financing operations. We will also present the consequences of post-acquisition integration costs on lending policy. The second section will study the link between organisational architecture and its evolution on SME lending policy post-acquisition. The third section will present the methodology adopted and the data we used. The final section will present and discuss the results of the study.

## **1. Theoretical Framework and Research Question**

Our study refers principally to two research fields: empirical studies analysing the consequences of bank mergers and acquisitions; and work that studies agency problems between hierarchical levels following bank consolidations.

### **1.1. Bank Mergers and Acquisitions and SME Lending Policies**

Numerous studies have looked at the impact of mergers and acquisitions on performance and the availability of bank loans. The results of these studies vary greatly depending on the nature of the consolidation, the size of the parties involved, their organisational complexity and their geographical spread (Berger et *al.*, 1999; Bonaccorci di Patti and Gobbi, 2007; Uchida et *al.*, 2008).

The study by Focarelli et *al.* (2002) into Italian banks shows that mergers usually result in a growth in the volume of loans granted to large companies, but that this effect is not always apparent after acquisitions. Empirical studies carried out in the United States find a significant increase in SME lending when two small banks join together. Other research finds that a reduction in numbers of small banks has no significant effect on SME financing<sup>1</sup>.

Research into the consequences of the growth of organisational complexity in consolidated banks has also shown a reduction of the supply of credit to SMEs (Berger et *al.*, 1999). In this case the rationing has been measured in relation to the geographical spread of the bank's activities or in relation to the size of the banks involved in the consolidation (Berger et *al.*, 1999; Beretta and Del Prete, 2010). Empirical studies in the United States have found a reduction of lending to small businesses when large banks join together or when a large bank acquires a small one (Peek and Rosengren, 1996; Walraven, 1997; Berger et *al.*, 1998; Zardkoohi and Kolari, 2001). The same results have been observed in Italy (Bonaccorsi di Patti and Gobbi, 2007), in Japan (Ogura and Uchida, 2008) and in Spain (Montoriol-Garriga, 2008).

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<sup>1</sup> See the literature review by Berger et *al.* (1999) which cites studies carried out in the United States on this subject up to the 1990s.

However, other empirical research has given support to the idea that mergers and acquisitions have a positive effect. They suggest that these consolidations stimulate the supply of credit by local banks and new entrants which compensates for the reduction in the supply of loans to small businesses (Berger et al., 1998; Berger et al. 2001; Keeton, 2000; Bonaccorsi di Patti and Gobbi, 2007; Berger et al., 2004). The studies by Berger et al. (2001; 2005b) carried out in the United States, find that consolidations have a positive effect on the SME lending policies of former banking competitors on the same market. Other studies show that the share of assets allocated to SME loans by new entrants is greater than that allocated by other competing banks of the same size and with the same organisational structure (Goldberg and White, 1998; DeYoung et al., 1999). According to Peek and Rosengren (1998), this enables the short-term financing of opaque SMEs and maintains the balance of the credit market<sup>2</sup>.

It is true that most of the abovementioned studies do not explain why or how consolidation has such varied effects on SME lending. Thus Sapienza (2002) asserts that the reduction in SME lending is not related to the borrower. The different types of credit abandoned by consolidated banks do not necessarily have a negative NPV. These small business customers often move to other existing banks or new entrants (Berger et al., 1998). This research also ignores organisational changes resulting from mergers and acquisitions. We therefore propose that changes in lending policies depend on other factors linked to the bank's investment decision process. The varying results of studies into the consequences of the merging of large and small banks confirm the existence of a link between the organisation of the bank and its specialisation in SME financing.

## **1.2. Bank Mergers and Acquisitions and Integration Costs**

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<sup>2</sup> According to Berger et al. (2004b), although bank consolidation partly explains the appearance of new entrants, it does not explain the large volume of credit granted by these new entrants. Indeed, the consequences of mergers and acquisitions on SME lending by competing banks depend on the type of consolidation and the size and age of the banks prior to consolidation.

According to several studies, the way a bank is organised determines the way it finances SMEs. For example, the bank's size, organisational complexity and geographical spread conditions the nature of the information used in the credit risk evaluation process (Berger et al., 2005a ; Delgado et al., 2007 ; Ogura and Uchida, 2008 ; Uchida et al., 2008 ; Shen et al., 2009 ; De Haas et al., 2010 ; Beck et al., 2011; Ongena and Sendinez-Yüncü, 2011). So, when an organisation grows in size, transfer costs for soft information and agency costs will rise (Berger & Udell, 2002).

More generally, the change in status from that of a small bank to that of a banking group makes the managerial structure of the merged banks more complicated. The growth in number of hierarchical levels and in the number of parallel responsibilities and procedures implies significant integration costs, which justifies the fact that organisations limit their expansion (Williamson, 1988). So, for example, large structures resulting from bank consolidations can experience diseconomies of scale due to an increase in the administration and coordination costs of loans during the transitional period. These costs are more likely to grow when procedures are multiplied because of the adoption of two financing techniques relying on two distinct lending processes.

Moreover, the disadvantages of integration are not limited to administrative costs. In a world of incomplete contracts, the prior motivation of an agent matches the degree of control or authority he has over a given asset (Aghion & Tirole, 1997; Stein, 2002). The merger of two or more different entities leads to higher agency costs and integration costs because of differences in firm culture, performance, information technology and lending practice. In such cases, the cost of controlling may make it difficult for the banks to keep their former clients or to maintain their previous performance. Parent banks have to find a compromise between granting greater autonomy and reinforcing their control over the group.



Consolidation leads to an increase in the complexity of the organisational structure and so to an increase in control costs. This affects the motivation of the agents who are responsible for the collection and management of soft information necessary for relationship lending to SMEs. Because of the idiosyncratic nature of this type of information, a growth in size and organisational complexity leads to agency costs between the different hierarchical levels that take part in the lending process. The informational asymmetry implied by this soft information increases with the distance separating the agents. Complex organisations are therefore less efficient in providing incentives and less effective in allocating funds via their operational units to finance opaque SMEs.

Stein (2002) demonstrates that decentralised banks are more efficient in processing soft information than those with a centralised structure. Liberti (2005) finds that more soft information is processed and transmitted in decentralised organisations. This result agrees with that of Liberti and Mian (2006) who show that the amount of soft information falls as the hierarchical level rises, and that giving more authority to loan officers would lead to an increase in their efforts to collect soft information. This research, based on employee incentives and soft information, partly explains why there is no negative impact on SME financing when small banks join together.

Post-acquisition organisational change is also influenced by technological innovation. The implementation of internal scoring systems should reduce the disadvantage large centralised banks have in processing information about small businesses (Akhavain *et al.*, 2005; Berger *et al.*, 2005a). Integrating these techniques into the standard evaluation process also makes it possible to reduce agency problems and to facilitate the control of loan officers' decisions. The results of empirical studies confirm the existence of a significant link between an increase in the volume of SME lending by large banks and the adoption of a standardised scoring system.

As far as we are aware, apart from the research by Beretta and Del Prete (2010) into the Italian banking sector, little research has concentrated on the consequences of mergers and acquisitions on banks' organisational architecture. Although our work follows on from these studies, its main objective is not to analyse the consequences of consolidation on organisational architecture (the decentralisation of decision-making rights, evaluation systems and mechanisms for rewarding employees), but to study the impact of post-acquisition changes to these mechanisms on SME lending policies.

## **2. Changes in Organisational Mechanisms and Lending Policy**

In Agency Theory, we can explain the link between a bank's organisational structure and the volume of SME credit by the specific nature of the information necessary to assess these companies. This idiosyncratic information is subject to agency problems that vary depending on the size and organisational complexity of the bank. However, whilst a great deal of prior research has studied the link between the organisational structure of consolidated banks and the nature of the bank-SME relationship (Berger and Udell, 2002; Berger *et al.*, 2005a; Stein, 2002), it has not looked at the impact of changes in the organisational mechanisms that regulate lending policy.

SME lending policy, which we compare in our research to an investment choice, can be defined as a process within an organisation where different hierarchical levels can come into conflict and where the issue of investment control depends on the efficiency of the organisational architecture (Noda and Bower, 1996). An analysis of the responsibilities and motivation of the actors who participate in this decisional process in different organisations will help to provide an answer to questions concerning the impact of post-consolidation organizational changes on SME lending policy. In this context, the theory of organizational architecture, which attempts to explain firm investment policies, is a theoretical framework which can help us to clarify our research question.

## 2.1. Organisational Architecture

We cannot analyse investment choices in an organisation without studying the organisational mechanisms that regulate them. *“Studying the investment process cannot be disassociated from studying organisational architecture and processes for the creation and distribution of value”* (Charreaux 2001, p.51). Unlike traditional financial views of investment choice, we opt for an organisational approach. This defines investment as a process within an organisation where different hierarchical levels can come into conflict (Noda and Bower, 1996). Using Agency Theory (Jensen and Meckling, 1995), this approach takes into account several organisational aspects, in particular personal factors, the formal organisation, information systems and mechanisms for the control and reward of staff.

Unlike the normative branch of Agency Theory, this approach highlights the role of the mechanisms that make up the organisational architecture as determinants of the investment policy. According to Charreaux (2001, p.48), *“We can approach the different financial decisions using the theory of organisational architecture, resulting from the work of the principal founders of positive agency theory, in particular Fama, Jensen and Meckling ... the organisation is based on three essential subsystems which must be well matched for a satisfactory level of performance to be achieved”*. In the same way, we deal with lending policy as a bank’s investment choice resulting from the interaction of several employees belonging to different hierarchical levels (Berger and Udell, 2002).

This theory is based on the principle of organisational efficiency. This depends on the extent to which the three components which define it (the distribution of decision-making rights and the characteristics of two mechanisms, evaluation and reward) are coherent, complementary and interdependent. Moreover, an efficient organisational architecture is one which, apart from giving decision-making rights to those who have specific information, also makes sure that decision makers have appropriate incentive systems enabling value to be maximised. This

also requires arbitration between the costs linked to improper use of specific information (insufficient decentralisation of decision-making rights) and those linked to conflicts of interest (due to the decentralisation of rights). Companies can minimise these costs via appropriate control and incentive systems to the amount of delegation in operation.

According to Brickley *et al.* (1997), the choice of a firm's organisational architecture varies depending on the characteristics of the firm and the evolution of its external environment. A change in technological, regulatory or competitive environment impacts the organisation directly. It has to evolve continually and adapt by adjusting its distribution of decision-making rights and its internal control system. In this context, the effectiveness of the investment policy depends on continual adjustment of the mechanisms making up the organisational architecture.

Changes in the environment are the principal encouragement for a bank's mergers and acquisitions. These also oblige the bank to make new strategic choices and modify its organisational structure. Above and beyond static effects such as growth in size and organisational complexity, the consolidation will impact every hierarchical level of the organisation and *ipso facto*, the organisational architecture and the decision-making process for investment choices.

To explain the possible effects of bank mergers and acquisitions on small business lending policy, we must understand the evolution of performance determinants and the organisational mechanisms that regulate investment policy. The theory of organisational architecture offers a unifying framework that makes it possible to analyse the effects of changes in both the mechanisms for attributing decision-making rights and the systems that control (through incentives and sanctions) the organisation's performance and investment policies.

Our objective is thus to analyse the link between changes in the three subsystems defining the organisational architecture of consolidated banks (distribution of decision-making rights,

assessment mechanisms and incentive systems) and their post-acquisition SME lending policy. We will study in particular the loan officers who are in permanent contact with SME clients and who are in possession of the specific information necessary to assess the risk. We will also concentrate on the direct hierarchical superiors of these employees who are likely to influence decisions concerning loans to small businesses through the degree of control they exercise.

## **2.2. Changes to the Delegation of Decision-making Rights**

To respect organisational efficiency, consolidated banks need to reduce the transfer costs of specific information. To do this, decision-making rights and specific information need to be in the same place. So, banks involved in relationship lending should adapt their hierarchical structure and delegate authority to loan officers. This would reduce the transfer costs of specific information (Berger and Udell, 2002).

Takats (2004) proposes a model to explain the impact of bank consolidation on SME lending. According to Takats, the problem of asymmetric information between the management and loan officers can be cancelled out if the bank decentralises its organisation and uses a more extensive and expensive system of control. A centralised structure is more profitable for a large bank but reduces small firms' access to finance. Therefore, the choice of organisational architecture to reduce agency problems is decisive for the efficiency of SME lending policy. The evolution of this lending policy depends then on the level of autonomy and the type of decision-making rights given to loan officers.

Bank consolidations inevitably result in changes in size and organisational complexity. In such a situation loan officers will be lead to work with several hierarchical levels, and this makes transferring and interpreting soft information more complicated. This in turn makes it more difficult to use this information in the evaluation process. These changes can then have a negative impact on the efforts made by loan officers to collect, process and transfer this type

of information. At the same time it can reduce their incentive to develop and maintain relationship lending, which is crucial for opaque SMEs (Stein, 2002).

According to Aghion and Tirole (1997), increasing the formal authority of the officer increases his initiative and his effort. This is particularly true when the officer is concerned about results obtained and not just the amount of effort he puts in. Liberti (2005) observes that giving more autonomy to loan officers has several beneficial effects on bank-firm relationships. He finds that officers increase the amount of time they give to clients, and that borrowers perceive greater efforts on behalf of officers and make fewer complaints. Officers themselves perceive their efforts more positively, and this implies that they will use their specific information better, since it will be used as part of their individual evaluation (Liberti, 2005).

Overall, the effects of decentralisation on loan officer motivation result in more use of soft information and should have positive effects on SME lending policy. These factors lead us to propose the following hypothesis:

**Hypothesis 1a:** The effectiveness of SME lending policy in acquired banks is positively related to increases in the decision-making rights of loan officers.

Our objective is to analyse the impact of changes in post-acquisition delegating mechanisms on SME lending policy. The reduction in agency costs related to soft information depends on the choice of organisational design. The decentralisation of decision-making rights will be accompanied by more flexible hierarchical control mechanisms but followed by the implementation of a loan officer evaluation system. The centralisation of decision-making rights will reinforce the hierarchical control of loan officers. So, a change in the level of control exercised by hierarchical superiors will be paralleled by the amount of delegation and rights given to loan officers. This will have an effect on SME lending policy, which relies on soft information and more autonomy for loan officers. Hence we propose hypothesis 1b:

**Hypothesis 1b:** The effectiveness of SME lending policy in acquired banks is positively related to post-acquisition changes on of middle managers' powers of control over loan officers.

An increase in the autonomy of loan officers can also result in conflicts of interest between the bank's demands and the personal interests of the loan officer (Berger and Udell, 2002). So, the theory of organisational architecture recommends using mechanisms to reward and sanction, so as to align the interests of all the protagonists.

### **2.3. Evolution of Evaluation and Rewarding Mechanisms**

The nature of information collected about SMEs gives rise to a specific problem for the bank's organisation. Indeed, the evaluation of the credit risk of this type of firm uses two categories of information, general (hard) information and specific (soft). To minimise the risk of manipulation of this type of information, banks implement costly but unavoidable control systems to encourage officers to collect and produce this soft information. Banks also implement loan officer control mechanisms made up of evaluation and rewarding systems (Brickley *et al.*, 1997)

To maximise these officers' performance, evaluation measures must be appropriate for the activity exercised. In other words, the officers' motivation will only be ensured by the implementation of evaluation measures that take into account their efforts whilst ignoring the efforts of the outside environment. In this way the precision of the evaluation measures used affects the extent to which loan officers are motivated to collect soft information. This leads us to formulate the following hypothesis:

**Hypothesis 2:** The effectiveness of SME lending policy in acquired banks is positively related to changes in mechanisms for business loan officer evaluation following acquisition.

According to organisational architecture theory, the reduction of information transfer costs requires decision-making rights and specific information to be located in the same place,

using a system of control. This type of specific information influences the organisational structure of the bank and therefore the optimal allocation of resources. The collection, processing and production of soft information by SME loan officers thus rely on reward schemes and budget allocation levels.

The aim of the incentive system is to encourage loan officers to act in accordance with the interests of the bank. These mechanisms must encourage officers to transfer their specific information to higher-ranking staff in a form that is simple to understand. Indeed, the incentives of officers who are responsible for risky decisions in the bank are influenced by the reward scheme. This is part of the overall risk culture of the bank's internal control procedures. There is therefore a significant link between the nature of the information processed and the reward scheme adopted. Rewards linked to performance encourage officers to collect specific information (Ozerturk, 2004; Bernardo *et al.*, 2001).

There is thus a double causality between the type of information processed and the loan officer's reward scheme. The effects on the information collection, processing and transfer process vary depending on the organisational design adopted by the bank following consolidation and according to the lending policy and evaluation processes it implements. The intangible nature of the specific information, which leads to information asymmetry and non-verifiability, imposes organisational changes. We propose that the reward scheme, and in particular the incentive scheme, encourages loan officers to manage specific information. This motivation can affect the quality of risk evaluation and consequently SME lending policy.

<p><b>Hypothesis 3:</b> The effectiveness of SME lending policy in acquired banks is positively related to incentive schemes for business loan officers and their evolution post-acquisition.</p>
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### **3. Methodology and Data**

#### **3.1. Field of Study**



We chose to carry out a quantitative study in the form of a questionnaire to a sample of loan officers working in acquired banks. We chose French banks that have recently experienced acquisition and that have significant SME loan activity. The acquisition of the Crédit Lyonnais by the Crédit Agricole fulfils these conditions, as does the acquisition of the Banque Palatine by the Caisses d'Épargne Group.

Our research concentrates exclusively on the consequences of changes in the three components of organisational architecture on the SME lending policy of the acquired banks. This choice is motivated by two reasons. Firstly, the number of bank consolidations is very low in France and most of them in the form of acquisitions. Secondly, the consequences of a bank consolidation are more acutely felt in the acquired bank than in the acquiring bank. Using only French banks makes it easier for us to access information and avoid any risk of cultural, conjunctural, economic, regulatory or technical bias.

The aim of this study is not to test our hypotheses against several consolidated banks but against several individuals who work in the same position at the same hierarchical level in the acquired banks. This procedure is similar to that adopted by the work carried out by Catelin (2001); Nagar (2002); Demers *et al.* (2004) and Moers (2006) on organisational architecture. We chose to administer our questionnaire to only one hierarchical level, loan officers in acquired banks. These are the employees who are most liable to be aware of or to undergo the changes to the three components of organisational architecture that may occur after mergers and acquisitions. By administering our questionnaire to several loan officers in different regions and bank branches we are able to explain and compare the effect of changes to the three components of organisational architecture on lending policy.

We carried out our study between October 2006 and February 2007. Our questionnaire was distributed internally to all of the small business loan officers in the two banks studied, by email. Out of 200 questionnaires sent (140 loan officers in the Crédit Lyonnais and 60 in the

Banque Palatine), 63 were returned, of which 62 are usable. Our final sample is made up of 33 replies from Crédit Lyonnais loan officers and 29 from the Banque Palatine.

### **3.2. Variable Measurement**

To measure the different variables, we referred to indicators calculated from the different items of our questionnaire. We used the principal indicators encountered in the work related to our theoretical framework and are also indicators encountered in the pre-study phase<sup>3</sup>. Apart from the dichotomous variable “Bank”, each variable is represented by at least one question and is measured on a 5 point Likert scale (c.f. table 1).

To structure the information obtained on these different scales we carried out a number of principal components analyses (PCA) by applying an orthogonal rotation (*Varimax*)<sup>4</sup>. This method enables us to generate non-correlated factors, which is particularly important for our research since these will be considered as the independent variables in our econometric model. Henceforth, these factors extracted from the different PCAs are the new measurements of our variables (c.f. table 1).

We retained items with a coefficient of correlation to a given factor superior or equal to 0.5. To decide the number of factors to retain we used the most commonly used rule, Kaiser’s rule, which consists of only retaining factorial axes whose own values are superior to 1. We also carried out Bartlett’s sphericity test and we only retained the factors with an index below 0.1<sup>5</sup>. Once we had carried out the PCAs we checked the internal coherence of the measurements made up of the different items by calculating Cronbach’s alpha ( $\alpha$ ). We only retained factors whose  $\alpha$  is considered acceptable ( $\alpha$  superior to 0.6).

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<sup>3</sup> We tested our questionnaire on several loan officers in the banks studied and their competitors. We also tested it on hierarchical superiors, and in particular Directors of Communication, Risk Directors and Regional Directors.

<sup>4</sup> We prefer this method of rotation to oblique rotation since it minimises the number of variables with a strong projection on each factor.

<sup>5</sup> The objective of this test is to reject the zero hypotheses, according to which all the correlations would be equal to 0.

We measured the dependent variable “SME lending policy” using several items based on previous studies of the bank-SME relationship and various suggestions by interviewers during the pre-study phase. By carrying out PCAs we were able to extract three factors to understand several facets of SME lending policy: financial policy (Pol\_Fin\_Credit), commercial policy (Pol\_Cle\_Credit) and operational policy (Pol\_Ope\_Credit). However, we did not retain the third factor as it had an  $\alpha$  of 0.512.

To measure the independent variable “changes in the decentralisation of decision-making rights”, we adapted it to the banking context. Agency theory defines four types of decision-making rights: initiative, implementation, ratification and supervision (Fama and Jensen, 1983). However, we did not analyse changes in implementation rights. When granting loans to SMEs, loan officers naturally have this right. Similarly, supervision rights are not in the hands of the loan officers but of their superiors. Therefore we analysed the evolution of supervision rights towards middle management. Again, we measured each one of these dimensions of decision-making rights through a different question.

The independent variable “changes in the decentralisation of decision-making rights” is represented by three dimensions: the decentralisation of initiative towards loan officers (Dec\_Initiative), the decentralisation of ratification rights towards loan officers (Dec\_Rat\_Offre and Dec\_Rat\_Cout) and the decentralisation of supervision rights towards middle management (Role\_Hierar\_Anim et Role\_Hierar\_Cont). In all, this variable is measured by 5 factors extracted from the PCA (c.f. table 1). The items used to understand changes to initiative and supervision rights are based on Catelin’s study (2001). The items used to measure ratification rights are based on the work of Zardkoohi and Kolari (2001) and various suggestions made by the loan officers during the pre-study phase.

The items used to measure “changes in loan officer incentive mechanisms”, were divided into two categories, in reference the work of Catelin (2001) and Chatelin (2001): financial and

non-financial. The PCAs enabled us to extract two factors: the first describes multi-dimensional benefits such as promotion, holidays and both financial and non-financial bonuses (Incit\_Multi) and the second describes financial incentives in the form of profit sharing and stock holdings (Incita\_Fin).

The independent variable “changes in the loan officer evaluation mechanisms” is divided into three categories: formal measurements (financial criteria), informal measurements (non-financial criteria) and multidimensional measurements combining the two previous measures. Based on previous work (Catelin, 2001; Chatelin, 2001; Nagar, 2002; Moers, 2006), we developed items that mainly reflected financial and non-financial evaluation criteria. The PCA enabled us to extract two factors: the first reflected multidimensional evaluation mechanisms based on financial and non-financial measurements (Eval\_Multi); the second reflected evaluation mechanisms made up of financial measurements (Eval\_Fin).

The last independent variable “Bank”, enabling us to understand the size and organisational complexity of the acquired bank is a dichotomous measurement. This binary variable has the value 1 if the bank is large and organisationally complex (the Crédit Lyonnais) and 0 in the opposite case (the Banque Palatine).

### **3.3. Empirical Model**

To test the plausibility of our theoretical hypotheses, we chose to apply the SUR model (*Seemingly Unrelated Regression*) proposed by Zellner (1962). This model can be summarised as a model of regression to two equations that brings out the dependent variable “SME lending policy” through its two factors extracted from the APC. These different regressions are measured by independent variables, identical for the two equations. The SUR model is presented in the form of a system of apparently unrelated equations, but which are correlated by the error terms (*Contemporaneous Correlation*). According to Zellner, the SUR model obtains in this case more precise estimators than the OLS method.

The estimation of our model by the ordinary least squares method (OLS) equation by equation might have been legitimate. However, our independent variable is measured by several composite factors, in other words several independent variables in the same model. We could have taken each of the q factors retained and carried out q multiples regressions. However, this procedure would not have been pertinent since each of the q factors only reports on part of the overall correlation. Since SME lending policy is not limited to only one factor the OLS method is not advisable. It does not take into account complementary relationships or substitution of the different factors measuring the independent variables.

We chose to test two models in the form of a system of simultaneous equations. The first equation of the first model studies the relationship between SME financial lending policy and the independent variables defined above. The second equation of model 1 uses the same independent variables used in the first equation but this time, to explain SME commercial lending policy. The second model uses the same dependent and independent variables apart from two new variables that we added so as to test the influence of the “delegation of hierarchical supervision rights” on SME lending policy. Our two models are presented as follows:

### **Model 1**

$$\text{Pol\_fin\_credit}_i = \beta_0 + \beta_1 \times \text{Dec\_Initiative} + \beta_2 \times \text{Dec\_Rat\_Offre} + \beta_3 \times \text{Dec\_Rat\_Cout} + \beta_4 \times \text{Incit\_Multi} + \beta_5 \times \text{Incita\_Fin} + \beta_6 \times \text{Eval\_Multi} + \beta_7 \times \text{Eval\_Fin} + \beta_8 \times \text{Banque}_i + \varepsilon_i$$

$$\text{Pol\_cle\_credit}_i = \alpha_0 + \alpha_1 \times \text{Dec\_Initiative} + \alpha_2 \times \text{Dec\_Rat\_Offre} + \alpha_3 \times \text{Dec\_Rat\_Cout} + \alpha_4 \times \text{Incit\_Multi} + \alpha_5 \times \text{Incita\_Fin} + \alpha_6 \times \text{Eval\_Multi} + \alpha_7 \times \text{Eval\_Fin} + \alpha_8 \times \text{Banque}_i + \varepsilon_i$$

### **Model 2**

$$\text{Pol\_fin\_credit}_i = \beta_0 + \beta_1 \times \text{Dec\_Initiative} + \beta_2 \times \text{Dec\_Rat\_Offre} + \beta_3 \times \text{Dec\_Rat\_Cout} + \beta_4 \times \text{Incit\_Multi} + \beta_5 \times \text{Incita\_Fin} + \beta_6 \times \text{Eval\_Multi} + \beta_7 \times \text{Eval\_Fin} + \beta_8 \times \text{Role\_Hierar\_Anim} + \beta_9 \times \text{Role\_Hierar\_Cont} + \beta_{10} \times \text{Banque}_i + \varepsilon_i$$

$$\text{Pol\_cle\_credit}_i = \alpha_0 + \alpha_1 \times \text{Dec\_Initiative} + \alpha_2 \times \text{Dec\_Rat\_Offre} + \alpha_3 \times \text{Dec\_Rat\_Cout} + \alpha_4 \times \text{Incit\_Multi} + \alpha_5 \times \text{Incita\_Fin} + \alpha_6 \times \text{Eval\_Multi} + \alpha_7 \times \text{Eval\_Fin} + \alpha_8 \times \text{Role\_Hierar\_Anim} + \alpha_9 \times \text{Role\_Hierar\_Cont} + \alpha_{10} \times \text{banque}_i + \varepsilon_i$$

The calculation of Pearson’s coefficient of correlation between the independent variables shows that there are no problems of multicollinearity for the models tested (c.f. table 2). Indeed, all of the correlation coefficients are inferior to 0.8: the limit starting from which we begin to have serious problems of multicollinearity. We also calculated the Variance Inflation Factor (VIF) using Stata software. The highest VIF is 1.58, which is well below 10, the limit starting from which we begin to have serious problems of multicollinearity between the independent variables.

**Table 2 – Matrix of correlations**

	1	2	3	4	5	6	7	8	9	10
<b>1 Banque</b>	1									
<b>2 Dec_Initiative</b>	0.025	1								
<b>3 Dec_Rat_Offre</b>	0.236	0.127	1							
<b>4 Dec_Rat_Cout</b>	-0.027	-0.106	0	1						
<b>5 Incit_Multi</b>	-0.293	0.020	0.160	0.05	1					
<b>6 Incita_Fin</b>	0.026	0.155	-0.001	0.121	0.002	1				
<b>7 Eval_Multi</b>	-0.184	0.212	-0.154	0.166	0.040	-0.034	1			
<b>8 Eval_Fin</b>	-0.061	-0.132	0.036	0.307	0.061	0	0	1		
<b>9 Role_Hierar_Cont</b>	-0.079	0.305	-0.093	-0.122	0.112	-0.193	0.432	-0.276	1	
<b>10 Role_Hierar_Anim</b>	0.004	-0.149	0.091	0.380	0.118	-0.079	0.198	0.314	0	1

We recall that the SUR model allows us to estimate several equations simultaneously, supposing that the error terms are correlated. We therefore analysed the correlation between the residuals of the two equations studied for each model, applying the Breusch-Pagan test. Our results confirm the dependence of the residuals and reaffirm the interest of the SUR model in comparison with the OLS method (c.f. table 3)<sup>6</sup>.

**Tableau 3 - Breusch-Pagan Independence Test**

	Model 1	Model 2
<b>Chi-square</b>	3.381	4.559
<b>Chi-square probability</b>	0.0660	0.0328
<b>Correlation between residuals</b>	-0.2354	-0.2734

#### 4. Empirical Results and Discussion

In what follows we analyse the results of the SUR model for each of the factors extracted from the PCAs measuring the variable to be explained “SME Lending Policy” (c.f. table 4). We note that the explanatory powers ( $R^2$ ) of our equations are relatively high for factors related to “financial lending policy” and “commercial lending policy” (0.3689 and 0.4082 for model 1 and 0.4202 and 0.4397 for model 2). The results of both our models demonstrate that

<sup>6</sup> Moreover, comparing the results of the two methods, we observe that the SUR model gives better estimations.

the links between changes in mechanisms of organisational architecture post-acquisition evolve differently according to the different factors of the SME lending policy.

**Table 4 - Results of estimation of SUR models**

Independent Variables	Model 1	Model 2
	<b>Pol_Fin_Credit</b>	
Banque	<b>-0.449**</b>	<b>-0.445**</b>
Dec_Initiative	0.163	0.085
Dec_Rat_Offre	<b>-0.237**</b>	<b>-0.201*</b>
Dec_Rat_Cout	<b>0.255**</b>	<b>0.313***</b>
Incit_Multi	-0.102	-0.122
Incita_Fin	0.027	0.067
Eval_Multi	<b>0.254**</b>	0.186
Eval_Fin	0.139	<b>0.229**</b>
Role_Hierar_Anim		-0.140
Role_Hierar_Cont		<b>0.247**</b>
Constant	0.236	0.235
R <sup>2</sup>	0.3689	0.4202
Chi-square	35.65	44.21
Chi-square probability	0.0000	0.0000
	<b>Pol_Cle_Credit</b>	
Banque	<b>-0.711***</b>	<b>-0.732***</b>
Dec_Initiative	<b>0.323***</b>	<b>0.373***</b>
Dec_Rat_Offre	0.061	0.033
Dec_Rat_Cout	0.006	-0.053
Incit_Multi	<b>0.231**</b>	<b>0.227**</b>
Incita_Fin	-0.067	-0.070
Eval_Multi	-0.028	-0.031
Eval_Fin	<b>0.315***</b>	<b>0.251**</b>
Role_Hierar_Anim		<b>0.190*</b>
Role_Hierar_Cont		-0.095
Constant	<b>0.379**</b>	<b>0.391***</b>
R <sup>2</sup>	0.4082	0.4397
Chi-square	42.08	47.86
Chi-square probability	0.0000	0.0000

\*\*\* : p<1 % ; \*\* p<5 % ; \* : p<10 %

#### 4.1. Results of the first Model

The analyse of the two equations of the first model show the different links between the three variables explaining evolutions in the delegation of decision-making rights (Dec\_Initiative, Dec\_Rat\_Offre et Dec\_Rat\_Cout) and the two factors explaining SME lending policy (Pol\_Fin\_Credit ; Pol\_Cle\_Credit).

The second equation shows a positive link between changes in initiative rights and SME commercial lending policy. This result confirms our hypothesis 1a, which states that SME lending policy in acquired banks is positively linked to an evolution in the delegation of decision-making rights. Hence, granting more freedom of initiative to loan officers leads to an

increase in the average amount of loans granted and an improvement in the offer of services related to SME loans. However, this result is not significant for SME financial lending policy. Concerning the evolution of ratification rights, the results show the contrasting effects. On one hand the evolution of ratification rights concerning loan charges shows a positive link to SME financial lending policy. Growth in the authority given to loan officers to fix charges and interest rates for SME loans varies in parallel with financial policy. A growth in autonomy at the level of ratification of credit charges leads to an increase in profit margins, an improvement in the profitability of loans and products sold and a reduction in default risk. On the other hand, an increase in ratification rights concerning the offer is negatively linked to financial policy and does not therefore vary in the same way as this dependent variable. This result is in opposition to hypothesis 1a. We can explain this by the fact that the ratification of the characteristics of SME loans is centralised in acquired banks (loan amount and approval). The results concerning the delegation of initiative and ratification rights and credit costs agree with the previous work by Aghion and Tirole (1997) and Liberti (2005). These authors stress that a growth in the informal authority of the officer increases the effort he puts in. Liberti's study of the banking sector also confirms the positive effect of increased autonomy of loan officers on effort made and time given to clients. This should result in better use of specific information and have a direct impact on the loan officers' output and SME lending policy. The results concerning factors explaining "loan officer evaluation criteria" confirm our second hypothesis and show significant relationships that differ depending on the lending policy studied. The evolution of multidimensional criteria post-acquisition is positively related to SME financial lending policy. Indeed, this result is applicable both to the evaluation of quantifiable activities (increase in average amounts of SME loans) and qualitative activities (reduction of the default risk). Our results also show a positive link between the evolution of financial evaluation criteria and SME commercial lending policy. Indeed, commercial policy is a reflection of exclusively quantitative factors (increase in average amounts of SME loans; improvement in the offer of services linked to SME loans), which are perfectly adaptable to financial and tangible evaluation criteria. According to the theory of organisational architecture, an efficient evaluation system results in convergence between the interests of the different actors (Brickley *et al.*, 1997). The choice of mechanisms can affect the motivation of officers when they consider the mechanisms to be more objective. Our results show coherency between evaluation mechanisms adopted post-acquisition and the factors shedding light on the SME ending policy.



The analysis of the results of the last component of organisational architecture, “loan officer incentive mechanisms”, confirms hypothesis 3. Our results show a positive link between commercial policy and the evolution of the multidimensional incentive system in the form of financial and nonfinancial bonuses<sup>7</sup>. According to Ozerturk (2004) and Liberti (2005), the rewards scheme, and particularly incentives, motivates officers to collect, process and transfer soft information. This motivation has positive impacts on the quality of risk evaluation and so improves lending policy in acquired banks.

Finally, application of the SUR model shows that the size and organisational complexity of acquired banks, measured by the variable “Bank”, has negative effects on SME financial and commercial lending policy. These results confirm those of previous research work which underlined the significant effects of organisational characteristics on SME lending policy in consolidated banks. More precisely, mergers between large banks or the acquisition of a small bank by a large one, have negative effects on SME lending (Berger et al., 1998; Zardkoohi and Kolari, 2001; Bonaccorsi di Patti and Gobbi, 2007). Indeed, large, organisationally complex banks are less successful in collecting and processing the specific information necessary for effective decision-making.

#### **4.2. Results of the Second Model**

Our second model includes a new variable, “changes in the delegation of supervision rights towards middle management”, but retains the same independent variables as in the preceding model. This additional variable is analysed using two factors extracted from the PCA reflecting the role played by middle management in supervision of the loan officers, “management and advice” and “supervision”.

This second model shows effects on SME financial and commercial lending policy that support hypothesis 1b. However, these results vary depending on the factors describing the evolution of the “decentralisation of supervision rights towards middle management”. The results show that when the role of superiors evolves towards management (Role\_Hierar\_Anim) this has a positive impact on commercial policy but has no significant impact on financial policy. On the other hand, when supervision by superiors evolves towards one of control (Role\_Hierar\_Cont), this has a positive effect on financial policy but has no significant impact on commercial policy.

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<sup>7</sup> Incentives in the form of share offers or profit sharing do not have a significant effect. This result is justified because this type of reward is not generally used in the banks we studied according to the different people interviewed during the pre-test phase.

Indeed, middle management has specific information of the effort made by the members of their team. On one hand, this effort put in by the loan officers in terms of increases in the average amounts of SME loans and improvements in the offer of services to SMEs, increases with the managerial role of their hierarchical superior. On the other hand, the effort they make in terms of increasing profit margins and the profitability of loans and services sold, and in reducing the risk of default, increases with the supervisory role played by their superior.

In another context, by introducing the variable “evolution of the decentralisation of supervision rights towards middle management”, we notice that the positive links between the two mechanisms “multidimensional incentives” (Incit\_Multi) and “financial evolution” (Eval\_Fin) and the variable “commercial policy” for SME lending, remain the same. However, the coefficients of the variables Incit\_Multi and Eval\_Fin fall respectively from 0.231 to 0.227 and from 0.315 to 0.251. This shows that the role played by hierarchical supervision reduces those of incentive mechanisms and financial evaluation systems. Moreover the introduction of the variable hierarchical supervision improves the explanatory coefficient of “decentralisation of initiative rights”. To sum up, an increase in the managerial role played by hierarchical superiors reduces the explanatory effect of control mechanisms (incentives and evaluation) and reinforces the positive effect of delegating initiative rights.

The introduction of the variable hierarchical supervision also brings significant changes. Unlike the results on commercial policy, our second model shows that financial policy is negatively linked to reinforcement of the supervisory role of middle management. Moreover, the introduction of this variable cancels out the significant link between financial policy and multidimensional evaluation mechanisms whose coefficient was 0.254 in the first model. We also note that the variable “financial evaluation” becomes significant with a coefficient of 0.229.

These results confirm the hypotheses of the theory of organisational architecture. Indeed, a growth in hierarchical supervision means that more formalised evaluation systems based on financial criteria will be used to a greater extent. We can conclude that in such cases, even in the first model, where multidimensional evaluation (financial and non-financial) showed a significant link to financial lending policy, financial evaluation criteria evolve much more after acquisition than non-financial criteria. Thus, the role of hierarchical “supervision” is significantly linked to financial lending policy but not to commercial lending policy. Finally, the introduction of the variable “Role\_Hierar\_Cont” also increases the explanatory power of the decentralisation variables. It confirms the positive effect of an increase in ratification

rights of the loan charges on financial lending policy and the negative effect of an increase in ratification rights of the characteristics of the loan on this lending policy.

## **Conclusion**

Our study proposes a new theoretical framework that brings out the potential consequences of bank consolidations on SME lending policy. It also follows on from previous work testing the link between organisational architecture and performance and company investment policy. We analyse the effect of changes to the three components of organisational architecture in acquired banks (decentralisation of decision-making rights, evaluation and incentive mechanisms) on SME lending policy. Unlike previous work, we studied the evolution of organizational mechanisms in the area of lending policy and not the impact of mergers and acquisitions on this architecture. To analyse lending policy we have to study the process that regulates investment choices in acquired banks. In this way our study presents several original results.

The results of applying Zellner's SUR model show that the size of acquired banks is negatively related to SME financial and commercial lending policy. These results confirm earlier studies that showed a negative link between growth in the size of banks and the volume of SME lending. Concerning changes in the components of organisational architecture, our results differ according to the aspect of lending policy analysed: financial or commercial.

We found that changes in financial evaluation systems and multidimensional reward mechanisms are positively related to commercial policy (increase in average amount of SME loans and improved offer of services linked to SME loans). Changes to the delegation of initiative rights is also positively linked to SME commercial lending policy. On the other hand, the multidimensional evaluation of loan officers is significantly linked to financial policy. An evolution of initiative rights is also positively linked to SME commercial lending policy. Conversely, an evolution of ratification rights is only significant to financial policy, and the link differs depending on the type of ratification.

However, our results do not allow us to conclude that there is a significant between changes to the different components of organisational architecture and lending policy. Changes to incentive mechanisms and the delegation of initiative rights are not significantly linked to financial policy. Equally, decentralisation of ratification rights is not positively linked to commercial lending policy.

We analysed the effects of changes to the role of hierarchical superiors on SME lending policy. We show positive links, but these vary depending on the aspect used for the analysis

of the superiors. In this way the “supervision” function of superiors is positively linked to financial policy whereas the “management” function is positively linked to commercial policy.

Despite these different original results, our research has certain limitations. For example, our questionnaire targeted SME loan officers in French acquired banks. Further research is necessary to increase the sample to a wider range of French or European banks. We could also widen our target by administering the questionnaire to other hierarchical levels in consolidated banks. It would also be interesting to complement the study by analysing the effects of changes to the components of organisational architecture on the different characteristics of SME loan contracts (for example the duration, interest rate, guarantees, administration costs, the rate of favourable replies etc.) in situations of bank consolidation. Research into these different mechanisms will help to explain the effects of bank mergers and acquisitions on the characteristics and nature of the bank-SME relationship.

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**Table 1 – Summary of PCAs and Definition of Variables**

Variables	Measurements	Extracted Factors	Variable Name	r	$\sigma$	$V_p$	$\alpha$			
Small Business Lending Policy	3 factors extracted from the PCA	<b>Factor 1: Financial Policy</b> Item 1: increase in profit margin Item 2: increase in profitability of loans and products sold Item 3: reduction of default risk <b>Factor 2: Commercial Policy</b> Item 1: increase of average amount of SME loans Item 2: improvement of service offer linked to SME loans <b>Factor 3: Operational Policy</b> Item 1: Penetration on new markets Item 2: Reduction of processing time for loan requests	Pol_Fin_Credit	0.909	44.355	3.105	0.891			
				0.906						
				0.845						
						Pol_Cle_Credit	0.875	17.625	1.234	0.632
							0.786			
						Pol_Ope_Credit	0.884	14.898	1.043	0.512
							0.711			
								76.878		
			Change of loan officer incentive mechanisms	2 factors extracted from the PCA	<b>Factor 1: multidimensional incentives</b> Item 1: awarding of special prizes Item 2: travel Item 3: promotion Item 4: individual bonuses Item 5: bonus in relation with a competition Item 6: team bonuses <b>Factor 2: financial incentives</b> Item 1: profit sharing Item 2: share offers	Incit_Multi	0.944	57.699	4.616	0.915
	0.895									
	0.853									
	0.723									
	0.703									
	0.619									
						Incita_Fin	0.867	19.356	1.548	0.802
							0.855			
							77.054			
Change of loan officer performance evaluation criteria	2 factors extracted from the PCA	<b>Factor 1: multidimensional evaluation criteria</b> Item 1: percentage of targets achieved Item 2: number of new clients Item 3: satisfaction of superiors Item 4: number of services sold Item 5: level of commitment Item 6: total amount of credit Item 7: customer satisfaction <b>Factor 2: financial evaluation criteria</b> Item 1: number of defaulting clients Item 2: total margin achieved	Eval_Multi	0.910	62.025	5.582	0.924			
				0.898						
				0.819						
				0.717						
				0.705						
				0.597						
				0.560						
						Eval_Fin	0.903	13.265	1.194	0.864
							0.887			
					75.290					



**Table 1 - Summary of PCAs and Definition of Variables (contd.)**

Variables	Measurements	Extracted Factors	Variable Name	r	$\sigma$	$V_p$	$\alpha$
Decentralisation of initiative rights	1 factor extracted from the PCA	<b>Factor 1: initiative</b> Item 1: active search Item 2: opportunities perceived by the team Item 3: opportunities perceived by regional management Item 4: flexibility towards each customer's specific nature	Dec_Initiative	0.907 0.888 0.735 0.679	65.322	2.613	0.817
Decentralisation of ratification rights	2 factors extracted from the PCA	<b>Factor 1: ratification of the characteristics of the loan</b> Item 1: amount of loan Item 2: approval of loan <b>Factor 2: ratification of the loan charges</b> Item 1: charges Item 2: interest rate	Dec_Rat_Offre	0.933 0.932	60.909	2.436	0.890
			Dec_Rat_Cout	0.939 0.858	27.360	1.094	0.808
Decentralisation of supervision rights towards middle management	2 factors extracted from the PCA	<b>Factor 1: management and advice</b> Item 1: advice Item 2: management <b>Factor 2: supervision</b> Item 1: supervision	Role_Hierar_Anim	0.883 0.849	51.040	1.531	
			Role_Hierar_Cont	0.985	33.568 84.608	1.007	
Size and organisational complexity of the acquired bank	Dichotomous variable	0 = Banque Palatine: small size and low organisational complexity; 1 = Crédit Lyonnais: large size and high organisational complexity	Banque				