“Changes in organizational architecture and small business lending policy: the case of bank acquisitions”

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Changes in organizational architecture and small business lending policy: the case of bank acquisitions

Abstract

This article aims to analyze the effects of changes in organizational architecture resulting from bank acquisitions on operational, commercial and financial small business lending policies. Unlike previous work, this paper offers an intra-organizational analysis. It focuses on the organizational mechanisms that direct the credit decisions of loan officers, namely the allocation of decision rights, evaluation mechanisms and remuneration systems. We chose to carry out a quantitative study in the form of a questionnaire to a sample of loan officers working in acquired banks. The analysis of responses from this questionnaire shows several significant relationships between the evolution of the three mechanisms of organizational architecture and financial and commercial policies for small business lending after acquisitions. The results show that changes in financial evaluation systems, changes in multidimensional reward mechanisms and changes to the delegation of initiative rights to loan officers are positively related to commercial lending policy. The multidimensional evaluation system of loan officers is significantly linked to financial lending 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.

Keywords: bank, mergers and acquisitions, lending, SME, organizational architecture.
JEL Classification: 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 analyzing the impact of bank mergers and acquisitions vary depending on the type of acquisition, the size of the organizations concerned, the organizational 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.

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, organizationally complex banks. There is then a significant link between the organizational 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 organizational 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 organizational 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 organizational 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 organizational point of view. Similarly, although recent research into the link between the bank's organizational 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 organizational 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 organizational mechanisms that regulate lending decisions. When banks join together, they undergo important organizational changes. These transform not only bank-borrower relationships, but also the relationships between the

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different actors in the decision making process. An intra-organizational 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 organization on small business lending.

The lending decision is analyzed in this article as a decisional choice on the part of the acquired bank. However, whether in strategic or in economic-financial terms, the analysis of a decisional choice seems henceforth inseparable from organizational structure. Thus we take an organizational approach in the sense that in our analysis of the SME lending; we take into account human and organizational aspects. We pay particular attention to agency theory, which attempts to explain decisional choice through the behavior of individuals and their ability to produce and exchange the information necessary to make good decisions.

Our organizational approach highlights the role of the mechanisms that make up the organizational architecture as determining small business lending policy. In this context, the theory of organizational architecture, which explains the decisional choice of organizations, provides a theoretical framework that clarifies our research question (Jensen and Meckling, 1995). Indeed, the organizational mechanisms that regulate lending decisions, in other words the attribution of decision-making rights and control systems (evaluation and incentive mechanisms), 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 changes on organizational architecture following bank acquisitions on operational, commercial and financial small business lending policies. Our analysis will concentrate in particular on the components of organizational architecture that frame the decision-making process at junior level, especially 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 organizational changes that affect SME lending processes. Our analysis of responses from a questionnaire sent to loan officers in acquired banks shows several significant relationships between the evolution of these three mechanisms of organizational architecture and financial and commercial policies for small business lending after acquisitions.

We have organized our article as follows. The first section will deal with the theoretical framework that will enable us to analyze 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 organizational 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. Bank mergers and acquisitions, organizational characteristics and SMEs lending policies

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

1.1. Impact of bank mergers and acquisitions on 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 organizational 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[1].

Research into the consequences of the growth of organizational complexity in consolidated banks has also shown a reduction of the supply of credit to SMEs. 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).

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

[1] 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.

local banks and new entrants which compensates for the reduction in the supply of loans to small businesses (Berger et al., 1998; Keeton, 2000; Berger et al., 2001; Berger et al., 2004; Bonaccorsi di Patti and Gobbi, 2007). 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 organizational 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[1].

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 organizational changes resulting from mergers and acquisitions. We therefore propose that changes in lending policies depend on other factors linked to the bank's decisional 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 organization of the bank and its specialization in SME financing.

1.2. Banks's organizational characteristics post consolidation and integration costs. According to several studies, the way a bank is organized determines the way it finances SMEs. For example, the bank's size, organizational 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 organization grows in size, transfer costs for soft information and agency costs will rise.

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 organizations 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 and 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 organizational 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 organizational 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 organizations are therefore less efficient in providing incentives and less effective in allocating funds via their operational units to finance opaque SMEs. Liberti and Mian (2009) 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 organizational change is also influenced by technological innovation. The implementation of internal scoring systems should reduce the disadvantage large centralized banks have in processing information about small businesses

[1] 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.

(Akhavein 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.

2. Theoretical framework

The idiosyncratic information necessary to assess SME is subject to agency problems that vary depending on the size and organizational complexity of the bank. However, whilst a great deal of prior research has studied this link for consolidated banks, it has not looked at the impact of changes in the organizational mechanisms that regulate lending policy. However, SME lending policy can be defined as a decisional process within an organization where different hierarchical levels can come into conflict and where the issue of decisional control depends on the efficiency of the organizational architecture. In this context, the theory of organizational architecture, which attempts to explain firm decisional choice, is a theoretical framework which can help to provide an answer to questions concerning the impact of post-consolidation organizational changes on SME lending policy.

2.1. Organizational architecture theory. We cannot analyze decisional choices without studying the organizational mechanisms that regulate them. We opt for an organizational approach which defines decisional choice as a process within an organization where different hierarchical levels can come into conflict. Using the organizational architecture theory (Jensen and Meckling, 1995), we highlight the role of the organizational mechanisms as determinants of the decisional process. In the same way, we deal with lending policy as a bank's decisional 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 organizational efficiency. This depends on the extent to which the three components which define it, the distribution of decision-making rights, evaluation mechanisms and reward systems, are coherent, complementary and interdependent. Moreover, an efficient organizational 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 maximized. This also requires arbitration between the costs linked to improper use of specific information (insufficient decentralization of decision-making rights) and those linked to conflicts of interest due to the decentralization of rights. Companies can minimize these costs via appropriate evaluation and incentive systems to the amount of delegation in operation.

According to Brickley et al. (1997), the choice of a firm's organizational 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 organization directly. It has to evolve continually and adapt by adjusting its distribution of decision-making rights and its evaluation and reward systems. In this context, the effectiveness of the decisional choice depends on continual adjustment of the mechanisms making up the organizational 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 organizational structure. Above and beyond static effects such as growth in size and organizational complexity, the consolidation will impact every hierarchical level of the organization and *ipso facto*, the organizational architecture and the decision-making process.

Our objective is thus to analyze the link between changes in the three subsystems defining the organizational 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.

2.2. Organizational subsystems and SME lending. To respect organizational 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).

According to Takats (2004), the problem of asymmetric information between the management and loan officers in consolidated banks can be cancelled out if the bank decentralizes its organization and uses a more extensive and expensive system of control. A centralized structure is more profitable for a large bank but reduces small firms' access to finance. Therefore, the choice of organizational 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 organizational 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.

The same results have been observed by Shen et al. (2009) for a sample of Chinese banks. The results showed a positive link between the use of soft information, the amount of SME lending and the decentralization of decision-making rights in favor of loan officers. Another research on a sample of Italian banks (Benvenuti et al., 2010) and Mexican SME loans (Canales and Nanda, 2012) also confirmed a positive link between an increase in loan officers' authority and SME lending. Overall, the effects of decentralization on loan officer motivation result in more use of soft information and should have positive effects on SME lending policy.

H1: 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 analyze 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 organizational design. 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 organizational architecture recommends using mechanisms to reward and sanction, so as to align the interests of all the protagonists.

The nature of information collected about SMEs gives rise to a specific problem for the bank's organization. Indeed, the evaluation of the credit risk of this type of firm uses two categories of information, hard and soft information. To minimize the risk of manipulation of this type of information, banks implement costly but unavoidable evaluation systems to encourage loan officers to collect and produce this soft information (Brickley et al., 1997).

To maximize 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.

H2: 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 organizational 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 evaluation. This type of specific information influences the organizational 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 (Shen et al., 2009). 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 organizational 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 organizational changes. According to organizational architecture theory, we propose that the reward scheme, and in particular the incentive scheme, encourages loan officers to manage specific information (Nagar, 2002). This motivation can affect the quality of risk evaluation and consequently SME lending policy.

H3: The effectiveness of SME lending policy in acquired banks is positively related to the evolution of incentive schemes for business loan officers post-acquisition.

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 organizational 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 Nagar (2002), Demers et al. (2004) and Moers (2006) on organizational 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 organizational 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 organizational architecture on lending policy.

Our questionnaire was distributed internally to the entire 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 previous research related to our theoretical framework and are also indicators encountered in the pre-study phase[1]. Apart from the dichotomous variable "*Bank_Size*", each variable is represented by at least one question and is measured on a 5 point Likert scale (c.f. Appendix).

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*)[2]. 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. Appendix)[3].

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[4]. 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 (α). We only retained factors whose α is considered acceptable (α superior to 0.6).

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

[1] We tested our questionnaire on several loan officers in the banks studied and their competitors. We also tested it on hierarchical superiors, in particular Directors of Communication, Risk Directors and Regional Directors.

[2] We prefer this method of rotation to oblique rotation since it minimizes the number of variables with a strong projection on each factor.

[3] The variables used in our study cannot be directly measured and therefore require the construction of a scale. To structure the information obtained through these different scales, we conducted a series of PCAs with the objective to find quantified measures for our different latent variables.

[4] This test is to reject the zero hypotheses, according to which all the correlations would be equal to 0.

SME lending policy: financial policy (*Fin_Pol_Credit*), commercial policy (*Com_Pol_Credit*) and operational policy (*Ope_Pol_Credit*). However, we did not retain the third factor as it had an α of 0.512.

To measure the independent variable "decentralization 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 analyze 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. Again, we measured each one of these dimensions of decision-making rights through a different question.

The independent variable "decentralization of decision-making rights" is represented by two dimensions: the decentralization of initiative towards loan officers (*Initiative_Dec*), the decentralization of ratification rights towards loan officers (*Dec_Rat_Loan* and *Dec_Rat_Cost*). In all, this variable is measured by 3 factors extracted from the PCA (c.f. Appendix). The items used to understand changes to initiative and 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 "loan officer incentive mechanisms", were divided into two categories: 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 (*Multi_Incit*) and the second describes financial incentives in the form of profit sharing and stock holdings (Fin_Incita).

The independent variable "loan officer evaluation mechanisms" is divided into three categories: formal measurements (financial criteria), informal measurements (non-financial criteria) and multi-dimensional measurements combining the two previous measures. Based on previous work (Nagar, 2002; Moers, 2006) and various suggestions made by the loan officers during the pre-study phase, 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 (*Multi_Eval*); the second reflected evaluation mechanisms made up of financial measurements (*Fin_Eval*).

The last independent variable "*Bank_Size*", enabling us to understand the size of the acquired bank is a dichotomous measurement. This binary variable has the value 1 if the bank is large and (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 summarized 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 the model in the form of a system of simultaneous equations. The first equation studies the relationship between SME financial lending policy and the independent variables defined above. The second equation uses the same independent variables used in the first equation but this time, to explain SME commercial lending policy. The model is presented as follows:

$$\begin{aligned} Fin_Pol_Credit_i &= \beta_0 + \beta_1 \times Initiative_Dec_i + \\ &+ \beta_2 \times Dec_Rat_loan_i + \beta_3 \times Dec_Rat_Cost_i + \\ &+ \beta_4 \times Multi_Incit_i + \beta_5 \times Fin_Incita_i + \\ &+ \beta_6 \times Multi_Eval_i + \beta_7 \times Fin_Eval_i + \\ &+ \beta_8 \times Bank_Size_i + \varepsilon_i. \end{aligned} \quad (1)$$

$$\begin{aligned} Com_Pol_Credit_i &= \alpha_0 + \alpha_1 \times Initiative_Dec_i + \\ &+ \alpha_2 \times Dec_Rat_loan_i + \alpha_3 \times Dec_Rat_Cost_i + \\ &+ \alpha_4 \times Multi_Incit_i + \alpha_5 \times Fin_Incita_i + \\ &+ \alpha_6 \times Multi_Eval_i + \alpha_7 \times Fin_Eval_i + \\ &+ \alpha_8 \times Bank_Size_i + \varepsilon_i. \end{aligned} \quad (2)$$

The calculation of Pearson's coefficient of correlation between the independent variables shows that there are no problems of multicollinearity for the model tested (c.f. Table 1). 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 1. Matrix of correlations

		1	2	3	4	5	6	7	8
1	*Bank_Size*	1							
2	*Initiative_Dec*	0.025	1						
3	*Dec_Rat_Loan*	0.236	0.127	1					
4	*Dec_Rat_Cost*	-0.027	-0.106	0	1				
5	*Multi_Incit*	-0.293	0.020	0.160	0.05	1			
6	*Fin_Incita*	0.026	0.155	-0.001	0.121	0.002	1		
7	*Multi_Eval*	-0.184	0.212	-0.154	0.166	0.040	-0.034	1	
8	*Fin_Eval*	-0.061	-0.132	0.036	0.307	0.061	0	0	1

We recall that the SUR model allows us to estimate several equations simultaneously, supposing that the error terms are correlated. We therefore analyzed the correlation between the residuals of the two equations studied, 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 2)[1].

Table 2. Breusch-Pagan independence test

Chi-square	3.381
Chi-square probability	0.0660
Correlation between residuals	-0.2354

4. Empirical results and discussion

In what follows we analyze 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 3). 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). The results demonstrate that the links between mechanisms of organizational architecture post-acquisition evolve differently according to the different factors of the SME lending policy.

Table 3. Results of estimation of SUR models

	Fin_Pol_Credit	*Com_Pol_Credit*
Bank_Size	**-0.449****	**-0.711*****
Initiative_Dec	0.163	**0.323*****
Dec_Rat_Loan	**-0.237****	0.061
Dec_Rat_Cost	**0.255****	0.006
Multi_Incit	-0.102	**0.231****
Fin_Incita	0.027	-0.067
Multi_Eval	**0.254****	-0.028
Fin_Eval	0.139	**0.315*****
Constant	0.236	**0.379****
R^2	0.3689	0.4082
Chi-square	35.65	42.08
Chi-square probability	0.0000	0.0000

Notes: *** $p < 1\%$; ** $p < 5\%$; * $p < 10\%$.

The analyze of the two equations of the model show the different links between the three variables explaining evolutions in the delegation of decision-making rights (*Initiative_Dec*, *Dec_Rat_Loan* and *Dec_Rat_Cost*) and the two factors explaining SME lending policy (*Fin_Pol_Credit*; *Com_Pol_Credit*).

The second equation shows a positive link between initiative rights and SME commercial lending policy after acquisition. This result confirms our first hypothesis, 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 the 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

[1] Moreover, comparing the results of the two methods, we observe that the SUR model gives better estimations.

in opposition to hypothesis 1. We can explain this by the fact that the ratification of the characteristics of SME loans is centralized 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 (Shen et al., 2009; Benvenuti et al., 2010; Canales and Nanda, 2012).

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 organizational 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 organizational architecture, "loan officer incentive mechanisms", confirms our third hypothesis. 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[1]. According to Ozerturk (2004), Shen et al. (2009) 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 organizational complexity of acquired banks, measured by the variable "*Bank_Size*", has negative effects on SME financial and commercial lending policy. These results confirm those of previous research work which underlined the significant effects of organizational 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, organizationally complex banks are less successful in collecting and processing the specific information necessary for effective decision-making.

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 organizational architecture and decisional process. We analyze the effect of changes to the three components of organizational architecture in acquired banks (decentralization 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 analyze lending policy we study the process that regulates decisional 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 organizational architecture, our results differ according to the aspect of lending policy analyzed: 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 are also positively linked to SME commercial lending policy. On the other hand, the multidimensional evaluation of loan

[1] 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.

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 link between changes to the different components of organizational architecture and lending policy. Changes to incentive mechanisms and the delegation of initiative rights are not significantly linked to financial policy. Equally, decentralization of ratification rights is not positively linked to commercial lending 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. Even if the loan officer is a key factor in the lending process, according to Hattori et al. (2012), focusing on him as the only player in this process is insufficient. It would also be interesting got complement the study by analyzing the effects of changes to the components of organizational 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.

A change in external environment of the consolidated bank also affects the bank's organizational architecture and in the same way the SME relationship lending. For example, Cotugno et al. (2013) found that a decentralized bank's choice between soft and hard information is influenced by economic conjecture. Indeed, a financial crisis can impact the loan assessment behavior of loan officers. 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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Appendix

Table 1A. Summary of PCAs and variable definitions

Variables	Measurements	Extracted factors	Variable name	r	σ	V_p	α
Small business lending policy	3 factors extracted from the PCA	**Factor 1: Financial policy**	*Fin_Pol_Credit*		44.355	3.105	0.891
		Item 1: Increase in profit margin		0.909			
		Item 2: Increase in profitability of loans and products sold		0.906			
		Item 3: Reduction of default risk		0.845			
		Factor 2: Commercial policy	*Com_Pol_Credit*		17.625	1.234	0.632
		Item 1: Increase of average amount of SME loans		0.875			
		Item 2: Improvement of service offer linked to SME loans		0.786			
		Factor 3: Operational policy	*Ope_Pol_Credit*		14.898	1.043	0.512
		Item 1: Penetration on new markets		0.884			
		Item 2: Reduction of processing time for loan requests		0.711			
					76.878		
Incentive mechanisms	2 factors extracted from the PCA	**Factor 1: Multidimensional incentives**	*Multi_Incit*		57.699	4.616	
		Item 1: Awarding of special prizes		0.944			
		Item 2: Travel		0.895			
		Item 3: Promotion		0.853			
		Item 4: Individual bonuses		0.723			
		Item 5: Bonus in relation with a competition		0.703			
		Item 6: Team bonuses		0.619			
		Factor 2: Financial incentives	*Fin_Incita*		19.356		
		Item 1: Profit sharing		0.867		1.548	0.802
		Item 2: Share offers		0.855			
					77.054		
Evaluation system	2 factors extracted from the PCA	**Factor 1: Multidimensional evaluation criteria**	*Multi_Eval*		62.025	5.582	0.924
		Item 1: Percentage of targets achieved		0.910			
		Item 2: Number of new clients		0.898			
		Item 3: Satisfaction of superiors		0.819			
		Item 4: Number of services sold		0.717			
		Item 5: Level of commitment		0.705			
		Item 6: Total amount of credit		0.597			
		Item 7: Customer satisfaction		0.560			
		Factor 2: Financial evaluation criteria	*Fin_Eval*		13.265	1.194	0.864
		Item 1: Number of defaulting clients		0.903			
		Item 2: Total margin achieved		0.887			
					75.290		
Decentralization of initiative rights	1 factor extracted from the PCA	**Factor 1: Initiative**	*Initiative_Dec*		65.322	2.613	0.817
		Item 1: Active search		0.907			
		Item 2: Opportunities perceived by the team		0.888			
		Item 3: Opportunities perceived by regional management		0.735			
		Item 4: Flexibility towards each customer's specific nature		0.679			
Decentralization of ratification rights	2 factors extracted from the PCA	**Factor 1: Ratification of the characteristics of the loan**	*Dec_Rat_Loan*		60.909	2.436	0.890
		Item 1: Amount of loan		0.933			
		Item 2: Approval of loan		0.932			
		Factor 2: Ratification of the loan charges	*Dec_Rat_Cost*		27.360	1.094	0.808
		Item 1: Charges		0.939			
		Item 2: Interest rate		0.858			
					88.269		
Size of the acquired bank	Dichotomous variable	0 = Banque Palatine: small size; 1 = Crédit Lyonnais: large size	*Bank*				

Notes: r is the correlation coefficient; σ is the percent of variance explained; V_p is the eigenvalue of the extracted factor; α is the Cronbach's alpha.