

How Does Organizational Form Matter? Communication, Distance and Soft Information

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Abstract

This paper empirically examines how both soft and hard information are transmitted and used within an organization. For this purpose I explore the hierarchical decision-making approval process of corporate loans in a foreign bank in Argentina. Results suggests that loans that go to higher levels in the organization for approval embed more hard relative to soft information in explaining credit availability. These results are robust to alternative measures of vertical dimension such as the level of approval, total number of signatures and total time to approve the loan. I also analyze whether geographical location of the ultimate person approving the loan impacts the results. I find that loans that are approved inside the branch rely significantly more on soft information compared to those loans that are approved elsewhere. Direct communication with the ultimate layer approving the loan implies that soft is relatively more used than hard information. Transmission of soft information is easier if direct personal communication is feasible. I use several credit complexity measures to analyze alternative channels that could explain the previous results and find that results are robust to the inclusion of such measures. Finally, I question the definition of both hard and soft information measures. Results show that soft information can be transmitted and used along the hierarchical levels and that further qualifying hard information matters. Namely, I find higher reliance on soft information even at higher hierarchical levels when hard information is not reliable. These last results raise questions regarding the validity of the main assumptions for “non-transmission” of soft information used by current theoretical models of organizational structure.

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1 Introduction

Transmission and usage of information are important characteristics on shaping organizational structure. However, to this date, it is still an empirical puzzle how and what type of information flows within organizations. The existing theoretical models have highlighted the importance of both vertical and horizontal aspects of organizational structure in the transmission and communication of information. Most of the existing models assume that soft information cannot be transmitted given its inherited characteristics. Yet, to the best of my knowledge, there is no empirical attempt to understand how information flows within organizations and what type of information ends up actually being transmitted and ultimately used.

Questions such as “How does information flow within organizations?” , “Should all information be considered the same along the decision-making process?” , “Can soft information be transmitted across different layers?” , or “What happens when communication is allowed across layers?” are in need of a first empirical answer.

The aim of this paper is to provide *some* answers to these questions. More specifically, I explore the credit decision-making process of a multinational bank in order to understand how organizational form matters in terms of usage and transmission of information. The results of this paper should by no means be taken as definite since they rely on a clinical study of a given organization, in this case a foreign bank in Argentina. Nevertheless, to the best of my knowledge, this is the first attempt to narrow the existing gap between theoretical and empirical research in this area.

The discussion this paper proposes is also relevant to the empirical banking literature as it focuses on the internal credit process of corporate loan approvals; in this case a hierarchical-credit approval process as opposed to a credit-committee approval. Two points are worth mentioning. First, analyzing the empirical advantages and disadvantages of each of these systems lies beyond the scope of this paper.¹ Second, I will not study the reasons for the emergence of the existing hierarchy in its current format as this is not the focus of the present paper.²

Specifically, this paper empirically examines how both soft and hard information are transmitted and used across the hierarchies of the organization. I have gathered and manually assembled a unique database on the organizational structure of this bank. I have collected and followed the path of each approval process for all credit loans and for all corporate clients of the bank during the year 1998.³ I study two main dimensions of

¹Dessein (2003) theoretically analyzes the advantages and disadvantages of hierarchies and committees. He concludes that a trade-off exists between both systems where there is a tendency to "less costly" or faster decisions in hierarchies and more objective decision-making by committees.

²There are different theories for the emergence and existence of hierarchies. Among other reasons, hierarchies may emerge from the optimality of parallel information processing as in Radner (1992), from matching problems with human capital as in Garicano (2000) or from the effectiveness of communication affecting the optimal structure of decision-making as in Dessein (2002).

³Liberti (2003) explored a change in the hierarchical structure of the same organization between 1999-2001. That paper studied how decentralization of decision rights and empowering managers at the lower layer of the hierarchy impacted the

the organizational structure: a *vertical* and a *horizontal* dimension. As suggested by the existing theoretical literature, the impact on the amount of soft and hard information to be used under each of these dimensions is an empirical matter.

The *vertical* dimension is given by the internal hierarchical credit decision-making process of the organization. Loans from corporate clients must follow a determined hierarchical path (levels) to be approved. Such levels are known *ex-ante* to the officer in charge of the approval process. Results show that those loans which must go to higher levels in order to be approved embed more hard relative to soft information in explaining credit availability. Also, I find that communication affects these results. For those loans in which communication between the loan officer and the final layer of approval is possible (*i.e.* the final level of approval is inside the branch as opposed to outside the branch or even outside the country) soft information matters relatively more than hard information in explaining the total size of the loan. Results are robust to a wide array of specifications for measures of vertical dimension: level of approval, total number of signatures and total time it takes to approve the loan.

The *horizontal* dimension is given by the number of account officers in teams reporting to a supervisor.⁴ The interaction among team members and his supervisors may affect the amount and quality of both hard and soft information being used in preparing the credit loans and embedded in the amount of the loan to be approved. Results show that conditional on the level of approval, teams with direct communication between the loan officer and the supervisor (single teams) embed more soft relative to hard information in explaining the total size of the loan. The underlying rationale is that transmission of information is easier when the loan officer works directly with his team leader as opposed to cases where communication is not direct.

Let me now describe the vertical dimensions results in greater detail.

First, what type of information is embedded in loans approved at higher levels of the organization? As mentioned, loan officers know how high in the hierarchy the loan approval must go according to a set of pre-determined rules. These officers prepare the recommendation forms and the credit analysis, and the loan is then submitted through the hierarchical decision-making process. One measure of vertical dimension I use is level of approval. Clearly, the level of approval is linked, although not only, to the size of the loan. I also use alternative measures for the vertical dimension, such as the total number of signatures in a credit approval and the total time (in days) it takes to approve the loan. The former provides an idea of how often the loan approval changes hands, while the latter provides a sense of the complexity of the credit. Results from this section show that hard information is used relatively more than soft information in explaining the amount of loan approved at higher layers of the organization. Likewise, loans with larger number of signatures and longer time to obtain approval embed relatively more hard than soft information.

incentives of the individuals to exert effort. Delegation of formal authority was found to be positive from the bank's perspective. This paper takes the hierarchical structure of 1998 as given and attempts to understand how information flows within the organization.

⁴Loan officers are organized into business units, which vary in their size.

Second, I argue that the geographical distance or location of the final officer approving the loan may impact the relative usage of information. Availability of direct communication between the account officer and the final level of approval may entail a differential impact on the type of information being used, regardless of the hierarchical level of approval. To answer this question, I re-group the loans according to the geographic location of their final level of approval: inside the branch, outside the branch or outside the country. Also, I exploit the variation within one of the middle layers of approval to examine the importance of communication controlling for level of approval. Results suggest that, ignoring communication effects, more soft relative to hard information is embedded in loans inside the branch. Allowing for communication, we observe that for the *same* level of approval, loans in which communication is possible (In Branch) embed more soft than hard information relative to those loans in which direct communication is not feasible (Out Branch).

Selection issues raise a potential problem throughout the analysis of the vertical dimension. Thus, I document possible selection flaws for these first two stages of the paper which could be driving the results and then test for their importance. Also, I conclude that there is no clear selection between loans that stay inside the branch versus those which are approved outside the branch for the same level of approval.

Let me now describe my horizontal dimension results.

Third, I investigate whether conditional on the loan approval level, does variation in the number of account officers across teams impact the way information is used in preparing the recommendation loans at the lower layers of the organization? I exploit variation in the number of loan officers across teams to examine this issue. Results from this horizontal analysis suggest that account officers who work directly with their supervisor embed more soft relative to hard information compared to those account officers in multiple teams. Easier communication between the account officer and the supervisor suggests a reduction in the cost of transmitting soft information. Also, the argument for higher usage of soft information in single teams may be jointly formed soft information, as there is no need to transmit information that is collectively gathered. Further, I test whether this result stems from authority to approve a loan by the account officer rather than from communication. For that matter, I exploit variation in the authority that loan officers hold in approving some of their loans by themselves. Results from the team size and authority analysis show that for the subset of loans approved by the account officer (with authority) soft information is again relatively more used than hard information. For account officers in single teams the effect of authority is more prominent than for those in multiple teams as the communication and the authority effects reinforce one another.

Fourth, I examine whether the complexity of the loan approvals are driving the results on the differential usage of information. It is plausible that more complex accounts go higher in the hierarchy. These loans might be inherently different in their structure and in their types. Specific firm characteristics could be generating the previous results on the differential usage of information at different levels, and it may be fairly difficult to uncover what those characteristics are. For this purpose, I use several *credit complexity*

measures to capture the effects that may not be accounted for by the variables used in the analysis so far. I gathered three different measures of credit complexity. Perhaps the most relevant measure is the indicator of whether the loan was rejected at a certain level and asked to be revised and resubmitted for approval.⁵ Other measures of complexity of credit include the time (in days) it took the credit analyst to prepare the loan approval background paperwork and its analysis and an indicator of whether additional information was requested to the company along the process. Results show that these complexity measures are not driving the results regarding differential usage of information.

Finally, I question the quality of both the hard and soft information measures used in the previous sections of the paper. In particular, I ask: How *soft* is soft information? and How *hard* is hard information? I analyze whether transmission of soft information is bound to be precluded by its subjective content, as well as whether further qualifying hard information can alter its practical usage.⁶

To tackle the *softness* of soft information I use different measures which vary in content and degree of subjectivity. For instance, I compare the relevance of different soft measures, such as firm business assessments completed by the account officer assigning a numeric rating to different fields, and reading and interpreting open answers account officers provide regarding the management characteristics of the firms they handle. Results suggest that although, by definition, soft information is subjective and impersonal (Petersen, 2004), some of the a priori soft information behaves as hard information. It is not always true that soft information is used less relative to hard information as one moves up the hierarchy. It is important to understand the content of the information. Nevertheless, management characteristics either from a less subjective assessment (rating) or a more subjective one (reading and interpreting credit reports) are used less as the credit approval moves up the hierarchy.

Lastly, how *hard* is hard information? Questioning the reliability of the hard information is a logical final step in my analysis. It is difficult to determine what is reliable hard information. For that matter, I searched through annual reports of each of the firms under analysis and through the credit analyst reports and declared as “unreliable hard information” those financial statements that were not endorsed by a top quality auditor, the reports that were *qualified* by the auditor, and those financials which displayed a significant gap (in months) between the month the credit approval took place and the last available statement. Results suggest that having a top quality auditor and having unqualified auditor’s financial reports bring an additional impact on the hard information used. In particular, soft information is used even as moves along the vertical dimension when the firm has unreliable hard information. Therefore, I conclude that soft information is

⁵Unfortunately I do not know whether the amount of the loan was rejected or required a reduction. I only observe whether the credit approval returned to the lowest level in order to be revised. Revisions can include a wide range of analysis, including further questions regarding the firm’s management or requests for forecasting new scenarios.

⁶Theoretical models of information transmission assume that soft information is difficult to transmit because of its costly verification by third parties as in Stein (2002) or that private information of the agent is soft as in Dessein (2002). Particularly, Dessein (2002) argues: “...Private information is then de facto soft...”. I adopt in this paper an agnostic approach towards soft and hard information and let the data tell us which type of information behaves as soft and hard.

transmitted and used along the vertical dimension when there are reasonable doubts about the reliability of the hard information.

The paper is organized as follows. Section 2 presents a brief review of the relevant theoretical background. Section 3 describes the institutional setup and the data used in the paper. Sections 4 and 5 describe the vertical and horizontal dimension results respectively. Section 6 analyzes the complexity of credit issues and the confounding stories which could be driving the former results. Section 7 examines how soft is soft information. In the same way, Section 8 discusses how hard is hard information and the importance of its reliability. Section 9 is left for concluding remarks.

2 Related Literature

2.1 Theories On Vertical Communication

Where and how should decisions be made inside organizations? This question has been vastly studied in the organizational design literature. Researchers have focused on both vertical and horizontal communication theories and the on the exchange of information along these dimensions. This paper is closely linked to the vertical communication theories. Nevertheless, it is difficult to conclude whether one is testing any particular theory. I take the hierarchical organization as given and try to understand the role that information has along the two dimensions under analysis.

One of the building blocks of the existing literature is the incentive view of delegation proposed by Aghion and Tirole (1997). They show that a principal may delegate formal authority to its subordinate in order to give her better incentives to acquire information. The focus of Aghion and Tirole is the linkage and impact between authority and the information structure. Liberti (2003) provided a test for this theory by exploiting a change in the hierarchical structure of a large financial institution between 1999 and 2001. Formal authority was delegated to some account officers of the corporate clients accounts. Liberti empirically investigates how the allocation of authority affects the usage of information. Dessein (2002) studies delegation as an alternative to communication. Dessein shows that it is sometimes optimal to delegate authority in order to avoid the loss of information rather than to communicate it, as long as the incentive conflict between both parties is not large enough. Under his framework, he concludes that it is always better to delegate than communicate information to top level decision-makers.

The empirical test I propose here is not related to an incentive view of delegation. Given the hierarchical approval level structure, I attempt to answer what type of information is used and transmitted across layers of the hierarchy. I then add the concept of communication to the hierarchy. Seidman and Winter (1997) show that in certain cases when communication is feasible or even perfect the principal never delegates authority since he can verify all the information collected by the agent.

In this respect, this paper is closer to the literature on strategic communication (“cheap talk”) models based on Crawford and Sobel (1982). These models focus on the quality of decision and allocation of decision making authority. The decision-maker takes decisions that affect the utility of both agents, but the expert has a taste for size (empire builder). These agency problems prevent full communication and decrease the quality of the final decision. For example, Krishna and Morgan (2001) consider multiple biased experts, while Harris and Raviv (2002) consider the possibility that the top level decision-maker also has private information about the activities under analysis. These papers are more concerned about the structure of hierarchies, rather than distribution of decision-making power in a given level of the hierarchy.

Other related literature which is close to the work developed in this paper is Stein (2002) and Dessein (2003). Stein explores the differences in transmission costs of soft relative to hard information across hierarchical structures. He concludes that a decentralized structure entails more incentives to gather and to use more soft relative to hard information as opposed to centralized structures. This happens because transmission of soft information is more costly when the chance of being overruled is at stake. Dessein (2003) theoretically explores the difference between hierarchical and committee decision-making. He argues that only communication of hard information results in communication costs as it requires a costly state verification process. While committees decision-making ensures unbiased decision-making, they excessively rely on such costly hard information. Soft information is more useful under hierarchical decision-making process, thus reducing the costly verification of hard information. Dessein concludes that soft information works very poorly under committee decision-making, being the hard information the optimal way to aggregate information. On the other hand, soft information works better in hierarchical decision-making process avoiding time consuming costly state verification of hard information .

When I think about communication in organizations, some of the assumptions that these models propose seem to be rather unrealistic. Thus, I will use bits-and-pieces of these different models and theories to frame the theoretical predictions of this paper. I will discuss these issues in further detail in Section 3.3.

2.2 Soft and Hard Information

A related literature which should not be omitted here is the existing discussion of hard and soft information. This paper fits into the growing literature on the role of hard and soft information affecting economic behavior and organizations. Berger et al (2004), Butler (2004), Carruthers and Cohen (2001), Goetzman, Pons-Sanz and Ravid (2004) and Liberti (2003) are examples on the usage of soft and hard information at different settings. So far these papers have focused mainly in understanding the impact of these different types of information on availability of credit between small and large banks, credit ratings, bond underwriting, screenplays in the movie industry and hierarchical organizational changes in a multinational bank, respectively.

This paper contributes to this literature in understanding the transmission and usage of different infor-

mation at different layers in the organization. Variation in the usage of soft and hard information explains corporate loans size depending on how high-up in the approval process the loan must travel for approval. This paper also contributes to the question on how subjective soft information really is. Theoretical models assume that this type of information is private and thus difficult to convey to a third party. Results from this paper show that, in certain cases, subjective information can be transmitted for two reasons. First, transmission availability depends on the content and meaning of the soft information in question. It is the meaning of the subjective information that matters.⁷ Second, if the reliability of the hard information is questionable, then it could be the case that soft information plays a larger role in explaining availability of credit.

In this sense the paper departs from the work by Berger et al (2004). They test the theory developed by Stein (2002) in the context of availability of credit to small business firms. Their results are consistent with small banks being more efficient in collecting and processing soft information than are large banks. This is a rather simple view of transmission of information inside financial institutions. It is the internal credit process of loan approvals inside organizations the one that determines how information will be structured, collected, transmitted and used in credit loan approvals. This is not only common from small banks.⁸ The key ingredient that this paper adds to the discussion in this literature is that I am able to use the internal credit process of the organization in order to test a prediction of Stein (2002). I will explore this mechanism in detail in the next section.

3 Institutional Setup

3.1 The Corporate Bank

The organization under analysis is a foreign multinational bank in Argentina. The bank is a top tier financial institution in the country with a major participation in the large business lending segment.⁹ The bank is ranked as one of the best corporate commercial banks in the world.¹⁰

The Corporate Bank Division is the heart of the business of any commercial bank. It provides short, medium and long term financing as well as non-lending products and transactional banking services to

⁷I can convey subjective information on the industry characteristics where the firm operates. Although measures can be subjective, they are close in meaning to hard information. In contrast, it is difficult to transmit more subjective measures on management since these are more costly to “certify” or “verify”.

⁸Anecdotal evidence from conversations with loan officers from large financial institutions suggest that large banks tend to structure their small business lending divisions in such a way so as to make the AO closer to the source of information. They generally delegate power to the account officer regarding loan approvals. There is no or little hierarchical decision-making process attached to small business lending divisions.

⁹At the time of the information used in this analysis (1998), the bank was ranked 3rd in terms of total assets and 5th in terms of net worth.

¹⁰I have signed a non-disclosure agreement with the institution and therefore cannot mention in any written document the name of the institution where the data I use comes from.

large corporations. This division is where the relationship between the firm and the bank is shaped and consolidated throughout the years.

Account Officers (AOs) are in charge of developing the firm-bank relationship. They are essentially *financial advisors* to the firms they manage. On average each account officer manages around 20-23 firms.¹¹

To qualify as a corporate client of the bank, a firm must satisfy specific constraints on its industry and display annual net sales above \$ 50 million pesos.¹²

Account Officers focus on day-to-day credit decisions and credit maintenance of existing credit facilities (loans) for the firms they handle. These credit facilities are renewed on an annual basis in a pre-determined month of the year. The Corporate Bank Division is organized in a number of Business Units (BUs), each one in charge of a group of industries. In 1998, each BU was headed by a team leader overseeing 1 (single), 2 (multiple x 2) or 5 (multiple x 5) account officers. The team leader or Unit Head (UH) is in charge of supervising, coordinating and helping AOs in the process of approving the credit facilities. Both the UH and AOs exert effort in a complementary way convincing the upper layers of the organization to approve the credit facilities proposed. The AO may personally review different aspects of the underlying credit process, adding different value to the ultimate credit decision if necessary. The AO reports to the UH any advances and changes in the bank-firm relationship such as potential new deals, new non-lending products that could be sold and any other information she considers relevant to the relationship.

One point to highlight is that AOs and UHs work in a *complementary* way to develop the firm-bank relationship. In each BU, the UH coordinates and participates in each of the projects in conjunction with the AO. While the UH supervises and has knowledge of all the corporate clients handled by her AOs, each AO handles only a subset of firms in the unit.

3.2 The Credit Approval Process

All credit facilities extended to each firm must be reviewed and reapproved on an annual basis. The purpose of this process is to reassess risk, renew old credit facilities and recommend new loans for approval if necessary. This credit recommendation folder is composed by a complete financial review of the firm, including current financial and forecasts, analysis of market conditions and an in depth management and business assessment of the company. The questions and documentation required in the credit approvals are the same world-wide for all corporate clients.

Credit facilities approval processes are common to all financial institutions with Corporate Commercial Divisions. However, the format of such process varies across financial institutions. While some banks opt

¹¹For a complete description of individual account officer selection statistics for the period 1999-2001 see Liberti (2003). The organization of accounts in 1998 is very similar both qualitatively and quantitatively to the one in 1999. I will not report in this paper all the individual level and portfolio composition statistics. Tables at the individual level are available upon request.

¹²During the year 1998, under Convertibility Law 25,445, \$1 Argentine Peso was equivalent to 1 US Dollar.

for a credit committee decision-making approval process, others adopt a hierarchical credit decision-making process. The organizational structure of the bank under analysis is a hierarchical credit decision-making process.¹³

A hierarchical credit approval process establishes that the credit recommendation folder is approved *independently* by different senior officers in the organization following a pre-determined hierarchical level of approval. This level of approval is known ex-ante by the AO. The different layers of approval are not necessarily located inside the branch. They can be located either outside the branch or even outside the country.

Specifically, the hierarchical credit decision-making process is composed by up to 5 levels of approval, being 1 the lowest and 5 the highest. The level of approval at which a credit folder must arrive is not random. Given certain internal pre-specified rules described in detail in credit policy manuals¹⁴, a level of approval is determined for each of the corporate clients with ongoing credit facilities. For example, if the credit folder requires a level 4 signature, then to be approved by this level, the credit approval must first pass through levels 1, 2 and 3 respectively in order. The total size of the loan is not the main characteristic that determines the level of approval. For example, a level 4 approves on average loans of size of \$ 36.48 million, while a level 5 approves \$26.22 on average. See Table III-A for a complete description of selected statistics across approval levels. As another example, the *complexity* of the credit folder can turn a smaller size loan towards higher approval levels.

There are, to my knowledge, a total of 37 internal credit rules that affect a loan's level of approval changing it upwards or downwards. Following the credit rules policy manual, I classified these rules into 10 different categories. These categories are: (1.) Obligor is not in the target market of bank; (2.) Obligor is above a determined risk acceptance criteria relative to its size; (3.) Overall exposure with Obligor is above a certain threshold limit; (4.) Obligor was downgraded twice since last full annual review; (5.) Obligor experienced a significant increase in total credit facilities; (6.) Adverse change in industry conditions; (7.) Major risk event at the company; (8.) Adverse change in risk profile of the company; (9.) Significant adverse change in critical success factors; (10.) Significant adverse change in collateral/support. The purpose of controlling for these internal credit criteria is two-fold. First, it will enable the conditional analysis to capture any effect that could be driving the results other than pure hard or soft information variables. Second, specific criteria might explain particular decisions at different levels of the hierarchy.

One simple way of understanding this hierarchical approval process is to compare the submission of the credit approval folder to the submission of an academic paper to a journal.

¹³It is not the purpose of this paper to determine the advantages and disadvantages of one system over the other one, although this is an interesting venue for future research. Also, I will not study the reasons for the emergence of the existing hierarchy in its current format.

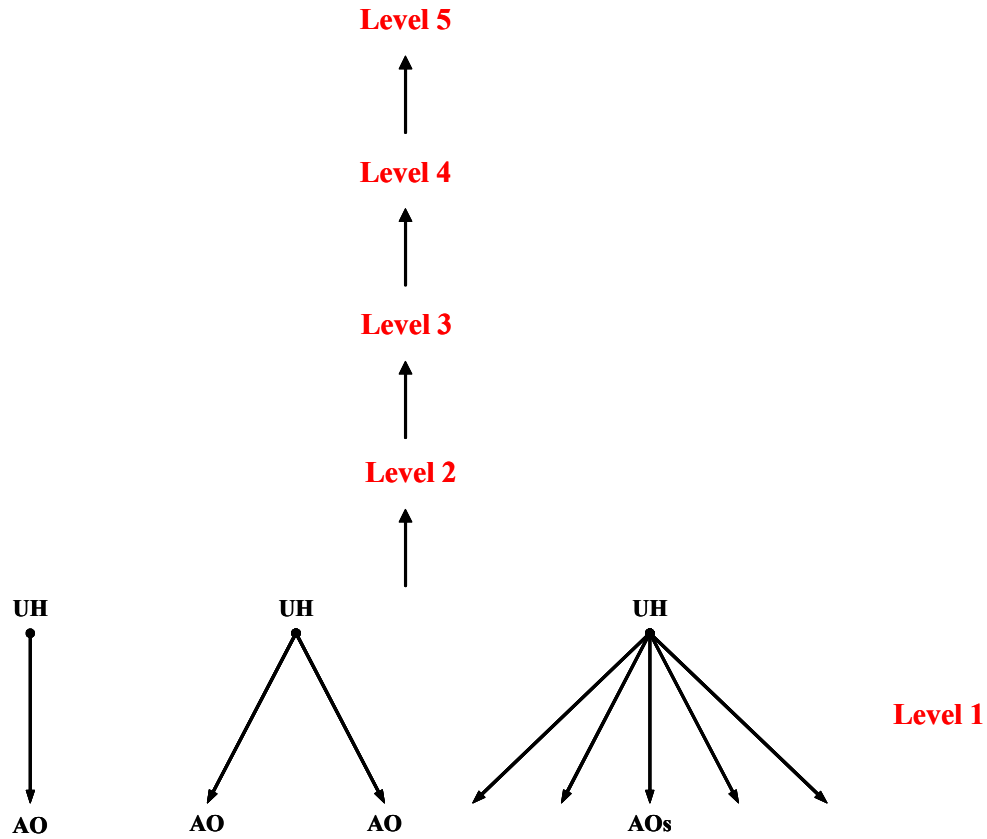
¹⁴These internal rules conform the core credit policy rules of the institution. They are specified in a credit policy manual. These rules are common to *all* countries where the bank has large business lending activities.

On general occasions, AOs do not know where exactly the credit folder is standing along the process. This is more common for those credit approvals which must travel to higher levels in the organization. There are three possible outcomes to the process: Approval, Rejection or Revise and Resubmit. Since I followed the credit approvals from the beginning of their life when AO and credit analysts are still preparing the loan for approval, I know whether at a certain point along the process there was a request for a revise and re-submission of the credit approval.¹⁵ Unfortunately I cannot observe rejections since the first page of the credit approval is replaced with the updated one indicating the new total credit facilities extended to the company, and my access is restricted to this new page. Therefore, I cannot check whether the original amount was decreased or increased in the new version.

Let me summarize the organizational structure just proposed in a graph. The vertical dimension analysis is given by the levels of approvals or measures that proxy for the vertical dimension as the time in days to approve the loan and the number of signatures in a credit folder. The horizontal dimension analysis is given by the lowest level of approval (Level 1) in the organization. The fact that AOs work in different team sizes and have different authority in terms of which loans they can approve may (or may not) impact the way data collection is gathered and used in the credit approval. Thereby, conditional on the horizontal dimension, what happens along the vertical dimension and, conditional on the vertical dimension, what happens along the horizontal dimension.

¹⁵Revise and resubmissions of credit folders might vary in context and style. An approving authority at a higher level may ask for more documentation to support the credit approval, deeper financial analysis or get acquainted about the management characteristics of the company. There is no specific or common procedure about what is asked in a revise and resubmit case.

HIERARCHICAL-DECISION MAKING PROCESS
Vertical and Horizontal Dimension Analysis



3.3 Vertical Dimension

The vertical dimension of the organization is given by the hierarchical levels of approval. Specifically, how high up the credit approval folder must arrive in order to receive approval. In the empirical analysis I use alternative measures of vertical dimension such as: level of approval, total number of signatures gathered through the approval process, the time in days it takes for the loan to be approved and the geographical location of the final person approving the loan.

Conditional on the horizontal dimension (the number of AOs in each BU) what type of information is used in explaining the loan amount as we move up the hierarchy?

3.3.1 Theoretical Predictions

I divide the theoretical predictions of the vertical dimension analysis according to whether communication is feasible across levels or not.

No Communication Case

When there is *no communication* among the different levels of approvals any costly transmission of soft information argument, as in Stein (2002), will result in hard information being used relatively more than soft information in explaining the total size of the loan as the credit approval moves up through the different layers in the organization. On the contrary, under the scenario that hard information is costly to verify as in Dessein (2003), soft information should be embedded relatively more than hard information as one moves up the hierarchy.

Communication Case

Direct communication across layers can ease the transmission of soft information. The fact that AOs in certain cases can communicate directly with a superior approval layer may have an impact on the transmission of soft information relative to hard information. If communication is possible, then soft information should explain a higher proportion of the total size of the loan relative to the no communication case.

3.4 Horizontal Dimension

The horizontal dimension is given by the number of AOs in each BU. These teams conform the lowest layer of the hierarchy. The interaction and degree of communication between the AOs and their supervisors impacts the collection and usage of information in the preparation of the credit approval paperwork, and this may impact the credit approval at later stages as it moves up the hierarchy.

Conditional on the vertical dimension, is the information embedded in explaining the total size of the loans different when AOs work in single versus multiple teams?

3.4.1 Theoretical Predictions

The theoretical predictions can be divided in two possible cases depending whether the AO has enough *authority* to approve some of the loans by herself or not. This authority channel might impact the relative importance of one type of information relative to the other one. When the credit folder is approved by the AO there is no need for the loan to be sent to a higher level of approval.

No Authority Case: Communication vs. Monitoring

When AOs do not have *authority* to approve the loans by themselves the only mechanism of interaction between the AO and UH is through communication. This could have an implication on the type of information being used to prepare the credit approval. AOs in single teams enjoy more fluent communication availability

with their UHs relative to those working in multiple teams. One could think of the case where AO and UH work together gathering information. In this scenario, there is no need for transmission of any type of information. In contrast, in multiple teams, communication is more sparse, and therefore one would expect reliance on soft information to be less obvious for these cases.

A different argument can be developed with opposite predictions. Since AOs in single teams are likely to be under heavier supervision with higher chances of being overruled, then incentives for collection and usage of soft information are not clear relative to those AOs in multiple teams. If decisions are taken ultimately by the UH then there is no need to exert effort in collection and usage of soft information. I will let the data determine which story is more palpable.

Authority Case

There is an additional dimension to the communication channel which might affect the decisions on the type of information being used. Depending to their experience in the organization, each AO may be entitled to approve some of the credit approvals of the loans they manage. This subset of credit folder approvals is inherently different than the ones which are approved at higher levels in the organization. They are on average smaller loans \$5.71 million, with an average time of approval of 1.43 days and an average folder preparation of 3.56 days. They are basically smaller and less complex credit approvals. See Tables I and II for a complete description of the summary statistics.

AOs with authority to approve a loan know that there is no need to further transmit the information they gather. This process facilitates the usage of soft information in explaining credit availability. Soft information is then expected to have a higher impact in explaining credit availability under authority. From the sample of loans which are approved by the AO, it should then be the case that single teams should embed more soft relative to hard information as opposed to those on multiple teams.

4 Data Description

I personally conducted the field work in the organization in the months of July and December of 2004. The hierarchical structure analysis corresponds to the year 1998. There are four reasons for choosing this year. First, as explored in Liberti (2003) the bank went through an important change in its hierarchical structure as well as in the definition of the credit roles of certain AOs in 2000. Using 1998 as the year of analysis will not interfere with any change in the organization or with any potential “leakage” about the change in structure which could jeopardize the results if using 1999. Second, 1998 was a positive/stable year for Argentina in terms of macro-economic activity. Third, I managed to hand-collect and assemble the data for *all* of the corporate clients which the bank has a relationship with. Finally, only for 1998, I had access to information about the credit analyst and the AO, the time in days taken to prepare the credit approval and information as to whether the client was contacted by the credit analyst or AO for the purpose of obtaining

additional information to prepare the approval.

Data collection can be divided into 4 different groups.

I. Credit Approvals and Credit Folder Analysis.

The most important pieces of information in the construction of this database emerge from these two sources. From the Credit Approvals I used the final level of approval, the number of signatures, the geographic location of the last person signing the loan, if the credit approval was asked to be revised and resubmitted, the total number of days the credit approval took to be approved and the month the credit approval started its approval process.

From the credit folder analysis I collected hard and soft information measures for *each* of the corporate clients the bank had a relationship in 1998. As part of the hard information measures I also collected financial information from the annual reports of the companies and the financial forecast of the credit analysts. I also collected information on the quality of the auditor and whether the annual reports were qualified/unqualified.

I define as *hard information* variables those measures that are easy to verify by a third party at no additional cost and that are recorded as numbers. One of the main characteristics of hard information is that collection can be impersonal, its meaning being independent of who has collected the information. This type of information is easy to collect, store and transmit. Among the hard information measures collected, I hereby mention: credit risk rating of the firm, if the firm is in financial distress, Tenor of Facilities over 3 years, % of Unsecured Facilities, Covenant Violations, Years In Industry, Length of Relationship with the Bank, Access to Capital Markets, Access to Other Banks and Type of Ownership.

Soft information is subjective, impersonal and costly to verify by a third party. This type of information can be more or less subjective depending on its content and meaning. I will tackle this issue in detail in Section 8. As soft information measures I use subjective information which the AO must complete regarding the business-risk assessment of the company. This "grid" used in understanding business and management characteristics is an integral part of the credit folder. Its purpose is to serve as a summary to the questions the AO has answered in the credit analysis about the company's financial and business position. The grid assessment includes fields and measures on Industry, Competitive Position, Management and Risk Management Policies. Each of these fields is graded on a scale from 1 to 6.

The process of hardening soft information may imply that this information loses its main intrinsic characteristics. Nevertheless, it is still personal and subjective. Assigning a 6 for "Ability to Act Decisively" in Management means that the management is *Hopeless*. The definition of *Hopeless* however, may clearly vary across individuals. For the time being, I will continue using these definitions for soft information. In Section 8, I will challenge these measures using alternative and *more* subjective measures of soft information which I constructed from the "text" reports that AOs must write.

II. Internal Credit Policy Manuals.

From the internal credit policy manuals I collected all relevant information regarding the different approval rules which are used in the organization. I examined and compared each credit folder approval with the internal credit policy manual to check for consistency of the level of approval assigned. I classified the 37 internal credit rules into 10 different criterias. These criterias are part of the inputs that determine the level of approval function inside the organization.¹⁶ I use these measures in the empirical analysis for basically two reasons. First, it will enable the conditional analysis to capture any effect that could be driving the results other than pure hard or soft information variables. Second, specific criteria might explain particular decisions at different levels of the hierarchy.

III. Complexity of Credit Measures.

I also constructed measures that proxy for the complexity of the credit. It is sometimes difficult to determine which are the measures that reflect whether a particular credit loan is complex, and to uncover which are the firm specific variables that could categorize a loan as “more difficult or more complex” than a peer one. Since I manually constructed the database based on the trajectory of each credit folder from its start, I was able to compute three different measures which could proxy for complexity. First, I computed an indicator of whether there was ever a request for a revise and resubmit of the credit loan along the hierarchical approval-process. Second, I computed an indicator of whether additional information (both soft or hard) was requested to the client along the process. Third, I computed the time in days taken by the credit analyst and the AO to prepare the background paperwork related to the credit approval. These measures provide an indication of a differential level of difficulty associated to specific credit accounts and allow for controlling for such conditions in the empirical analysis. They also allow for comparing whether results hold under inherently different samples.

IV. Potential Alternative Stories.

Last, I also collected information related to specific events that may affect the loan approval process and might bias the decision of upper layers in the organization to use more of one type of information relative to the other. More specifically, the second page of the report asks *specific* questions (yes/no basis) on firm specific related issues. These issues might put doubts on the way upper layers in the organization interpret and use the different types of information. From the credit folders, I constructed an indicator of whether there were covenant violations, whether the firm’s auditor had further qualified the firm’s financial reports, whether there were negative checkings on the client, other issues related to the account and if the model to determine the internal credit rating was not used for the specific firm under analysis.

I also checked the financial reports of each of the companies under analysis and noted information related to the auditor that endorses each firm’s financial statements, if the report was qualified by the auditor and

¹⁶I am not interested in estimating the credit rating model of the bank; the level of approval as a function of different inputs.

the availability of current versions of the financial statement relative to the month that the analysis was taking place.

4.1 Data Aggregation Issues

One of the main challenges of assembling the data was the procedure to adopt when dealing with the aggregation of information in conglomerates. Given that I collected information on *all* corporate clients, this also included conglomerates and groups. Groups may be composed by many different firms. The bank might have a relationship with the group as a whole by lending to only some of these firms. It could even be the case that the lending is done at the holding company/parent level and funds are then allocated according to the firms internal capital market decisions. If this is the case, then there was no problem in finding the relevant hard and soft information for each of the firms. Occasionally, some of the hard and soft information was missing for determined firms. In these cases, the credit approval would outline the amount, the terms of the loan and the name of the firm of the conglomerate for which the funds were being disbursed. That is, all specific information of the loan was available but there was no hard or soft information for these companies. For these cases, I analyzed the ownership structure of the conglomerate to check where the firm was eventually consolidating. This procedure enabled to determine which was the ultimate responsible for the loan. I then used the soft and hard information of the company where the missing firm was consolidating. This has direct implications on the way perform the empirical analysis is performed.

The conditional analysis is reported at the individual borrower level, clustered at the group level. Although not reported, I also conducted robustness checks checking the importance of each individual borrower in the conglomerate. For this purpose I used as weights the total size of the loan and the total outstanding of each individual borrower. Results are qualitatively and quantitatively similar. Also not reported, I conducted the same analysis at the group level. Results at the group level are not always the same as the ones reported here. The reason for this is that aggregation of soft and hard information is not always the correct way to proceed. Furthermore, AOs do not aggregate the information when preparing the credit folders.¹⁷ Furthermore, the different layers of approval receive a folder with the different analysis of the firms.

Figure I displays the monthly overload of credit folder approvals, by both number of borrowers and number of groups. Although approvals are not evenly distributed around the year, there is no particular concentration of activity at any given month. The early months of the year are typically slower since it is the summer holiday and there are interactions between the relevant firm and the bank in order to arrange the final credit facilities.¹⁸

¹⁷As an illustrative example, take the case of a conglomerate with 5 firms. If the bank operates with the 5 firms, then there will be hard and soft information analysis for each of these firms. There is no reason to believe that information should be aggregated in this case. If anything, the aggregation of information averages out possible idiosyncracies. For this particular reason, I opted to present results at the individual borrower level clustered at the group level.

¹⁸Although not reported, I run the variable “time to approve a loan” against levels of approval, number of borrowers and

5 Vertical Dimension Results

The conditional analysis along the vertical dimension is developed in Tables V through VIII. Let me first describe some selection issues and descriptive statistics that will shed some light on the organizational structure.

A first look at the unconditional data in Table I, Panels A and B, shows that not all firms arrive to the highest levels to be approved. Only 43 individual borrowers (12 groups) arrive to Level 5 relative to the 137 borrowers (116 groups) in Level 1. A similar reasoning applies using the total number of signatures instead of levels of approvals. Table I shows selected descriptive statistics along level of approval and number of signatures. Using the later as a vertical dimension measure gives a sense of the number of hands the credit folder has crossed. This measure has basically two purposes. First, AOs can decide to jump a determined level, and the number of signatures will reflect that. Second, it also provides a proxy for how complex or difficult the credit is.¹⁹ Both the average time (in days) to approve a loan and the average time (in days) to prepare the credit folder increase the higher up we move in the organization. This is true by level and by number of signatures. At Level 1 the approval takes 1.43 days and the preparation of the folder takes 3.56 days, while at Level 5 it takes 103.98 and 32.63 days respectively. Revise and resubmits (RRs) seem to be common at each level. For example, 25% of the credit folders that arrive to Level 3 are asked for a RR. There is no distinctive pattern or trend in the hard risk rating and soft risk rating measure. These measures are on a scale of 1-10 and 1-6 respectively. Table III-A provides Mann-Whitney tests for equality of distributions at different levels of approval and number of signatures. In these tests I compare a level with the one following it. Both hard risk rating and soft risk rating are not statistically different at each level. Total facilities and total outstanding are statistically different across levels and number of signatures. The total amount recommended to be approved does not increase monotonically as the credit approval moves up the hierarchy. This is consistent with the fact that the size of the loan is not the unique characteristic which determines the level of approval. Bank Stability Criteria are other inputs that help to determine how high the credit approval travels in the organization, among other measures.

I test for the statistical significance of the importance of soft and hard information across hierarchical levels using the following basic specification:

$$\begin{aligned} \text{Total Loan}_i = & \alpha + \beta_1 \text{Hard}_i + \beta_2 \text{Soft}_i + \beta_3 (\text{Hard}_i * \text{High-Level}_i) + \\ & \beta_4 (\text{Soft}_i * \text{High-Level}_i) + \beta_5 \text{High-Level}_i + \gamma X_i + \varepsilon_i \end{aligned} \quad (1)$$

month-fixed effects in order to capture if any one month was having a differential impact on the delay of approval. This is not the case. Specifically June and July are not having a differential impact on the time it takes to approve the loan.

¹⁹Suppose among the credit facilities for a certain company there is a credit facility for “leasing”. In this case, the leasing product specialist needs also to sign the credit approval. Although this signature is not part of the hierarchical approval level, it is an internal requirement of the organization.

where Hard_i and Soft_i are indicator variables that take a value of 1 if firm i 's hard and soft information are considered "good", respectively.²⁰ High-Level_i is an indicator variable that takes a value of 1 if the firm goes to a Level 4 or higher for approval. The variable X_i includes controls for team size, firm specific characteristics and bank stability criteria, as indicated in each column of the tables. Firm specific characteristics include length of relationship, percentage of unsecured loans, percentage of loan with tenor over 3 years, covenants, years in industry, professional ownership, access to other banks and access to capital markets.

The parameters of interest in the analysis are β_1 versus β_2 , which allow for a comparison of the importance of usage of hard versus soft information in explaining credit availability, as well as the parameters β_3 and β_4 , which measure whether there are any *additional* effects related to usage of hard and soft information at higher levels of approval. Equation (1) will be properly modified to account for the relevant interaction terms and the appropriate dimension under analysis at each stage of the paper. Tables V and VI summarize the results for the vertical dimension analysis using the levels of approval as the hierarchical measure, conditional on the horizontal dimension (team sizes).

5.1 Levels Of Approvals

Table V column (1) is the most stripped down version of the equation with no interaction terms. Both hard and soft information seem to explain credit availability in different magnitudes. On average, good soft firms get \$ 13.3 million more than those with bad soft information. In the same way, those with good hard receive on average \$ 8.8 million more than bad hard firms. Columns (2) to (7) show the difference in usage of hard and soft information across approval levels. Columns (2) to (5) are clustered at the group level, while columns (6) and (7) report results weighted by the total size of the loan and the total amount outstanding respectively. In particular, hard information is found to be significantly *more* important while soft information is found to be significantly *less* important in explaining the size of the loan at higher approval levels relative to the lower levels. This result is robust in both sign and magnitude to the inclusion of a variety of controls, as shown in the table, as well as to using weights reflecting the importance of each borrower in its holding company. Column (5) includes team size controls, bank stability criteria and firm specific controls. Results suggest that good soft firms explain relatively less the availability of credit at higher levels in the organization as compared to hard information. Note that the overall effect of soft information is still positive ($\beta_2 + \beta_4$). One interpretation of this specification is to think about relative weights of soft and hard information at each level of approval.

Columns (8) and (9) provide additional specifications to equation (1) allowing responses at each level to vary and for their interaction with both hard and soft information. Results show an increasing importance

²⁰ A firm's measure of hard and soft information is qualified as good hard or good soft when it falls above the median of the distribution of that particular measure for the whole bank in the year 1998. One advantage of this procedure is to equalize the unities across different measures.

of hard information as level of approval increases, as well as a decreasing importance of soft information as level of approval increases relative to the lowest level (Level 1). Soft information has basically no effect in explaining credit availability at Levels 4 and 5, while hard has a strong and significant impact. At lower levels, the opposite holds; soft information is relatively more important than hard information. Although not reported, independent regressions at each approval level show the same results as in Table V. Dividing the sample across levels of approvals shows relatively strong and significant effects of hard information at higher approval levels and relatively strong and significant effect of soft information at lower approval levels. At Level 3 however, both hard and soft information impact the amount of loan approved. The reason from this will become clear later when I introduce the distance dimension into the analysis.

5.2 Number of Signatures and Time To Approve

Table VI allows for alternative measures of vertical dimension, namely the number of signatures involved in the approval process and the total time it takes to approve the loan. Both measures are good proxies of the vertical dimension to the extent that the frequency at which a loan changes hands and the length of the approval process are associated with the credit folder reaching individuals higher in the hierarchy. They are also proxies for complexity measures. In terms of regression specification, equation (1) is modified to incorporate the appropriate interaction terms.

I find that results are qualitatively similar when using number of signatures as a vertical dimension indicator. Columns (1)-(4) show individual regressions dividing the sample according to the number of signatures in the credit approval. Namely, hard information is significantly more important when a larger number of signatures are present and soft information is significantly more important when a lower number of signatures are involved. For those loan approvals with less than 3 signatures, results in column (5) show that there is differential impact of soft relative to hard information for credit approvals with less than 3 signatures. For these cases, good soft information explains 14.7 million of the loan size relative to those with more than 3 signatures. Furthermore, column (6) shows that their relative importance increase (for hard information) and decrease (for soft information) as the number of signatures increases. Column (7) repeats the analysis eliminating number of signatures 5 and 6 since these represent a very small portion of the companies, and results are robust to their omission.

Columns (8) to (11) of Table VI show the differential impact of soft and hard information using the time it takes to approve a loan as my vertical dimension measure. Long time is defined as an indicator variable which takes a value of 1 if the credit approval is in the top 50% of the distribution of the firms under these characteristic. When using total time it takes to approve, soft information appears to be significant in the sub-sample of loans that take *longer* to be approved, which seems to contradict the previous results. One possible explanation is that the complexity of the loan heavily influences the time it takes for a loan to be approved, and complex accounts exist at *all* approval levels. For the sample of firms that are approved

faster, soft information is more important in explaining loan amount, and for the whole sample we observe the differential usage of soft and hard information to a lower extent across hierarchical levels, again possibly due to credit complexity.

5.3 Distance and Communication

The next stage is to analyze the importance of distance and communication in the transmission and usage of soft information. Direct communication between the AO and the ultimate person approving the loan may have a differential impact on the type of information that is used *independently* of the hierarchical level of approval.

For this purpose, I re-group the loans according to the geographical location of the ultimate person in charge of the approval. I created three main categories: loans that are approved “Inside the Branch”, those that are approved “Outside the Branch”, and those that are approved “Outside the Country”. Table I, Panel C, shows unconditional descriptive analysis. Results are similar to those obtained for the level of approval and number of signatures. As the loan is approved outside the branch there is an increase in the time it takes to approve the loan (from 4.35 days to 103.98 days) and an increase in the time it takes to prepare the credit folder (from 5.31 to 32.63). Table III-B provides Mann-Whitney tests for the equality of distributions at different geographical locations. The tests are conducted comparing inside the branch against outside the branch and outside the branch against outside the country. Tables VII-A and VII-B summarize the conditional results on the distance and communication issues along the vertical dimension. Again, equation (1) is modified to incorporate the relevant interaction terms.

Columns (1) to (3) in Table VII-A show a striking difference in usage of information across loans that are approved inside the branch from those that are not. Specifically, loans that are approved inside the branch rely significantly more on soft information while loans that are approved elsewhere rely significantly more on hard information to explain loan amount. Results are robust to eliminating those loans that are approved outside the country. This result is shown in Column (3). Good soft information explains relatively less the total amount of loan compared to those that are approved inside the branch. For those loans that are approved outside the branch, Columns (4) through (6) show that higher reliance on hard information and lower reliance on soft information increase with distance. A possible explanation for these results is that communication is increasingly more difficult as a loan is approved further away, especially the transmission of soft information. This would increase incentives for higher usage of hard information.²¹

One particular characteristic of the organizational structure is that within level of approval 3 there are two types of loans: loans that approved inside the branch and loans that are approved outside the branch.

²¹While for some purposes it may not matter whether distance is outside the branch or outside the country, here such distinction is relevant. One possibility is that outside the branch often involves repeated interactions with the same bank personnel (at main branch), facilitating communication of subjective information, while outside the country involves more isolated interactions with bank personnel at various countries.

Thereby to disentangle the effect of communication, I exploit the variation in the geographical location in order to examine differential usage of hard and soft information within the *same* level of approval. It is worthwhile noting that there is no clear selection issues for those companies from Level 3 that are approved inside the branch and those outside the branch. Mann-Whitney tests were constructed for this purpose and the results are shown in Table III-C. The main statistical difference between inside and outside branches at Level 3 are the time to approve and the RR folders. The difference is statistical and economic significant: 11.15 days vs. 29.35 days and 5% against 38% respectively. Other than these two measures there is not any significant difference. Conditional results for this analysis are shown in Table VII-B. Columns (1) and (2) show the results only for the Level 3 sample, while column (3) shows the results for all the sample. Again, hard information is significantly more important for those loans that are approved outside the branch while soft information is significantly more important for those loans approved inside the branch in terms of explaining loan amount. In column (2) the overall effect of soft and hard information for those firms inside the branch is given by \$ 13.4 and \$ 2.6 respectively.

Overall, the analysis of the vertical dimension shows clear results. Specifically, I find significantly higher reliance on hard information relative to soft information for explaining loan amounts for the loans that must travel towards higher levels of the hierarchy to obtain approval, and the opposite for loans that are approved at lower levels. Further, such results are robust to the usage of alternative measures of vertical dimension - such as number of signatures collected along the process and total time it takes for the loan to obtain final approval, as well as to the inclusion of several controls - such as team size, firm specific characteristics, bank stability criteria and weights. Also, similar results hold when I use a measure of distance. Hard information is found to be significantly more important than soft information for loans that must travel outside the branch for approval, while the opposite holds for those loans approved inside the branch. Finally, I showed that communication matters in terms of explaining the usage and transmission of soft information.

There are at least two possible interpretations of the results I find. The *first* interpretation is that the upper layers do not act on the soft information collected by the AOs. They may prefer to use the hard information because it is the one “they can easily verify by themselves”. This literally means they do not trust the soft, the issue being its poor communication along the hierarchy. The *second* interpretation relates to career concerns. One may argue that officers at upper layers may prefer to use the hard information because when (potentially) things go bad, showing that the firm had “good hard” provides a better justification for why a loan was approved (“saves their job”) in a way that good soft information doesn’t. In contrast to the first interpretation, the issue here is that soft is not accepted by the bank as well as hard in terms of “loan justification towards their bosses/the bank” in case of default. A challenge to this alternative explanation is the consistency of the lower level analysis. AOs at the lower levels have career concerns as well (and most likely have a longer horizon in the bank) and bad decisions could jeopardize their career, regardless of the fact that such loans represent smaller amounts from the bank’s perspective. Their very usage of

(costly) soft information under this scenario would only be consistent if default rates amount smaller loans were considerably smaller and their decisions were hardly questioned, which is not a reasonable assumption. Taken together, this evidence suggests that inability to properly communicate soft information is the proper explanation for its lower usage at upper hierarchical levels.

6 Horizontal Dimension Results

In this step of the analysis I examine potential differences in usage of soft and hard information driven by the variation in team sizes across the lower layer of approval. As mentioned, account officers are organized into business units, which vary in size.

There are at least two alternative theoretical frameworks that provide insight for the expected results of this analysis. As the number of officers per supervisor varies across the units, the availability of direct communication between each officer and her supervisor also varies, possibly altering the incentives for using each type of information. On one side, higher usage of *soft* information is expected in smaller teams, as the increase in the availability of communication between account officers and supervisor lowers its transmission costs. On the other side, higher usage of *hard* information is expected in smaller teams, as higher monitoring increases the possibility of overlapping and overruling and decreases the incentives for collection of soft information.

Table VIII explores this possibility. Again, equation (1) is modified to account for the relevant interaction terms. Columns (1) through (4) allow for a comparison of relative information usage across account officers working in single teams versus the remaining account officers. Note that account officers in single teams rely significantly more on soft information and less on hard information in explaining loan amount than officers in multiple teams. As shown, this result is robust to the inclusion of various controls. Column (5) shows the differential effect on information usage for both individuals working in single and individuals working in multiple (x2) versus individuals working in multiple (x5). Note that the relative effect of soft information is now stronger for single teams, and that multiple (x2) teams also display a differential effect on usage of soft information relative to multiple (x5) teams. However, unlike the results for single teams where hard information has little importance explaining loan amount, hard information matters for multiple (x2) teams. Column (6) explores the possibility that individuals working in multiple (x5) teams are subject to a structure that is considerably different. Thus, single teams are compared only against multiple (x2) teams, and I find that the differential impact on usage of soft information remains.

Overall, results on horizontal dimension are consistent with the idea that individuals working in single teams have more opportunities or higher ability to communicate soft information to their supervisors, and this entails higher usage of such information.

7 Confounding Stories: Is Complexity Of Credit Driving the Results?

At this point in the analysis it is a logical step to question whether there could be alternative explanations for the previous results. In particular, I examine whether other channels could be providing the true underlying information explaining credit availability, but so far had been reflected in the measures of hard and soft information used in the analysis.²²

As previously mentioned, I have gathered information related to the complexity of credit loans that could potentially explain credit availability through the measures of hard and or soft information. I explore three such measures: an indicator of a revise and resubmit, an indicator of whether additional information was requested to the client along the approval process, and the time taken by the credit analyst to prepare the background paperwork related to the credit approval.

Table XI examines whether the previous results encountered for the vertical dimension analysis - for both level of approval and number of signatures - are robust to the inclusion of measures of credit complexity as possible explanatory variables of credit availability. I find that they are. These alternative measures, and in particular client information request and the time taken by the credit analyst to prepare the background information do help explain the size of the loan; however, the results related to the differential usage of hard and soft information across levels are qualitatively the same as before. Thus, I conclude that the effects found for both hard and soft information are not being driven by such measures.

Apart from credit complexity, there are still other issues that could be potentially driving forces of the previous results. AO might be biased in the way they collect information if any of these measures has a positive answer. The same way the person reading and understanding the ultimate loan officer deciding its approval might also be biased its decision on which type of information to use. To further examine this hypothesis, I collected information on these issues. In particular, I gathered information regarding whether there are covenant violations in the approval process, whether the firm's auditor has further qualified the information provided on the financials, whether there are negative checkings in the account, whether the AO has ignored the credit rating model of the bank, and other issues (which might include family ownership and holding companies). Again, such measures could be the true explanatory variables but so far had been reflected in the soft and/or hard information measures.

Table XII examines this hypothesis for each of the main results previously discussed in the paper - vertical dimension measured as high/low level of approval, number of signatures, each independent approval level, geographic distance and horizontal dimension, in columns (1) through (5) respectively. The variable Z_i in the table corresponds to the appropriate measure of interest. Namely, in column (1) Z_i represents high-level,

²²An example would be the case where the soft information measure, for instance, is heavily based on some alternative measure, such as an alternative complexity measure.

in (2) it represents more than three signatures, in (4) it represents outside the branch while L_5 represents outside the country, and finally in (5) Z_i represents single.

I find that auditor's opinion and negative checkings bring a significant impact on the size of loans. Family companies and holding companies have a positive impact on the size of the loans. Covenant violations appears to be unimportant for explaining loan amount. Other issues and model override have a negative effect, as expected, but are not found to be statistically significant at the usual levels. More importantly, I find that results on usage of soft and hard information are robust to the inclusion of these measures as explanatory variables; specifically, the differential effects found for both soft and hard information across hierarchy levels and team size are not being driven by these alternative measures.

8 How *Soft* Is Soft Information?

One important aspect of the analysis so far is the definition of soft information. Thus, for robustness, I now question the reliability of the soft information measures.

For this purpose, I use *all* less subjective measures of soft information which are available in the credit risk assessment of the company. That is I divide the sample in the 4 fields which appear in the soft information measures: Industry, Competitive Position, Risk Management Policies and Management. Although the four of these measures are subjective in nature, they vary in their content. Also, some of them are *more* firm-specific than others. As well some other measures may act more like *hard* in terms of their content. For example, Industry reflects specific information about the industry, so it is not really subjective information specific to the firm.

Table X shows the results of using the alternative measures of soft information for different concepts of vertical dimension. As shown, they vary with the particular measure under consideration. For the more subjective and firm specific measures such as management and competitive position, results are similar to the previously found results on soft information. However, for Industry and Risk Management Policies, which are measures that could be interpreted more closely to hard information results change quantitatively and qualitatively. The content of information is the main characteristic determining its usage regardless of its degree of subjectivity.

9 How *Hard* is Hard Information?

Hard information is conventionally understood as easily verifiable. However, a closer look at the data raises the possibility that further qualifying measures of hard information would suggest different degrees of its hardness. I constructed three measures to assess the quality of hard information. I use the attributes of each firm's auditors to create an indicator for "top quality auditor"; I use the credit analysis of each firm to create

an indicator of financial distress, and I measure the gap in months between the month where the credit approval is being analyzed and the date of the last available financial. Presumably, financials endorsed by top auditors, financials from firms that are financially healthy and financials that are more readily available convey hard information of higher quality.

To examine whether there is in fact a role for differential quality of hard information in the analysis, I focus on the subsets of the database where hard information was not important in explaining the size of the loan, namely the lower levels of approval and the single teams. I re-define the measure of good hard information to be good hard information and high quality information, where quality is defined by the three different measures described above.

Table XIII shows the results of this analysis. When good hard information is re-defined to be good hard and good quality, I find that hard information does help explain the size of the loan even for those samples where it was not significant before. Both the size and the significance of the parameters are affected by the re-definition of hard information. For both lower levels and single teams, hard information does bring a positive and significant impact on the size of loan. Still, the impact of hard information is smaller than the impact of soft information for these samples.

Another interesting approach is to examine what happens to relative usage of soft and hard information when hard information is questionable. Again, I defined as questionable hard information the financials that are endorsed by “lower than top”, or “bad” auditors, and financials that display a large gap to the current date. Table XIV shows the results of this analysis.

For “bad” auditors, there is a striking difference compared to the initial results. Note that when hard information is questionable, its usage along the hierarchy is significantly reduced and soft information is the one that is mattering the most in explaining the availability of credit.

Overall, the analysis developed at this step of the process suggests that there is no rigid definition in practice regarding the transmission of soft and hard information. It is not always that soft information is not transmitted by definition.

10 Concluding Remarks

This paper has taken the position of searching for an empirical answer to the debate regarding the economic role and behavior of soft and hard information across organizational structures. Although the theoretical literature is vast, to the best of my knowledge there is no empirical answer to how information flows within organizations.

I analyze the hierarchical credit-approval process and the importance of transmission of soft and hard information across within an organization, in this case a foreign multinational bank in Argentina. For this purpose, I explore two dimensions of this organization: a vertical dimension given by the hierarchical

approval level and a horizontal dimension given by the number of account officers per team at the lower level. I concentrate specifically on theories of vertical communication.

The evidence provided in this paper supports the view that hard information is relatively more important than soft information as a loan moves up the hierarchy. I find that hard information is significantly more important than soft information for explaining credit approvals at higher hierarchical levels, while the opposite holds at lower levels. Moreover, the availability of direct communication strengthens the use of soft information, implying that soft information is easier to transmit in person. These results are shown in two ways. First, across the horizontal dimension, as smaller teams rely more heavily on soft information than larger teams. Second, across the vertical dimension, as loans approved inside the branch also rely more on soft information than loans approved elsewhere.

I have gathered several credit complexity measures such as RRs, time to prepare the credit folder and if additional information was requested from the client. I also checked whether alternative indicators of credit specific conditions that pertain to the loan credit approval process might be driving the results. These measures might impact the way soft information is collected by the AOs and interpreted by the remaining officers at higher levels in the organization. I examined whether the results are driven by such channels, and I find they are robust to these specifications.

In the last two sections of the paper I focus on challenging the measures I use as hard and soft information. An interesting result of the paper is that not all subjective information behaves as “soft information”. This analysis suggests that the importance of hard information decreases and reliance on soft information increases when hard information is questionable or unreliable. Such results question the conventional assumptions over transmission of soft information taken by most theoretical papers in organizations which state that, by definition, soft information is difficult to transmit. I find that soft information can be transmitted depending on its content and on the reliability of the hard information.

This paper has taken a first step in understanding transmission of information across hierarchical structures. The underlying analysis confirms that organizational form matters in transmission of information process. These results should not be taken as definite since they rely on a clinical study of a single organization, but, to the best of my knowledge, they provide a first attempt to narrow the gap between theoretical and empirical research in the area.

Additional research is needed to understand the role of information in other types of industries and for the reasons of the existence and emergence of hierarchies in this particular way. Furthermore, there is no rationale for the reasons for the existence of this type of hierarchical credit-decision making. Is it more or less efficient than a credit-committee decision making process? We still do not know the answer to this question. This is clearly an interesting venue for future research.

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Figure I: MONTHLY OVERLOAD OF CREDIT FOLDER APPROVALS

Monthly Distribution of Approvals for Individual Borrowers and Consolidated Groups

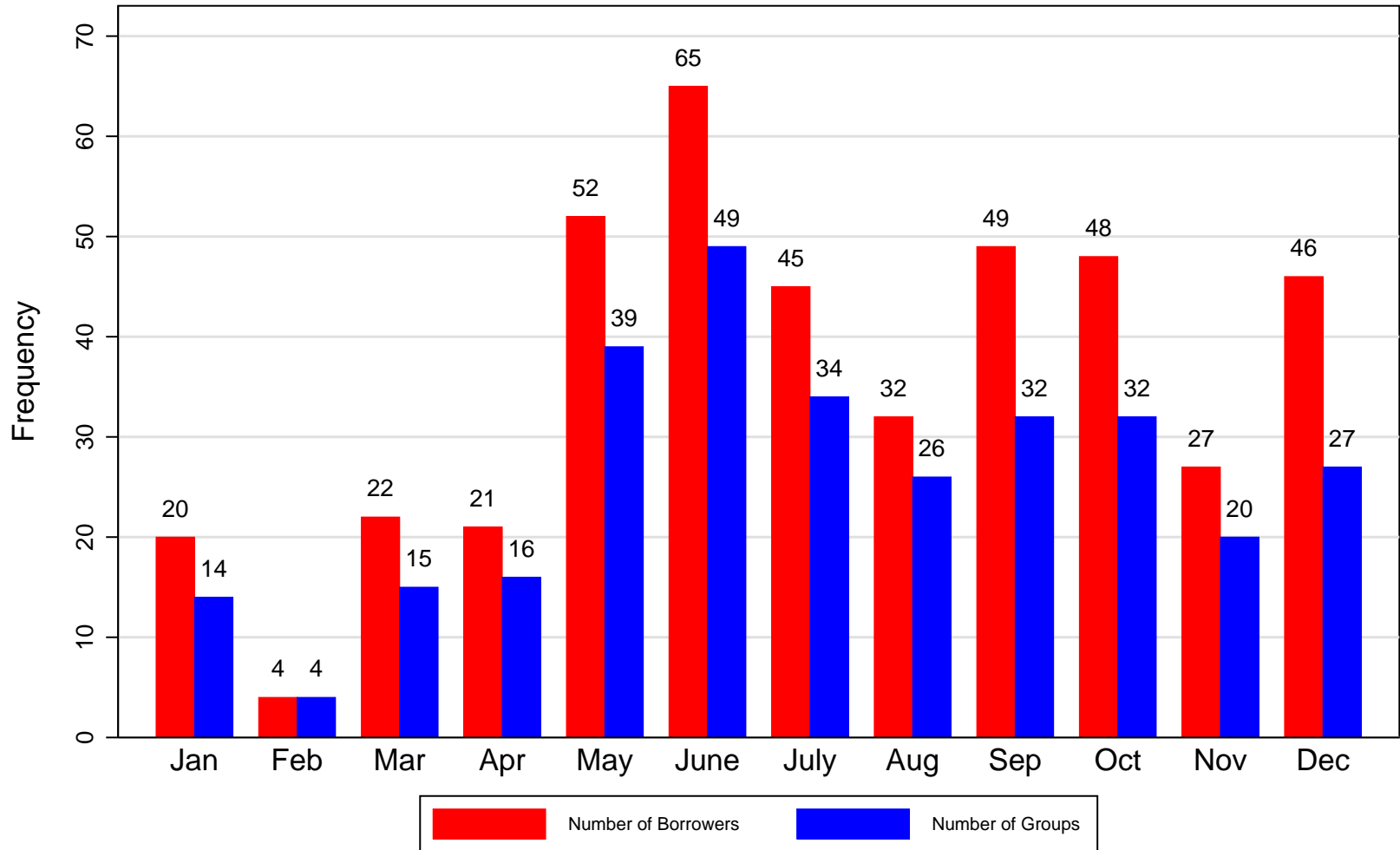


Table I - Descriptive Statistics

**Panel A: Vertical Dimension
By Level of Approval**

Level of Approval	Number of Borrowers	Number of Groups	Number of Firms In Group	Credit Analyst Average Time	Average Time To Approve	Revise and Resubmit	Client Information Requested	Hard Risk Rating	Soft Risk Rating	Average All Soft	Management Characteristics	"Credit Folder" Soft Measure
1	137	116	1.33 (1.02)	3.56 (4.30)	1.43 (2.01)	0.03 (0.17)	0.46 (0.50)	5.38 (0.66)	4.76 (0.56)	4.55 (0.52)	4.64 (0.53)	0.00 (0.00)
2	169	125	1.63 (0.24)	5.99 (8.46)	11.00 (8.49)	0.06 (0.23)	0.53 (0.50)	5.23 (0.92)	4.59 (0.64)	4.47 (0.53)	4.47 (0.58)	0.01 (0.08)
3	59	43	1.78 (1.81)	17.79 (18.85)	22.66 (15.93)	0.25 (0.44)	0.41 (0.49)	4.67 (0.72)	4.51 (0.57)	4.33 (0.50)	4.32 (0.60)	0.02 (0.14)
4	58	34	2.66 (1.69)	21.09 (17.00)	58.90 (40.83)	0.59 (0.50)	0.16 (0.36)	4.68 (0.89)	4.16 (0.71)	4.17 (0.56)	4.20 (0.65)	0.02 (0.14)
5	43	12	5.35 (2.49)	32.63 (12.62)	103.98 (44.09)	0.37 (0.49)	0.40 (0.49)	5.10 (1.07)	4.26 (0.77)	4.08 (0.83)	4.09 (1.05)	0.15 (0.36)

**Panel B: Vertical Dimension
By Number of Signatures**

Number of Signatures	Number of Borrowers	Number of Groups	Number of Firms In Group	Credit Analyst Average Time	Average Time To Approve	Revise and Resubmit	Client Information Requested	Hard Risk Rating	Soft Risk Rating	Average All Soft	Management Characteristics	"Credit Folder" Soft Measure
1	146	125	1.31 (0.99)	3.64 (4.33)	1.64 (2.34)	0.03 (0.18)	0.45 (0.50)	5.36 (0.65)	4.76 (0.54)	4.56 (0.51)	4.66 (0.53)	0.00 (0.00)
2	183	133	1.60 (1.39)	6.43 (8.65)	8.01 (12.44)	0.05 (0.23)	0.53 (0.50)	5.18 (0.93)	4.56 (0.64)	4.45 (0.52)	4.43 (0.57)	0.01 (0.11)
3	89	57	2.48 (1.95)	21.78 (19.24)	42.98 (33.81)	0.51 (0.50)	0.26 (0.44)	4.68 (0.84)	4.31 (0.68)	4.23 (0.57)	4.24 (0.66)	0.01 (0.11)
4	28	11	3.68 (1.78)	30.39 (12.79)	87.89 (35.48)	0.36 (0.49)	0.43 (0.50)	4.70 (1.06)	4.22 (0.64)	4.04 (0.46)	4.07 (0.57)	0.15 (0.38)
5	13	3	6.85 (2.93)	26.62 (11.08)	118.15 (66.14)	0.69 (0.48)	0.38 (0.50)	5.46 (0.97)	4.08 (0.95)	3.94 (1.26)	3.85 (1.62)	0.00 (0.00)
6	7	1	7 (0.00)	45 (0.00)	129 (0.00)	0 (0.00)	0 (0.00)	5.57 (0.79)	4.86 (0.38)	4.72 (0.27)	4.83 (0.31)	0.17 (0.41)

**Panel C: Vertical Dimension
By Distance to Approval**

Distance To Approval	Number of Borrowers	Number of Groups	Number of Firms In Group	Credit Analyst Average Time	Average Time To Approve	Revise and Resubmit	Client Information Requested	Hard Risk Rating	Soft Risk Rating	Average All Soft	Management Characteristics	"Credit Folder" Soft Measure
Inside Branch	327	258	1.48 (1.24)	5.31 (7.61)	4.35 (7.10)	0.46 (0.21)	0.50 (0.50)	5.25 (0.83)	4.64 (0.61)	4.48 (0.54)	4.51 (0.58)	0.01 (0.08)
Outside Branch	96	60	2.42 (1.92)	20.93 (18.61)	46.95 (36.28)	0.50 (0.50)	0.24 (0.43)	4.68 (0.85)	4.33 (0.68)	4.27 (0.52)	4.28 (0.62)	0.01 (0.11)
Outside Country	43	12	5.35 (2.49)	32.63 (12.63)	103.98 (44.09)	0.37 (0.49)	0.40 (0.49)	5.10 (1.07)	4.26 (0.77)	4.08 (0.83)	4.09 (1.05)	0.15 (0.36)

Table II - Descriptive Statistics

**Horizontal Dimension
Team Size**

Number of Members in Team	Number of Borrowers	Number of Groups	Number of Firms In Group	Credit Analyst Average Time	Average Time To Approve	Revise and Resubmit	Client Information Requested	Hard Risk Rating	Soft Risk Rating	Average All Soft	Management Characteristics	"Credit Folder" Soft Measure
One	154	83	2.77 (2.13)	18.17 (17.99)	34.71 (39.98)	0.27 (0.44)	0.34 (0.47)	5.01 (0.93)	4.52 (0.64)	4.44 (0.50)	4.46 (0.58)	0.01 (0.12)
Two	138	101	2.01 (2.10)	11.30 (13.12)	29.88 (47.99)	0.24 (0.42)	0.36 (0.48)	4.92 (0.94)	4.30 (0.74)	4.21 (0.70)	4.18 (0.79)	0.02 (0.12)
Five	174	146	1.40 (1.19)	4.52 (7.76)	5.42 (13.82)	0.02 (0.15)	0.58 (0.49)	5.37 (0.72)	4.75 (0.51)	4.51 (0.49)	4.60 (0.54)	0.03 (0.16)

**Table III - A
Selection Issues**

	Vertical Dimension Level of Approval					Vertical Dimension Number of Signatures					
	Level 1	Level 2	Level 3	Level 4	Level 5	1	2	3	4	5	6
Group Level Measures											
Analyst Average Days Taken	3.56*	5.93***	17.79	21.09***	32.63	3.64**	6.43***	21.78***	30.39	26.62	45.00
Average Days To Approve	1.43***	5.99***	22.66***	58.9***	103.97	1.64***	8.01***	42.98***	87.89	118.15	129
Revise and Resubmit	0.03	0.06*	0.25**	0.59***	0.37	0.03	0.05***	0.51	0.36	0.69	0
Client Information Requested	0.46	0.53	0.41**	0.16**	0.40	0.45	0.53**	0.26	0.43	0.38	0
Number of Firms In Group	1.33*	1.63	1.78***	2.66***	5.35	1.31*	1.60*	2.48	3.68	6.85	7
Individual Borrower Measures											
Hard Risk Rating	5.38	5.23	4.67	4.68	5.10	5.36*	5.18***	4.67	4.70*	5.46	5.57
Soft Risk Rating	4.76**	4.59	4.52***	4.16	4.26	4.76***	4.56***	4.31	4.22	4.08**	4.86
Average All Soft Information	4.55	4.47	4.33*	4.17	4.08	4.56**	4.45**	4.23*	4.04	3.94	4.72
Management Characteristics	4.64**	4.47	4.32	4.21	4.09	4.66***	4.43*	4.24	4.07	3.85	4.83
Problematic Companies (Over 4)	1.18	1.15***	1.36	1.22**	1.91	1.17	1.24	1.17	1.68***	2.08	2.00
Total Facilities (in \$ Million)	5.71***	15.41	13.89***	36.48*	26.22	5.88***	15.51	28.94	28.64***	18.29***	22.24
Total Outstanding (in \$ Million)	3.53***	9.60	8.06***	24.54	20.93	3.51***	9.59	18.99***	22.82***	15.8***	17.22
Tenor Over 3 Years	0.11*	0.14	0.28	0.25	0.26	0.12**	0.15	0.25	0.38***	0.08	0.25
% Unsecured	0.82	0.86	0.65	0.68	0.71	0.82	0.84***	0.67	0.67*	0.85	0.50
Covenants	0.03	0.03	0.17**	0.34	0.36	0.04	0.03***	0.30	0.35	0.33	0.33
Years In Industry	19.62	24.75	31.47	31.30	31.37	19.53	26.01**	31.00	31.43	39.77*	16.00
Length of Relationship (logs)	7.46	7.53	7.78	7.70	7.52	7.46	7.55	7.78*	7.35	7.89	7.47
Access to Capital Markets	4.87*	4.61	4.55**	4.10	4.19	4.90**	4.56**	4.29	4.11	4.46	4.33
Access to Banks	4.52	4.34	4.01*	3.77	3.95	4.52**	4.30***	3.86	3.85	3.85	4.67
Professional Ownership	0.93	0.92	0.74	0.68	0.69	0.93	0.91***	0.69	0.79	0.58	0.57
Stability Criteria Measures											
SC ₁ : Target Market Exception	0.12	0.1***	0.52	0.64	0.65	0.13	0.14***	0.60	0.58	0.86	0.67
SC ₂ : Risk Acceptance Exception	0.02	0.05***	0.37	0.42	0.44	0.02**	0.08***	0.41	0.46	0.29	0.50
SC ₃ : Obligor Limit Exception	0	0**	0.02	0	0	0	0.01	0	0	0	0
SC ₄ : Downgrade in ORR since Last Full Review	0.01	0.01***	0.12	0.13	0.06	0.01	0.02	0.12	0.08	0.00	0.17
SC ₅ : Significant Increase in Total Facilities	0	0***	0.08**	0**	0.09	0	0***	0.05	0.08	0	0.16
SC ₆ : Adverse Change in Industry/Outlook	0.04	0.02***	0.25**	0.09*	0	0.04	0.04***	0.17**	0	0	0
SC ₇ : Major Risk Event at the Company	0	0.01	0.02	0.02**	0.15	0	0.01	0.01***	0.15	0	0.17
SC ₈ : Adverse Change in Risk Profile	0	0	0	0	0.03	0	0	0*	0.04	0	0
SC ₉ : Adverse Change KSF, Risk Mitigants	0	0	0	0.02	0	0	0	0.01	0	0	0
Covenant Violations	0	0.01***	0.08	0.04	0	0	0.02	0.05	0	0	0
Qualified Auditors' Opinion	0	0.01	0	0.04	0	0	0.01	0.02	0.04	0	0
Negative Checkings	0.02	0.01***	0.10	0.03	0	0.02	0.02	0.05	0.00	0	0
Other Issues	0.07	0.07***	0.46**	0.25	0.38	0.07	0.10***	0.37*	0.19*	0.57	0.67
DRM Override	0.04	0.01	0.04	0.04	0.09	0.04	0.02	0.04	0.08	0.00	0.17
Financial Measures											
Net Sales (in \$ Million)	57.1**	139.9***	304.9**	488.3	545.7	69.9***	157.7***	424.6	647.1	300.5	322.3
Net Income (in \$ Million)	0.61	1.16***	14.7	14.2	55.5	1.67	2.39***	14.1	70.4	34.1	12.1
Net Worth (in \$ Million)	24.7***	57.1***	139.9***	389.6*	590.2	28.22***	69.7***	289.9	725.3	409.2	132.1
Leverage	3.58	4.64	1.86	2.42	1.70	3.54	4.46	2.18	1.42	1.30***	3.05

Notes: * Denotes that the numbers in question are different at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table III - B
Selection Issues

Vertical Dimension			
Geographical Distance			
Location Final Approval of Loan	Inside Branch	Outside Branch	Outside Country
Group Level Measures			
Analyst Average Days Taken	6.95***	21.09***	32.63
Average Days To Approve	6.94***	58.90***	103.98
Revise and Resubmit	0.08***	0.59	0.37
Client Information Requested	0.48***	0.16***	0.40
Number of Firms in Groups	1.54***	2.66***	5.35
Individual Borrower Measures			
Hard Risk Rating	5.19***	4.68**	5.10
Soft Risk Rating	4.64***	4.16	4.26
Average All Soft Information	4.47***	4.17	4.08
Management Characteristics	4.50***	4.21	4.09
Problematic Companies (Over 4)	1.20	1.22**	1.91
Total Facilities (in \$ Million)	11.51***	36.5*	26.22
Total Outstanding (in \$ Million)	7.07***	24.54	20.93
Tenor Over 3 Years	0.15	0.25	0.26
% Unsecured	0.81**	0.68	0.70
Covenants	0.05***	0.34	0.36
Years In Industry	24.01***	31.30	31.37
Length of Relationship (logs)	7.54	7.70	7.52
Access to Capital Markets	4.69**	4.11	4.20
Access to Banks	4.35***	3.77	3.95
Professional Ownership	0.90***	0.68	0.69
Stability Criteria Measures			
SC ₁ : Target Market Exception	0.18***	0.64	0.65
SC ₂ : Risk Acceptance Exception	0.09**	0.42	0.44
SC ₃ : Obligor Limit Exception	0.01	0	0
SC ₄ : Downgrade in ORR since Last Full Review	0.03***	0.13	0.06
SC ₅ : Significant Increase in Total Facilities	0.01	0**	0.09
SC ₆ : Adverse Change in Industry/Outlook	0.06	0.09*	0
SC ₇ : Major Risk Event at the Company	0.01	0.02**	0.15
SC ₈ : Adverse Change in Risk Profile	0	0	0.03
SC ₉ : Adverse Change KSF, Risk Mitigants	0**	0.02	0
Covenant Violations	0.02	0.04	0
Qualified Auditors' Opinion	0.01	0.04	0
Negative Checkings	0.02	0.04	0
Other Issues	0.13**	0.25	0.38
DRM Override	0.03	0.04	0.09
Financial Measures			
Net Sales (in \$ Million)	138.3***	488.3*	545.7
Net Income (in \$ Million)	3.18***	14.2	55.5
Net Worth (in \$ Million)	59.5***	389.6*	590.2
Leverage	3.81	2.42	1.7

Notes: * Denotes that the numbers in question are different at the 10% level, ** denotes 5% level and *** denotes 1%

Table III - C
Selection Issues Along the Vertical Dimension

	Level of Approval 3	
	Inside the Branch	Outside the Branch
Group Level Measures		
Analyst Average Days Taken	12.3	20.9
Average Days To Approve	11.15***	29.35
Revise and Resubmit	0.05***	0.38
Client Information Requested	0.48	0.38
Number of Firms In Group	1.29	2.08
Individual Borrower Measures		
Hard Risk Rating	4.67	4.68
Soft Risk Rating	4.35	4.59
Average All Soft Information	4.13*	4.42
Management Characteristics	4.13	4.41
Problematic Companies (Over 4)	1.62	1.22
Total Facilities (in \$ Million)	13.86	13.91
Total Outstanding (in \$ Million)	4.68	9.98
Tenor Over 3 Years	0.24	0.31
% Unsecured	0.71	0.62
Covenants	0.12	0.20
Years In Industry	40.44*	27.11
Length of Relationship (logs)	7.90	7.71
Access to Capital Markets	4.41	4.62
Access to Banks	3.47**	4.27
Professional Ownership	0.83	0.70
Stability Criteria Measures		
SC ₁ : Target Market Exception	0.59	0.49
SC ₂ : Risk Acceptance Exception	0.29	0.40
SC ₃ : Obligor Limit Exception	0.00	0.03
SC ₄ : Downgrade in ORR since Last Full Review	0.07	0.14
SC ₅ : Significant Increase in Total Facilities	0.00	0.11
SC ₆ : Adverse Change in Industry/Outlook	0.17*	0.41
SC ₇ : Major Risk Event at the Company	0.06	0.00
SC ₈ : Adverse Change in Management	0.00	0.00
SC ₉ : Adverse Change KSF, Risk Mitigants	0.00	0.00
Covenant Violations	0.06	0.08
Qualified Auditors' Opinion	0.00	0.00
Negative Checkings	0.06	0.11
Other Issues	0.53	0.43
DRM Override	0.06	0.03
Financial Measures		
Net Sales (in \$ Million)	489.7**	219.9
Net Income (in \$ Million)	18.8	12.7
Net Worth (in \$ Million)	173.1	124.8
Leverage	1.69	1.94

Notes: * Denotes that the numbers in question are different at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table IV
Horizontal Dimension
Selection Issues

Number of AOs in Teams	One	Two	One	Five	Two	Five
Group Level Measures						
Analyst Average Days Taken	18.17**	11.30	18.17***	4.52	11.3***	4.52
Average Days To Approve	34.71**	29.88	34.71***	5.42	29.88***	5.42
Revise and Resubmit	0.27	0.24	0.27***	0.02	0.24***	0.02
Client Information Requested	0.34	0.36	0.34***	0.58	0.36***	0.58
Number of Firms in Groups	2.77**	2.01	2.77***	1.40	2.01	1.40
Individual Borrower Measures						
Hard Risk Rating	5.01	4.92	5.01***	5.36	4.92***	5.36
Soft Risk Rating	4.52***	4.29	4.52***	4.75	4.29***	4.75
Average All Soft Information	4.44**	4.21	4.44	4.51	4.21***	4.51
Management Characteristics	4.46***	4.17	4.46**	4.59	4.17***	4.59
Problematic Companies (Over 4)	1.23	1.17	1.23	1.37	1.17	1.37
Total Facilities (in \$ Million)	21.46	22.58	21.46***	6.02	22.58***	6.02
Total Outstanding (in \$ Million)	15.55	13.99	15.55***	3.42	13.99***	3.42
Tenor Over 3 Years	0.26*	0.19	0.26***	0.09	0.19***	0.09
% Unsecured	0.69**	0.80	0.69***	0.86	0.80	0.86
Covenants	0.20	0.14	0.20***	0.02	0.14***	0.02
Years In Industry	23.67***	29.94	23.67	23.93	29.94***	23.93
Length of Relationship (logs)	7.37***	7.84	7.37	7.50	7.84**	7.50
Access to Capital Markets	4.51*	4.36	4.51***	4.79	4.36***	4.79
Access to Banks	4.23*	3.92	4.23**	4.51	3.92***	4.51
Ownership	0.81	0.81	0.81***	0.92	0.81***	0.92
Stability Criteria Measures						
SC ₁ : Target Market Exception	0.39	0.36	0.39***	0.10	0.36***	0.10
SC ₂ : Risk Acceptance Exception	0.26	0.21	0.26***	0.03	0.21***	0.03
SC ₃ : Obligor Limit Exception	0.00	0.01	0.00	0	0.01	0
SC ₄ : Downgrade in ORR since Last Full Review	0.06	0.07	0.06***	0.01	0.07*	0.01
SC ₅ : Significant Increase in Total Facilities	0.04**	0	0.04**	0.01	0	0.01
SC ₆ : Adverse Change in Industry/Outlook	0.04**	0.13	0.04	0.03	0.13**	0.03
SC ₇ : Major Risk Event at the Company	0.01	0.02	0.01	0.03	0.02	0.03
SC ₈ : Adverse Change in Risk Profile	0.01	0	0.01	0	0	0
SC ₉ : Adverse Change KSF, Risk Mitigants	0	0	0	0.01	0	0.01
Covenant Violations	0.01	0.03	0.01	0.01	0.03	0.01
Qualified Auditors' Opinion	0.01	0.01	0.01	0.01	0.01	0.01
Negative Checkings	0.01	0.05	0.01	0.01	0.05*	0.01
Other Issues	0.22	0.23	0.22***	0.06	0.23***	0.06
DRM Override	0.03	0.06	0.03	0.02	0.06	0.02
Financial Measures						
Net Sales (in \$ Million)	293.2	337.4	293.2***	62.3	337.4***	62.3
Net Income (in \$ Million)	13.5	16.5	13.5**	0.54	16.5**	0.54
Net Worth (in \$ Million)	172.9**	289.1	172.9***	23.6	289.1***	23.6
Leverage	4.27**	2.33	4.27	3.55	2.33	3.55

Notes: * Denotes that the numbers in question are different at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table V
Vertical Dimension Analysis

Dependent Variable = Total Credit	High-Low Level							Levels 1-5	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Clustered Group Level				Weighted			Clustered Group Level	
Good Hard Information	8.858* (4.873)	5.625 (5.767)	8.558 (7.151)	6.041 (5.698)	5.484 (7.535)	10.163* (6.327)	2.995 (5.432)	5.222 (4.812)	3.063 (5.681)
Good Soft Information	13.281*** (3.060)	15.290*** (3.660)	15.881*** (4.184)	14.921*** (3.781)	14.399*** (3.895)	17.483*** (4.287)	15.941*** (3.980)	10.790*** (2.994)	11.477*** (4.086)
High/Low Level	1.56 (2.789)	3.525 (2.497)	0.003 (3.904)	0.593 (3.964)	1.742 (5.170)	1.393 (7.881)	2.322 (7.604)		
High Level*Good Hard		13.926* (10.000)	15.643* (10.642)	16.614* (11.137)	14.792 (13.942)	7.857 (13.955)	15.293 (12.745)		
High Level*Good Soft		-10.800** (4.674)	-13.483** (6.952)	-9.992* (5.741)	-12.283* (7.272)	-11.934 (12.562)	-13.264 (11.804)		
Level 5								16.317*** (4.500)	12.791*** (4.281)
Level 4								22.522*** (3.851)	12.444** (6.112)
Level 3								5.254** (2.237)	2.987 (3.733)
Level 2								8.254*** (2.810)	8.128*** (2.503)
Level 5*Good Hard									37.831* (21.448)
Level 4*Good Hard									14.470** (7.040)
Level 3*Good Hard									11.558* (7.261)
Level 2*Good Hard									3.886 (6.174)
Level 5*Good Soft									-10.231* (6.168)
Level 4*Good Soft									-9.906* (5.264)
Level 3*Good Soft									-5.419 (7.664)
Level 2*Good Soft									2.281 (6.524)
Team Size Controls									
Team of One						11.576** (4.681)	16.373** (5.082)	16.623*** (4.721)	8.346** (4.182)
Team of Two						8.474** (3.567)	10.532** (4.849)	10.071** (4.487)	7.863** (2.748)
Weights	No	No	No	No	No	O/S	Facility	No	No
Firm Specific Controls ¹	No	No	Yes	No	Yes	No	No	No	No
Bank Stability Criteria	No	No	No	Yes	Yes	Yes	Yes	No	Yes
R-Squared	0.09	0.10	0.19	0.11	0.22	0.15	0.13	0.15	0.20
Number of Observations	424	424	352	409	352	258	291	424	409

1. Regression includes Length of Relationship (logs), % Unsecured, Tenor Over 3 Years, Covenants, Years In Industry, Ownership, Access To Other Banks, Access To Capital Markets.

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table VI
Vertical Dimension Analysis: Alternative Measures

Dependent Variable: Total Credit	Number of Signatures							Time To Approve Loan			
	S ₁₂ (1)	S ₃ (2)	S ₄ (3)	S ₅₆ (4)	All Sample (5)	(6)	No S ₅₆ (7)	Longest (8)	Shortest (9)	All Sample (10)	In Days (11)
Good Hard Information	-2.917 (4.134)	15.350* (9.310)	35.160* (17.549)	11.701* (5.910)	25.174 (18.382)	3.157 (4.229)	3.126 (4.389)	10.332* (5.909)	-7.837 (6.079)	-2.076 (5.961)	-1.103 (5.011)
Good Soft Information	10.956*** (3.441)	14.216** (6.371)	0.279 (8.111)	3.722 (10.430)	0.388 (7.268)	10.814*** (3.643)	10.780*** (3.680)	12.492*** (3.930)	9.891*** (3.700)	11.676** (4.668)	11.860*** (3.371)
Less 3 Signatures					-7.307* (4.440)						
Less 3 Signatures*Good Hard					-20.720 (18.853)						
Less 3 Signatures*Good Soft					14.311* (7.913)						
Long Time										2.039 (3.539)	0.045 (0.045)
Long Time*Good Hard										14.412* (8.568)	0.177* (0.102)
Long Time*Good Soft										1.068 (6.063)	-0.008 (0.047)
S ₃						1.966 (3.953)	3.263 (4.564)				
S ₄						1.684 (4.370)	7.032 (5.940)				
S ₅₆						6.379** (2.369)					
S ₃ *Good Hard						13.005 (10.207)	12.315 (10.63)				
S ₄ *Good Hard						37.969** (18.539)	43.305** (19.685)				
S ₅₆ *Good Hard						8.164 (7.513)					
S ₃ *Good Soft						5.937 (6.376)	6.241 (7.24)				
S ₄ *Good Soft						-10.842* (6.244)	-18.819*** (6.915)				
S ₅₆ *Good Soft						-6.550 (6.385)					
Team Size Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Specific Controls ¹	No	No	No	No	No	No	No	No	No	No	No
Bank Stability Criteria Controls	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.10	0.18	0.21	0.37	0.15	0.16	0.17	0.11	0.11	0.14	0.15
Number of Observations	290	87	27	20	411	411	396	230	181	411	411

1. Regression includes Length of Relationship (logs), % Unsecured, Tenor Over 3 Years, Covenants, Years In Industry, Ownership, Access To Other Banks, Access To Capital Markets.

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table VII-A
Vertical Dimension Analysis
Distance and Communication

Panel A - Distance To Approval						
Dependent Variable Total Credit	In Branch	Not In Branch	Inside Country	All Sample		
	(1)	(2)	(3)	(4)	(5)	(6)
Good Hard Information	2.313 (5.722)	19.431** (8.592)	2.411 (5.753)	18.471*** (8.303)	2.388 (5.768)	3.055 (5.925)
Good Soft Information	13.460*** (3.211)	4.403 (3.287)	13.491*** (3.255)	4.394 (3.292)	13.474*** (3.263)	13.585*** (3.374)
Inside the Branch*Good Hard				-16.013* (10.025)		
Inside the Branch*Good Soft				9.129** (4.368)		
Outside the Branch * Good Hard			8.476 (7.000)		8.538 (7.026)	9.405 (7.241)
Outside the Branch * Good Soft			-11.389** (4.901)		-11.482** (4.946)	-11.722** (5.567)
Outside the Country*Good Hard					30.633* (17.616)	31.367* (20.422)
Outside the Country*Good Soft					-10.448*** (4.488)	-10.386* (6.299)
Inside the Branch				1.957 (3.042)		
Outside the Branch			-3.869 (3.635)		-3.817 (3.605)	-5.128 (3.866)
Outside the Country					1.868 (2.361)	3.590 (3.878)
Team Size Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Specific Controls ¹	No	No	No	No	No	No
Bank Stability Criteria	No	No	No	No	No	Yes
R-Squared	0.13	0.16	0.13	0.14	0.15	0.16
Number of Observations	307	117	382	424	424	409

Table VII - B
Vertical Dimension Analysis
Distance and Communication

Panel B - Communication			
Dependent Variable Total Credit	Level 3 Only		All Sample
	(1)	(2)	(3)
Good Hard Information	12.132*** (4.071)	15.468*** (5.031)	6.141 (5.500)
Good Hard*Level 3 Inside		-12.924* (9.476)	-4.800 (11.906)
Good Hard* Level 3 Outside			7.069 (7.013)
Good Soft Information	1.610 (3.161)	1.667 (3.788)	10.787*** (3.213)
Good Soft * Level 3 Inside		11.787** (5.702)	-2.444 (6.051)
Good Soft* Level 3 Outside			-10.389** (5.287)
Inside		0.434 (3.701)	-1.374 (3.622)
Team Size Controls	Yes	Yes	Yes
Firm Specific Controls ¹	No	No	No
Bank Stability Criteria	Yes	No	No
R-Squared	0.27	0.35	0.21
Number of Observations	54	54	424

1. Regression includes Length of Relationship (logs), % Unsecured, Tenor Over 3 Years, Covenants, Years In Industry, Ownership, Access To Other Banks, Access To Capital Markets.

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table VIII
Horizontal Dimension Analysis

Dependent Variable Total Credit	All Account Officers						Account Officers with Authority to Approve a Loan			
	All Team Sizes					Only 1 and 2	All Teams	Only 1 and 2	All Teams	Only 1 and 2
	(1)	(2)	(3)	(4)	(5)	(6)	(7) Authority	(8) By Level	(9) Authority	(10) By Signatures
Good Hard Information	4.618 (4.821)	6.135 (5.272)	8.799 (6.714)	7.051 (6.829)	4.777** (2.049)	6.204 (6.876)	1.179 (4.442)	-0.083 (7.457)	0.544 (3.382)	-1.386 (5.036)
Good Soft Information	10.416*** (2.978)	7.050*** (2.347)	5.657** (2.713)	5.731** (2.777)	1.404 (1.976)	9.670** (4.099)	3.717 (2.560)	7.061 (6.331)	5.133** (2.188)	8.378* (4.585)
Team of 1*Good Hard		-7.646 (12.288)	-4.429 (13.729)	-6.972 (14.765)	-3.704 (11.023)	-6.094 (12.060)	-20.85 (18.175)	-19.468 (19.634)	-19.083 (13.101)	-17.161 (13.717)
Team of 1*Good Soft		12.761* (7.683)	14.392* (8.253)	14.234* (8.260)	18.291** (7.841)	10.898* (6.729)	36.173*** (13.585)	32.616** (14.816)	27.704** (11.437)	24.717** (12.099)
Team of 1	7.335* (3.970)	-0.822 (3.079)	-1.562 (3.655)	-2.146 (3.691)	1.173 (3.227)	-1.858 (3.440)	0.379 (3.778)	-2.389 (5.941)	0.901 (3.077)	-0.807 (4.458)
Team of 2*Good Hard					9.458 (6.862)					
Team of 2*Good Soft					9.491** (4.882)					
Team of 2	5.529** (2.492)				2.498 (3.684)					
Level of Approval Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Specific Controls ¹	No	No	Yes	Yes	No	No	No	No	No	No
Bank Stability Criteria	No	Yes	No	Yes	Yes	No	No	No	No	No
R-Squared	0.16	0.17	0.24	0.26	0.19	0.13	0.18	0.16	0.15	0.13
Number of Observations	424	409	352	346	409	274	236	103	290	147

1. Regression includes Length of Relationship (logs), % Unsecured, Tenor Over 3 Years, Covenants, Years In Industry, Ownership, Access To Other Banks, Access To Capital Markets.

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table IX
Horizontal Dimension Analysis

Dependent Variable Total Credit	Authority versus Communication					
	Team 1		Team 2		Teams 1 and 2	
	(1)	(2)	(3)	(4)	(5)	(6)
Good Hard Information	1.142 (10.018)	14.855* (9.419)	8.196 (6.898)	16.242 (13.546)	5.204 (5.833)	16.242 (13.523)
Good Soft Information	22.523*** (6.925)	10.204*** (3.756)	12.531*** (4.328)	10.791 (7.745)	16.763*** (3.923)	10.791 (7.732)
Good Hard * Authority		-32.887** (15.743)		-15.311 (14.312)		-15.311 (14.288)
Good Soft * Authority		23.837** (12.159)		-2.761 (8.839)		-2.761 (8.825)
Good Hard * Single						-1.388 (16.477)
Good Soft * Single						-0.588 (8.596)
Good Hard * Authority *Single						-17.576 (21.252)
Good Soft * Authority *Single						26.598* (15.017)
Authority		-4.133 (3.875)		-9.197** (4.274)		-9.198** (4.268)
R-Squared	0.10	0.13	0.17	0.17	0.08	0.14
Number of Observations	144	144	130	130	274	274

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table X
Alternative Measures of Soft Information

Measures of Soft	Panel A					Panel B				
	Level of Approval					Number of Signatures				
	Soft Information Given By					Soft Information Given By				
	Management	Competitive Position	Industry	Risk Managment	Credit Folder Questions	Management	Competitive Position	Industry	Risk Managment	Credit Folder Questions
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
Good Hard Information	1.047 (3.617)	0.718 (3.754)	3.227 (3.125)	2.626 (2.999)	3.252 (3.272)	4.342 (4.928)	5.356 (4.656)	8.799** (4.317)	8.845 (4.357)	6.609* (3.935)
Good Soft Information	12.964*** (3.273)	11.228*** (3.339)	-0.765 (2.247)	0.971 (2.567)	7.718*** (2.032)	12.039*** (2.909)	11.747 (2.952)	1.865 (2.362)	0.868 (2.447)	10.640*** (6.334)
High/Low Level	7.745** (3.369)	3.943 (4.451)	5.063 (4.814)	1.288 (4.717)	13.740** (5.762)					
High Level*Good Hard	36.137** (17.337)	34.095** (16.215)	29.505* (15.844)	30.317* (16.281)	31.948* (18.488)					
High Level*Good Soft	-15.453** (6.200)	-8.218 (5.945)	9.214** (4.589)	0.992 (9.082)	-10.952** (6.374)					
More than 3 Signatures						4.725 (3.629)	1.793 (4.484)	-4.968 (4.430)	-1.002 (4.201)	-1.333 (6.531)
More 3 Signatures* Good Hard						19.899 (16.579)	18.650 (15.478)	15.102 (15.481)	15.103 (15.860)	18.013 (17.660)
More 3 Signatures*Good Soft						-11.188** (5.758)	-7.551 (5.132)	5.387 (4.452)	1.614 (8.057)	-13.400** (6.558)
Team Size Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Squared	0.15	0.14	0.11	0.11	0.14	0.15	0.13	0.10	0.09	0.14
Number of Observations	424	424	424	424	424	411	411	411	411	411

Table XI
Complexity of Credit Measures

Dependent Variable Total Credit	Panel A: Level of Approval					Panel B: Number of Signatures					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Good Hard Information	2.191 (5.566)	2.646 (5.644)	1.237 (5.827)	2.992 (5.175)	1.236 (5.669)	Good Hard Information	4.281 (4.526)	4.595 (4.612)	3.963 (4.674)	4.786 (4.247)	3.994 (4.558)
Good Soft Information	13.445*** (3.273)	13.139*** (3.138)	13.692*** (3.244)	12.785*** (3.261)	13.322*** (3.174)	Good Soft Information	14.464*** (2.897)	13.828*** (2.770)	14.321*** (2.988)	13.427*** (2.931)	13.733*** (2.832)
High Level*Good Hard	16.013* (10.002)	15.841* (9.995)	17.191* (10.113)	18.306* (10.321)	17.122* (10.148)	S ₄₅₆ *Good Hard	20.994 (16.367)	21.022 (16.043)	21.814 (16.109)	24.380* (15.894)	21.565 (16.466)
High Level*Good Soft	-9.122** (4.520)	-8.212* (4.566)	-9.997** (4.425)	-11.689*** (4.459)	-9.131** (4.712)	S ₄₅₆ *Good Soft	-15.945*** (5.427)	-14.461*** (5.014)	-15.403*** (5.312)	-12.569** (6.211)	-14.631*** (5.151)
High Level	-2.219 (3.142)	-2.096 (3.083)	-3.405 (3.023)	-3.201 (2.934)	-3.669 (3.093)	S ₄₅₆	6.075* (3.525)	5.329 (3.604)	4.946 (3.741)	-1.340 (6.199)	4.112 (4.136)
Revise and Re-Submit	2.717 (3.678)				0.826 (3.716)	Revise and Re-Submit	1.919 (4.162)				0.734 (4.221)
Client Information Request		-5.701*** (2.148)			-5.892*** (2.086)	Client Information Request		-4.368** (2.162)			-4.477** (2.102)
Time Taken by Credit Analyst			4.892* (3.104)		5.085* (3.169)	Time Taken by Credit Analyst			2.251 (3.307)		2.592 (3.330)
Analyst Fixed Effects				Yes		Analyst Fixed Effects				Yes	
Team Size Controls	Yes	Yes	Yes	Yes	Yes	Team Size Controls	Yes	Yes	Yes	Yes	Yes
R-Squared	0.13	0.14	0.14	0.18	0.15	R-Squared	0.14	0.15	0.14	0.18	0.15
Number of Observations	424	423	421	424	420	Number of Observations	409	408	406	409	405

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table XII
Alternative Stories

Dependent Variable	High/Low Level	Signatures	Distance	Team Size	All Levels
Total Credit	(1)	(2)	(3)	(4)	(5)
Z_i is =	High Level	More 3 S	Out Branch	Single	All Levels
Good Hard Information	2.783 (5.728)	4.093 (4.748)	2.714 (5.738)	6.550* (4.339)	3.828 (5.623)
Good Soft Information	13.368*** (3.244)	14.268*** (2.892)	13.329*** (3.272)	6.475*** (2.354)	10.979*** (4.086)
Z_i *Good Hard	14.752* (9.573)	19.779* (12.149)	8.601* (5.972)	-7.135* (5.583)	
Z_i *Good Soft	-8.594* (4.924)	-13.515* (7.978)	-11.991** (5.148)	12.897* (7.699)	
Z_i	-1.065 (3.696)	7.693* (4.269)	-3.572 (4.171)	-0.881 (2.929)	
L_5 * Good Hard			28.854* (20.241)		35.945* (20.414)
L_4 * Good Hard					15.263** (6.906)
L_3 * Good Hard					11.826 (13.791)
L_2 * Good Hard					-3.451 (5.925)
L_5 * Good Soft			-9.821* (5.569)		-8.484* (5.069)
L_4 * Good Soft					-10.643** (5.183)
L_3 * Good Soft					5.079 (7.434)
L_2 * Good Soft					1.403 (4.203)
Covenant Violations	0.344 (4.968)	1.037 (5.069)	3.658 (3.773)	-1.365 (3.659)	2.956 (3.456)
Auditor's Opinion	-8.424* (4.514)	-13.934** (5.536)	-9.340** (3.822)	-13.662*** (4.646)	-15.838*** (4.957)
Negative Checkings	5.209* (3.385)	0.044 (3.894)	5.958* (3.282)	6.634** (2.762)	4.989 (2.735)
Other Issues	-2.360 (3.312)	-4.415 (3.121)	-2.457 (3.296)	-3.629 (2.965)	-4.334 (2.974)
Model Override	-1.496 (5.739)	-2.931 (5.786)	-2.611 (5.857)	-4.461 (6.252)	-2.167 (4.985)
Team Size/Level Controls	Yes	Yes	Yes	Yes	Yes
Firm Specific Controls ¹	No	No	No	No	No
Bank Stability Criteria	No	No	No	No	No
R-Squared	0.13	0.15	0.15	0.17	0.2
Number of Observations	409	395	409	409	409

1. Regression includes Length of Relationship (logs), % Unsecured, Tenor Over 3 Years, Covenants, Years In Industry, Ownership, Access To Other Banks, Access To Capital Markets.

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table XIII
Re-Defining Hard Information

Dependent Variable Total Credit	Top Auditors		No Financial Distress		Gap in Financials	
	Low Level	Teams 1 and 2	Low Level	Teams 1 and 2	Low Level	Teams 1 and 2
	(1)	(2)	(3)	(4)	(5)	(6)
Good Hard Information* X_i	5.435* (3.532)	5.325* (3.910)	5.317* (3.924)	5.885* (3.890)	13.778* (8.243)	12.723* (7.752)
Good Soft Information	12.051*** (3.178)	13.956*** (4.196)	13.398*** (3.107)	14.510*** (4.318)	11.470*** (2.933)	14.696*** (3.702)
X_i	6.005** (2.955)	8.343*** (2.878)	-2.208 (3.328)	0.529 (3.758)	-6.442*** (2.213)	-10.718*** (2.552)
Team Size Controls	Yes		Yes		Yes	
Level of Approval Controls		Yes		Yes		Yes
Bank Stability Criteria	No	No	No	No	No	No
R-Squared	0.14	0.13	0.13	0.13	0.15	0.14
Number of Observations	328	274	328	274	328	274

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.

Table XIV
How Hard is Hard information?

Dependent Variable Total Credit	Bad Auditor		Unreliable Information	
	(1)	(2)	(3)	(4)
Z_i is =	Bad Auditor		Bad Auditor, Financial Distress	
Good Hard Information	5.370 (6.591)	5.805 (6.741)	6.094 (6.795)	6.481 (6.937)
Good Hard Information * Z_i	-13.014* (7.381)	-12.352* (7.528)	-16.311** (7.231)	-15.058** (7.391)
Good Hard*Highlevel	13.615 (10.863)	14.708 (12.019)	17.545* (11.061)	17.677* (11.229)
Good Hard Information * Z_i * Highlevel	-3.001 (11.576)	-1.059 (11.667)	-19.239* (12.858)	-22.894* (13.418)
Z_i *HighLevel	4.396 (4.372)	3.559 (4.699)	11.708** (4.302)	15.202** (4.841)
Z_i	-4.672 (3.333)	-5.012 (3.670)	-1.427 (2.877)	-2.464 (3.145)
Good Soft	12.439*** (3.192)	12.497*** (3.922)	12.789*** (3.177)	12.687*** (3.315)
Good Soft * HighLevel	-4.863 (4.395)	-4.579 (5.477)	-4.914 (4.141)	-3.249 (5.054)
Highlevel	-2.800 (3.322)	-3.811 (4.276)	-9.171** (3.748)	-10.276** (3.924)
Team Size/Level Controls	Yes	Yes	Yes	Yes
Bank Stability Criteria	No	Yes	No	Yes
R-Squared	0.14	0.15	0.15	0.15
Number of Observations	424	409	424	409

Notes: * Denotes significance at the 10% level, ** denotes 5% level and *** denotes 1% level.