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Soft Information and Default Prediction in Cooperative and Social Banks

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Abstract

In this paper, to begin with, we define soft information as qualitative, subjective information produced by banks through the establishment of long-term lending relationships. We then highlight the importance of soft information for cooperative and social banks in the screening, pricing and monitoring of their borrowers as a result of their institutional features (governance, values, etc.) and the specificities of their clientele. We finally emphasise the value of qualitative (economic, social and/or environmental) factors stemming from the production of soft information in predicting credit default events.

Keywords: Relationship Lending, Soft Information, Credit Rating, Cooperative and Social Banking.
JEL Codes: G21, L22, M21, P13.

1. Introduction

In the aftermath of the financial crisis that broke out in 2007, The Economist (02/2010, the 11th) wrote: "*these eggheads* [quantitative analysts] *are now in the dock, along with their probabilistic models. In America a congressional panel is investigating the models' role in the crash.* Wired*, a publication that can hardly be accused of technophobia, has described default-probability models as 'the formula that killed Wall Street'.*"

From an academic stance, the exclusive use of quantitative information in assessing borrower creditworthiness is also deemed to be one of the causes of the financial crisis (Diamond and Rajan, 2009).[1] By using data on securitised subprime mortgages issued in the period 1997-2006, Rajan et al. (2008, 2010) highlight the increasing prevalence of hard information in setting interest rates. The authors also demonstrate that statistical default models solely equipped with this source of information do not yield satisfactory default predictions for borrowers for whom expert, subjective judgement using soft information is more valuable.

This gradual retreat from the reliance on qualitative information results from the remarkable transformations undergone by the banking industry in the last few decades. Front offices (i.e. loan officers in local branches) have reduced in size and have been subject to intensified staff turnover, to the advantage of the back office and headquarters. Banks have, it would seem, exploited the opportunities offered by financial liberalisation, regulation and ICT progress to become large, consolidated financial institutions. As a consequence, old-fashioned, interpersonal lending relationships have been progressively replaced by more standardised and impersonal rapports (Ferri, 2010). Of course, not all financial institutions

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[1] This analysis should of course be put into a broader context whereby financial intermediaries were not incited to conduct a thorough screening of credit applicants, since the loans originated by banks were then securitised and sold to financial markets.

have followed this trend at the same pace. This is especially the case for cooperative banks, and even more so, that of a specific fraction of them – social banks – whose distinctive feature lies in their emphasis on sustainability (i.e. social and/or environmental) goals.[2] Because of their specific governance, regulation, values, and missions, cooperative banks continue to rely on soft information in order to assess their borrowers. Soft information summarises subjective, unquantifiable facts about a firm and its owner, which are idiosyncratic to individual long-term credit relationships.

In this paper, we contend that these lending practices previously viewed as archaic should now be better considered by the sector and prudential regulation authorities, given the fallacy of quantitative models. Our objective consists of demonstrating the critical importance of soft knowledge when it comes to obtaining accurate default predictions for borrowers subject to credit rationing. This is typically the case for firms who are by nature informationally opaque on account of their size (e.g. SMEs) and/or their specific missions and values (e.g. social enterprises, cooperatives). Our main contribution lies in the aggregation of synthesised sets of banking literature, which are closely related and complementary, but seldom assembled. In particular, we make the connection between how soft information is produced and the way it could be used in credit rating models by cooperative banks. In doing so, this paper also contributes to the topical debate on the design of credit rating systems tailored to suit the peculiarities of the relational approach to banking.

The rest of the paper is structured as follows. In section 2, we deal with conceptual preliminaries involving the definition of soft information and the consequential effects of its properties on internal contracting issues. In section 3, we document that credit cooperatives have behaved from scratch as veritable information machines, so as to be able to finance informationnally opaque borrowers. Notwithstanding the substantial changes they have

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[2] In the rest of the article, we use interchangeably the terms "social" and "sustainable/sustainability".

experienced, cooperatives are still heavily reliant on the production of soft information in the lending operations. We also argue that social banks follow a similar pattern, to an even greater extent, especially because they claim more asserted ethical values. In section 4, we highlight the added merit of incorporating qualitative factors derived from soft information into credit default prediction models. We also show that these qualitative factors should not necessarily be economically-oriented but can also take the form of sustainability criteria. Section 5 concludes.

2. The Problem of Knowledge Production in Banks

In this section, we make a general distinction between the two categories of knowledge produced by financial intermediaries, i.e. hard and soft information (2.1.). We then elucidate the internal contracting and organisational issues inherent to the use of soft information (2.2.).

2.1. Hard and Soft Information

From a theoretical stance, banks' *raison d'être* comes from their special capacity to overcome informational asymmetries in credit markets (Stiglitz and Weiss, 1981). The production of non-public knowledge on firms confers to banks an informational advantage over other financial operators (Leland and Pyle, 1977; Diamond, 1984; Bhattacharya and Thakor, 1993). This informational superiority enables banks to provide external debt funding to informationnally indefinite segments of the financial market, such as small- and medium-sized businesses (SMEs).

Knowledge produced by banks stems from two sources: hard and soft information. Hard information is explicit knowledge reported through formal instruments such as audited financial statements, history of repayments, checking accounts, and other financial usage

(Petersen, 2004). The collection of these quantitative data abides by standardised and third-party verifiable procedures. This implies that the content of information and its interpretation are not contingent on the agents in charge of its collection. What may then differ across banks is their storage capacity as well as their in-house computing and coding technologies, employed to synthesise the gathered information into decision-support indicators such as credit scores.

In contrast, soft information refers to implicit (or idiosyncratic) knowledge that takes the form of unpublished, informal aspects of the firm's management quality, inside conflicts, strategy, competencies, critical suppliers, underlying motives or customer dependencies, etc. (Uzzi and Lancaster, 2003). These qualitative inputs are especially valuable for banks, since their uniqueness enables them to tailor their credit conditions to the confidential specificities of their borrowers. This customisation provides banks with a competitive advantage, because it is difficult to be imitated by other market players.

Whether a bank relies on soft or hard information depends on the extent to which its commercial transactions with borrowers are embedded in social ties. Social relationships can be represented as a continuum with arm's length at one end, and embeddedness at the other (Uzzi, 1999; Uzzi and Gillespie, 1999; Uzzi and Lancaster, 2003). Arm's length ties are characterised by meagre, sporadic, cool and impersonal transactions without any prolonged human and social contact between parties (Uzzi, 1999). Arm's length ties typically refer to transaction technologies in which a bank exploits all hard, financial information available on credit applicants at the time of loan origination. The most frequent transactional techniques are financial statement lending, asset-based lending, and credit-scoring lending (Berger and Udell, 2002). Among these techniques, Small Business Credit Scoring (SBCS) is the most important and fastest-growing one. SBCS is typically used to evaluate under € 250,000

business loans by combining financial data and consumer data about the owner (Mester, 1997; Akhavein et al., 2005; Berger and Frame, 2007).

In sharp contrast to one-shot, transactional interactions, relationship lending enables a bank to accumulate qualitative information over time through repeated contacts with the entrepreneur, the firm's stakeholders, and the local community. Moreover, we consider the quality of soft knowledge as varying in the degree to which lending relationships are imbued by nonmarket attachments between parties (Uzzi and Gillespie, 1999). A trustful and cooperative basis is essential for an easy flow of qualitative facts and informalities between lenders and borrowers (Uzzi and Lancester, 2003). Therefore, such soft knowledge transfer cannot occur properly if pure market mechanisms and narrow self-gain behaviours, as described by Jensen and Meckling (1994), are alone at work.

Besides, knowledge transfer across firm boundaries, i.e. a borrowing firm and its bank, is strongly affected by the bank's internal structure, which is generally shaped by environmental factors such as market structures, technological innovations, business conditions, as well as legal and regulatory aspects (Berger and Udell, 2002; Degryse and Ongena, 2008). As we shall see below, that for any bank regardless of its status (i.e. cooperative or not) and its social mission, there exists a strong correlation between a propensity to favour one lending technology over the other and its organisational architecture.

2.2. Soft Information, Internal Contracting Issues, and Organisational Architecture

One property that largely differentiates hard from soft knowledge is transferability (Grant, 1996). This means that quantitative information is communicable with ease and at a low cost, whereas the transfer of qualitative information among agents proves to be costly and uncertain (Jensen and Mecking, 1995). To exemplify the concept of transferability in the context of banking, imagine two scenarios. In the first one, a loan officer puts into the bank's

information system hard facts extracted from audited financial statements. This information will be explicitly communicated across space, i.e., across hierarchical layers and physical distances. It will also flow easily across time, since its storage is facilitated by its quantitative nature. In the second situation, a loan officer who has spent a lot of time with a small-business owner may come to strongly believe that the latter is honest and hardworking – in other words the typical candidate for an unsecured "character loan". Since the loan officer's belief – which is a typical piece of intrinsic information – is not verifiable by anyone but themselves, it cannot be unambiguously transferred across space and across time. In this regard, Liberti and Mian (2009) report that a greater number of hierarchical layers or larger geographical distances between the agent who collects the information and the loan approving officer, leads to more reliance on objective, hard information at the expense of subjective, soft information in making credit-granting decisions. Thus, soft knowledge loses its informative power when it is transferred among agents.

Another aspect associated with transferability is the recipient's ability to analyse and compute the transmitted knowledge (Grant, 1996). With regards to the information format, hard information is presented in numeric format so as to facilitate its aggregation and comparison. In contrast, soft information, which comes via text format as well as by intuitions and judgements of loan officers, lacks objective benchmarks to render it comparable. Typically, the interpretation of honesty may differ from one loan officer to another. Moreover, qualitative information, even though hardened through a scale and an index, remains loan officer-dependent and idiosyncratic to one peculiar lending relationship (Petersen, 2004). From a broader perspective, the quality of soft knowledge, i.e. the accuracy of its interpretation, depends on the extent to which bank employees are embedded in local communities and whether they have established pre-existing, affinitive bonds with their customers. The sharing of similar cultural values and ethical traits homogenises – and

stabilises – socio-demographic, behavioural and personal characteristics amongst local community members (Katerinakis, 2012). The regularity of social networks and relations generates substantial economic outcomes, since it enables trading parties to infer markedly accurate predictions on the other's future behaviour. From the bank's viewpoint, producing accurate forecasts on its customers' propensity to meet their commitments proves extremely valuable, especially for implicit, trust-based arrangements (i.e. not enforceable by third-parties) which rely on the prior collection of soft information.

The difficulty in transferring and aggregating soft information entails inevitable internal contracting issues within the banking institution, particularly between the management and lending staff (Jensen and Meckling, 1995).[3] When the credit eligibility process relies on intense lending relationships, loan officers – whose role is thus pivotal – typically benefit from more delegated authority. Entrusting lending staff with more discretion in credit-granting operations may potentially have undesirable effects in credit allocation. For example, overlending may arise from "social attachment" between loan officers and borrowers (Uzzi and Gillespie, 1999) or from loan officers' willingness to manage larger budgets (Ozbas, 2005). In contrast, certain borrowing fractions may be rationed because loan officers exhibit preferences or/and stereotypes, which are incongruent with their organisations' mission statement (Agier and Szafarz, 2010). This directly echoes the *group thinking* issue raised by Alexopoulos et al. (2013). The authors suggest that group thinking occurs when, in a context of deficient organisational control, a category of stakeholders (e.g. loan officers) rationalise all of their decisions autonomously from the organisation's missions and objectives. This situation potentially brings about agency problems because the managerial discretion granted to the "thinking group" members may be detrimental to the organisation, since they may seek to pursue their own interests – rather than adopting creative

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[3] Other contracting issues may arise, for instance between bank managers, on the one hand, and stockholders (or members), on the other (Berger and Udell, 2002; Alexopoulos et al., 2013).

and innovative practices beneficial to the organisation. For all these reasons, banks spend resources monitoring loan officers and the performance of their individual portfolios, when more authority is bestowed on field personnel (Udell, 1989).

The magnitude of contracting problems is also likely to increase with the complexity and the size of the banking institution. In a theoretical model, Stein (2002) predicts that qualitative information production is only efficient in small or decentralised banks, which are characterised by few managerial layers. Loan officers will be more predisposed to collecting high-quality soft information on the condition that they have a sufficient authority on the bank's fund allocation. Typically, contracting problems can be resolved if the loan officer is also the manager of the bank. By contrast, large, centralised banks with multiple layers of management and more hierarchical decision-making processes in which soft facts on borrowers are amassed and compiled lead to organisational diseconomies – low transferability of qualitative information resulting in prohibitive internal contracting costs. Large, hierarchical banks are therefore more inclined to adopt transaction-oriented technologies based on explicit and transmittable knowledge. Empirical evidence supports this theoretical view. For example, Cole et al. (2004) show that large banks, with over $ 1 billion in assets and numerous hierarchical layers, exhibit a higher propensity to base loan approvals on standard criteria obtained from financial statement, while small banks rely, to a greater extent, on information about borrowers' character. In the same vein, Berger et al. (2005) find that large banks lend at a greater distance and interact more impersonally with their borrowers.

In the past three decades, the banking industry has been characterised by a huge concentration, spurred by changes in the legal regulatory framework and by the advent of technological innovations. Larger bank size, greater distances with borrowers, as well as improved computing performance capacities are all factors explaining the adoption of

transaction lending models, to the detriment of technologies based on soft information (Petersen and Rajan, 2002; Brevoort and Hannan, 2004).

In spite of this dramatic shift, recent evidence indicates that discretion in the lending process remains widespread and economically significant, especially in small banks (Cerqueiro et al., 2011; Puri et al., 2011). Moreover, loan approval decisions, based on loan officers' discretionary judgment, do not necessarily lead to excess risk (Puri et al., 2011). Similarly, Gropp et al. (2012) document that loan officers may even use soft information too cautiously in their loan approval decisions. Interestingly, these findings would suggest that internal contracting problems may be less important than what conventional agency theory indicates. In spite of their discretionary latitude, loan officers do not seem to misuse soft information to adopt opportunistic strategies which would be detrimental to the bank.

3. The Importance of Soft Information Production in Cooperative and Social Banks

In this section, we explain why cooperative lending practices are heavily reliant on soft information produced via the establishment of long-term credit relationships (3.1. and 3.2.). We also show that the production of qualitative information is even more critical to social banks (3.3.).

3.1. Credit Cooperatives as Information Machines

In light of the advancements made in the previous section, the practices of the first credit cooperatives introduced in rural Germany in the nineteenth century appear surprisingly novel.[4] These financial institutions operated as veritable *information machines* given their

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[4] We describe Raiffeisen's model in rather functionalist terms. However, we fully agree with Goglio and Leonardi (2010) and Kalmi (2012) on the fact that these credit cooperatives were primarily animated by non-instrumental goals and distinct ideological attitudes towards finance – compared to commercial banks.

great ability to both produce soft information on borrowers and exploit it efficiently. Guinnane (2001) captures the essential features of their successful functioning. In particular, the author provides compelling evidence that cooperatives were intentionally confined to limited geographical areas. By focusing on local, stable communities, they managed to access to first-rate soft information concerning potential borrowers. This specific information was peer-produced within the community by congruent cooperative members who had an in-depth knowledge of each other's habits, characters and competencies.

Importantly, credit cooperatives were also able to exploit this high-quality soft knowledge produced by its members thanks to their decentralised organisational scheme. As documented by Guinnane (1997), these credit providers were not, legally speaking, cooperative branches but rather individual grass-root cooperatives with full autonomy in decision-making. Nonetheless, most of them took part in the formation of regional centrals and auditing associations. The former ensured liquidity on the condition that cooperatives were audited by the latter. Audits were not conducted in a pure top-down fashion but were rather a mix of formal control and customised counsel. Consequently, lending operations were carried out at the grass-root level. Given their (very) small size, cooperatives exhibited simple organisational structures with few hierarchical layers, thereby avoiding most internal contracting problems associated with the low transferability of soft knowledge. This informational superiority explains – at least partially[5] – why these cooperatives were successful in screening and monitoring borrowers spurned by commercial banks, as well as in tailoring loans according to the specific needs of borrowers.

The archetypical model of credit cooperatives, briefly outlined above, has undergone dramatic changes over the last century to form large banking groups (Ayadi et al., 2010). This

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[5] While we focus on the sole production of information, other factors are evoked in the literature, such as the ability to enforce loan agreements due to proximity among cooperative members (Banerjee et al. (1994; Guinnane, 2001). For instance, deviant borrowers may suffer from social sanctions.

integration process, fostered by market liberalisation and industry concentration, has resulted in central units taking more power, to the detriment of local, regional cooperatives. This phenomenon of centralisation in the decisional pyramid has *de facto* reduced the democratic power held by grass-root cooperative members (Di Salvo, 2002). As highlighted by this author, prudential authorities have favoured this institutional evolution by designating centralised bodies as their single interlocutor for regulatory aspects.[6] This critical evolution in governance structure is, among other things, a clarifying factor in the hybridisation process, observable in a number of cooperatives. Evidently, exceptions to this process would deserve to be mentioned. For instance, Katerinakis (2012), in his analysis of major Greek credit cooperatives, considers the latter as "polycentric self-organisations".

Hybridisation has led to various cooperatives abandoning the explicit goal of facilitating access to credit to non-bankable, by evolving over time into full-service universal banks or by entering into activities that were not inherently entrenched, such as corporate and investment banking (Ayadi et al., 2010; Ory and Lemzeri, 2012). Nonetheless, the vast majority of cooperative banks remain firmly anchored to their business basics since they have preserved a unique ability in serving small borrowing firms characterised by informational opacity, such as SMEs. Retail activities remain their cash cow by providing cooperatives with a stable source of revenue.[7] In the context of France, Gianfaldoni and Richez-Battesti (2005) show that cooperative banks are by far the main external funders of SMEs and households. Labye et al. (2002) and Ayadi et al. (2010) generalise these findings to Europe by showing that cooperative banks remain major retail banking players in most EU countries.

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[6] This entails "bottom-up" constraints for local cooperatives (e.g. reporting to central units) as well as "top-down" constraints (e.g. risk models imposed by the regulator via central units).
[7] Traditional retail activities operated by local banks act as a buffer, which in bad times dampens losses from market operations and corporate investment activities undertaken by central bodies (Ory and Lemzeri, 2012).

Cooperative banks still rely on soft, idiosyncratic information to evaluate their borrowers, but their relationship lending technologies have evolved over time. In the nineteenth century, cooperatives had recourse to peer monitoring to overcome asymmetric information problems such as adverse selection (Stiglitz, 1990; Barnerjee et al., 1994). Members of rural, local communities were typically able to self-select themselves to form credit cooperatives, since they benefited from an intimate profile of each other via day-to-day interactions. This self-selection mechanism is no longer efficient when the cooperative grows and its membership is dispersed throughout urban and/or larger rural areas.[8] Cooperative banks have consequently switched to a different pattern in which they establish bilateral long-term credit relationships with borrowers. Interestingly, the reliance on lending relationships is still a distinctive feature of cooperative banking (Ferri, 2010).

3.2. The Reasons for Relationship Lending in Cooperative Banks

Here, we explain why cooperative banks still rely on relationship lending while in the last decades the banking industry as a whole has massively adopted transactional technologies. Conversely, we do not intend to demonstrate that relationship lending is the preserve of cooperative banks.[9] In many instances, commercial financial institutions that follow the same organisational pattern (i.e. a decentralised decision-making) may exhibit quite a similar behaviour in their lending practices (e.g. De Young et al.; Scott, 2004). This is especially the case for stakeholder-oriented banks, such as community banks and savings banks.

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[8] On a related note, the importance of peer-monitoring in explaining the current success of microfinance seems exaggerated. Other factors are at work (Morduch, 1999). For instance, dynamic incentives induced by long-term credit relationships may be a more powerful devise than peer-pressure mechanisms in enforcing microfinance contracts (Cornée and Masclet, 2013).

[9] This justifies why the studies reviewed in this section are not specifically conducted on cooperative banks. There exists very little research comparing cooperative banks with their commercial counterparts; the studies being generally carried out on the banking industry as a whole. In addition, the dummies controlling for the bank status are unfortunately constructed in such a way we cannot properly isolate the "cooperative bank" effect on credit conditions.

As argued above, retail banking, and particularly SME financing, remains by far the business goodwill of cooperative banks. The latter still hold a noticeable expertise in serving informationally opaque borrowing fractions. This expertise stems mainly from the intensive use of qualitative information derived from the establishment of long-term credit relationships. Engaging in repeated interactions entails beneficial effects for both parties, allowing them to reach pareto-superior outcomes compared to what they could get in spot-market transactions. Repeated lender-borrower interactions enhance cooperative behaviour and mutual trust, which in turn facilitate the flow of soft information between parties (Uzzi and Lancaster, 2003). A sort of implicit arrangement is formed: borrowers are ready to deliver more private information on their situation to lenders provided that they believe they are guaranteed credit availability in the future. Lenders make the promise of ensuring further credit availability to borrowers because they have a good impression of the latter, thanks to the high-quality soft knowledge they have gathered (Sharpe, 1990; Rivaud-Danset, 1996).

There exists a plethora of empirical work highlighting the benefits associated with relationship lending in terms of credit availability. Methodologically speaking, the strength of lending relationships is generally measured via three indicators: i) its duration, defined as the number of years the bank has offered loans, deposits or other financial services to the firm; ii) its scope, proxied by the quantity of financial services contracted by the firm; iii) its exclusivity, in terms of the bank being the firm's sole debt provider. Regardless of the indicator, empirical evidence reports quite univocally that for the borrowing firm, stronger lending relationships result with a lower probability of being rationed (e.g. Angelini et al., 1998; Cole, 1998; Elsas and Krahnen, 1998; Uzzi, 1999; Machauer and Weber, 2000; Lehmann et Neuberger, 2001; Cole et al., 2004), or a lesser recourse to more expensive sources of corporate financing such as trade credit (e.g. Petersen and Rajan, 1994; Harhoff and Korting, 1998). This evidence shows that banks amplify credit availability directly

through facilitated debt provision, but they can also do it indirectly by reducing collateral requirements.

The repeated interactions in long-term credit relationships allow lenders to condition their credit terms on the past repayment behaviour of borrowers. By repeatedly repaying their debt rather than defaulting, borrowers can positively alter lenders' beliefs about their creditworthiness (Fehr and Zehnder, 2006; Brown et al., 2009; Cornée et al., 2012). By strengthening their creditworthiness over time, borrowers build a reputation with lenders. Reputation can act as an intangible asset which may be pledged by small entrepreneurs to compensate their lack of real assets; thereby circumventing the problems associated with collateral requirements. Empirical evidence unambiguously supports this argumentation by documenting that stronger relationships are associated with reduced collateral requirements (e.g. Berger and Udell, 1995; Harhoff and Körting, 1998; Degryse and Van Cayseele, 2000; Machauer and Weber, 2000).

The information produced by repeated borrower-lender interactions may be regarded as hard, since it directly feeds the customer's credit history. We cannot exclude that it is partially the case, if we consider information-sharing schemes between lenders (e.g. credit bureaus). Nonetheless, a closer look at the studies reveals that collateral requirements depend positively on the temporal length of the lending relationship, highlighting the fact that immaterial reputation assets are built over time. Furthermore, the less exclusive the relationship (i.e. the greater the number of banks the borrower trades with), the higher the collateral requirements. This indicates that borrowers' creditworthiness assets are specific to each credit relationship and represent essentially soft, idiosyncratic knowledge amassed over time by the bank on its debtors (Guille, 1994).

So far, we have insisted on the "win-win" consequences of relationship lending, however this technology may also bring about undesirable side effects. The principal effect is an informational hold-up for borrowers. By trading with only one bank, a borrower may, over the course of the relationship, become captive to their incumbent bank since they are unable to signal their quality to other banks – their debt provision relying mainly on soft, non-transmittable knowledge (Sharpe, 1990).[10] Lenders may in turn take advantage of their bargaining power and extract rents from lending relationships by raising their interest rates (Boot, 2000; Von Thadden, 1995). Empirical evidence regarding this hold-up hypothesis is contradictory. For instance, D'Auria et al. (1999), Degryse and Cayseele (2000), and Degryse and Ongena (2005) report that longer relationships results in a higher interest rate charged to borrowers. Berger and Udell (1995), Uzzi (1999), Bodenhorn (2003), as well as Berger et al. (2007) reach an opposite conclusion.[11] Moreover, many studies (e.g. Elsas and Krahnen, 1998; Machauer and Weber, 1998; Lehmann and Neuberger, 2001; Canovas and Solvano, 2006) show no significant effect. Finally, the findings from Angelini et al. (1998) are of great interest with regards to this topic. The authors report a hold-up effect for borrowers trading with commercial banks. However, they do not observe such an effect for borrowers that are members of a credit cooperative.

Altogether, these studies reveal that cooperative banks, like their commercial counterparts, guarantee credit availability and are less stringent for collateral requirements when long-term credit relationships are established. Though limited however, evidence shows that cooperatives appear to be particular with regards to sharing the rent generated by credit

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[10] To mitigate this "hold-up" problem, SMEs increasingly favour multiple sources of capital. By trading with several banks and by pitting one against the other, borrowers can reduce the cost of their debt. Nonetheless, multi-banking strategies affect the cost of capital in various ways. As explained in the rest of this section, the quality of debt supply (i.e. capital availability and reduced collateral requirement) deteriorates along with the number of financiers, thereby incurring indirect financing costs that will eventually be embedded in the interest rate.

[11] On a related note, Ferri and Messori (2000) show that stronger relationships offer greater protection against the interest rate cycle.

relationships. Specifically, they do not charge higher interest rates even though their borrowers may be in a situation of informational capture.

Another reason explaining cooperative banks' reliance on relationship lending lies in the specificities of their decision-making processes. Cooperative banks still exhibit more decentralised and complex organisational architecture than do their commercial counterparts in spite of the dramatic consolidation and integration they have undergone (Ory and Lemzeri, 2012). Abdesselam et al. (2002) carry out a comparative analysis of the role played by loan officers in both cooperative and mainstream major French banks. They conclude that cooperatives grant more discretion to their loan officers in the lending process. Loan approval decisions are more likely to be based on proximity, mutual trust and borrowers' credit reputation. The temporal length of the lending relationship is also a key factor taken into consideration by loan officers. Furthermore, the management of credit lines, which crystallises the quality of the interactions, may also be more flexible. In contrast, loan officers in commercial banks have less managerial latitude and adopt a more technical approach to lending and credit-granting decisions, which depend on the firm's financial statements and on credit analysts' sector expertise. Moreover, credit lines granted to borrowers are proportionally less important in terms of "volume", and more stringently managed.

Finally, cooperative banks rely more so on relationship lending, as a result of their ownership structure. The way equity is held and traded is still a major distinctive feature between cooperatives, which are not listed in stock markets, and commercial banks, which are often listed corporations (Hesse and Cihac, 2006; Ory et al., 2006). Subsequently, commercial banks are considerably more exposed to the pressure and "discipline" exerted by stock markets. The pursuit of shareholder value maximisation may also impact the lending strategy of commercial banks. Typically, they are incited to invest in assets that are currently

profitable to meet the short-term profitability constraints dictated by shareholders.[12] In contrast, cooperative banks are notably less subject to market pressure and their goal is not profit maximisation – at least in the short run – but rather their members' consumer surplus, through the provision of financial services at moderate prices to retail clients (Hesse and Cihac, 2006). Even though cooperatives do not face short-term market constraints, they need to attain a certain level of profitability in the medium or long term to be competitive in the industry. On the whole, cooperatives' profitability constraint is not dictated by short-term pressure exerted by stock markets but rather by medium- or long-term product market (Gianfaldoni and Richez-Battesti, 2005).

The medium- or long-term profitability constraint is more in line with the temporality of relationship lending. Financing young or *de novo* small borrowing firms is seldom profitable instantaneously. When a bank finances small businesses via relationship lending technology, it makes a substantial informational investment in the first interactions, which is then amortised over several periods, i.e. through repeated interactions with the businesses. In other words, lenders subsidise borrowers in early periods and get reimbursed for this subsidy thereafter (Petersen and Rajan, 1995). Such a long-term strategy may be feasible for cooperative banks, but rather incompatible with their commercial counterparts that may be subject to short-term shareholder maximisation.[13]

3.3. Soft Information in Social Banking

In the previous point, we restricted our analysis to the case of cooperative banks relying massively on soft information to manage lending operations with informationnally opaque SME borrowers. More generally, the collection of soft information proves to be essential

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[12] Orléan (1999) provides an in-depth theoretical analysis explaining how the microstructural features of financial markets lead to short-term profit maximisation.

[13] Similarly, a fiercely competitive credit market may be destructive to the formation of mutually beneficial relationships between lenders and borrowers. Lenders are reluctant to assist informationnally-opaque borrowers and consequently accept lower returns upfront if they fear that the future benefits associated with this early assistance may be reaped by competitors (Petersen and Rajan, 1995).

when a bank explicitly claims that it pays attention to the non-economic (i.e. social, environmental, ethical) consequences of its financial activity. To exemplify this view, let us examine the case of social banks, which are burgeoning financial intermediaries falling within the broad scope of cooperative banking (Kalmi, 2012; Artis and Cornée, 2013).[14] Social banks aim to encourage a community of values by matching the two sides of financial intermediation: socially-minded investors (i.e. members/shareholders and savers) and socially-responsible borrowers (Cornée and Szafarz, 2013). Thus, social banks are special in the midst of cooperative banks, since their foundational principles go beyond the rigorous application of conventional cooperative principles, as they explicitly prioritise social aims over financial ones (Becchetti et al., 2011; San-Jose et al., 2011; Weber and Remer, 2011).[15] In concrete terms, these foundational principles accommodate the selection of credit applicants that relies on both a financial basis *and* sustainability (i.e. social and/or environmental) criteria. In practice, social banks may be viewed as specialised financial intermediaries providing external debt funding to borrowers who meet this double-bottom line, i.e. organisations pertaining to the social economy sector, such as cooperatives, not-for-profit organisations, and community projects supported by the civil society (Borzaga and Defourny, 2001).[16]

To uphold this commitment to their funders, social banks assess the social dimension of projects in addition to conventional economic analysis.[17] Evaluating the social aspects of

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[14] Admittedly, not all social banks operate under the legal status of 'cooperative' even though it is the case for most major social banks. When social banks have a standard private-owned equity structure they are not listed, and most importantly, their shareholders' power and profit are restricted through ad hoc mechanisms to favour the involvement of stakeholders (San-Jose et al., 2011). For instance, the number of voting shares at *Alternative Bank Schweiz* (Switzerland) and *Triodos Bank* (The Netherlands and Belgium) are limited (GABV, 2010).

[15] There is actually no clear-cut division between "social cooperative banks" and "non-social cooperative banks". For instance, some small- or medium-sized credit cooperatives (e.g. the BBCs in Northern Italy) that do not explicitly self-identify as social banks could be considered as such.

[16] For the sake of simplicity, we henceforth use the catchword of *social enterprise* to designate all these organisations.

[17] Social bank loan officers who are often at the crux of this double-screening process dedicate a substantial fraction of their workload to amassing qualitative facts on the social dimension of projects – compared to their counterparts from mainstream cooperative banks. In Cornée and Szafarz (2013), we approximate that loan

an investment project involves compiling a hard, explicit knowledge component, including all the public information available on the project (e.g. activity sector), and a soft, idiosyncratic knowledge component. The latter cannot reasonably be built up by following a strict, automatic procedure, given the specificity of each project. Rather it involves judgments on intangible characteristics such as borrowers' social preferences, the ethicality and environmental-friendliness of the business activity, and responsibility towards stakeholders, etc. Interestingly, social screening is also subject to informational asymmetries, which can be attenuated over the course of the lending relationship. This may explain why social ratings of start-ups, which are particularly plagued by informational asymmetries, tend to be systematically lower than those of existing firms (Cornée and Szafarz, 2013).

The gathering of soft knowledge on sustainability aspects has advantages other than the mere measurement of borrowers' non-financial performance for accountability purposes. As we examine in Section 4, these sustainability criteria are likely to improve the forecast quality of borrowers' credit default. At this stage, we explain why this is the case. Assessing the creditworthiness of social enterprises through the sole lens of economic viability may appear too restrictive. Since the ultimate goal of these organisations is the satisfaction of a social or a community need – and not profit maximisation per se –, the quality of ties between these organisations and their stakeholders (members, users, local community, public funders...) is critical to the fulfilment of their mission. In other words, this "relational capital", definable as an intangible, idiosyncratic asset composed of social relations and values embedded in the local community and reproduced through the interactions taking place within it, is vital to the success and survival of social enterprises in their environment (Gagliardi, 2009). By screening credit applicants through the collection of qualitative information on both

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officers dedicate about one third of their workload to social screening. Let us remark however that social assessment is not systematically conducted by loan officers. For example, in *Banca Etica* (Italy), social auditing is carried out by so-called "social auditors or experts".

financial and sustainability aspects on each of their borrowers, social banks manage to appraise quite accurately their relation capital and can in turn predict satisfactorily credit defaults of social enterprises (Artis and Cornée, 2013). Conversely, this may explain why mainstream cooperative banks that do not engage in non-financial screening are sometimes at odds with financing the social economy sector (Gagliardi, 2009).

4. Soft Information and Credit Rating

In this section, we first depict the conventional view of credit rating (4.1.). We then highlight the value of qualitative economically-oriented factors, representative of the soft information produced by relational banks, in predicting credit default events (4.2.). Finally, we discuss whether and by what means sustainability criteria improve forecast quality of default models (4.3.).

4.1. The Conventional View of Credit Rating

Credit risk measurement has dramatically thrived over the two past decades, especially since the announcement of the Basel Accord on credit risk capital adequacy. Banks have modified existing internal credit risk systems or developed new systems to calculate the probability of default (PD) and, possibly, loss-given-default (LGD) on their credit assets (Altman, 2002).

In this context, credit rating has become a widespread practice not only in capital markets, but also within banking institutions. Credit rating is used not only internally for screening borrowers, pricing loans, and managing credit risk thereafter (e.g. for loan-loss provisioning), but also externally for calibrating regulatory capital requirements. To correctly

fulfil these functions, credit ratings should be a good predictor of default, as noted by Krahnen and Weber (2001) in their normative set of "generally accepted rating principles".

The construction of nearly all credit rating models follows the same pattern. A set of quantitative accounting ratios are combined and weighted to predict bankruptcy. These accounting ratios aim to capture the main aspects of a firm's financial performance: capital structure (e.g. equity-to-assets ratio), profitability (e.g. ROA), and liquidity (e.g. current ratio). Market-based information (e.g. Tobin's Q) has been used insofar as the original models have been primarily applied to large corporate firms. Since the seminal works by Beaver (1966) and Altman (1968), a substantial body of work has investigated whether and to the extent of which a combination of the aforementioned variables can predict corporate default events. Predictive models have generally been based on linear discriminant analysis, on logit and on probit regression analysis, or more recent ones, on neural networks (Altman and Saunders, 1997). Throughout this extensive research, most academics and many sophisticated practitioners have systemically moved toward the elimination of non-quantitative factors in credit rating modelling. The survey carried out by Altman and Saunders (1997) on the developments of credit risk measurement since the 80's is quite representative of the lack of interest for qualitative factors. The authors argue that the expert's (i.e. the banker's) subjective assessment, or the "4 Cs" [18] methodology, tends to be outperformed by univariate accounting-based credit scoring systems. The authors (p. 1722) then conclude that "*perhaps, not surprisingly, financial institutions themselves have increasingly moved away from subjective/expert systems over the past 20 years towards systems that are more objectively based.*" This view is now widely accepted by the banking sector, and bankers' expertise and subjectivity are disregarded by the Basel Committee on Banking Supervision (henceforth

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[18] The so-called four Cs encompass borrower character (reputation), capital (leverage), capacity (volatility of earnings) and collateral. This screening methodology confers a critical role to bankers' expertise and subjective judgement.

BCBS) (2000b, p. 108).[19] A good illustration of this is provided in BCBS (2006), which suggests that a regulator may rely on a third party to assess the probability of default on bank loans (Rajan et al., 2008, 2010). This means essentially that a bank is not expected to produce qualitative information because a remote third-party (e.g. rating agency) will only use public, explicit knowledge when it rates the bank's borrowers (Diamond and Rajan, 2009). Thus, banks are in some way incited to not collect and use soft information in their lending activities.

The BCBS favours quantitative default models. In this regard, the BCBS (2000b, p. 110) states that "*all in all, multivariate accounting-based credit-scoring models have been shown to perform quite well*." At the same time, the BCBS points out shortcomings in these models that lack theoretical foundations and pivot on personal judgement when it comes to selecting the accounting data to be included in the statistical analysis. Moreover, accounting data are by nature backward-looking since they account for what happened in the past. Thus, they do not capture future firm prospects. To take into account a forward-looking perspective, the BCBS suggests that financial institutions rely not on judgemental, subjective appraisals, but rather on market-price-based measures (e.g. the KMV model), or equivalents for non-listed companies (e.g. the Private Firm Model). Prices are supposed to give a correct estimate of a firm's situation since they embody the synthesised views and forecasts of many investors who are constantly performing analysis on companies. Furthermore, the BCBS implicitly recognises the superiority of market-price-based measures over accounting-data-based measures, when it states that "*they pick up more subtle and fast-moving changes in borrower conditions, such as those that are reflected in capital market data and values. In addition,*

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[19] The BCBS (2000b, p. 108) is quite clear on this point by stating that "*the main advantage of this approach is also its limit: the analysis is subjective, so that it can take into account all those qualitative factors that are difficult to quantify. On the other hand, it is difficult to assess the creditworthiness of a firm whose balance-sheet ratios are discordant: a firm may have a poor profitability ratio but an above-average liquidity ratio, and in this case different experts may have different opinions on the same firms.*"

accounting-data-based measures are often only tenuously linked to an underlying theoretical model (2000b, pp.6-7)."

In all these developments, the regulator and, more generally speaking, the banking industry takes credit rating models, applicable to large, conventional corporations, as reference. These models cannot obviously be adopted, likewise for other agents such as SMEs or social enterprises. Furthermore, qualitative approaches to risk management such as bankers' subjective judgements appear to be downgraded, benefiting quantitative approaches. The high degree of interest in market-price-based measures, expressed since the turn of the century, is one step further from the reliance on banker's judgemental expertise, which is the only way of interpreting soft information.[20]

4.2. The Value of Qualitative Factors in Predicting Default

A number of empirical studies document that, depending on the bank, internal rating systems are characterised by a huge diversity, ranging from statistical methods to exclusive expert judgements (Elsas and Krahnen, 1998; Machauer and Weber, 1998; Treacy and Carey, 2000; Brunner et al., 2000). In this regard, pure quantitative approaches to credit risk management are incompatible with the lending practices of banks that are heavily reliant on the production of qualitative knowledge. As argued in Section 2, the main properties of soft information are its low transferability and capacity of aggregation for comparability purposes. Subsequently, the best interpretation of this type of knowledge is given subjectively by its producers (e.g. loan officers). In other words, the only way of exploiting soft information from a risk management perspective involves relying on bankers' judgemental expertise.

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[20] Surprisingly enough, this evolution has occurred even though the BCBS itself has documented the variety of rating techniques employed by financial institutions (BCBS, 2000a). The BCBS (2000a, p. 4) states that "*while there does not appear to be a single standard for the structure and operation of internal rating systems, the survey highlighted a few alternative approaches. These can be viewed as points on a continuum with, at one extreme, systems focussed on the judgement of expert personnel, and at the other, those based solely on statistical.*"

Furthermore, the financing of entire credit market segments may be hampered by inadequate risk models (Altman et al., 2010). This is particularly the case of SMEs and, to an even greater extent, of firms such as cooperatives and social enterprises. Some precursors of the accounting-based credit rating now recognise the value of qualitative factors for SME risk modelling. For instance, Altman and Sabado (2007, p. 335) "*acknowledge that our analysis could still be improved using qualitative variables as predictors in the failure prediction model to better discriminate between small and medium enterprises.*" To the best of our knowledge, the amount of empirical evidence supporting this insight is still limited. Table 1 takes stock of the few existing studies.

All of these studies follow the same methodological pattern. They examine the benefits associated with the inclusion of qualitative factors in addition to the conventional accounting and financial factors in terms of predicting default events. The analysis is generally based on logit or probit regressions, and the main indicators of forecast quality used are the area under the ROC (receiver operating characteristic) curve, the percentage of observations correctly classified, and the Brier score.[21] As displayed in Table 1, the findings unambiguously show that mixed models combining both qualitative and quantitative factors significantly outperform models including only quantitative factors, thereby highlighting the value of subjective factors derived from soft information. The results hold true regardless of the type of banking institution, whether commercial, as in Lehmann (2003) and Grunert et al. (2004) or cooperative, as in Cornée (2013).[22] It is worth mentioning that Altman et al. (2008) have a rather rigid definition of qualitative information, which they consider as non-accounting and non-subjective data such as the activity sector, and the age of the firm, etc. In

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[21] For further details on these various indicators, refer to Brier (1950), Güttler (2005), Behr and Güttler (2007), Krämer and Güttler (2008).
[22] More precisely, this is a financial cooperative that self-identifies as a social bank.

spite of this limited definition, qualitative factors still remain valuable in terms of forecast quality.

Table1: The Value of Qualitative Factors in Credit Risk Management

Study	Sample	Qualitative factors	Results
Lehmann (2003)	20, 000 SMEs from a German commercial bank. 2/3 of firms have a turnover up to €5 million.	1) Factor synthesising subjective assessments of future financial prospects, market position, and quality of lending relationship. 2) "Behavioural" factor derived from an analysis of the checking account.	FIN: AUC = 0.72 FINQUAL: AUC = 0.81
Grunert et al. (2004)	409 medium-sized firms from a German commercial bank. Firms' turnover is €25 million to €250 million.	1) Subjective assessment of management quality. 2) Subjective assessment of market position.	FIN: OCC[d] = 0.89, BS[e] = 0.13 FINQUAL : OCC = 0.92, BS = 0.10
Altman et al. (2008)	5.8 million SMEs from UK Companies House. Firms' turnover goes up to £22.8 million.	1) County court judgements (y/n), 2) audited accounts (y/n), 3) subsidiary (y/n), cash-flow statement (y/n), 4) late filing days, 5) audit report judgement, 6) age of the firm, 7) sector.	FIN[a] : AUC[c] = 0.67 (Model 1) and 0.71 (Model 2) FINQUAL[b]: AUC = 0.76 (Model 1) and 0.75(Model 2)
Cornée (2013)	389 very small firms from a French financial cooperative. Firms' average turnover is €540,000.	1) Subjective assessment of management quality. 2) Subjective assessment of project quality.	FIN: AUC = 0.68, BS = 0.17 FINQUAL: AUC = 0.73, BS = 0.16

[a] FIN: model only including quantitative financial factors, [b] FINQUAL: model including both quantitative and qualitative factors, [c] AUC: area under the curve, [d] OCC: % of observations correctly classified, [e] BS: Brier score. The differences between indicators (OCC, AUC, or BS) are always significant, mostly at the 1% threshold.

How can the value added by qualitative factors be explained? The best way of assessing informationally opaque borrowers consists of gathering soft information over the course of long-term relationships. As argued in Section 3, financial statements are markedly insufficient in bridging the informational gap between banks and SMEs or social enterprises, since they lack the relevant information to accurately assess a small business' creditworthiness. Subsequently, if a credit risk model does not include factors deriving from soft information, it automatically leaves aside a substantial fraction of knowledge, thereby losing part of its predictive power.

4.3. The Value of Sustainability Criteria in Predicting Default

As mentioned previously in Subsection 3.3., social banks condition their loan approval decisions on the satisfaction of sustainability criteria. Therefore, the relevant question from a risk management perspective is whether these sustainability criteria may be good predictors of default events – in addition to qualitative and quantitative economically-oriented factors. In other words, should the use of extra-economic ratings by social banks be restricted to not only the screening stage – as is already the case – but also throughout the whole credit risk management process?

In Cornée and Szafarz (2013), we scrutinise the behaviour of a French social banking institution and provide theoretical and empirical evidence of the significantly negative impact of social ratings on default probability. Moreover, we report that this effect exhibits a similar magnitude as that of financial rating. This range is quite substantial since an additional unit of social rating leads to around a 10% decrease in default probability. These findings can be rationalised as follows. Firstly, the social rating that is determined in-house by the social bank can be viewed as a measurement of the degree of proximity between its own identity and values, on the one hand, and those of borrowers, on the other. Secondly, the social bank signals their "privileged status" to the borrowers who share its social values by charging them a lower interest rate, *ceteris paribus*. Lastly, these privileged borrowers respond favourably to this signal by making safer investments than the rest of the clientele with similar *ex ante* creditworthiness, thereby reducing their probability of defaulting.

Weber et al. (2010) provide evidence confirming our findings. Their study, based on a sample of 180 German SMEs, shows that incorporating sustainability criteria into risk management is advantageous. The impact is considerable, since the percentage of correctly classified observations increases from 78.9% to 86.6% with the inclusion of social and

environmental factors. The authors also argue that sustainability may improve the creditworthiness of firms through the avoidance of certain economic or financial risks.

Integrating extra-economic factors incurs additional costs and impacts banks' profitability. Thus, a more comprehensive cost-benefit evaluation should be carried out to effectuate the net advantage of using sustainability criteria in credit risk management. In Cornée and Szafarz (2013), we partially address this issue by conducting a simple cost-benefit analysis to assess the net benefit of the "reciprocity" policy implemented by social banks. This policy seems to be costly for the bank, and the benefits associated with the decrease in credit default do not offset the extra-costs incurred by social screening. The assessment of social rating appears to be particularly expensive in our case. This may be explained by the combination of two factors: i) social rating measurements imply that a considerable soft-informational investment is made at the outset of a lending relationship and then amortised in the subsequent interactions; ii) 50% of our sample consists of start-ups. If the proportion of existing firms in a relationship with the bank had been higher, the result of the cost-benefit analysis would have been different, since the marginal cost of assessing social rating is lower for this type of firm.

5. Conclusion

In this paper, we have attempted to show that banks' risk management procedures, especially credit rating systems, should be congruent with the peculiarities of their screening, pricing, and monitoring practices. Our analysis involves three steps. First, we elaborate on the notion of soft information and highlight the internal contractual issues inherent to its use by banking organisations. We then provide compelling evidence that, regardless of the dramatic evolutions undergone by the banking industry in recent decades, soft information is *still*

critical for cooperative banks and, even more so, for social banks in their lending operations. Finally, we attest to the fact that credit rating significantly benefits from the inclusion of qualitative factors – not only economically-oriented but also sustainability-oriented.

In our view, allowing the incorporation of soft components into credit ratings may be a legitimate means of fostering diversity in the banking sector. In contrast, restricting credit rating models to hard, explicit information alone may incite financial intermediaries not to screen credit applicants on the basis of first-rate qualitative knowledge collected through repeated interactions. Yet, it appears that a relational approach to financing is essential in tackling the problem of credit rationing. The emergence of the Raiffeisen cooperatives in the late nineteenth century provides a good illustration of this approach, and so does the nascent phenomenon of social banking nowadays (Kalmi, 2012). In comparison, "pure" quantitative default models, disconnected from many facets of socio-economic reality, appear inconclusive when it comes to facilitating access to credit in a desirable manner. As suggested by the Economist (02/2010, the 11th), let us hope that, "[the] *changes* [in the banking industry resulting from the financial crisis] *point toward greater use of judgement and less reliance on numbers in the future.*"

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