



Embracing Expert Approaches in Modern Credit Rating Modeling

Over the last thirty years, supervisory regulations have pushed banking institutions to adopt credit rating models that are based almost exclusively on quantitative and retrospective predictive variables, such as financial ratios and explanatory indicators of past performance in the bank-firm relationship. However, the “new normal” of uncertainty requires that these models evolve towards expert approaches, capable of capturing the onset of business weaknesses before they manifest at the economic and financial level. This means incorporating new, more forward-looking variables that are essentially qualitative in nature, reflecting the inherent strategic and managerial characteristics of the company.

CREDIT RATING//CREDIT SCORING//DEFAULT PREDICTION MODELLING//FORWARD-LOOKING APPROACHES//EXPERT MODELS



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A bank's ability to create value for its stakeholders depends on its proficiency in accurately assessing the reliability of its current and potential clients. This assessment is conducted through rating models, which make it possible to measure customers' probability of default and the risk level of the investment projects for which they seek financing. Such models are essential tools for deciding whether to grant credit and for determining the appropriate interest rate to apply.

Over the last thirty years, banking supervisory regulations issued by the Basel Committee and the European Central Bank, along with the regulatory and moral suasion activities carried out by the national supervisory authorities (in our case primarily by the Bank of Italy), have significantly influenced credit institutions to adopt rating models

focused on automatic processes based on predictive variables that are almost exclusively quantitative and retrospective. These are mainly financial ratios (e.g., Altman et al., 2020) and explanatory indicators of the past performance of the relationship between the company and the bank (variables of past payment behavior; e.g., Back, 2005). However, a large body of empirical evidence shows that these models perform poorly, especially for forecasting horizons longer than one year (e.g., Du Jardin and Séverin, 2011), and not infrequently lead the bank to behave procyclically, either rationing/denying credit to

companies with sound and resilient business models or lending to companies with sound financial structures but weak competitive strategies and/or managerial capabilities and thus not resilient in the medium term (e.g., Ciampi, 2015).

The reason for this poor performance is that these models take a retrospective (backward-looking) approach, while the reliability of the client company concerns the future. In fact, by the time financial statement data is processed, on average nearly twelve months have passed since the corresponding business events took place. By

FIGURE 1 TRADITIONAL RATING MODELS: FOCUS ON QUANTITATIVE, BACKWARD-LOOKING PREDICTIVE VARIABLES

FINANCIAL RATIOS	PRIOR PAYMENT BEHAVIOR VARIABLES
Financial Debt/Turnover	Total bank revocable credit granted
Short-Term Financial Debt/Gross Working Capital	Total bank revocable credit used
Financial Debt/Total Assets	Total overdrawn bank revocable credit
Financial Debt/Equity	Total bank revocable credit used/Total bank revocable credit granted
Financial Debt/Total Debt	Total overdrawn bank revocable credit/Total bank revocable credit granted
Bank Debt/Total Assets	Overdraft days on bank revocable credit granted
Bank Debt/Turnover	Usage rate of advance subject to collection
Bank Debt/Equity	Usage rate of advance invoicing
Bank Debt/Total Debt	Total non-performing bank revocable credit
Bank Debt/Net Financial Position	Total non-performing bank revocable credit/Total bank revocable credit granted
Equity/Total Debt	Total bank irrevocable credit granted
Trade working capital/Net Financial Position	Total bank irrevocable credit used
Financial Debt/EBITDA	Total past due bank irrevocable credit
Total Debt/EBITDA	Total bank irrevocable credit used/Total bank irrevocable credit granted
Equity/Fixed assets	Total past due bank irrevocable credit/Total bank irrevocable credit granted
Net Financial Position/Turnover	Past due days on bank irrevocable credit granted
Current Ratio	Total non-performing bank irrevocable credit
Quick Ratio	Total non-performing bank irrevocable credit/Total bank irrevocable credit granted
Profit/Equity	Total overdue or overdraft bank credit
EBIT/Net Capital Invested	Total overdue or overdraft bank credit/Turnover
EBITDA/Turnover	Total overdue or overdraft bank credit/EBITDA
EBIT/Turnover	Total overdue or overdraft bank credit/Total bank credit granted
Financial Charges/EBITDA	Total overdue or overdraft bank credit/Total bank credit used
Added Value/Turnover	Total overdue or overdraft bank credit/Net Financial Position
Financial Charges/Turnover	Number of overdrafts/payment delays exceeding 60 days in the last 6 months
Added Value/Number of Employees	Number of overdrafts/payment delays exceeding 60 days in the last 12 months
Turnover/Number of Employees	Number of overdrafts/payment delays exceeding 120 days in the last 6 months
Turnover/Net Capital Invested	Number of overdrafts/payment delays exceeding 120 days in the last 12 months

the time the company's payment history indicates difficulty in meeting obligations, the process of financial deterioration is often well underway, making the crisis difficult to reverse.

THE SME CREDIT CHALLENGE

Numerous converging empirical studies have shown that credit assessment metrics based predominantly on quantitative and backward-looking variables have significant limitations, particularly when applied to small or medium-sized enterprises (SMEs). The information contained in the financial statements of SMEs is typically less comprehensive and reliable than that found in similar documents prepared by larger companies. This is partly due to the tendency of entrepreneurs running small companies to delay reporting negative economic results to postpone the negative impact on the credit rating.

Furthermore, in SMEs, ownership and management often coincide, resulting in limited delegation of decision-making.

Additionally, due to the simple organizational structure of SMEs, changes in organization and strategy often occur suddenly and are difficult to predict based on past behavior. Moreover, the behavior and performance of SMEs are more influenced by external events and actors than is the case for large companies.

For instance, the economic performance of a SME in a given financial year may be significantly affected by a major customer exercising contractual power to reduce selling prices, or by the need to increase salaries for key employees to retain them, or by having to pay a higher price to a non-substitutable supplier (Ciampi et al., 2021).

These considerations are particularly important in the Italian context. The small size of companies remains a characteristic feature of the Italian economic system: businesses with fewer than ten employees represent 95% of the total. What's more, the average size of manufacturing companies in Italy is just ten employees, six fewer than in France and about a quarter of the size of German manufacturers.

CREDIT RATINGS IN THE NEW NORMAL OF UNCERTAINTY

Over the past fifteen years, the expectations and development prospects of companies and markets have been repeatedly tested by a series of recessionary shocks that have impacted the global economy: the bursting of the US housing bubble leading to the financial crisis of 2008, the sovereign debt crisis of 2010, the COVID-19 pandemic in 2020, and the conflicts that erupted in 2023 (such as the Russian invasion of Ukraine, the Red Sea crisis, and the Israeli-Palestinian conflict). These unexpected and unpredictable events have had systemic and global implications. Managers, entrepreneurs and policymakers have had to acknowledge a "new normal" characterized by instability, sudden shocks, and the asynchronous and overlapping diffusion of the effects of these shocks across different industrial and geographical areas.

The high levels of turbulence characterizing current competitive contexts have led to an exponential increase in business scenario uncertainty and the frequency and speed of corporate crises. This situation has generated a surge in the demand for financial resources. Companies need funds to overcome liquidity shortages caused by crises and to cover the costs of business restructuring and expansion projects necessary to adapt to the new economic, social and geopolitical realities. In the coming years, the support of the banking system will be fundamental in providing adequate financing to companies with viable industrial plans, ensuring their financial needs are met in line with expected cash flows once these projects are fully operational.

The new normal of uncertainty represents a formidable driver for the evolution of rating systems towards forward-looking approaches (e.g., Duarte et al., 2018). First, the greater unpredictability and variability of scenarios reduce the signaling value of variables related to past results and behavior. Second, the relative importance of industrial restructuring and turnaround projects is increasing. These projects, by nature, represent prospects of

discontinuity from the past and must, therefore, be evaluated with a focus almost exclusively on the future. Third, the success of financial and industrial restructuring plans depends to a significant extent on the timeliness of their implementation. An excellent turnaround project carried out when a company's deterioration is already advanced has much less chance of success than a barely satisfactory project implemented before the crisis has manifested financially.

A financial crisis typically marks the end of a process of progressive deterioration in a company's equilibrium. In the first phase, anomalies appear only at a managerial (i.e., non-financial) level, such as the loss of key managers or customers, or reduced product competitiveness (weak signals of corporate deterioration). In the second phase, economic-financial anomalies also become apparent; the imbalance becomes evident at the accounting level (deteriorating financial ratios) and/or in payment behavior (difficulty fulfilling financial commitments). The effectiveness of new rating model development processes will depend on their ability to detect weak managerial signals in the first phase, which often lasts for a significant time (even one to two years). Today these signals are almost never intercepted by traditional rating models.

EXPERT RATING MODELS TO CREATE VALUE

Over the last three decades, Italian banks have bolstered their economic performance by reducing operating costs, notably through staff reductions and branch closures. However, these strategies face natural limits due to the need to maintain contact with the local context and the impossibility of reducing costs below the minimum physiological threshold necessary to guarantee acceptable service levels. Although the banks' interest margins (the difference between interest applied to loans and interest paid to depositors) have significantly grown over the last two years due to rising central bank interest rates, this margin is expected to decrease in the next six months as the European Central Bank

(ECB) halts its rate hikes and a gradual reduction is anticipated. In the years to come, maintaining adequate profitability for banks will depend above all on better loan management, particularly improving their ability to assess customer and business project ratings.

Also leveraging the formidable predictive potential of big data, new digital technologies, and artificial intelligence, banks must invest in developing "expert" rating models, capable of capturing the onset of corporate imbalances before they become apparent at the accounting level and irreversibly impact a customer's economic and financial stability.

To this end, innovative rating models must measure, incorporate, and weigh new variables that are primarily qualitative, reflecting the inherent strategic and managerial characteristics of the firm (on which, ultimately, the resilience and ability to create value for the client company depend). These new variables include the efficacy of industrial plans, the skills and reliability of the management team, the solidity and sustainability of the competitive advantage, the quality of production and marketing policies, the adequacy of the organizational structure, the coherence between organizational structure and competitive strategy, the capability to innovate, and the ability to establish long-term relationships with strategic stakeholders (e.g., Ciampi et al., 2021). These variables are far more predictive than traditional accounting parameters and prior payment behavior, yet they are also more difficult to measure and evaluate. This requires a significant evolution in the bank's ability to analyze, interpret, and evaluate competitive strategies and business models, competitive dynamics, and the quality of managers and industrial plans – essentially, a shift towards relationship banking. In our opinion, this evolution must involve revaluing the role of the bank branch manager as the person who directly and consistently manages relationships with firms, entrepreneurs, and managers. This should lead to a renewed emphasis on the traditional role of the "bank branch director."

The latest guidelines from the European Banking Authority (EBA) on loan origination and monitoring

(European Banking Authority, 2020), ratified in Italy in mid-2021, confirm the need for evolving rating models. These guidelines clearly indicate that banks must adopt forward-looking credit rating approaches, placing greater importance on forecasts of future performance rather than solely on past economic and financial results and collateral, which should be considered only as a secondary source of reimbursement. Additionally, these guidelines stress the necessity of adequately weighing the credibility of these forecasts through sensitivity analyses capable of revealing the resilience of client companies in adverse prospective scenarios. The EBA also advises banks to give greater weight to qualitative variables such as the sustainability of the business model and competitive advantage, the adequacy of the organizational structure, the skill level of the management team, the quality of the business plan, contractual power over customers and suppliers, the presence of adequate succession plans for management, the stability of the ownership structure, and the quality of R&D investments.

To effectively implement this evolution, banks must make a leap in quality at both a managerial and organizational level. First of all, they need to overcome the separation between managing problematic loans versus performing loans. A substantial portion of banking loans are in an intermediate area, requiring personalized and flexible management and a diverse range of approaches, tools, and skills (financial, industrial, legal, and relational). Second, banks must develop new capabilities to detect and interpret the managerial (i.e., non-financial) symptoms of corporate crisis (weak signs of deterioration), before they manifest at an economic and financial level. The aim here is to allow companies to roll out necessary financial and industrial remedial measures before reaching the point of no return in corporate deterioration. Lastly, banks must evolve their overall credit culture. Such a change is not easy to achieve in a short time frame, as it requires comprehensive staff training programs, as well as new incentives to enhance the use of expert approaches in granting and monitoring credit.

ADVANCED RATING SYSTEMS TO COMBAT THE THREAT OF WEB GIANTS

A further driver for the evolution of rating models is the significant and concrete competitive threat that banks will face in the coming years from web giants (e.g., Gambacorta et al., 2022). In 2016, Alibaba founded Mybank in China, where banking regulation is much less stringent than in Europe and America. Mybank became the first bank in the world capable of operating exclusively via the cloud. By leveraging automatic credit management systems that apply artificial intelligence to big data, Mybank has virtually eliminated loan processing and disbursement times, completing the process in less than three minutes from application to disbursement. Similarly, e-commerce giants Mercado Libre and Rakuten have been operating in the banking sector in Argentina and Japan for several years. What's more, in 2011, Amazon launched Amazon Lending, an experimental loan service offering up to \$750,000 to a selected group of small and medium-sized firms with an Amazon seller account. Currently, Amazon provides over \$5 billion loans annually through this service in the US, Great Britain, Japan, Canada, India, France, and Italy. By the end of 2018, Facebook had obtained a banking license in Ireland, and Amazon in Luxembourg.

These web giants are gaining substantial experience in the banking sector and are working on designing entry solutions that comply with the stringent requirements of European and American banking supervisory regulations. Once they complete this phase and begin operating on a large scale with their digital banks, the effects on the competitive dynamics of the banking sector could be profound.

Internet giants will in fact be able to exploit significant synergies between the traditional platform activities and their new digital banking operations. For example, they could channel payments from sales made on their web platforms and use these payments as collateral or as a direct source of loan reimbursement. They might also offer banking services at particularly competitive

costs (or even free of charge) to acquire valuable new information about their customers (income levels, investments, planned projects, spending behavior, etc.) thereby generating further value creation opportunities in their traditional platform management activities. Moreover, these new competitors can leverage the wealth of data and information from activities on their platforms (transaction volumes and value, competitiveness of commercial offers, past reliability, etc.) to implement

highly effective, AI-based algorithms for measuring their customers credit ratings.

No traditional player, regardless of its size and structure, will be able to match the information collection and processing capacity of the major internet players today. To avoid entering a competitive arena where failure is almost certain, traditional banks must refocus their business on segments of banking services with higher added value, particularly those grounded in relationship

FIGURE 2 EXPERT RATING MODELS: FOCUS ON QUALITATIVE, FORWARD-LOOKING PREDICTIVE VARIABLES

Variables related to Competitive Strategy

Competitive advantage drivers
Competitive advantage strength
Competitive advantage sustainability
Business model consistency
Customer turnover
Customer satisfaction by customer/product/market segment
Market power
Strategic supplier turnover
Degree of satisfaction of strategic suppliers
Reliability of industrial plan
Economic and financial projections
Reliability of assumptions underlying the industrial plan
Contractual power of customers
Contractual power of suppliers
Product innovation capability
Process innovation capability

Variables related to Management

Strategic management skills
Leadership skills
Ability to delegate
Financial skills
Marketing skills
Technological skills
R&D skills
Administrative skills
HR skills
Management team reliability
Quality of management succession plans
Presence of independent managers
Turnover of management team members
Management team size

Variables related to the management of specific functional areas

Quality of marketing policies
Quality of production policies
Quality of supply policies
Quality of R&D policies
Quality of human resource management policies
Quality of management control system

Variables related to Organizational Structure and Human Resources

Adequacy of organizational structure
Consistency between organizational structure and competitive strategy
Quality of the organizational climate
Level of competence of employees who work in different management areas
Average salary of employees who work in different management areas
Degree of satisfaction of employees who work in different management areas
Employee turnover

Variables related to Ownership Structure

Financial capacity of company owners
Stability of ownership structure
Managerial culture of company owners
Degree of ownership concentration
Degree of company owners' cohesion
Degree of overlap between ownership and management

Variables related to Corporate Governance

Board size
Skill level of board members
Complementarity of board member skills
COE duality
Presence of independent directors
Turnover rate of board members
CEO turnover
Remuneration policies for board members
Remuneration policies for management team members

banking rather than transactional banking. In this the competitive advantage will continue to depend on the capability to collect, interpret, and update soft, qualitative information on companies and projects that require financing. This capability can only be sustained through community presence and direct, ongoing customer relationship management – capabilities that large digital players currently lack and will struggle to develop in the future.

To achieve this, credit institutions must redefine their business model by gradually reducing the scope of service areas with lower added value and divesting activities that are not aligned with the core competencies of traditional banks, such as real estate brokerage services. The development of expert rating systems aligns with this strategy. These systems must effectively weigh quantitative and retrospective variables, although competing with web giants in managing these variables will become increasingly challenging. More importantly, however, they must effectively manage qualitative variables related to strategy, management and organization projected into the future, such as the reliability of industrial plans and the sustainability of competitive advantage. Traditional banks, deeply rooted in the community and immersed in stable relationships with local businesses, possess the ability to grasp, measure, and weigh these variables with a level of detail, depth, and immediacy that no internet giant can match.

INCORPORATING ESG VARIABLES

Today, society's demands for sustainability significantly influence the business models and competitive strategies of companies. These demands have led national and supranational policymakers to establish increasingly complex systems of rules and obligations, aiming to compel companies to adopt sustainable practices. For instance, European legislation on Extended Producer Responsibility progressively regulates manufacturing companies' responsibilities in managing various phases of their product life cycles, emphasizing end-of-life

management, recycling, and waste and scrap reuse.

More relevant is the effect that these social and environmental sustainability issues are having on how companies develop their business strategies. The trade-off between economic value creation and sustainability is evolving into a mutually supportive relationship. To create value, companies must establish solid and enduring relationships with customers, based on high levels of reputation and credibility. Today, a company's environmental and social sustainability, along with that of its products, are prerequisites for initiating and maintaining trust-based relationships with consumers, especially younger ones. Recent research by the Boston Consulting Group (2022) highlighted that when faced with two products of equal price, four out of five consumers prefer to purchase the one characterized by high levels of social and environmental sustainability, with particular attention to aspects relating to climate change, food safety, CO₂ emissions, and consumption of scarce resources. Additionally, research conducted by Deloitte (2022) showed that both Millennials (individuals born between 1980 and 1996) and Generation Z (born between 1997 and 2012) closely consider environmental and social issues and demonstrate a relatively higher propensity to purchase products distinguished by high levels of sustainability.

To create value, companies must also excel in selecting and retaining talented human resources and fostering stable, solid relationships with strategic suppliers. A plethora of empirical evidence (e.g., McKinsey & Company, 2021) illustrates that environmental and social sustainability rank at the top among the main criteria individuals consider when choosing their workplace. What's more, the vast majority of employees consider their employer's commitment to environmental issues and, even more so, to social aspects such as gender inclusion, diversity appreciation, and work-life balance, as fundamental elements for nurturing long-lasting, fulfilling working relationship.

The medium-term resilience of a company depends on its ability to generate value for customers, cultivate strong relationships with

employees and suppliers, and uphold and defend its reputation and credibility towards financial operators. All these stakeholders measure “value” with regard to environmental and social criteria, in addition to economic factors. Consequently, today, a company’s resilience is closely linked to its ability to construct business models and development strategies grounded in the relevant drivers of sustainability, and to establish environmental and social sustainability objectives that extend beyond simple regulatory compliance.

Therefore, to endure adequacy in terms of predictive effectiveness and forecasting horizon, the new rating models must also possess expertise in reading, weighing, and interpreting the dual materiality of the relevant ESG variables (e.g., Badayi et al. 2020). This entails understanding both the impact of these variables on the competitive positioning, development prospects, and performance of the client company (Financial Materiality), and the impact of the client company’s ESG policies on society and the environment (Impact Materiality).

MANAGERIAL IMPACT FACTOR

- Rating models used by banks today are predominantly based on quantitative and retrospective predictive variables, such as balance sheet ratios and explanatory indicators of past performance of the bank-firm relationship.
- Various empirical studies have shown that such models perform poorly, especially when forecasting beyond a one-year horizon and when analyzing SMEs.
- The high level of uncertainty in today’s competitive environment is driving the evolution of rating models towards forward-looking approaches that are capable of intercepting, assessing, and weighing weak signals of deteriorating business balance processes before they manifest themselves economically and financially.
- New rating models will have to measure, incorporate and weigh new variables of a qualitative nature, inherent in the strategic and managerial character of the business system.
- The company’s resilience and ability to create value ultimately depend on these qualitative variables.



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