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FINANCIAL FIRMS' CRISIS AND PRODUCTIVITY ANALYSIS

Prompting to measure the firms' adequate organizational set-ups

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INTRODUCTION

The EU Directive 2019/1023 of 20th June 2019 (the so-called *Insolvency*) ensures that companies in financial difficulty have the opportunity to access "national preventive restructuring frameworks", or a system of tools and procedures that Member States are required to make available to all those who carry out an economic activity, in order to manage their crisis. The ability to recognize in advance the onset of potential critical issues, so as to intervene adequately and limit the damage, is increasingly significant in the business context, since it is undisputed that the passage of time aggravates the loss of value of the company.

In the referenced literature so far consolidated, numerous diagnostic tools start from the analysis of balance sheet data and from the elaboration of specific performance indicators. However, the partial ineffectiveness shown so far by these indicators to discriminate companies in crisis from healthy ones, especially in a context in which the entire global economic system is compromised by the harmful effects of the pandemic, induces the European legislator to favour an approach aiming at the emergence of the forerunners of insolvency no longer backward oriented, but forward looking.

A risk management system, which favours the choice of risks to be avoided over those that can be mitigated or transferred to others, is essential for the construction of indicators, including non-financial ones, useful for monitoring the health of the company over time. More generally, an adequate organizational, administrative, and accounting structure must ensure that the management of the company develops, in compliance with the conditions of equilibrium of the company system, according to the achievement of the objectives defined by the subjects charged with governance mandate.

A useful model to define these objectives and, more generally, to guarantee the strategic control of the company is the so-called balanced scorecard

(Kaplan & Norton, 1992), which represents a dashboard of indicators to be divided into four balanced perspectives: beyond to the economic-financial perspective, which brings out the result of previously undertaken actions, other three linked to the drivers of future value creation are analysed (the customer perspective, that of internal processes and, finally, that of training and growth).

Anticipating and managing opportunities and risks of non-strictly economic nature means having a competitive advantage; just think, by way of example, how much the sustainability objectives are able to significantly influence the image and corporate reputation.

This work addresses the issue of business crisis prediction, through the study of different machine learning models, such as logistic regression, classification trees and neural networks. A comparative, quantitative approach is provided in order to assess the goodness of each model, and to find the best fitting quantitative analysis to each case submitted.

The present book consists of three main sections, which offer an overview of the topic from different perspectives, looking at the most effective solution to insolvency forecasting issues. The first section of the book provides a general assessment of the extant normative and regulatory framework, discerning from the European legislation and the adaptation of the national accounting principles and risk management issues on financial resilience and stability. In this section, elements related to the early warning tools, the national preventive restructuring frameworks and the related approaches are exposed, with a specific focus on how the Italian system manages such instruments.

The second section of the book outline a bibliometric analysis of the extant literature, assessing the most used and mainly studied methodologies employed to perform risk analysis and insolvency forecasting. For this reason, a set of keywords were analysed and processed via one of the most exhaustive repositories of documents, i.e., Scopus, which allowed to perform the bibliometric analysis on 3,526 documents extracted from 1,709 different sources. Analyses on citations, authors, keywords, and literature strands were carried out to provide a general overview of the state of the art of the research in the field and the main issues detected to conduct future research.

The third section consists of the main object of the volume, providing a complete, quantitative approach to the study of the phenomenon. Indeed, this section is composed of a research framework that is accomplished through the application of three different methodological approaches, i.e., the approach provided by the National Council of Chartered Accountants and Accountants (CNDCEC), the Altman score approach, and the Efficiency and Productivity approach. All of such methodologies have a clear recognition

among scholars and practitioners, and the application to a single case study provides an excellent mean of comparison in the framework of this plural approach to the problem. A dataset of more than 10,000 firms was analysed with each methodology to provide the correct assessment of the phenomenon and outline the best empirical strategic approach.

The novelty of such volume is carried on by its very nature, consisting of the opportunity to parallelly assess effective, recognizable methodology to discern possible common implications and substantial differences, based also on the opportunity to let academics, professionals, and policymakers, to adopt multiple schemes of approach, equally eligible to perform forecasts on a forward-looking basis.

1. THE COMPANIES' CRISIS: THE LEGISLATIVE PERSPECTIVE IN A EUROPEAN COMMON FRAMEWORK

1.1. Premises

On implementation of Proposal no. 2016/0359 of 22 November 2016, the Parliament and the Council of the European Union issued Directive 2019/1023 (so-called *Insolvency*) on 20 June 2019. The purpose of the directive was to ensure, through the harmonisation of national laws on preventive restructuring, insolvency, discharge, and disqualifications, the proper functioning of the internal market, as well as the full exercise of fundamental freedoms of movement of capital and the establishment of activities.

The Directive was intended to remove existing market viscosities by amending 2017/1132 to aid companies in financial difficulty. The goal was two-fold. First, it was intended to create the possibility of firms to access "*national frameworks on preventive restructuring*" that allow them to continue operating, without prejudice to the rights of workers. Second, it was intended for firms to have more effective procedures (both restructuring, and insolvency and discharge), at least in terms of duration. The shortening of the duration, in particular, of restructuring procedures would have the effect of increasing recovery rates for creditors, as the passage of time aggravates the loss of value of the company.

Among the various innovations introduced by this directive, the main one concerns the obligation for Member States to ensure a regime aimed at facilitating the preventive restructuring of the company whenever an *insolvency likelihood* is found. The competent bodies of the European Union had already expressed with the Proposal for a Directive of 22 November 2016 (and, therefore, at a time well before both the pandemic and the global economic crisis that ensued) the wish for preventive restructuring. This includes the wish to guarantee "*healthy companies in financial difficulty... access to a*

national insolvency framework that allows them to restructure at an early stage in order to avoid insolvency, thus maximising the total value for creditors, employees, owners and the economy in general".

The pandemic has only exacerbated, also at the macroeconomic level, the need for companies in difficulty to have the tools to deal with the increasing number of situations of economic and capital imbalance that, while revealing the existence of a crisis, can be considered reversible. All the more so as a result of the cessation of the transitional support measures for them which the various Member States have provided: for example, financial contributions, tax concessions, moratoriums on loans, measures to maintain employment levels, as well as measures relating to the drawing up of budgets and, in particular, business continuity.

In particular, it is a question of implementing a system of instruments and procedures, called "*preventive restructuring frameworks*", that are to be made available to all firms who carry out an economic activity. The intent is to allow them to manage their crisis, to ensure the sustainability of their company and to prevent its insolvency, making it possible to protect jobs, minimize losses for creditors in the supply chain, preserve the *know-how* and skills of the company and more generally, to prevent the accumulation of impaired loans in periods of unfavourable economic conditions, mitigating their negative impact on the financial sector.

Member States shall consider whether to include in the harmonised instrument those cases where economic activity is continued on an indirect basis, thereby transferring the holding in operation to third parties, or by transferring it to new or existing companies, or even by other means.

1.2. The objectives pursued by the *Insolvency* Directive

The fundamental aspects of the aforementioned "*frameworks*" include: the provision of *early warning tools*; the possibility of granting and revoking the suspension of executive actions; the content and discipline of the restructuring plan; the training regime, in some respects compulsory, of classes, including *equity holders*; the interventions, on the one hand limited and on the other mandatory, of the judge and the administrative authority that in some jurisdictions exercises its functions (in Italy, for example, it is the Ministry of Development in the case of extraordinary administration).

Key aspects already clearly indicated in the original text of the then Proposal for a Directive of 22 November 2016 include the concept that debtors in each Member State must "*have access to one or more clear and tran-*

sparent early warning instruments capable of identifying situations that could lead to the probability of insolvency and of informing the debtor of the need to act without delay".

In order to avoid insolvency, therefore, the European legislature is oriented towards voluntary initiatives by the debtor, and supports a lean but articulated system of advisory and information services. Although this prospect could involve excessive reliance on the initiative of the debtor (whose intervention could be late and perhaps dispersive of those resources that should be used to rehabilitate the company early), a precise choice of field is implemented that invests in trust towards the debtor and in its ability to promptly recognise from within the need to face the situation.

As mentioned, the Directive deals with two further issues, complementary to the aforementioned "*preventive restructuring frameworks*": 1) that of measures aimed at increasing the effectiveness of all restructuring and insolvency procedures (and, therefore, not only of the "*frameworks*"), and 2) that of the discharge of persons in crisis.

As regards the former, in accordance with recital 85, Article 25 requires Member States to ensure that restructuring and insolvency proceedings are dealt with by judicial or administrative authorities, whose members are specifically trained and competent. In this regard, recital 86 specifies that the appropriate means to achieve the objectives of efficiency and speed "*could* (but should not) *be the creation of judicial bodies or specialised sections or the appointment of specialised judges in accordance with national law, as well as the concentration of jurisdiction in a limited number of judicial or administrative authorities*". For example, special "restructuring courts" have been set up in Germany and the Netherlands.

Equally adequate training (including cross-border training) is required for professionals appointed by the judicial or administrative authorities by article 26. This article also requires clear, transparent and fair conditions for the appointment, revocation and resignation from office, as well as the possibility of the debtor and creditors to oppose their choice or appointment, or to request their replacement, in order to avoid any conflict of interest.

In line with the stated objective of ensuring the effectiveness of restructuring and insolvency proceedings, Article 27 calls on Member States to: 1) submit, in a public and transparent manner, appointed professionals to supervision positions within the exercise of their tasks, 2) within supervisory mechanisms that ensure that functions are carried out with competence, effectiveness, impartiality and independence from the parties involved, 3) encourage adherence to codes of conduct, 4) regulate their remuneration in line with the objective of efficient procedures, and 5) establish appropriate pro-

cedures to resolve any disputes over their remuneration. In the wake of the intended effectiveness of the procedures, Article 28 also prescribes the use by operators of electronic means of communication, although providing for longer times for the transposition of the prescriptions.

In summary, the Directive not only makes available the procedures and instruments of preventive restructuring in favour of debtors who intend to continue economic activity, if even partially, but it also guarantees the effectiveness of the instruments that aim at the total liquidation of the assets. A secondary issue that is complementary to the "*preventive restructuring frameworks*" is the possibility for entrepreneurs to obtain debt relief more easily. The aim is to avoid exclusion from the market those firm owners who have poorly managed the risk inherent in the economic activity carried out without having exhibited reckless conduct, and, more generally, to allow them to restart one by drawing lessons from experience.

1.3. The company's *early warning tools*

In governing the regulation of situations of economic-financial or capital imbalance that risk compromising the ability of companies to continue to operate as operating entities in a defined period of time, the European legislator introduces a taxonomy – actually already present in the academic field and expressed there in an even more widespread way – of the stages of growing difficulty in which the debtor can be.

The firm may initially find itself in the *crisis* stage, which manifests itself as an inadequacy of its prospective cash flows to regularly meeting the obligations over a predefined period of time (for example, the following twelve months). The firm then may move to *insolvency*, which manifests itself with defaults or other external events capable of demonstrating that the firm is no longer able to regularly meet its obligations.

Whether the temporal transitioning of firms across these stages of increasing financial difficulty is adequately identified is secondary. In fact, the awareness that "cash is king", i.e. the lack of liquidity, has an immediate external value such as to be able to compromise the ability of a company to remain in the market, regardless of the configuration of economic and financial difficulties. The fundamental principle remains that when the entrepreneur is in a state of crisis that could result in insolvency with some significant probability, the entrepreneur is encouraged to undertake, under certain conditions, a judicial restructuring process aimed at avoiding potential bankruptcy. These are the so-called "*preventive restructuring frameworks*",

defined by Article 2 of the Directive as "*the measures and procedures aimed at the recovery of the company through the modification of the composition, status or structure of its assets and liabilities or capital*".

The notion of crisis on the one hand presupposes a non-static vision, or a perspective of the evolution of the company's activity. On the other hand, such crisis places the burden on the firm's directors to undertake prompt action to adopt and implement one of the instruments provided for by law to recover business continuity. The intervention of the directors is made more effective when its activation is timely, as is clearly crystallized by both recital 22 of the Directive ("*The sooner a debtor is able to identify its financial difficulties and take appropriate measures, the more likely it is to avoid imminent insolvency or, in the case of an undertaking whose economic sustainability is permanently compromised, the more orderly and effective the liquidation process will be*") and by recital 24 of the Directive ("*It is appropriate that debtors ... have a restructuring framework that allows them to cope with financial difficulties at an early stage, when it seems likely that insolvency can be avoided and the sustainability of the insured activity*").

A successful outcome requires that an effective corrective strategy be made in a timely attempt at financial recovery, hopefully through sustainable solutions, before insolvency becomes irreparable. This reality suggests the prudent opportunity for directors to equip themselves with proper tools of corporate governance systems, both external and internal, that allow them an appropriate early diagnosis of the firm's present state of difficulty. These are the so-called *alert mechanisms.*

An external alert is defined as the report made by qualified public creditors (for example, the tax and social security administration) or by credit institutions to the administrative body, concerning the overrun by the company of certain thresholds of absolute or relative indebtedness. The internal alert reflects the burden on both statutory and independent auditors to report to the administrative body both the existence of the causes of crisis and the need to intervene to restore the conditions of business continuity. They also monitor the outcome of the activities carried out by the company for this purpose to remedy the contingent situation. The promptness with which this report is made is also relevant for the purposes of any liability actions that may arise.

The significant increase in the liability of independent and statutory auditors in the corporate crisis prevention system in this situation could also lead to increased reports of firms in financial and economic difficulties, which are not in fact likely to affect business continuity. The risk to be avoided, in other words, is that the internal control bodies promote

premature, rather than timely, reporting that brings out situations of purported difficulty that instead may still be physiological (the so-called *false positives*).

Generally, early emergence of the crisis is revealed through the analysis of financial statements. Such analysis develops a series of *performance* indicators based on consolidated accounting results. These indicators are important if monitored over time and properly compared between uniform companies (although such uniform companies are not so easy to identify). However, at a time when the entire global economic fabric is compromised by the harmful effects of the recent pandemic, he efficacy of such analyses may decline, potentially generating distortive informational effects. We refer to the many companies whose financial statements are deteriorated by the socio-health restrictions still held in place. These firms could, if immediately entered into the warning circuit and the inevitable preventive restructuring frameworks, incur an inevitable judicial liquidation. This would lead to a destruction of value, despite the Directive intending to privilege those mechanisms designed to protect firm continuity with respect to its automatic liquidation.

Regardless of the pandemic contingency in the evaluation of a firm's financial health, the ensuing economic crisis is no longer considered as a pathological moment in a company's life, but rather an integral part of the broader and dynamic system of management and control of the physiological risks associated with the overall business organization.

The partial ineffectiveness exhibited by these financial indicators, developed on the basis of consolidated accounting data to distinguish companies in crisis from healthy ones, induces the European legislator to favour emerging insolvency products of the type that no longer look *backward* at financial information but look *forward*. In other words, if financial statement results allow for evaluating the result of actions previously undertaken, *budget* forecasts and the continuous monitoring of their compliance allow for the timely identification of a pending crisis.

The directors, therefore, have the obligation to act not only against the loss of share capital when the effects of the crisis have already occurred (*backward* approach), but also act in advance, to effectively pursue negotiating solutions to the crisis (using the *forward* approach). The instrument that directors can use to properly assess prospective cash flows in an appropriate and timely manner – i.e. those expected to be received – are suitable for meeting maturing obligations. This is, in particular, the treasury *budget*, which shows the expected financial income and expenditure over a predetermined period of time. These forecasts are functional, moreover, to implement

the use of the so-called prospective *debt service coverage ratio*, which specifically indicates whether the company will be able to cope precisely with maturing debts through the cash flow predictably generated by operational management and other management.

The monitoring of financial assets and debts, both within the current stage and in their evolution over time, should be based on reliable assumptions. Thus, the basis of the anticipated management trend should enable – in the hopes of regulatory reform – rapid decisions on what solution would avoid the emergence of a state of financial decline. Such an approach to insolvency forecasting cannot be separated from the adequacy of the organizational, administrative and internal accounting structures, nor of the mechanisms, tools and information and organisational procedures. This latter group can be define as "*internal controls*" that are prepared by management to ensure, on a budget and in the final balance, the direction and monitoring of company *performance* in relation to the achievement of the set objectives (strategic, operational, reporting, compliance).

The internal control system, designed by the so-called *Coso American* framework, requires each entrepreneur to pursue the effectiveness and efficiency of operational activities that guarantee the effectiveness of management, financial and protection targets of the company's assets. this requires the reliability of financial information, both internal (which must be timely) and external (which must be transparent). Further, compliance with the laws and regulations currently in force is essential. The pursuit of these aforementioned business objectives requires the business organization to implement a *risk management* function, which is called upon to identify negative events (*event identification*), assess the probability and extent of economic impact (*risk assessment*), and identify the optimal countermeasures (*risk response*).

A *risk management* system, which favours the choice of risks to be avoided with respect to those that can be mitigated or transferred to others, is essential for the construction of indicators. This includes non-financial indicators that are useful for monitoring the health of the company over time. The construction of exclusively accounting indicators, in fact, fails to account for numerous risks to which the company is subjected, such as environmental, reputational, strategic, organisational and market risks, which can undermine its continuity.

Therefore, in order for the use of the aforementioned *debt service coverage ratio* as a robust predictor of firm insolvencies, its construction must be based on an internal and external analysis of current and expected business conditions. These considerations cannot be separated from a careful assessment of all risks, even those not strictly related to mere economic-financial

characterisation. For example, a company with a constantly growing labor force turnover but still exhibits healthy financial metrics could be exempt from the prospect of a future crisis, that is if the firm were assessed exclusively with the help of indicators expressing past *performance*. However, such a firm could still be subject to a market risk, such as exposure to the risk of market obsolescence in the products/services being offered. Those non-financial indicators that are useful to detect advance the signs of a possible state of financial crisis include the degree of use of infrastructure, the methods of organisation of human resources, *customer satisfaction*, the loss of customers/strategic suppliers, the presence of disputes capable of impacting management performance, and so on.

1.4. The appropriate organizational arrangements

It is not easy to identify a set of *key performance indicators*, financial or otherwise, that are appropriate to the size, structure and nature of the individual firm. It is necessary to first know, in a timely and complete manner, the firm's economic activity and the critical success factors driving the continuity of this activity. In any case, in its document *Integrated reporting for Smes: implementation guidance* of 2018, the *Italian Business Reporting Network* clarifies that these indicators must be at least consistent with the company's objectives and strategies, best represent the value creation process, and be reliable and comparable.

It is, therefore, necessary to define the company's *mission* and objectives, identify the financial and non-financial aspects that should be (and can be) measured, collect and analyse this data and, develop the appropriate *key performance indicators*. A useful model for the such preparation and, more generally, for the purposes of strategic control of the company, is the so-called *balanced scorecard* (Kaplan R., Norton D.). This model is a dashboard of indicators articulated in four balanced perspectives. It combines the traditional economic-financial perspective with the result of actions previously undertaken by the firm. It then adds three other metrics related to the drivers of future value creation are analysed (the customer's perspective, that of internal processes and, finally, that of training and growth).

The *balanced scorecard* approach allows an organization to translate its *vision* expressed in terms of objectives, measures, *targets*, and initiatives, taking its cue from the awareness that value creation is not related only to tangible assets. Value creation also resides in the ideas of the people who work within the firm, in the relationships with customers and suppliers, in

the information available in its *databases*, in maintaining a culture of continuous innovation, and in the quality of its internal processes. In fact, it is necessary to identify what the value proposition for the customer (customer perspective) should be, in which processes one should excel (perspective of internal processes) and with which people and technologies (perspective of growth and learning).

The value of this tool also lies in the ability to describe the cause-effect relationships between the different levers on which firm strategy is based, and to communicate to the organisation the operational meaning of the same. Moreover, by monitoring performance against strategy over time, companies can adapt their strategies to any changes in the competitive environment or develop new ideas and formulate new directives. For example, firms can check whether the assumptions underlying their strategies are still valid, or need to be modified to adapt to new market conditions.

A similar approach to company management means that the strategy, in addition to being set up and implemented, is continuously reviewed, which allows for the timely management of even the most harmful phases of company life, such as the possible crisis, in order to prevent insolvency and ensure the economic sustainability of the activity (with every benefit in terms of preservation of jobs). Think, for example, of the resilience that companies were called upon to show during the pandemic, understood as the ability to adapt their business to market changes and to resist the crisis triggered by the health emergency.

On the other hand, anticipating and managing opportunities and risks – both present and future, and not only of a strictly economic nature - means having a competitive advantage that allows you to create value in the long term. Consider, for example, how much sustainability objectives are able to significantly influence the image and reputation of the company. It is no coincidence that non-financial *disclosure*, allowing for proper evaluation and a *forward-looking* perspective, the company's medium-long term survival capacity is increasingly appreciated by corporate *stakeholders*.

The growing interest of *stakeholders* in reporting in terms of sustainability derives from the awareness that companies assume a decisive role within the fabric in which they operate. They are, in fact, invested with a responsibility linked to the impact of their activity on the company, as also noted by the European Commission. By way of example, the attention of companies to their consumption of natural resources and, more generally, to the impact of operational activities on the environment (in terms of energy efficiency, greenhouse gas emissions, management of water resources and waste, etc.). Such awareness can protect the firm from risks that are associated with a