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Highlights

The Impact of AI on Leadership

The Mediation Effect of Supply Chain

Discovering Thoughts, Inventing Future

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By Dr. René Rüth & Dr. Torsten Netzer

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The first route, for which numerous publications are available, focuses on the implementation of AI and shows, which tasks leaders should perform to ensure acceptance amongst staff and smooth operation of AI in their companies. However, little can be learned about an AI as an established employee of a company. The perspective on the relationship between leadership and AI is only addressed by a small part of the research literature and forms the second route. It merely indicates procedural issues and ethical questions as challenges for AI leadership in years to come and also gives first considerations on future leadership by AI.

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The Impact of AI on Leadership: New Strategies for a Human - Machine - Cooperation

Dr. René Rüth [α] & Dr. Torsten Netzer [σ]

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Once the current issues concerning management and AI have been compiled, it becomes clear that the decisive challenges from AI can only be overcome, if basic principles are followed. These are called transparent leadership in the following, outlined at the end.

I. Introduction: AI in Corporations

The dream of machines executing the work, while enabling people to focus exclusively on what they enjoy goes back centuries (Skilton & Hovsepian, 2018). Today we are closer than ever to accomplishing this aspiration. But contrary to the original hopefulness, the image of endless bliss and sweet idleness seems far from being within reach. AI keeps us on our toes, and its translation into economic processes even increases the tasks to be accomplished. Frequently new technologies not only replace earlier action steps, but also create new ones in addition to existing procedure. Some examples from recent developments (may) confirm this notion.

Software for optimizing business processes has been in use for a long time. SAP, one of the most prominent providers in this field of applications, covers many business activities in planning and execution, including: controlling, sales, logistics, HR, CRM and R&D (Leukert, Müller, & Noga, 2019). AI has given this management software a boost: Once connected to automated monitoring sensors in warehouses and interfaces with devices throughout the enterprise, AI is able to independently aggregate data, evaluate what should be done in future, and even execute decisions (Leukert et al., 2019). Although this accelerates the usual business processes, care and conscientiousness must be invested in the adoption of such a system into the company, in the development and maintenance of the respective software tools and in monitoring the decisions of the automated system. Once firmly established, AI creates many more possibilities for analyzing and controlling business process than were previously achievable by employees only. However, instead of replacing these people, their tasks have changed to interpreting automatically generated data analyses and operating with new parameters for evaluation.

Another example comes from the financial sector, which is particularly prone to the implementation of AI measures and in which the automation of workflows is also an issue, e.g., the automatic verification of a debtor's credibility or the cross-checking of relationships between people involved in financial fraud (Kreutzer & Sirrenberg, 2020). However, AI-based applications were also developed to perform high-frequency trading and decide on huge investments in a fraction of a second (Kreutzer & Sirrenberg, 2020). In such cases the data quality and the precision of the algorithms must be double-checked consistently. Otherwise, a flash crash like the one on May 6, 2010, which shook the financial world to its bones, could occur (Bowley, 2010). Obviously, AI does not replace human beings, but confronts us with new tasks and requires a new kind of interaction. This is surprisingly little reflected in current leadership studies.

Although there are many theoretical and best-practice models for implementing AI (Ashri, 2020; Bootle, 2019; Burgess, 2018; Castrounis, 2019) there is often little talk about how to tame, control and manage AI technology in companies (Klein, 2020) by enabling people to develop a thorough understanding of an 'augmented collaboration' to secure a company's survival in the future. So, what about leadership with AI? How to co-work with machines? Does AI change leadership in terms of its goals and means? In this article we will look at leadership beyond digital leadership. It will present some very current strategies for leadership with and in the face of AI. Finally, it will build on these ideas and outline a comprehensive model of transparent leadership that will be able to integrate the various demands that AI presents to business leaders.

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II. Leadership and Artificial Intelligence

a) *Envisioning the Future*

Managers have long been recognized as leaders in business (Zaccaro, 2014). A few decades ago, however, two roles were distinguished (Kotter, 1990). Since then, managers are identified with executives who run the day-to-day operations, review the numbers and take care of all business processes (Yukl, 2013). This must be separated from the role of leadership in companies (Algahtani, 2014). Of course, the tasks of both roles can also be performed by one and the same person. But the larger the corporation and the higher the hierarchical position, the more these two roles should be separated. In contrast to management, leadership goes beyond the daily business processes and focuses on the future of a company (Northouse, 2016). The reason for this is a need for envisioning future business models with a better ROI by anticipating innovations that could improve the company's market position, or by reflecting the behavior of customers and competitors in order to predict how the market might change in future (Yukl, 2013). In times of rapid change such as the current digital transformation, it is particularly important to think about the future and dissociate from the everyday perspective, because the changes ahead could be revolutionary for many companies. Therefore, being "innovative visionary" and "having a futurist entrepreneurial mentality" are two crucial qualities leaders should possess (Klein, 2020, p. 895). At least this applies to digital leaders. But will it also have a bearing when it comes to AI?

b) *Revolutionary AI*

The digital transformation is omnipresent: laptops, smartphones, smart products. All of which have become quite familiar in recent years and are a big topic in the leadership literature. AI is just as universal in today's world, often secret and obscure to many people. This could be the reason why leadership is a major topic in studies on digital transformation, such as Kreutzer, Neugebauer, and Pattloch (2017) but less so in studies on AI, since it can be illustrated by an equally comprehensive publication by the same author on AI: Kreutzer and Sirrenberg (2020). This is surprising, as AI has far more disruptive power than the mere digitization of business models and processes.

As is often the case with jargon, the term AI "is notoriously hard to define" (Ashri 2020, 15). When it was first coined about 70 years ago, scientists were driven by the dream of soon developing machines that could compete with humans in terms of intellectual, emotional and even cognitive characteristics (Taulli, 2019). For several decades, computers were far too slow to even come close to something remotely similar to human intelligence. It is only in the last decade or so that computer performance has risen to a level that can create some kind of intelligence. However, it turned out that AI is still not quite identical to what we call human intelligence, but it shares some characteristics that scientists did not expect when AI was first conceived. To understand what AI is, it helps to describe what it does.

Recent innovation leaps have led to a sharp increase in computer power. This was not only due to Moore's law (Brock, 2006) but also because graphic processing units (GPU) have proven to be much more suitable for calculating large data blocks in parallel than the traditional central processing units (CPU) (Schürholz & Spitzner, 2019). Even before the introduction of GPUs, a method called machine learning (ML) had been developed in the 1980s. It enables computers to structure large amounts of data by breaking down terms into tiny elements. Which of these an AI uses is determined by programmers who execute algorithms with different sets of elements and who finally decide which produce the best results (Zhou & Chen, 2018). Once these elements are set, machine learning systems improve autonomously through the amount of experience they gain in resolving given data into these elements and rearranging the information of each to complete the task for which it was created.

Based on the better performance of GPUs, a new and more powerful type of AI, called deep learning (DL), has been developed in recent years. DL takes advantage of the structures of natural neuronal systems that have been uncovered by neuroscience. While ML was based on elements that require conscious decisions by programmers, DL only requires specification on how many neuronal layers are to be established between the input and the output levels of the algorithm (Sejnowski, 2018). The number of those layers determines the complexity and increment of computations that a particular DL algorithm is capable of. Their number is limited only by the power of a computer and the time taken to achieve the result (Gentsch, 2018). The big difference between ML and DL is, that in ML the analytical structure of a given algorithm is defined, while in DL the algorithm independently finds out which elements it should distinguish in order to perform the given task most efficiently. Since DL machines can not only learn how to do things, but also assess what needs to be done, they are the driving force behind the current AI evolution (Ertel, 2016; Lanzetta, 2019).

Two reasons for the dramatic increase in AI performance in recent years have already been mentioned: Processing power and intelligent algorithms. The third reason is the availability of big data (Hildesheim & Michelsen, 2019). Only with the help of huge data sets can AI algorithms be trained to function correctly. However, researchers and practitioners of AI point out, that AI is currently often over- and underestimated (Skilton & Hovsepian, 2018; Wess,

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2019). It is overestimated as there still is no well-defined way of creating a human-like machine. On the other hand, AI is underestimated because it is far more powerful and widespread in companies than most people might think. This is where leadership comes in.

III. Connecting People and Technology: how to Create A Perfect Match

a) Central Elements for a Beneficial Relationship

According to the evolution of AI, we are still in the first stage, which is called narrow AI (Hildesheim & Michelsen, 2019). Here, AI is able to perform rather precise tasks independently. The second level is the general AI, a level at which machines become similar to humans. In the distant future, there could also be a third type, called super AI, far beyond human intelligence. To date, only narrow AI has penetrated the realm of the economy. However, despite its widespread use in many industries, AI is yet to be extensively disseminated. Even narrow AI has not been realized completely. This means that the application of AI involves working, experimenting with its possibilities, trying out different algorithms, testing its capabilities, and constantly monitoring and improving results. AI is the opposite of a product that works 'out of box' (Boobier, 2018). At present, there are therefore two ways of applying AI. First, AI helps to be efficient in intellectually simple tasks with a high degree of repetition, such as in a smart factory where product assembly is done individually but in an identical framework. Second, AI can be used to analyze huge blocks of unstructured data (Hildesheim & Michelsen, 2019). For companies, both types of AI application mean that they are facing great challenges. Leadership must not only decide which path to take, but also prepare the implementation.

In recent research on AI and leadership, this period of implementation has received the greatest attention. Considering that business leaders should anticipate future developments and then motivate their employees to share this vision, the implementation of AI is an outstanding aspect of leadership (Daugherty & Wilson, 2018). The statements of this perspective on how the relationship between leadership and AI should be shaped are explained in chapter 3.2. However, this research perspective reflects little on the change that AI will bring about in the way companies are managed, once AI technology is introduced. Nevertheless, this second perspective is very important because it takes into account the consequences that AI will have for leadership in the future. This is particularly important because AI will intervene more deeply in the way companies are run than any technology has done before (Hildesheim & Michelsen, 2019). Research on this second perspective is discussed in chapter 3.3.

b) Leadership during the Implementation of AI

Since AI will change organizations profoundly, many employees and managers are reluctant to get involved in AI implementation. Simultaneously, AI is revolutionizing products, business models and markets – not to mention the efficiency gain it is causing. Finding a balance between opportunity and risk, meeting challenges and uniting all employees behind a comprehensive vision is the primary task of company leaders (Cox, 2018). The focus of leadership is on building trust (Williams, 2005). This is the critical value when organizations undergo profound changes, especially due to the fact that people trust people rather than machines or non-transparent processes (Daugherty & Wilson, 2018). Out of many similar approaches, an example from research on the implementation of AI in companies will be presented. It shows eight factors that determine success (Bughin et al., 2017; Wodecki, 2019). These factors not only capture characteristics that leaders should have, but also underline the importance of corporate culture. Leaders should possess:

- better analytical skills than their competitors,
- a board of directors with strong determination and vision for leadership during change,
- a concept for the implementation of change,
- a business strategy that is intertwined with a technological strategy.

Another four factors relate to the will and ability of a corporate culture to:

- cooperate freely and efficiently within the organization,
- accept new ideas and adaptation processes,
- change products and services for the sake of technological innovation,
- pursue comprehensive data governance.

By emphasizing the importance of corporate culture in the implementation of AI and the change it brings about, the factors also emphasize the importance of leadership. They also show that leaders direct organizations by instilling common goals, norms and values. In doing so, leaders need to overcome barriers that might hinder the implementation of AI. These include a possible lack of talents, fears among employees, lack of skills, competing projects outside AI, and lack of business cases for AI (Wodecki, 2019).

The success factors and challenges identified in the studies regarding the implementation of AI in companies are very similar to those explained (Ashri, 2020; Boobier, 2018; Bootle, 2019; Bughin et al., 2017; Burgess, 2018; Buxmann & Schmidt, 2019; Canals & Heukamp, 2020; Castrounis, 2019; Daugherty & Wilson, 2018; Davenport, 2018; Gentsch, 2018; Gläß, 2018a, 2018b; Iansiti & Lakhani, 2020; Mohanty & Vyas, 2018; Skilton & Hovsepian, 2018; West, 2018; Wodecki, 2019).

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Any company going through a period of major change must be supported by convincing leadership, whose task it is to provide employees with security and the confidence to master the transformation process. Leadership must embrace the organization and its members, allowing them to express their needs and motivating them to create a positive vision of an uncertain future.

Nevertheless, there are two reasons why the factors and challenges outlined above do not reflect the full range of disturbances and transformations that AI is likely to cause. Firstly, the circumstances associated with the implementation of AI are not different from the challenges related to any change process in the VUCA world. If AI were just another digital invention, this would not be a problem, but it is estimated that the power of AI will change businesses more profoundly than any other technology before. This profundity seems to have no equivalent in the theories of those who analyze the relationship between AI and leadership as an implementation problem of change management. This leads to the second reason why this perspective may not be convincing: it does not mention the power of AI over companies and enterprises. It does not reflect on AI as a possible team member. It does not mention the people, needed to set up, control and monitor AI software. It also fails to mention the various ethical and epistemological dilemmas that AI could pose to executives who are confronted with an opaque yet supposedly omniscient entity called AI. A deeper look at studies promoted by this second perspective will show whether any of these problems are addressed and, if so, what answers are given as to how AI can be thoroughly linked to leadership.

c) AI Guiding Leadership

While there are numerous studies that deal with the role of leadership in the implementation of AI, what is lacking are ideas about how leadership should change thereafter. This could be due to the fact that the implementation process is what every company is facing today, while the existence of a full-fledged AI is not yet in sight. However, AI is being developed very rapidly, and in other academic fields such as political economy and social sciences the consequences of the widespread use of AI are already being discussed. (LaGrandeur & Hughes, 2017). One of the crucial issues is, for example, where people will get their income from once most types of work have been assigned to machines (Santens, 2017). If these problems are already being considered, it is surprising not to find comprehensive studies on leadership changes once AI has to be led. What was said two years ago is still true: "There is a lack of research surrounding AI performance and human-led supervision" (Smith & Green, 2018, p. 86) which is needed in the next years to build a basis for the AI-induced change of leadership – the change of leadership culture will take its time. Nevertheless, here are the results of the few studies on the topic.

The studies are interested in the success factors once AI starts guiding leadership. They argue that in order to come to terms with AI, leaders should consider machines in a way they consider followers and employees (Smith & Green, 2018). This is not to say that AI will soon receive general or even super-intelligence. Rather, it means that any entity that can act independently should be designed as an entity that is integrated into the organization and influenced by the corporate culture and its vision and values. In the case of AI, this includes not only the machine itself, but also the programmers who generate, test, train and monitor AI. (Smith & Green, 2018). Since leadership is about responsibility and accountability to everyone in a company, followers are equally accountable to everyone else, including managers. This must be extended to AI as soon as AI becomes autonomous (Saurav Kumar & Banerjee, 2018). But AI won't be fully self-sufficient for a long time yet. Until then AI is not conceivable to be independent from programmers and IT engineers. They are part of the actual responsibility of the AI as a pseudo-member of a company. As long as the AI is not able to act completely autonomous, it should rather be understood as "an AI team or an AI/Human blended team" (Farrow, 2020, p. 10). In addition to the algorithm, these teams consist of programmers and post-programming controllers who manage the results and communicate them to those who need the information.

Building a responsible relationship between managers and the AI team will require ethical supervision of these teams, including the algorithm itself. Programmers will need to be trained to comply with corporate guidelines, and AI results will need to be reviewed accordingly. In addition, communication standards must be established that can be used by executives, programmers, post-programming controllers, and machines. Due to the complexity of AI-related technology, this can be a particular challenge (Smith & Green, 2018). The realization of compliance standards between AI and humans, including communication and accountability, is a prerequisite for supervision procedures, which are also of particular importance because AI algorithms can make mistakes and cause unintended output. Of course, once AI has become emotionally and consciously intelligent, the more authoritative management attitudes towards algorithms would have to change towards the same management style with which each member of the organization is treated (Smith & Green, 2018). However, this aspect of leadership is too far in the future and therefore outside the scope of this paper.

With a fully-fledged AI, leadership will experience a new diversity within the company, which will affect both the self-conception and the corporate image of the organization (Farrow, 2020). AI teams will

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depend equally on people and machines, which makes AI part of the identity of an organization. The challenge for leadership will be, that this identity could be in tension with social or religious norms, so fundamental to the employees that they cannot be neglected. In this case, leadership will have to find new answers to very old questions of security and meaning in the life of each individual (Farrow, 2020).

IV. A Comprehensive Strategy

a) *Dynamic Relationship*

Looking at the early stage of AI development today, the most revolutionary changes brought about by AI are still to come. It is still a long way from narrow AI to general or even super-intelligent AI. It´s development will therefore be highly dynamic and with it the relationship between leadership and AI. For company managers, dynamic environments are something they are familiar with in the VUCA world. Like any rapidly and constantly changing factor, AI must therefore receive special attention from management in order to maintain confidence in a company and its way of changing. Due to the unique nature of AI, it is important to ensure that it´s applications are well thought out, function correctly and are accepted by employees. "AI is less of a technology overhauling and more of a cultural shift, and both the business leadership and technology leadership have equal roles to play" (Mohanty & Vyas, 2018, p. 29).

The integration of AI into a corporate culture is particularly difficult as well as hard to communicate and supervise, as a powerful AI in the sense of DL is a "black box" (Mainzer, 2019, p. 245) where no one really knows what is actually going on inside. Under these conditions, building a trusting relationship is particularly difficult to achieve. Therefore, one of the key strategies to operate AI in companies will be transparency.

b) *Transparency Is the Key*

Calling for transparency is an important way to establish trust and efficiency between leaders and staff (Gebler, 2012; Zak, 2017). Especially in environments and interactions that are very dynamic and hardly predictable, trust is the very fabric that enables people to act together (Paxton & Ressler, 2018). The introduction of transparency as a strategy for linking man and machine builds on these findings, but extends them considerably. A strategy of transparency is not a matter of course, but a comprehensive way to connect man and machine.

Transparency is important for the AI that guides and supports leadership, but it will also be crucial if the AI is going to lead people. The reason for this is not that leaders could be replaced by machines in the foreseeable future. Nevertheless, the difference between leadership that uses AI as a source of information and leadership that is driven by AI is very blurred. In theory, the line between the two types of direction seems obvious, but in practice it will be almost impossible to portray it: "Artificial systems will become the trusted advisor to the C- level executive, and will be the ones to provide indisputable, data-driven insights" (Boobier, 2018, p. 179). Once a source of information becomes "indisputable", it will be very difficult to disregard it. As a result, executives who neglect undeniable insights tend to neglect their liability to staff. Balancing the hierarchy between man-made and machine-generated sources of information will be a major challenge for leaders in the age of AI, which can only be solved through transparency. This means that there will be no final decision on how to dispel doubts and delegate responsibilities. Rather, transparency points to the dynamic processes by which corporate agreements must be made and communicated under conditions of uncertainty and contingency of AI (Boobier, 2018). Many AI and leadership challenges may not yet be visible, but processes need to be discussed, delegated and implemented. Again, transparency will be the key value.

Within a company, transparency must take place on many levels and in many dimensions. The core idea behind this strategy is that without transparency neither trust nor efficient cooperation can be built. Without efficiency, however, no corporation could survive. In order to realize the transparency necessary for productive interaction, it must be implemented in self- management, in communication, in the interaction of employees, in the functioning of corporate strategies and also in the way companies are organized and managed. This means that the corporate culture must also be characterized by transparency. By introducing the idea of transparency into all aspects of a company, leadership will be based on four characteristics that ensure the future viability of a company. What we understand by transparent leadership is:

1. *Human:* because it is based on trust and respect and sees people as the raison d'être of a company. These people are stakeholders where employees and customers are the most important parties. AI must be set up in such a way that people are at the center.
2. *Democratic:* because it lets staff participate in the development of the company. No leader is able to understand their organization without listening to what employees have to say. AI may not override their importance, but it is another voice to be heard among many and it helps to decrease an asynchronous distribution of information and lead to a better cooperation.
3. *Able to cope with complexity:* because it enables the knowledge and experience of all employees, customers and stakeholders to be pooled equally.
4. *Flexible:* because it can and must be adapted to every company individually. Transparent leadership is not a fixed framework, but a set of values and

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goals that allow for individual solutions. This flexibility makes it an ideal strategy to integrate AI into a company.

V. Conclusion

The connection between humans and AI is deeply imbued with ethical questions. They will be a constant theme for leadership, because responsibility and trust are crucial to any leadership success, and they are fundamental ethical values. Due to its artificial origins, its supposed infallibility and its black box-like mechanisms, AI constantly questions trust, thus undermining the precondition for success. In the future, too, the power of AI will always be difficult to predict, because the essence of intelligence is to deal with unpredictable complexity (Boobier, 2018). The only comprehensive leadership strategy that seems to offer attitudes and processes that can deal with such unpredictability is transparent leadership. With its core characteristics of human, democratic and flexible structures while seizing the complexity of an organization, it can even serve as a guideline for a future in which AI itself will be able to exercise leadership.

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The Relationship between Ownership Identity, Ownership Concentration, and Firm Performance: Evidence from China

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Abstract- This study compares the performance of stateowned firms, local government SOEs, and privately-owned firms in China. Using panel data comprising 13,273 firm-year observations for the period 2005-2012 and OLS, 2SLS, and difference-in-difference regression, we report that the identity of the largest shareholder does matter. Our results show that the listed, central government-owned SOEs' operating costs are similar to those of local government owned SOEs and privately-owned firms. Our results suggest that ownership concentration matters in China, that is, central government shareholding is an important determinant of state owned firms' performance. The policy implication of this study is that helping-hand and protectionist policies have helped stateowned firms to prosper in by creating an uncompetitive market and ineffective legal infrastructure.

Keywords: privatized SOEs, ownership concentration, ownership identity, tobin's Q, efficiency.

GJMBR-A Classification: GEL Code: G28, G38



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The Relationship between Ownership Identity, Ownership Concentration, and Firm Performance: Evidence from China

Krishna Reddy

Abstract- **This study compares the performance of state-owned firms, local government SOEs, and privately-owned firms in China. Using panel data comprising 13,273 firm-year observations for the period 2005-2012 and OLS, 2SLS, and difference-in-difference regression, we report that the identity of the largest shareholder does matter. Our results show that the listed, central government-owned SOEs' operating costs are similar to those of local government owned SOEs and privately-owned firms. Our results suggest that ownership concentration matters in China, that is, central government shareholding is an important determinant of state owned firms' performance. The policy implication of this study is that helping-hand and protectionist policies have helped state-owned firms to prosper in by creating an uncompetitive market and ineffective legal infrastructure.**

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I. Introduction

The success of China's transition to a market economy depended on whether state ownership reform can achieve efficiency gains as expected. According to Shleifer and Vishny (1994), the efficiency gains from privatization can only be realized if control rights are passed from the state to private investors. In this regard, China's policymakers have tried to reconcile continuing state ownership with market-orientated economic reforms to make state control more effective (Hassard, Morris, Sheehan & Xiao, 2010).

The Chinese authorities established the State-owned Assets Supervision and Administration Commission (SASAC) in 2003 to restructure its state assets management system. According to Stiglitz (1999), commercialized state ownership might bring advantages in countries with weak institutional environments but these benefits tend to be associated with political connections or a "helping hand" from governments. In consequence, the transition to a free competitive market economy is likely to be impeded (Stiglitz, 1999; Bortolotti, Fantini & Siniscalco, 2001). Leng (2009) argued that governments have the financial incentives to promote SOEs' development by imposing policy barriers against potential competitors because governments act as owners and regulators, especially in the Chinese context. If SOE expansion is undertaken by means of preferential treatment by the state, ownership reforms may fail to realize efficiency gains, as intended (Hassard et al., 2010).

However, whether state sector ownership reform in China has been successful in improving performance is not well understood since no studies (to our knowledge) have focused on the effects of state ownership on firms' performance over the last decade. Accordingly, this study is motivated by the SASAC reform in China and we aim to address four important research questions. First, did SASAC reform in China improve the efficiency of government and local government-owned firms? If it did, does the type of ownership matter? That is, do different types (identities) of the large shareholders contribute to a higher level of economic efficiency in publicly listed firms? Does the controlling shareholder influence the profit-maximizing strategy of SOE-listed firms? Do listed central government-owned SOEs perform better than the local government-owned SOEs and privately-owned firms?

This study contributes to the literature in several ways. First, this is the first study undertaken after China's SASAC reform in 2003 that focuses on central versus local government ownership. Since the government has the fiscal incentives to boost SOEs' performance through policy protection or preferential treatment, we are interested in finding out whether the state's helping hand has affected SOE performance. Second, the study supplements the literature on the relationship between ownership structure and firms' value by focusing on more recent institutional changes undertaken in China. Prior researchers have focused either on the legal share type or artificial ownership classifications as proxies for real owner type. The drawback of the legal share type is that it fails to determine who the real controlling shareholder is. On the other hand, artificial ownership classification leads to unrealistic inferences concerning firms categorized as belonging to one ownership type when they have different interests and motivations (Chen et al., 2009; Leng, 2009). Third, this study extends the limited research on the ownership-performance nexus in China by using a wider set of measures as proxies for a firm's operating efficiency. Prior studies have used either

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accounting ratios (ROA) or market indicators (Tobin's Q) as proxies for firm performance. Using a series of indicators allows for capturing the potential differences in performance of different types of ownership in a more logical manner.

The remainder of the paper is organized as follows. Section 2 provides a brief background to China's enterprise reform, in particular the SASAC reform, and also discusses ownership types among China's listed firms. Section 3 provides the literature review and introduces the hypotheses. Section 4 describes the data and research method used. Section 5 presents the empirical results and Section 6 provides the conclusion and policy implications.

II. China's Enterprise Reforms and Ownership Structure

The Chinese government announced the "Grasping the large, letting go the small" policy in 1997. The aim was to distinguish different types of traditional SOEs, then assign disparate economic objectives to them (Leung & Cheng, 2013). The "Grasping the large" scheme refers to the actions taken by the state as an owner to strengthen its control over central SOEs as well as over large, local, state firms, which are scattered among strategic industries, such as energy, telecommunications, civil aviation, defense, transportation, publication, metallurgy, and heavy machinery (Leung & Cheng, 2013). In contrast, the "Letting go the small" scheme emphasizes the complete privatization of small to medium-sized SOEs.

Despite preliminary positive results achieved by partial privatization, attempts to improve corporate governance in SOEs were faced with challenges (Leng, 2009). The major drawback was that ownership was distributed over various state agencies, reflecting inconsistent responsibilities among different government departments and conflicting supervision systems (Hassard et al., 2010). Although the central government was the sole owner of all state assets prior to 2003, it exercised direct control and supervision only of the largest SOEs (central SOEs). On the other hand, the local governments were able to actively control local SOEs within their jurisdictions, they did not have the formal status of "owner" and all-important decisions on major transactions by local SOEs were made by the central government (Hassard et al., 2010). As a result, the central government enjoyed the sales revenue from the privatized local state firms and was considered to be the major cause of the conflict of interest (Leng, 2009) in state-owned assets in China.

The separation of ownership and control existed not only at different levels of government but also among multiple government agencies (Chen et al., 2009). Various government agencies with different, sometimes conflicting, objectives were responsible for some part of SOEs' business operations. None of these agencies, however, assumed ultimate responsibility for firms' performance (Leng, 2009).

To strengthen SOE corporate governance practices, the State Council established the State-owned Assets Supervision and Administration Commission (SASAC) in 2003 which redefined the relationship between SOEs and governments (Mattlin, 2009). First, the central government separated the central, provincial, and municipal SOEs and granted control rights to SASAC offices at the respective administrative levels (Mattlin, 2009). Second, the SASAC centralized functions that formerly were distributed among different institutions and Party organizations (Leng, 2009). Third, local governments were granted de facto ownership rights for local SOEs (Leng, 2009), and local SASACs at provincial and city levels handled SOEs within their respective jurisdictions and reported directly to local governments.

Between 1992 and 2004, Chinese listed firms operated under a unique ownership classification system, which divided equity into tradable and non-tradable shares. As a result, China's listed enterprises held up to 60% (on an average basis) of non-tradable shares, and most of these were owned by the government (Jiang, Laurenceson, & Tang, 2008). The artificial splitting of shares led to significant agency problems between holders of non-tradable and tradable shares. For example, the controlling shareholders of listed SOEs were not interested in stock price movements and consequently, minority individual investors suffered from irregular fluctuation in the share price (Leng, 2009). Furthermore, managers of SOEs tended to pursue objectives that were not related to profit maximization. As a result, the expropriation of minority shareholders' interests was widespread and the principal-agent problem was further exacerbated by the existence of multiple principal-agent problems (Yu, 2013). To deal with the corporate governance failures arising from non-tradable shares, the Chinese authorities enacted the Split Share Structure Reform in 2005 (Jiang et al., 2008).

As a result, the ownership structure of Chinese SOEs has changed dramatically since 2004. By the end of 2012, there were 113 large SOEs, commonly known as the central SOEs (SOECG), owned and directly controlled by the central government. SOECGs are supervised by SASAC and since SOECG chairmen are selected on the basis of their ability, many of them got promoted to positions at the ministerial level (Chen et al., 2009). Since the central government is the ultimate shareholder of these listed enterprises, incentives serve to impose policies and laws that enhance government objectives rather than misappropriate profits or assets (Cheung, Rau, & Stouraitis, 2010).

Local SOEs constitute the largest group of controlling shareholders of listed state-invested

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companies in China (Leung & Cheng, 2013). The SASAC reform in 2004 enabled local governments to implement aggressive policies or bylaws to boost the development and performance of local SOEs (SOELGs). Some researchers have reported that SOELGs improved performance after 2004 (Leng, 2009; Cheung et al., 2010), while others argue that local governments have a strong financial incentive to undermine minority shareholders' interests, especially when faced with difficult budgetary constraints or revenue inducements (Hassard et al., 2010). Since it is difficult to enforce laws and regulations at the provincial and municipal levels, the SOELGs are subject to weaker supervision and management (Chen et al., 2009). As the ultimate shareholders of the SOELGs, local governments tend to vary widely in their behavior. On the one hand, SOELGs are the local governments' instrument for generating revenue (Mattlin, 2009) but on the other, local governments may expropriate revenue due to the fact they are both owners and regulators (Leng, 2009).

By allowing the "natural person" to be the dominant shareholder of listed firms in China since 2001 (Wei, Xie, & Zhang, 2005), the total number of listed companies controlled by private investors increased from less than 10 to 1431 by the end of July 2013, accounting for 57.94% of all listed firms in capital markets.[1] The majority of these firms are listed on China's two main boards and by the end of 2012, 325 listed firms conducted their IPOs in the newly established growth enterprise market (ChiNext).[2] Chen et al. (2009) argued that controlling private shareholders tend to have a better understanding of the industry in which firms operate and therefore are better able to monitor managers' decisions. According to Wang, Chen, and Ye (2010), approximately half of the private listed firms in China are under family control. Since private investors are not monitored by the state, the existence of weak governance structures makes it possible for the dominant shareholders to misappropriate profits or assets (Wang et al., 2010). As a result, the principal-agent and principal-principal agency problems are widespread (Shen, 2008).

III. Literature Review, Theory and Hypotheses

The proponents of the helping hand hypothesis argue that firms that have close ties with the government can benefit from political connections (Fisman, 2001; Faccio, 2006). The specific benefits of government ownership include access to favorable terms for loans from state-owned banks, a higher IPO offering price, government-sponsored bailouts, favorable government contracts, lower taxation, and receiving special licensing powers (Sapienza, 2004; Goldman, Rocholl, & So, 2009; Leng, 2009).

SOEs in the strategic industries[3] sector receive preferential treatment from the government (Cheung et al., 2010). Since this sector has a strict ban on private and foreign investors, SOEs with monopolistic features enjoy windfall profits in these industries (Mattlin, 2009; Jiang & Lin, 2012). In addition to enjoying a strong influence on the market as a result of the government's protectionist policies, these SOEs also receive a disproportionately large share of the loans provided by the large state banks (Liu, Uchida, & Yang, 2012).[4] Given their soft budgetary constraints, SOEs have tended to expand the scale of their state assets, in some cases by overinvesting or by instigating a series of mergers and acquisitions. Consequently, the revenue and size of SOEs have increased dramatically (Mattlin, 2009).

In contrast, local government-owned SOEs and privately controlled firms do not operate on the same playing field and often face capital starvation and regulatory impediments in their routine business activities (Leng, 2009; Chen et al., 2010). Based on the helping hand hypothesis, we propose our first hypothesis as follows:

H1. Listed SOECGs have a higher level of liquidity compared to SOELGs and PRIVATEs.

The debate regarding state ownership inefficiencies is highlighted by the property rights theory and the political interference hypothesis (Martin & Parker, 1997; Villalonga, 2000; Shleifer & Vishny, 1994). The proponents of the property rights theory posit that property rights are clearly defined in the private sector but not in the public sector and in consequence, private owners have a stronger incentive to effectively reduce their production costs and actively monitor the performance of management (McCormick & Meiners, 1988). Shleifer and Vishny (1997) argued that state ownership leads to principal-principal and principal-agent agency problems because government tends to pursue many different objectives and not solely value maximization (Shleifer & Vishny, 1997). As a result, state-owned enterprises tend to suffer from problems such as higher costs and lower efficiency (Stiglitz, 1999).

Researchers investigating the ownership-performance nexus have reported a negative relationship between residual state shares and firm

[1] Naughty, Naughty: China's Corruption Crackdown Skims the Richest. (2013, 15 October). Forbes. Retrieved from http://www.forbes.com/sites/hengshao/2013/10/15/naughty-naughty-chinas-corruption-crackdown-skims-the-richest/

[2] Based on the data adopted in this study, 325 private listed firms had conducted their IPOs in China's growth enterprise market (ChiNext) by the end of 2012.

[3] Strategic industries include energy, heavy machinery, metal, telecommunications, and transportation.

[4] Large sums of money (4 trillion yuan) were pumped into large SOEs in the form of financial subsi- dies or direct loans from state banks during the period 2009 – 2011 (Liu et al., 2012).

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performance (Xu & Wang, 1999; Qi, Wu & Zhang, 2000; Sun, Tong & Tong, 2002; Sun & Tong, 2003). However, Tian and Estirn (2008) and Ng, Yuce, and Chen (2009) argued that state ownership has a nonlinear relationship with firm profitability. Researchers who have used the shareholder's real identity have reported that listed firms in which the state is a shareholder and SOEs affiliated with the central government have performed better than private-sector firms (Wang, 2003; Chen et al., 2009; Kang & Kim, 2012). However, Chen et al. (2008) argued that former SOEs now owned by private investors show an increase in profitability because of cost savings and/or a reduction in the number of employees. Since Chen et al. (2009) used data from the period 1996-2000, it is not clear whether similar performance phenomena still existed after the SASAC reform of 2003. We argue that partially privatized SOEs perform better than their private-sector counterparts because of protectionist policies and improved monitoring by the state. Based on the property rights and political interference hypotheses, we propose our second and third hypotheses as follows:

H2. Listed SOEs (SOECGs) have higher profitability than SOELGs and privately owned firms.

H3. Listed SOEs (SOECGs) have higher operating costs than SOELGs and privately owned firms.

Prior research has reported that the largest shareholder has both a positive and negative effect on firm performance. Corporate governance literature has identified block shareholding as an influential mechanism to mitigate principal-agent problems and reduce the "free-rider" phenomenon of small investors (Shleifer & Vishny, 1997; Claessens & Djankov, 1999). However, if the largest shareholder is also the controlling shareholder, a collision of control rights with cash flow rights is likely to occur. Consequently, the conflict of interest between the largest shareholder and minority shareholders will be exacerbated (Fama & Jensen, 1983; Morck, Shleifer & Vishny, 1989). Frye and Shleifer (1997) and Shleifer and Vishny (1998) argued that when the government acts as the dominant shareholder in public firms, the wealth of minority shareholders is misappropriated by authorities swayed by political considerations and the corrupt behavior of politicians. This view is known as the interest entrenchment hypothesis.

Xu (2004) reported that on average, the largest shareholder-owned 46% of SOEs prior to the 2005 Split Share Structure Reform. Having a large stake in SOEs, the largest shareholder (government) reserves the right to appoint firm directors and top managers and in this way, can exert considerable influence on the firm's operational activities (Chen et al., 2008). Given China's inadequate legal infrastructure and its poor shareholder protection regime, prior researchers have reported that the wealth of minority investors is misappropriated when the state's shareholding goes beyond a certain level (Wei & Varela, 2003; Wei et al., 2005; Ng et al., 2009; Yu, 2013). Furthermore, researchers point out that different types (identities) of the largest shareholder are also associated with tunneling behaviors.

Leng (2009) argued that public companies connected to local governments always subvert minority shareholders' interests by asset stripping or self-serving activities in most MBO transactions. Cheung et al. (2010) provided empirical evidence of local government's "grabbing hand," a ploy by which local authorities influence the SOEs they control in order to steal or transfer minority shareholders' wealth through related party transactions. In contrast, SOEs supervised by the central government provide a "helping hand" to protect minority partners' interests during the same process. This is referred to as the interest alignment hypothesis. According to Leng (2009), Chinese stock investors view central government-controlled SOEs (also known as blue-chip companies in the market) as a safer investment as they have the ability to secure the value of their portfolios. Arguably, local government-controlled SOEs experience a more negative reaction from the market and have lower market value compared to central SOEs and private firms (Zou, Wong, Shum, Xiong, & Yuan, 2008; Chen et al., 2009). Based on the above, we argue that SOEs connected to the central government have a higher market value compared to privately listed firms and SOEs connected to local governments. Therefore, we propose our fourth and fifth hypotheses as follows:

H4. Listed SOECGs have a higher market value than privately controlled firms.

H5. Listed SOECGs have a higher market value than SOELGs.

Shleifer and Vishny (1986) argued that dispersed small shareholders are reluctant to monitor management because the cost of monitoring is greater than the benefits. As a result, monitoring is only undertaken by the company's controlling shareholder or other non-controlling block shareholders (Shleifer & Vishny, 1986; Pound, 1988). Smith (1996) and Woidtke (2002) pointed out that non-controlling institutional shareholders such as mutual funds and pension funds usually act as an effective mechanism for monitoring managerial inertia and so mitigate the typical principal-agent problems in countries such as the US and the UK. This is referred to as the interest alignment hypothesis.

However, research on this issue in China has received little attention. A plausible reason may be that the majority of previous researchers have used legal type shares as a proxy for companies' ownership structure, not distinguishing between the controlling shareholder and other important blockholders. Consequently, the effect of non-controlling shareholders on performance is not well understood in the Chinese

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context. Song, Zhang, and Li (2004), reported a positive relationship between non-controlling shareholders and firms' market value using a 3-year sample for the period 1999-2001. However, it is not clear whether this relationship still holds after the numerous institutional changes that have taken place in China since 2004. Therefore, we propose our sixth hypothesis as follows:

H6. The presence of non-controlling blockholders in Chinese listed firms has a positive effect on the market value of these firms.

Foreign shareholders of Chinese listed firms tend to be financial institutions based in Europe, Hong Kong, Japan, and North America (Chen, Firth & Rui, 2006). Boubakri, Cosset, and Guedhami (2002) and D'Souza, Megginson, and Nash (2002) argued that the presence of foreign shareholders is associated with superior performance by privatized firms. Bai, Liu, Lu, and Song (2004) and Wei et al. (2005) argued that listed firms that have foreign institutional investors as shareholders experience a higher market valuation because of transparent financial disclosure requirements and enhanced monitoring procedures brought by sophisticated foreign investors. Therefore, we propose our seventh hypothesis as follows:

H7. The presence of foreign investors in listed firms has a positive effect on their market valuation.

IV. Data and Methodology

a) Sample Selection

Data was collected from China's Stock Market and Accounting Research Database (CSMAR). The initial sample included 1246 firms trading in either of two stock exchanges in China for the period 2005 – 2012. We have taken great care in identifying the major shareholder and the other top 10 shareholders for each listed firm in the sample. To determine the true owner of the shares, we carefully checked the prospectus data of each firm through SINA Finance (http://finance.sina.com.cn/stock) and the CNINF website (www.cninfo.com.cn) which is the official disclosure platform for firms in China. By merging these data with the CSI ownership classification scheme developed by China Securities Index Ltd., we finally confirm the real identity of the dominant (or largest) shareholder for each company and have reclassified each according to the different shareholder types: (i) central government-owned SOEs (SOECGs); (ii) local government-owned SOEs (SOELGs); (iii) privately owned firms (PRIVATE), and (iv) ownership unclear (PCHINEXT).

However, a number of exclusions apply to the dataset used. First, financial firms and companies for which operating performance data were not available were removed from our dataset. Second, we winsorized firm performance variables using a similar method to that of Wei et al. (2005) and Erkens, Hung, and Matos (2012)[5] to remove the effect of outliers in our dataset. Third, because some "shell companies" are traded on China's stock markets as vehicles for investors' grey activities, we removed those also to ensure the overall validity of the dataset. Our final sample consists of 13,273 firm-year observations, comprised of 5449 (51.05%) firm-year observations where PRIVATE is the major controlling shareholder, 4911 (36.99%) observations from SOELGs, 2135 (16.09%) observations from SOECGs, and 778 (5.86%) observations from PCHINEXTs.

Table I Panel A reports the shareholdings of the three largest shareholders. According to Panel A, the median holding of the largest shareholder is 34.94%, that of the second largest investor is 6.88%, and the third is 2.66%. Since blockholders own 5% or more of a firm's shares, a typical Chinese firm has only one or two blockholders and the largest shareholder tends to be the dominant one. These results suggest that the single largest shareholder has a major influence on the operations of Chinese listed firms. Our results hold for SOECGs and SOELGs, as well as PRIVATE firms in China.

However, privately controlled companies listed on ChiNext (China's growth enterprise market) tend to have three blockholders, although the second holds only about onethird of the shares held by the largest blockholder (the median for the largest shareholder is 32.12%, and for the second 12.86%, respectively). Since the largest shareholder is the controlling shareholder, we adopt the method used by Song et al. (2004) to define the non-controlling blockholders as shareholders ranked from 2 to 10 in the tier of the top 10 shareholders.[6] Based on the results reported in Panel A, non-controlling shareholders in privately controlled firms own a higher proportion of shares (a mean of 13.54% for PRIVATE and 21.96% for PCHINEXT) compared to state-controlled firms (a mean of 9.19% for SOECG and 9.06% for SOELG).

Table I Panel B reports Chinese firms' ownership structure after the Split Share Structure Reform of 2005. The results reported in Panel B show that by end of 2006, the proportion of state ownership in SOECGs declined by 6.19% (from a mean of 46.82% in 2005 to 40.63% in 2006). Similarly, state holdings in SOELGs declined by 5.42% (from a mean of 43.60% in 2005 to 38.18% in 2006). Although average state

[5] Due to the presence of outliers, we have winsorized ROA and ROS at the 2.5% level in both tails of the distribution and Tobin's Q at the 2.5% level only at the right tail of the distribution. After receiving anonymous reviewer feedback, we also tried to winsorize at 1%. However, winsorizing at 1% increased the number of outliers so we reverted to winsorizing at 2.5%.

[6] According to the studies by Tian (2003), Song et al. (2004) and Chen et al. (2009), the pyramid ownership structure of Chinese listed firms is not significant.

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ownership declined significantly in 2012 compared to 2006, it remained high in strategically important sectors.

Table II reports state ownership in SOEs belonging to strategic sectors, such as communications, construction, energy, heavy machinery, publications, public utilities, and transportation. The results in Table II show that the state still retains ownership control in strategic sectors (on average 48.29%), [7] [8] In contrast, the state holds a relatively smaller proportion of shares (around 37.16%) in SOEs that belong to other sectors, similar to the largest shareholders' equity holdings in privately controlled firms. These findings provide support for the view that the recent privatization process in China was largely influenced by the "Grasping the large, letting go the small" policy, which allowed the state to retain control of the strategic sectors of the economy.

Although all shareholders have equal voting rights (one share, one vote), in practice the largest shareholder always gains unbridled control over firms (Chen et al., 2009). Chen et al. argued that on average, all block shareholders who attend general meetings account for 95% of voting shares and the largest shareholder controls 84% of the shares present at these meetings. In other words, a typical Chinese listed firm has one shareholder with enough votes to exercise control and a few non-controlling blockholders who are able to implement effective monitoring activities of the controlling parties' behavior.

[7] Using the Chinese Securities Regulatory Commission (CSRC) industry classification, this study reclassifies all listed firms into 19 industries (Web site: http://www.csrc.gov.cn).

[8] 48.29% is the overall (pooled) mean value of the largest shareholders' holdings in the listed SOEs distributed among the important, strategic industries in the sample.

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Table 1: Ownership Concentration for Sample Firm Years (as percentage)

	SOECG (Obs. 2135)		SOELG (Obs. 4911)		PRIVATE (Obs. 5449)		PCHINEXT (Obs. 778)		ALL (Obs. 13273)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A: Ownership Concentration by Top Shareholder										
Percent by largest shareholder	41.77	42.40	38.71	37.28	33.38	30.16	33.86	32.12	36.73	34.94
Percent by second largest shareholder	9.02	5.28	7.48	4.33	10.21	8.84	13.58	12.86	9.20	6.88
Percent by third largest shareholder	3.10	1.87	2.96	1.85	4.47	3.50	7.04	5.99	3.84	2.66
Combined ownership by top 3 shareholders	53.89	53.79	49.14	49.24	48.06	48.14	54.48	55.82	49.77	50.08
Percent by non-controlling blockholders	9.19	7.00	9.06	6.78	13.54	12.13	21.96	21.28	11.68	9.54

		SOECG (Obs. 2135)		SOELG (Obs. 4911)		PRIVATE (Obs. 5449)		PCHINEXT (Obs. 778)		ALL (Obs. 13273)	
		Mean	Median	Mean	Median	Mean	Mean	Median	Mean	Median	Mean
Panel B: Percent by Largest Shareholder for Cross-sectional Years											
Year	No. of Companies										
2005	1246	46.82	50.07	43.60	42.50	33.46	29.56			40.61	38.13
2006	1402	40.63	41.03	38.18	36.77	30.94	28.93			36.03	33.52
2007	1489	40.36	41.19	37.58	36.30	32.13	29.69			35.99	34.40
2008	1502	41.26	42.23	37.86	37.25	33.09	30.58			36.53	35.42
2009	1503	41.46	42.43	38.00	36.64	32.98	30.00	30.22	27.93	36.41	34.43
2010	1708	41.38	42.22	38.27	37.42	33.75	31.16	33.54	33.07	36.43	34.83
2011	2045	41.43	42.14	37.99	36.20	34.17	31.61	34.31	32.82	36.32	34.53
2012	2534	41.36	42.14	38.50	36.27	34.42	32.07	33.99	32.12	36.41	34.63

Table I Panel A presents the summary statistics of ownership structure by largest shareholders' actual economic identity. SOECG refers to the mean/median percentage of equity ownership owned by the public companies where the largest shareholder is affiliated to the central government. SOELG refers to the mean/median percentage of equity ownership owned by the public companies where the largest shareholder is affiliated to a local government. PRIVATE refers to the mean/median percentage of equity ownership owned by the public firms that are controlled by the natural person (private investor). ALL the companies denoted as SOECG SOELG and PRIVATE are listed on China's main boards through the Shanghai and Shenzhen stock exchange markets. PCHINEXT represents the mean/median percentage of equity ownership owned by the public firms where the identity of the largest shareholder cannot be specified. The non- controlling blockholders are referred to as a combination of shares held by second largest shareholder to the tenth largest stockholder (within the top 10 shareholders' tier) in each firm. Table I Panel B reports the summary statistics for the largest shareholder at each ownership category for each year from 2005 to 2012.

Table 2: Ownership Structure by Industry (as percentage)

Industry	No. of Observations	No. of Companies	SOECG	SOELG	PRIVATE	PCHINEXT	ALL
Agribusiness	283	57	43.21	35.46	37.96	27.22	36.74
Food & Beverage	558	408	38.90	38.62	34.99	40.96	37.15
Textile & Clothing	522	99	31.34	34.96	35.09	00.00	34.79
Petrochemical & Chemical	1457	295	39.61	38.21	33.15	33.78	35.97
Metallurgy	1153	229	42.48	46.62	36.13	34.74	41.21
Light Industry	452	100	31.81	32.82	35.75	44.18	35.00
Pharmaceuticals	858	161	46.12	36.70	31.27	33.13	34.31
Real Estate	641	131	37.87	41.26	38.15	00.00	39.53
Transportation	509	89	46.32	43.36	30.93	28.30	42.67
Public Utility	582	99	34.03	44.45	33.96	58.51	40.03
Hospitality & Tourism	208	34	34.73	37.71	27.55	34.18	34.88
Energy	209	66	60.24	48.66	25.03	31.09	48.24
Construction	297	63	51.54	39.59	33.28	41.48	40.26

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Wholesale & Retail	780	145	36.94	34.12	31.36	21.55	33.31
Heavy Industry & Machinery	1798	401	44.14	36.85	33.96	33.32	37.37
Media & Publication	197	60	52.14	46.03	39.78	38.08	44.49
Communications & IT	911	227	43.36	30.04	28.64	31.15	31.91
Electrical Equipment	1280	301	35.73	36.65	33.01	36.16	34.50
Integrated & Mixed	497	102	30.57	28.41	29.00	00.00	28.77

Table II presents the summary statistics of ownership concentration for 19 industries for each type of public listed company. SOECG refers to the mean percentage of the largest shareholders' equity ownership in companies for each industry, where the largest shareholder of the company is affiliated with the central government. SOELG refers to the mean percentage of the largest shareholders' equity ownership in companies for each industry, where the largest shareholder of the company is affiliated with a local government. PRIVATE refers to the mean percentage of the largest shareholders' equity ownership in companies for each industry, where the largest shareholder of the company is controlled by a natural persons (private investor). ALL the companies referred to as SOECG, SOELG, and PRIVATE are listed on China's main boards through the Shanghai and Shenzhen stock exchange markets. PCHINEXT represents the mean percentage of the largest shareholders' equity ownership in public firms whose identity cannot be specified.

b) Measuring Operating Performance

Data relating to financial measures and employment are collated from the CSMAR Database. Following Dewenter and Malatesta (2001) and Chen et al. (2009), the proxies for the performance measures adopted in this study are ROA, CFOA, OCS, SPROD, and Tobin's Q. Return on Assets (ROA) is equal to operating income [9] divided by total assets. Net cash flows to total assets (CFOA) is equal to net sales minus the cost of goods sold, minus selling and administrative expenses, minus tax expenses plus net debt repayment plus depreciation plus amortization expenses plus net borrowing divided by total assets (Ghosh, 2001; Chen et al., 2009). Operating costs to total sales (OCS) is equal to the direct cost of goods plus selling and administrative expenses divided by total assets (Chen et al., 2008). Sales per employee (SPROD) is equal to net sales divided by the number of employees. Tobin's Q is the performance measure and is equal to the market value divided by total assets.

ROA and CFOA reflect on a firm's accounting income and cash flow, respectively. CFOA is also used as a scalar to reveal firms' operating cash flow. To investigate the operating efficiency of listed companies, this study uses operating costs to sales (OCS) as a proxy for a firm's efficiency. Shleifer (1998) argued that state-owned firms tend to suffer from overstaffing and low productivity problems. Consequently, we use the ratio of net sales to the number of employees (SPROD) to capture the effect of productivity. Tobin's Q is the market measure.

Table III reports the list of dependent and independent variables used in this study and also their estimation method.

[9] Since net income is prone to manipulation in China, we have used operating earnings instead (Chen et al., 2008).

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Table 3: Dependent and Independent Variables Used and Their Measurement

Return on Asset (ROA)	Operating income divided by total assets
Net Cash Flow to Assets (CFOA)	[Sales – cost of goods sold – selling and administrative expenses – tax + net debt repayment + depreciation + amortization + net borrowing]/total assets
Operating Cost to Sales (OCS)	[Costs of goods sold + selling and administrative expenses]/net sales
SPROD	Net sales/number of employees
Tobin's Q	Market value divided by total assets
SIZE	Natural logarithm of total assets
LEV	Total debt divided by total assets
IORA	Total asset growth ratio
DEVELOPI	Dummy variable equal to 1 if the company is headquartered in a region with above average GDP for the period 2005 – 2012
DSOECG	Dummy equal to 1 if the central government is the largest shareholder
DSOELG	Dummy equal to 1 if the local government is the largest shareholder
DPRIVATE	Dummy equal to 1 if a private investor is the largest shareholder
SOECG	Proportion of shares held by the central government
SOELG	Proportion of shares held by the local government
PRIVATE	Proportion of shares held by private investors
PCHINEXT	Proportion of shares in private firms whose ownership cannot be verified
BLOCK	Proportion of shares held by blockholders that is greater than 5% of the total shares held
PFOR	Proportion of shares held by foreign institutional investors
LMGP	Natural logarithm of the top-tier executives' remuneration in SOEs
LNDTP	Natural logarithm of the top three executives' remuneration in privately controlled firms
PEXESH	Proportion of shares held by the top three executives in privately controlled firms
SID	Dummy equal to 1 if the industry belongs to the strategic industry group
STATUS	Dummy equal to 1 if private ownership is highly ranked in comparison to shareholding by local investors
RESUDS	Total residual state shares excluding the dominant shareholder's proportion
PBDSH	Top three directors shareholding in SOEs
RESUDA	Proportion of shares held by individual investors
OPENNESS	Rank of the value of exports and imports to the provincial GDP

Table IV Panel A reports the means and medians of the performance measures used in this study for each ownership type and all firms combined as well.[10]

c) Model Specifications

i. *Comparison of corporate performance across controlling investor groups*

First, we examine whether firms held by a particular largest shareholder type (identity) achieve a higher level of financial performance. Since different types of largest shareholders have different incentives, interests, monitoring mechanisms, and political connections, we expect that different ownership identities/types may perform different functions in monitoring managerial behavior. To examine the distinct effects achieved by different ownership identities, five pairs of comparisons of mean and median results are undertaken for the four groups of firms, that is, SOECGs, SOELGs, PRIVATEs, and PCHINEXTs. The results of the comparison of means (medians) are reported in Table IV.

Second, we empirically examine whether the largest shareholder identity contributes positively to a firm financial performance. Following Chen et al. (2009), we have undertaken OLS regression after controlling for year fixed effects as follows:

$$OpPerformit = a0 + a1DSOECGit + a2DSOELGit + a3DPRIVATEit + \beta1SIZEit + \beta2LEVit + \beta3IORAit + \beta4DEVELOPIit + \varepsilon it \quad (1)$$

[10] Paired correlation (not reported) between different financial performance measures (ROA, CFOA, SPROD, OCS and Tobin's Q) is very low, ranging from 0.002 to 0.135. This result indicates that performance measures used in this study are not correlated and each performance indicator considers a different characteristic of the firm's activities.

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Where

OpPerformit is a set of performance measures described in section 4.2; DSOECG is a dummy variable coded 1 for firm years where the largest shareholder is a SOECG; DSOELG is a dummy variable coded 1 for firm years where the largest shareholder is a SOELG; DPRIVATE is a dummy variable coded 1 for firm years where the largest shareholder is a private investor.

The owner-type dummy variable is intended to capture the differences in operating performance between SOECG, SOELG, and PRIVATE controlled firms (PCHINEXT is treated as the omitted ownership type in regression equation (1)). In this study, we have used the natural logarithm of the book value of total assets at the end of the year as a proxy for SIZE. SIZE controls for potential economies of scale or the effect of size. LEV is the ratio of total debts to total assets at the end of the year and captures the underlying capital structure effect.

Hutchinson and Gul (2003) argued that firm performance can be influenced by the investment opportunity set it faces. Accordingly, we have used the total assets growth ratio (IORA) as a proxy to control for a firm's investment opportunity set. Finally, there are significant differences in regional development, and the study controls for the regional effect by using the geo-economic dummy variable DEVELOPI. Following Wei et al. (2005), China is reclassified into two regions based on the average GDP per capita for the period 2005-2012 and the study recognizes the provinces with higher average GDP per capita as the relatively developed regions.[11] Hence, DEVELOPI is a dummy variable coded 1 if the company is headquartered in one of these provinces. The results of equation (1) are reported in Table V.

Third, we examine whether the proportion of shares owned by the largest investor has the sort of bearing on firms' financial performance as does their identity. Reddy et al. (2010) argued that the largest owner may better align the incentives of the dominant owner with the interests of the minority investors. However, high percentage ownership may also make it easier to misappropriate assets from the firm (Leng, 2009). To explore the effect of the percentage of ownership, we rerun the equation (1) regression using the following model:

$$OpPerformit = \gamma 0 + \gamma 1LOWNit + \beta 1BLOCKit + \beta 2PFORit + \beta 3PBDSHit + \beta 4LNDTPit + \beta 5PEXESHit + \beta 6LNMGPit + \beta 7SIZEit + \beta 8LEVit + \beta 9IORAit + \beta 10DEVELOPIit + \varepsilon it \quad (2)$$

Where

OpPerformit is a set of performance measures described in section 4.2. LOWNit is the proportion of shares held by the largest shareholder, that is, SOECG, SOELG, or PRIVATE. SOECG is the proportion of shares held in SOEs by the central government. SOELG is the proportion of shares held in SOEs by the local government. PRIVATE is the proportion of shares in firms held by private investors. We have undertaken regression analysis after controlling for industry and year-fixed effects. The results of equation (2) are reported in Table VI.

However, Demsetz and Villalonga (2001) argued that ownership and firm value could be endogenously determined. Since shareholders have an incentive to vary their stock holdings in accordance with their expectations of future performance, the regression results relating to firm performance-dominant shareholders could be spurious.

Fourth, to test the potential endogeneity of the performance-ownership relationship, we have undertaken a Two-Stage Least Squares (2SLS) regression. Our model consists of two equations that determine firm performance (Tobin's Q) and the percentage of shares owned by the largest shareholder (SOECG) in listed central SOEs, simultaneously.

[11] The cities of Beijing, Shanghai, and Tianjin, and the provinces of Shandong, Jiangsu, Zhejiang and Guangdong belong to the relatively developed regions of China in terms of their higher average GDP per capita over the 8 sampling years. From 2011, some of these regions had a GDP per capita above US$10,000 US and the rest of these provinces' GDP per capita is close to this standard as well.

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$$\text{Tobin's Qit} = \gamma 0 + \gamma 1 \text{OWNit} + \beta 1 BLOCKit + \beta 2 PFORit + \beta 3 SIDit + \beta 4 SIZEit + \beta 5 LEVit + \beta 6 IORAit + \beta 7 DEVELOPIit + \sum_{j=1}^{8} \beta 7{+}jYEARit + \sum_{k=1}^{19} \beta 15{+}kINDUSTRYit + \varepsilon it \quad (3)$$

$$\text{OWNit} = \gamma 0 + \gamma 1 \text{Tobin's Qit} + \beta 1 LMGP + \beta 2 RESUDSit + \beta 3 SIZEit + \beta 4 IORAit + \beta 5 DEVELOPIit + \sum_{k=1}^{19} \beta 5{+}kINDUSTRYit + \sum_{j=1}^{8} \beta 24{+}jYEARit + \varepsilon it \quad (4)$$

Where OWN is the ownership percentage of the largest shareholder (SOECG or SOELG). The log of remuneration of top-tier executives (LMGP), strategic industry dummy (SID), and total residual state shares, excluding the dominant shareholder's proportion (RESUDS), are treated as exogenous variables (instruments). The remaining control variables are the same as those used earlier.

The 2SLS regression allows us to control for the effect of endogeneity between Q and the largest ownership. Given the dataset, we have identified the remuneration of toptier executives (LMGP), strategic industry dummy (SID), and total residual state shares (RESUDS) as the exogenous variables. According to Wei et al. (2005) and Mattlin (2009), when deciding the level of shares owned by the dominant shareholder in SOEs, the government takes into account whether the firm is in a strategic or pillar industry. Consequently, SID has an effect on Tobin's Q but not on SOECG.[12]

Moreover, through the corporate restructuring process during the early 2000s, the Chinese authorities adopted a debt for equity swap program to reduce the level of SOEs' bad loans, allowing a certain number of state shares to be held by different state agencies or enterprises rather than by the direct controlling shareholders (Kang & Kim, 2012). Since this type of equity is treated politically as a pledge of future debt repayment, the actual holders of these shares (various state agencies) rarely get involved in the management of these SOEs and seldom attend shareholders' meetings (Wang, 2003; Leng, 2009). For the reason stated above, we assume that RESUDS will have a positive effect on SOECG as proof of strong political links but these RESUDS will not have any effect on Tobin's Q.[13] In addition, the remuneration package of SOE senior management is designed by the state which takes into consideration size and meeting the objectives of the state (Leung & Cheng, 2013) rather than performance. Therefore, we do not expect LMGP to have an effect on firm value.[14]

However, the difficulty of disentangling the endogeneity of private ownership structure and firm performance has been widely documented in many studies, using samples from Western countries (Lemmon & Lins, 2003; Beiner, Drobetz, Schmid & Zimmermann, 2006; Bhagat & Bolton, 2008). Since private firms were only officially approved in 2001 to go public, it is unclear whether the same phenomenon also exists in China as well. To test for potential endogeneity in private ownership, we have modified equations (4) and (5) as follows:

[12] We have also undertaken correlation in pairs between SID, Tobin's Q, SOECG and SOELG. Our results show that the correlation between SID and Tobin's Q is -0.214, 0.015 between SID and SOECG, and 0.065 between SID and SOELG. These results suggest that SID is correlated with Tobin's Q but not with SOECG and SOELG.

[13] We have also undertaken paired correlation between RESUDS, Tobin's Q, SOECG and SOELG. Our results show the following correlations: between RESUDS and Tobin's Q, -0.098; between RESUDS and SOECG, 0.304; between RESUDS and SOELG, 0.446. This result suggests that RESUDS is correlated with SOECG and SOELG but not with Tobin's Q

[14] Our paired correlation results indicate that LMGP is negatively correlated with SOECG and SOELG, that is, for LMGP and SOECG, -0.162, and for LMGP and SOELG, -0.242. The paired correlation between LMGP and Tobin's Q is 0.058. These results suggest that LMGP is correlated with SOECG and SOELG but not with Tobin's Q.

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$$\text{Tobin's Qit} = \gamma 0 + \gamma 1\text{OWNit} + \beta 1 BLOCKit + \beta 2 PFORit + \beta 3 STATUSit + \beta 4 SIZEit + \beta 5 LEVit + \beta 6 IORAit + \beta 7 DEVELOPIit + \sum_{j=1}^{8} \beta 7 + jYEARit + \sum_{k=1}^{19} \beta 15 + kINDUSTRYit + \varepsilon it \quad (5)$$

$$\text{OWNit} = \gamma 0 + \gamma 1\text{Tobin's Qit} + \beta 1 LMGP + \beta 2 RESUDAit + \beta 3 OPENESSit + \beta 4 SIZEit + \beta 5 IORAit + \beta 6 DEVELOPIit + \sum_{j=1}^{8} \beta 6 + jYEARit + \sum_{k=1}^{19} \beta 14 + kINDUSTRYit + \varepsilon it \quad (6)$$

where OWN is the percentage of ownership of the largest private shareholder in equations (6) and (7). The natural log of remuneration for senior executives (LNDTP), the market status dummy (STATUS), the proportion of shares owned by individual investors (RESUDA), and the regional openness dummy (OPENNESS) are treated as exogenous variables (instruments).

We have identified STATUS as the first instrument. Tian and Zhou (2003) and Luo, Wan & Cai (2012) argued that the largest private investors tend to acquire the licenses of businesses that are performing well or sectors they regard as valuable. They also undertake merger and acquisition activities to obtain permits indirectly (Luo et al., 2012). Local protectionism is strong in China and without a local partner or making a direct investment in a region, enterprises cannot readily sell products in regional markets, especially those operating in highly competitive industries (Tian & Zhou, 2003). Consequently, private firms in these sectors will have high performance but the concentration of ownership will be low due to the expansion of their partnership networks (Tian & Zhou, 2003).

For the reasons stated above, we argue that STATUS affects PRIVATE but not Tobin's Q. [15] The second exogenous variable used is RESUDA, which represents the proportion of shares owned by individual investors. A higher proportion of shares owned by small investors indicates that a relatively lower proportion of stocks is available for the largest shareholder. Therefore, we argue that RESUDA in equation (7) affects PRIVATE, but not Tobin's Q.[16] The third exogenous variable used in this study is OPENNESS. Wang et al. (2010) argued that the majority of Chinese private listed firms are owned by families who operate typical product manufacturing and export processing businesses. These firms tend to have relatively high levels of ownership concentration and are often gathered in certain regions to form industrial clusters (Shen, 2008; Leng, 2009). Therefore, we have used the proportion of the total value of exports and imports to provincial GDP and ranked them to capture the most export-oriented regions in China. We presume that OPENNESS positively affects PRIVATE but not Tobin's Q.[17] Finally, we argue that the compensation plans for hired executives have the potential to be based on size and meeting the largest shareholders' objectives. Based on the above, we argue that LMGP affects PRIVATE but not Tobin's Q.[18]

V. Empirical Results

a) Effect of Ownership Identity on Firm Performance

The results reported in Table IV Panel A show that firms' financial performance does differ for different types of largest shareholders. For example, the mean (median) ROA for SOECGs as the largest shareholder is 5.60% (5.29%), 5.78% (5.39%) for SOELGs, and 6.79% (6.60%) for PRIVATEs. These results suggest that PRIVATE controlled firms perform better than both SOECGs and SOELGs. These results are statistically significant at a 1% level. The statistical significance of the differences in means (medians) of ROA for different types of the largest shareholder is reported in Table IV, Panel B. The results for ROA reported in Panel A do not support hypothesis H2. That is, SOEs (SOECGs and SOELGs) perform better than the PRIVATE controlled firms.

The results for SPROD show that SOELGs perform better than PRIVATEs and SOECGs and also that SOECGs perform better than PRIVATEs. The results of SPROD suggest that listed SOEs have a relatively stronger revenue-generating capacity compared to the PRIVATE controlled firms, thus supporting our hypothesis H1. The results of CFOA suggest that SOELGs and SOECGs have higher cash flow returns

[15] Our paired correlation results for PRIVATE, TOBIN's Q, and STATUS show that STATUS is cor- related with Tobin's Q (0.151) but not with PRIVATE (0.067).

[16] Our paired correlation results for PRIVATE, TOBIN's Q, and RESUDA show that RESUDA is not correlated with Tobin's Q (-0.056) but highly correlated with PRIVATE (-0.157).

[17] Our paired correlation results for PRIVATE, TOBIN's Q and OPENNESS show that OPENNESS is not correlated with Tobin's Q (0.002) but highly correlated with PRIVATE (0.146).

[18] Our paired correlation results for PRIVATE, TOBIN's Q and LMGP show that LMGP is not corre- lated with Tobin's Q (0.042) but highly correlated with PRIVATE (0.138).

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compared to PRIVATE and PCHINEXT. The results of CFOA provide support for hypothesis H1. The results of OCS show that the operating costs of PRIVATE controlled firms and PCHINEXT are slightly lower than the SOECGs and SOELGs. The results of OCS provide support for hypothesis H3. Results for Tobin's Q suggest that PRIVATE controlled firms have higher market value compared to SOECGs and SOELGs. Thus this finding does not provide support for hypotheses H4 and H5.

The cross-sectional results reported in Table IV Panel C show that PRIVATE controlled firms perform better than SOECGs and SOELGs. In the period 2005 – 2008, however, according to all performance measures SOECGs performed better than SOELGs but from 2009 to 2012, SOELGs achieved better performance than SOECGs. Our results suggest that SASAC 2003 has had a positive effect on SOELG performance.

Table 4: Operating Performance of Publicly Listed Firms with Different Types of Largest Shareholder

	SOECG		SOELG		PRIVATE		PCHINEXT		ALL	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A: Overall Performance										
ROA	5.60%	5.29%	5.78%	5.39%	6.79%	6.60%	8.61%	8.49%	6.33%	5.90%
CFOA	4.88%	4.61%	5.43%	5.31%	3.88%	3.96%	1.94%	2.74%	4.50%	4.51%
SPROD	2.905	1.242	4.386	1.214	2.357	1.085	1.931	1.472	3.171	1.176
OCS	0.795	0.825	0.758	0.798	0.735	0.770	0.592	0.627	0.745	0.781
Tobin's Q	2.117	1.636	1.996	1.996	2.641	2.008	2.812	2.404	2.328	1.786
Panel B: Test of Differences in Mean and Median of Different Performance Measures										
	SOECG vs SOELG		SOECG vs PRIVATE		SOECG vs PCHINEXT		SOELG vs PRIVATE		SOELG vs PCHINEXT	
	Mean[a]	Median[b]	Mean[a]	Median[b]	Mean[a]	Median[b]	Mean[a]	Median[b]	Mean[a]	Median[b]
ROA	0.459	2.187**	3.805***	8.794***	6.505***	10.343***	1.099	8.667***	4.451***	9.604***
CFOA	2.574**	3.687***	-4.179***	4.069***	-9.164***	8.993***	-8.587***	9.837***	-11.003***	12.301***
SPROD	3.954***	0.552	-3.324***	6.759***	-3.055***	4.075***	-8.704***	7.378***	-4.197***	4.404***
OCS	-8.528***	8.546***	-13.970***	15.530***	-31.186***	27.326***	-6.546***	8.329***	-24.461***	24.104***
Tobin's Q	-3.127***	4.519***	10.024***	13.118***	11.759***	16.926***	16.980***	23.290***	14.185***	21.806***

Panel C: Accounting Indicator and Market Measure of Performance by Year

Year	Observations	SOECG		SOELG		PRIVATE		PCHINEXT		ALL	
		Mean[a]	Tobin's Q	Mean[a]	Tobin's Q	Mean[a]	Tobin's Q	Mean[a]	Tobin's Q	Mean[a]	Tobin's Q
2005	1246	4.94%	1.313	3.96%	1.272	-0.64%	1.456			2.51%	1.345
2006	1402	5.88%	1.784	5.29%	1.621	4.01%	1.925			4.94%	1.760
2007	1489	7.54%	3.455	7.50%	3.193	8.95%	3.988			8.06%	3.548
2008	1502	5.13%	1.495	4.98%	1.480	6.10%	1.913			5.46%	1.658
2009	1503	4.81%	2.551	5.10%	2.548	7.42%	3.620	13.01%	5.136	6.16%	3.039
2010	1708	6.42%	2.797	7.17%	2.487	8.82%	3.736	10.01%	4.235	7.98%	3.205
2011	2045	5.56%	1.803	6.28%	1.723	8.36%	2.224	8.93%	2.475	7.42%	2.047
2012	2534	4.66%	1.675	5.80%	1.633	7.04%	2.113	7.36%	2.271	6.43%	1.943

Table IV Panel A reports a series of financial measures of operating performance for companies clustered according to different identities. ROA/CFOA is operating earnings/cash flows deflated by the average book value of total assets. SPROD is the ratio of net sales to the number of employees in millions of RMB. OCS is the ratio of operating cost to net sales. Tobin's Q is the market value of total assets deflated by the average book value of total assets, where the market value of total assets is the sum of monthly average market capitalization and average total debts. Table III Panel B represents the statistical differences from 0 in the T-test for means and in the Mann-Whitney U-test for medians at the 1%, 5% and 10% levels, respectively (marked ***, ** and *). a indicates the T-value from the T-test of differences in means; b indicates the Z-value from the Mann-Whitney U-test of differences in medians; and Table IV Panel C reports the average value of ROA and Tobin's Q for each type of ownership by years.

Table V reports the regression results for Equation (1). The results reported in Table V show that the coefficients of the owner type/identity variables are statistically significant for the performance measures ROA, CFOA, SPROD, and Tobin's Q, thus suggesting that ownership identity does matter. Our results suggest that as the largest owner of SOECGs, the central government has a positive effect on firm performance,

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measured by CFOA and Tobin's Q. For CFOA and SPROD, our results indicate that local governments have played an active role in the management of SOELGs after gaining ownership rights as a result of the recent SASAC reform. The coefficient of DSOELG is negative and statistically significant at a 1% level for the performance measure Tobin's Q. This finding is consistent with that reported by Zou et al. (2008) and Chen et al. (2009) that SOELGs experience negative market reactions compared to SOECGs and PRIVATEs. In regard to PRIVATEs, our results are positive for the performance measures ROA, CFOA, and Tobin's Q.

The coefficient of SIZE is positive and statistically significant for all the accounting based performance measures, thus suggesting that larger firms are better at exploiting economies of scale and have access to capital on more favorable terms. However, the negative coefficient of SIZE for Tobin's Q suggests that investors are concerned about the agency problems existing in larger firms and therefore favor smaller firms instead (Jiang et al., 2008). The coefficient of LEV is negative for the accounting-based measures but positive for the operating efficiency, productivity, and market measures, which suggest that firms that take on leverage are better governed and have better growth prospects. The coefficient of IORA is positive for both ROA and Tobin's Q, thus suggesting that firms that experience growth generate better returns for the shareholders. The positive coefficient of DEVELOP1 suggests that firms that operate in developed regions benefit from better developed regional business institutions and infrastructure (Fan et al., 2001; Qian & Stiglitz, 1996).

Table 5: Pooled OLS Regression Analysis of Operating Performance on Ownership Type/Identity

	Profitability		Operating Efficiency	Productivity	Market Performance
Dependent	ROA	CFOA	OCS	SPROD	Tobin's Q
Constant	**-0.186*** [0.22]**	-0.019 [0.014]	1.34 [1.19]	**-13.446*** [0.737]**	**14.428*** [0.252]**
DSOECG	**-0.007† [0.004]**	**0.005** [0.002]**	-0.204 [0.196]	-0.167 [0.121]	**0.117*** [0.039]**
DSOELG	-0.002 [0.003]	**0.011*** [0.002]**	-0.158 [0.152]	**0.452*** [0.094]**	**-0.178*** [-0.030]**
DPRIVATE	**0.006† [0.004]**	**0.005** [0.002]**	0.204 [0.196]	0.167 [0.121]	**0.190*** [0.029]**
SIZE	**0.012*** [0.002]**	**0.004*** [0.001]**	-0.007 [0.057]	**0.656*** [0.035]**	**-0.614*** [0.011]**
LEV	**-0.103*** [0.003]**	**-0.007*** [0.002]**	**0.472*** [0.138]**	**0.427*** [0.085]**	**0.946*** [0.027]**
IORA	**0.020*** [0.002]**	**-0.005 [0.001]**	0.014 [0.109]	-0.082 [0.067]	**0.271*** [0.021]**
DEVELOPI	**0.005** [0.002]**	**-0.003† [0.002]**	**-0.414*** [0.130]**	**0.966*** [0.080]**	**0.081*** [0.026]**
Industry dummies	no	no	no	no	no
Firm-fixed effects	yes	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes	yes
F-statistics	**171.41***	**31.99***	**3.12***	**52.41***	**609.66***
(P-value)	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**	**(0.000)**
R2	0.144	0.031	0.030	0.059	0.374
(Adj. R^2)	(0.143)	(0.023)	(0.021)	(0.048)	(0.374)
Durbin-Watson	2.016	1.428	1.786	0.457	1.085
			13273		

Notes: The Model: $\text{OpPerform}it = a0 + a1DSOECGit + a2DSOELGit + a3DPRIVATEit + \beta1SIZEit + \beta2LEVit + \beta3IORAit + \beta4DEVELOPIit + \varepsilon it$

where OpPerform is the performance measure, including ROA, CFOA, OCS, SPROD and Tobin's Q. DSOECG is a dummy variable coded 1 for firms whose biggest shareholder is a SOE affiliated to the central government. DSOELG is a dummy variable coded 1 for firms whose biggest shareholder is a SOE affiliated to a local government. DPRIVATE is a dummy variable coded 1 for firms whose biggest shareholder is a private investor. SIZE is the natural logarithm of total assets in billions. LEV is the ratio of total debt to total assets at the end of the year. IORA is the total asset growth rate. DEVELOPI is a geo-economic dummy variable for China's economically developed regions, including Beijing, Tianjin, Shanghai and the coastal regions (ranked by each region's GDP per capita over the 8 sampling years). The table reports pooled-OLS regression and fixed effects OLS regression. Standard errors are reported in brackets, where ***, ** and † represent statistical significance at the 1%, 5%, and 10% levels, respectively.

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b) Effect of Ownership Concentration on Firm Value

We are interested in finding out whether the proportion of shares held by the largest shareholder has a positive effect on the various financial performance measures. According to Shleifer and Vishny (1986), larger ownership may better align the incentives of the dominant owner with the preference of the minority investors but it also increases the possibility that the controlling party may undertake tunneling activities.

Table VI reports the results of the linear relationship between the five performance measures and the proportion of the largest shareholder ownership. According to columns 11 and 14 of Table VI, the percentage of shares held by the central government in SOEs is statistically significantly related to SPROD and Tobin's Q. However, the coefficient of SOECG in column 11 is negative, thus suggesting that the largest shareholder contributes negatively to firm performance measured by SPROD. This result indicates that the central government is interested in achieving social objectives. Consequently, it hires more people to boost employment, and this in turn leads to a decline in sales per employee (as measured by SPROD). On the other hand, the coefficient of SOECG in column 14 is positive and statistically significant at a 1% level. Results reported for the non-linear model in Figure 1, Graph A in the Appendix also show that central government ownership above 40% leads to higher Tobin's Q. Our results reported in Table II confirm that central government ownership in strategic industries is between 45% and 60%. Our results are similar to that reported by Wang and Xiao (2009), which suggest that the central government has kept a substantial amount of state shares in the partially privatized enterprises to retain control even after the Split Share Reform. This result supports our hypothesis H5.

According to columns 3, 6, 12, and 15 of Table VI, the percentage of shares held by the local government in SOEs is statistically significantly related to the firm performance measures ROA, CFOA, SPROD, and Tobin's Q. The coefficient of SOELG in columns 3, 6, and 12 is positive, thus suggesting that the largest shareholder contributes to firm performance measured by ROA, CFOA, and SPROD. Our findings support the view posited by Li, You, Wang, and Yuan (2013), that managers are interested in accounting based performance measures because their personal performance appraisals are determined by them. On the other hand, the coefficient of SOELG in column 15 is negative and statistically significant at a 5% level. This result supports the view posited by Zou et al. (2008), that local government-owned SOEs receive a negative market reaction from investors and consequently experience lower market valuation (similar to the results reported in Table V). Results reported for the non-linear model in Figure 1, Graph B in the Appendix show that local government ownership between 25% and 72% leads to higher Tobin's Q. Our results reported in Table II show that local government ownership in strategic industries is between 28% and 49%. However, Chen et al. (2009) and Leng (2009), argue that the proper legal infrastructures and weak law enforcement may have led to the expropriation of the minority shareholder rights by the local government.

According to columns 4, 10, 13 and 16 of Table VI, the percentage of shares held by private investors is statistically significantly related to firm performance measures ROA, OCS, SPROD, and Tobin's Q. The coefficient of PRIVATE in columns 4, 10, and 16 is positive, thus suggesting that the largest private shareholder contributes to a firm's performance, as measured by ROA, OCS, and Tobin's Q. This result indicates that the largest shareholder (PRIVATE) is interested in creating value for the firm. Results reported for the non-linear model in Figure 1, Graph C in the Appendix also show that the local government ownership above 30% leads to higher Tobin's Q. According to Wang et al. (2010), family businesses account for a large proportion of private firms where concentrated ownership of up to 45% is common. Since private firms are not close to government ties, expropriation seems to be lower. On the other hand, the coefficient of PRIVATE in column 13 is negative and statistically significant at a 5% level. This result suggests that firms with predominantly private investors tend to contribute negatively to sales per employee, which could be the result of misappropriation.

The results in Table VI show that the percentage of ownership by non-controlling blockholders (BLOCK) is positively related to the firm value measured by Tobin's Q, a result that is statistically significant at a 1% level. This result provides support for hypothesis H6 and is consistent with the results reported by Song et al. (2004), Kang and Kim (2012), and Leung and Cheng (2013). The evidence suggests that non-controlling, large shareholders play an active role in corporate governance in China irrespective of who the controlling investor is.

The coefficient of foreign ownership (PFOR) for Tobin's Q reported in Table VI is positive and is statistically significant at a 1% level for all three types of controlling investor groups. This result supports our hypothesis H7 and is consistent with the results reported by Bai et al. (2004), Wei et al. (2005), and Jiang et al. (2008), who in different contexts conclude that the presence of foreign shareholders in China's public firms leads to higher market value. A plausible reason for this may be greater transparency in these companies' financial performance, enhanced monitoring effects, and the technical support brought by foreign investors. Since foreign investors seek better economic returns, they force management to act more consistently in regard to the goal of profit maximization. Consequently, an increase in foreign investors in China's listed companies

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could lead to an improvement in corporate governance practices, especially in SOEs.

Finally, Table VI reports the results of the effect of board members' remuneration in Chinese public companies. Results show that board members' remuneration (LNDTP) contributes to firm value and the result is statistically significant at a 1% level. This result indicates that remuneration packages are an important mechanism for motivating top decision-makers in privately controlled firms (Li et al., 2013).

Table 6: OLS Regression with Fixed Effects for Different Performance Measures and Ownership Proportion

Dependent	ROA			CFOA			OCS			SPROD			Tobin's Q		
Constant	-0.264***	-0.263***	-0.67**	-0.101***	-0.099***	-0.023	4.754**	4.712**	1.983	-10.22***	-9.667***	-10.972***	14.856***	14.522***	15.103***
	[0.028]	[0.028]	[0.018]	[0.018]	[0.017]	[0.016]	[1.521]	[1.513]	[1.394]	[0.929]	[0.919]	[0.847]	[0.294]	[0.294]	[0.271]
SOECG	0.002			0.005			-0.549			-0.767**			0.869***		
	[0.008]			[0.005]			[0.417]			[0.253]			[0.081]		
SOELG		0.011†			0.021***			-0.516			1.723***			-0.143**	
		[0.006]			[0.004]			[0.335]			[0.203]			[0.065]	
PRIVATE			0.028***			0.004			1.042**			-0.528**			0.503***
			[0.007]			[0.004]			[0.354]			[0.216]			[0.069]
BLOCK	0.028†	0.033**	0.052***	0.024**	0.032***	0.032***	-0.678	-0.816	-1.053	-2.234***	-1.321**	-2.237***	1.711***	1.508***	1.685***
	[0.015]	[0.016]	[0.015]	[0.009]	[0.009]	[0.009]	[0.823]	[0.834]	[0.788]	[0.506]	[0.505]	[0.478]	[0.159]	[0.162]	[0.153]
PFOR		0.008	0.023		-0.016†	-0.007		-0.339	-0.408		-0.148	-0.386		0.885***	1.059***
		[0.015]	[0.015]		[0.009]	[0.008]		[0.810]	[0.809]		[0.495]	[0.497]		[0.157]	[0.153]
PBDSH	-0.007	-0.006		-0.027***	-0.025***		-0.211	-0.245		0.372	0.650		-0.025	-0.100	
	[0.008]	[0.008]		[0.009]	[0.005]		[0.465]	[0.467]		[0.284]	[0.284]		[0.090]	[0.091]	
LNDTP	0.015***	0.015***		0.011***	0.012***		-0.329***	-0.323		-0.213***	-0.185***		0.138***	0.121***	
	[0.002]	[0.002]		[0.001]	[0.000]		[0.084]	[0.084]		[0.052]	[0.051]		[0.016]	[0.016]	
PEXESH			-0.009			-0.023***			-0.480			0.225			0.133[0.124]
			[0.012]			[0.007]			[0.640]			[0.391]			
LNMGP			0.002[0.004]			-			-			0.000[0.000]			-
						0.000[0.001]			0.001[0.000]						0.002[0.000]
SIZE	0.006***	0.006***	0.012***	0.001	0.000	0.004***	0.024	0.017	-0.071	0.671***	0.660***	0.567***	-0.672***	-0.639***	-0.592***
	[0.001]	[0.001]	[0.001]	[0.000]	[0.001]	[0.001]	[0.067]	[0.065]	[0.059]	[0.040]	[0.039]	[0.036]	[0.012]	[0.013]	[0.012]
LEV	-0.102***	-0.002***	-0.103***	-0.003**	-0.003**	-0.005**	0.461***	0.461**	0.506***	0.209**	0.233**	0.225**	1.015***	1.006***	1.007***
	[0.003]	[0.001]	[0.002]	[0.002]	[0.002]	[0.002]	[0.141]	[0.141]	[0.140]	[0.085]	[0.086]	[0.085]	[0.012]	[0.027]	[0.027]
IORA	0.020***	0.019***	0.019888	-0.005***	-0.005***	-0.005***	0.099	0.101	0.088	-0.016	-0.014	0.002	0.221***	0.218***	0.206***
	[0.002]	[0.002]	[0.002]	[0.001]	[0.001]	[0.001]	[0.113]	[0.113]	[0.112]	[0.068]	[0.068]	[0.068]	[0.027]	[0.021]	[0.021]
DEVELOPI	0.002	0.001	0.005†	-0.001	-0.234†	-0.367**	-0.219	-0.239†	-0.367**	0.083	0.863***	0.793***	-0.000	0.078**	0.088**
	[0.001]	[0.003]	[0.003]	[0.002]	[0.109]	[0.135]	[0.138]	[0.138]	[0.135]	[0.068]	[0.083]	[0.082]	[0.002]	(0.027)	[0.026]
Ind.Dummy	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
YearDummy	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
F Stats	80.67***	80.80***	74.82***	39.75***	40.80***	33.99***	3.55***	3.57***	3.27***	46.65***	49.11***	45.90***	226.05***	220.91***	220.69***
(P Value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Overall R^2	0.151	0.150	0.144	0.068	0.071	0.064	0.089	0.086	0.070	0.090	0.094	0.089	0.262	0.259	0.255
(Within R^2)	(0.143)	(0.141)	(0.137)	(0.075)	(0.078)	(0.065)	(0.072)	(0.071)	(0.067)	(0.089)	(00.094)	(0.088)	(0.316)	(0.311)	(0.310)
Obs								10548							

OpPerform is the performance measure, including ROA, CFOA, OCS, SPROD and Tobin's Q. SOECG is the proportion of shares held by the central government. SOELG is the proportion of shares held by the local government. PRIVATE is the proportion of held by private investors. BLOCK is the non-controlling blockholders' shareholding. PFOR is the proportion of shares held by residents outside mainland China, include: foreign nationals, residents of Hong Kong, Macau, and Taiwan. PBDSH is the proportion of shares held by the board members. LNDTP is the natural logarithm of the total emolument of the top three directors on the board. PEXESH is the percentage shareholding of the top three ranked executives. LNMGP is the total emolument of the top three executives. SIZE is the natural logarithm of total asset. LEV is the ratio of total debt to total assets. IORA is the total asset growth rate. DEVELOPI is geo-economic dummy variable for China's economically developed regions, including Beijing, Tianjin, Shanghai and the coastal regions. Standard errors re reported in brackets and ***, **and † represent significance at 1%, 5% and 10% levels, respectively.

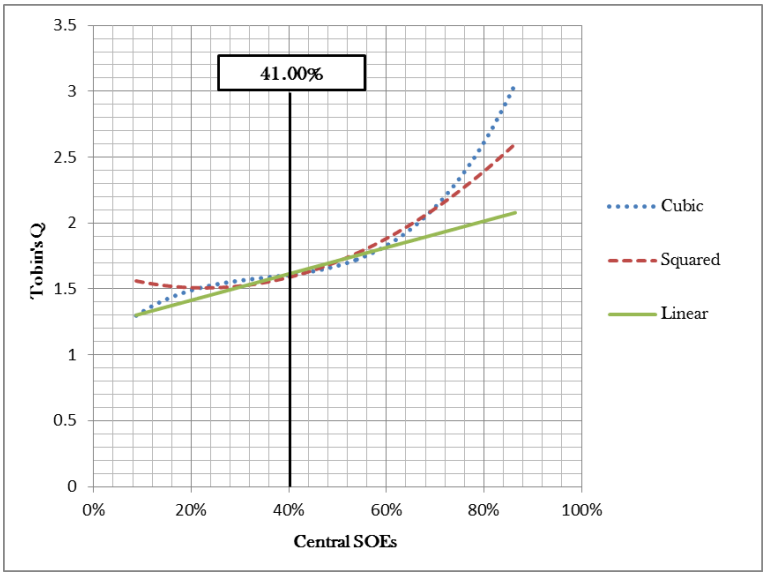
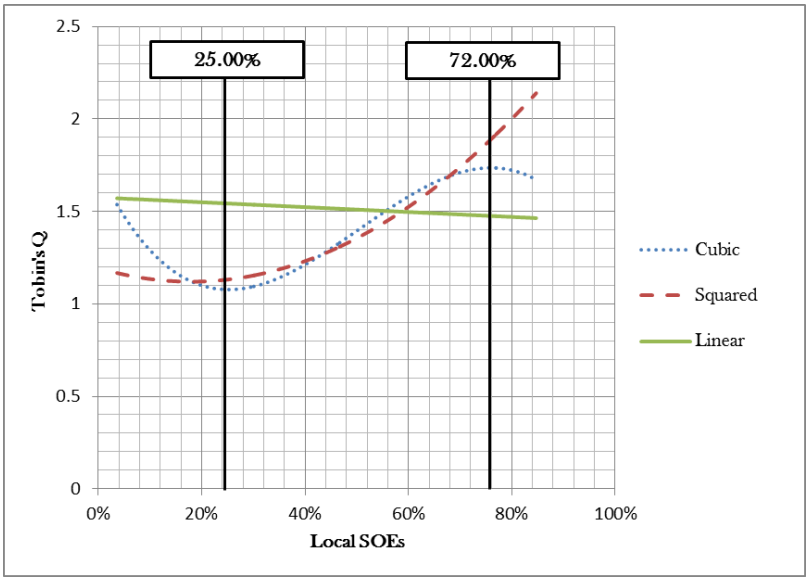
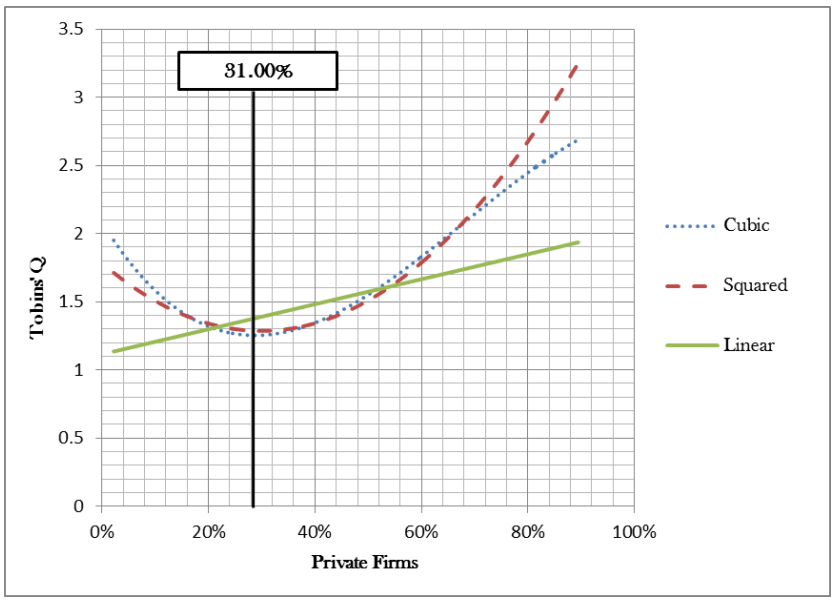


Figure 1: Graph A: Tobin's Q versus central SOEs

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Graph B: Tobin's Q versus local SOEs



Graph C: Tobin's Q versus private investor controlled firms

VI. Tests of Reverse Causality

To check for the robustness of our results reported in Table VI, we have undertaken further investigation using Two-Stage Least Squares (2SLS) which allows us to control for the effect of endogeneity.

Table VII Panel A reports the 2SLS regression results for equation (4) when the largest shareholder is a SOECG. The coefficient for SOECG is positive and is statistically significant at a 1% level, as with the results reported for OLS regression in Table VI. The coefficient of SID is positive and is statistically significantly related to Tobin's Q, thus providing support for the view that the government cherry-picks firms in industries that tend to perform well.

Table VII Panel B reports the 2SLS regression results for equation (4) where the largest owner is the local government. The coefficient of SOELG is statistically insignificant, thus indicating that local government ownership is not an important determinant of firm performance. Graph B shows that the relationship between local government ownership and Tobin's Q is not clear, as reported by Bai et al. (2004), Chen et al. (2004), and Li et al. (2004). The coefficient of SID in Panel B is statistically insignificantly related to Tobin's Q, thus providing support for the view that firms in which local government has the largest proportion of shares do not belong to the strategic industries sector.

To check the robustness of the 2SLS regression, we have undertaken further analysis as follows. First, we checked whether the instruments are not correlated with both ownership and Tobin's Q. Second, we tested the instruments' validity by checking

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whether they are orthogonal to the error term of the respective equation. The test for over-identifying restrictions is implemented where the equation has two or more instruments (Sargan, 1964). According to Panels A and B of Table VII, Hansen's J statistics for equation (5) is 0.095 and is statistically insignificant, thus indicating that the instruments of the system are orthogonal to the error term and are all valid. Third, we checked whether the instruments used are "weak," as this problem has the potential to cause severely biased results (Stock & Yogo, 2004). According to the results reported in Table VII, the F-statistic exceeds the general criterion of 10 (Stock & Watson, 2007), and we, therefore, conclude that the instruments used in equations (4) and (5) are not weak.

Table VII Panel C reports the 2SLS regression results for equation (6) when the largest shareholder is PRIVATE. The coefficient of PRIVATE is positive and is statistically significant at a 1% level. The coefficient of STATUS is statistically insignificant, thus indicating that the participation of private investors investing in high-performing firms in local areas is not an important determinant of firm performance. The evidence regarding the concentration of ownership in private firms when market barriers exist is not convincing. The results of instrument validity tests reported in Panel C of Table VII suggest that the instruments used in equations (6) and (7) are not weak.

Table 7: Two-Stage Least Squares Regression with Various Ownership Types and Tobin's Q

Tobin's Q is the performance measure market value divided by total assets. SOECG is the proportion of shares held by the central government, SOELG is the proportion of shares held by the local government, and PRIVATE is the proportion of shares held by private investors. In estimating the 2SLS system, Tobin's Q and SOECG, Tobin's Q and SOELG, and Tobin's Q and PRIVATE are treated as endogenous variables for simultaneous equations. LMGP refers to the log of remuneration of top-tier executives. SID is the strategic industry dummy. RESUDS is a fraction of total residual state shares, excluding the dominant shareholder's proportion in listed SOEs. STATUS refers to the market status dummy that captures whether there is a strong trade barrier for private firms in China's various regions. RESUDA is the proportion of shares owned by individual small investors. OPENNESS is the regional macro-economic indicator that labels the most export-oriented regions in China (ranked by each region's proportion of the total value of exports and imports to provincial GDP over the 8 sampling years). SIZE is the natural logarithm of the book value of total assets. LEV is the ratio of total debt to total assets. IORA is the total growth rate and is used to control for investment opportunities. DEVELOPI is a geo-economic dummy variable for China's more economically developed regions. Standard errors are reported in [ ] and ***, ** and † indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Panel A		Panel B		Panel C	
Variables	SOECG	Tobin's Q	SOELG	Tobin's Q	PRIVATE	Tobin's Q
Constant	-0.682*** [0.017]	15.878*** [0.489]	0.349 [0.036]	14.663*** [0.422]	-0.303**** [0.019]	12.136*** [0.459]
Tobin's Q	0.005*** [0.001]		0.007 [0.001]		0.004 [0.011]	
SOECG		2.266*** [0.335]				
SOELG				1.214 [0.174]		
PRIVATE						2.801*** [0.348]
BLOCK		2.273*** [0.178]		2.348*** [0.187]		1.695*** [0.151]
PFOR				0.872*** [0.184]		1.310*** [0.192]
SID		0.673** [0.279]		0.064 [0.268]		
STATUS						-0.198 [0.181]
LMGP	-0.084*** [0.004]		0.032*** [0.003]		-0.238*** [0.013]	
RESUDS	0.195*** [0.010]		0.401*** [0.010]			
RESUDA					-0.072*** [0.004]	
OPENNESS					0.006** [0.002]	
SIZE	0.031*** [0.001]	-0.681*** [0.022]	-0.004** [0.002]	-0.634*** [0.019]	0.015** [0.001]	-0.525*** [0.020]
LEV	-0.007*** [0.001]	1.021*** [0.091]	0.006 [0.012]	1.025*** [0.092]	-0.008*** [0.002]	1.042*** [0.093]
IORA	-0.009*** [0.001]	0.229*** [0.028]	0.002 [0.002]	0.221*** [0.028]	-0.014*** [0.003]	0.186*** [0.028]
DEVELOPI	0.010*** [0.003]	0.109*** [0.028]	-0.019† [0.003]	0.010*** [0.003]		-0.011 [0.032]
IndDummy	yes	yes	yes	yes	yes	yes
YearDummy	yes	yes	yes	yes	yes	yes
Chi^2 statistics (P-value)	108.02*** (0.000)	4634.10*** (0.000)	487.96*** (0.000)	4631.42*** (0.000)	899.67*** (0.000)	43332.61*** (0.000)
R^2 (Root MSE)	0.227 (0.149)	0.41 (1.438)	0.452 (0.178)	0.396 (1.443)	0.645 (0.112)	0.367 (1.478)
Obs			13273			
Instrument Validity Tests						
Instrument Overriding Test		0.95 (0.864)		1.54 (0.218)		3.678 (0.215)

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Hansen's chi^2 (P-value)					
Stock & Yoko (2004) Weak Instrument Test 310.75 (0.000) First-stage F-Statistics	13.16 (0.000)	423.58 (0.000)	36.27 (0.000	32.40 (0.000)	28.45 (0.000)
Hansen (1978) Specification Test 58.07 (0.582)	59.07 (0.5822)	145.56 (0.000)	145.57 (0.000)	4.27 (1.000)	4.27 (1.000)

a) Robustness Check

To further check the robustness of the results reported in Tables VI and VII, we have undertaken a difference and difference-in-difference regression.[19] The results are reported in Table VIII. The difference measures the change in the independent variable that contributes to the change in the dependent variable, that is, $\Delta Y_{it} = \Delta X_{it} + \varepsilon_{it}$, where $\Delta Y_{it} = Y_{it} - Y_{it-1}$ and $\Delta X_{it} = X_{it} - X_{it-1}$. On the other hand, difference-in-difference measures $2\Delta Y_{it} = 2\Delta X_{it} + \varepsilon_{it}$, where $2\Delta Y_{it} = (Y_{it} - Y_{it-1}) - (Y_{it-1} - Y_{it-2}) = Y_{it} - 2Y_{it-1} + Y_{it-2}$ and $2\Delta X_{it} = (X_{it} - X_{it-1}) - (X_{it-1} - X_{it-2}) = X_{it} - 2X_{it-1} + X_{it-2}$.

The results reported in columns 2 and 3 in Table VIII show that the presence of the central government as the largest shareholder contributes positively to Tobin's Q. The difference and difference-in-difference regression results also show that the coefficient of SOECG is positive and is statistically significant at a 1% level, thus suggesting that the central government as the largest shareholder provides a measure of vigilance over managerial decisions. The results reported in Table IV show that the performance of SOECGs is positive but not better than that of SOELGs and PRIVATEs. This suggests that the positive performance of SOECGs is the result of the central government's cherry-picking of industries for investment rather than close monitoring.

The results reported in columns 4 and 5 in Table VIII show that the participation of local government as the largest shareholder (SOELG) does not contribute to firm performance, nor does the private investor (PRIVATE) as the largest shareholder (refer to columns 6 and 7 in Table VIII). These results possibly reflect misappropriation by local government and private investors and suggest that tunneling activities may be involved.

The results of BLOCK, PFOR, and LEV are positive and statistically significant at a 1% level, thus suggesting that BLOCK, PFOR, and LEV are important mechanisms for monitoring managerial decisions. Furthermore, the results of IORA suggest that an increase in total assets is seen as a positive signal for growth and encourages a positive outlook among investors. Thus the firm is positively evaluated as measured by Tobin's Q. However, the coefficient of SIZE is negative and is statistically significant at a 1% level, thus suggesting that firm size is not at an optimal level. This result is not surprising, since industries in China are new and still in the development stage. Consequently, firm size may have been developed only to suboptimal levels as a temporary response to market demand.

[19] We thank the anonymous reviewer for suggesting that we use the difference and difference-in- difference method to check for robustness in our OLS and 2SLS regression.

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Table 8: Difference and Difference-in-Difference Regression for Ownership Variables and Tobin's Q as Performance Measure

	Difference for SOECG	Difference-in-Difference for SOECG	Difference for SOELG	Difference-in-Difference for SOELG	Difference for PRIVATE	Difference-in-Difference for PRIVATE
Constant	0.012 [0.019]	0.051 [0.035]	0.012 [0.019]	-0.044 [0.036]	0.014 [0.019]	0.046 [0.035]
SOECG	0.094*** [0.091]	0.964*** [0.098]				
SOELG			0.107 [0.072]	0.075 [0.077]		
PRIVATE					0.075 [0.082]	-0.009 [0.088]
BLOCK	1.418*** [0.178]	1.320*** [0.186]	1.358*** [0.180]	1.275*** [0.189]	1.491*** [0.175]	1.444*** [0.185]
PFOR			0.775*** [0.202]	0.518** [0.226]	0.898*** [0.203]	0.629** [0.227]
PBDSH	-0.009 [0.108]	0.097 [0.109]	-0.094 [0.108]	-0.009 [0.109]		
LNDTP					0.163*** [0.017]	0.193*** [0.019]
PEXESH					0.247† [0.139]	0.294** [0.140]
LNMGP	-0.128 [0.177]	-0.304† [0.79]	-0.095 [0.172]	-0.259 [0.172]	-0.0001 [0.0001]	-0.0000 [0.0001]
SIZE	-0.739*** [0.015]	-0.727*** [0.016]	-0.713*** [0.015]	-0.698*** [0.016]	-0.656*** [0.015]	-0.632*** [0.015]
LEV	0.925*** [0.032]	0.743*** [0.039]	0.915*** [0.032]	0.726*** [0.039]	0.898*** [0.032]	0.698*** [0.038]
IORA	0.283*** [0.032]	0.318*** [0.034]	0.278*** [0.033]	0.312*** [0.034]	0.272*** [0.033]	0.309*** [0.035]
F Stats (P Value)	432.13*** (0.000)	299.79*** (0.000)	416.07*** (0.000)	284.97*** (0.000)	402.74*** (0.000)	270.25*** (0.000)
R^2 (Root MSE)	0.24 (1.972)	0.22 (3.319)	0.24 (1.981)	0.23 (3.336)	0.23 (1.989)	0.20 (3.354)
Obs	10687	8942	10687	8942	10687	8942

VII. Conclusions and Policy Implications

The results reported in this study show that different types of owners behave differently to promote their firms' operating efficiency. The "helping hand" from the government tends to benefit both the central SOEs through preferential incentives, such as loans and subsidies, large government orders, and the protection of local industry. These resources tend to be an important factor contributing to SOECGs' performance. In contrast, the performance of PRIVATEs may be affected as they do not receive similar treatment from the government. Our findings are consistent with those of prior researchers who have reported that policy discrimination may have resulted in serious capital starvation in private firms (Leng, 2009). Our results also show that SOECGs have slightly higher operating costs compared to the SOELGs and PRIVATEs, thus suggesting that SOECGs are still required to meet the government's social/political objectives even after the SASAC reforms. However, our findings contrast with those of prior studies that reported that state-owned companies are superior to private ones because of their political connections and better corporate governance (Xu and Wang, 1999; Chen et al., 2009).

Our findings support the argument made by Stiglitz (1999) that without the helping hand and protection of government, it will be difficult for SOECGs to maintain sustainable performance in the long run. Finally, our results show that the three ownership types (central government, local government, and private investors) tend to determine their incentives by modifying their practice in accordance with a profit-maximizing strategy. Under the strict supervision of the central government, SOECGs show strong, positive alignment with minority shareholders when the largest investors increase their holdings. In contrast, without proper monitoring and with weak legal enforcement at local levels, both SOELGs and PRIVATEs tend to abuse

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minority shareholders' interests when the dominant shareholders' holdings are below a certain level.

Our results are timely for policymakers and can assist in better aligning the effects of ownership on firms' performance and can also provide guidelines for China's future enterprise reforms. In 2013, China's new government released its social and economic reform agenda for the next 10 years, highlighting major steps to further reform SOEs and plans to adopt such measures as "pushing further ownership diversification" as a "high priority."[20] In this regard, our results suggest that partial privatization has not led to higher performance and efficiency gains, especially when SOEs still have monopolistic powers. Shleifer and Vishny (1994) argued that efficiency gains from privatization can only be expected if control rights are passed to private investors.

The benefit of privatization can be realized by clearly defining property rights (Martin & Parker, 1997).[21] Leng (2009) argued that the rapid expansion of SOEs is likely to cause a "spill-over" problem in other parts of the economy since they consume large quantities of social and financial resources and use them inefficiently. Chen et al. (2008) also reported that the efficiency gains of China's former SOEs after privatization only appear when control rights are passed to a private entity. Consequently, our results provide support for the view that further ownership reform of large SOEs in China should be followed by increasing market competition, which could be beneficial for improving SOE performance. In this regard, Stiglitz (1999) argued that the effects of privatization in transition economies largely depend on the existence of a free competitive market.

Prior researchers who have studied the post-privatization performance of former SOEs have reported positive results for the OECD countries (Bortolotti & Faccio, 2006). However, the empirical evidence from the developing world is more equivocal and in some cases negative, thus indicating that privatization may not always work when addressing the operational inefficiencies of former SOEs (Leng, 2009). In this regard, Merritt and Michael (2000) reported that privatized firms in Russia have suffered from the pervasive interference of politicians, and enterprises are unable to freely implement their profit-maximizing strategies. Similarly, the oligarchs, who acquired the former large SOEs after privatization in Russia, colluded with politicians to obtain financing or set up excessive administrative barriers against potential competitors to ensure their monopoly status (Galina & Robert, 2003). Consequently, market failures tend to distort incentives for non-politically linked businesses and reduce the benefits provided by private ownership even after complete privatization (Leng, 2009).

The findings of studies undertaken in China and Russia suggest that in the absence of a free competitive market, "spill-over" problems may remain regardless of whether privatization is partial or complete. Finally, because of the lack of good corporate governance and legal protection for minority shareholders, the largest shareholders in both local SOEs and private firms have the opportunity to expropriate these shareholders when their holdings reach a certain level. Accordingly, it is recommended that Chinese policymakers enact regulations to improve the monitoring of the largest shareholders, especially at the local level.

[20] "SOE reforms to be launched after Plenum." China Daily, November 11, 2013.

[21] Control privatization refers to the situation where government relinquishes its control rights over state enterprises or reduces its holdings as a non-controlling shareholder after privatization. Revenue privatization refers to the situation where the government retains a controlling stake after privatization.

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Financial Performance Measurement of Manufacturing Small and Medium Enterprises in Pretoria, South Africa: A Multiple Exploratory Case Study

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Abstract- This article focuses on the financial performance measures used by manufacturing small and medium enterprises (SMEs) in Pretoria, South Africa. The objectives were to identify the financial tools that are used by SMEs to measure their financial performance, and recommend improvements (if any) and training interventions that would possibly be needed to measure financial performance successfully. Semi-structured interviews were conducted with SME owners. Most of the respondents use financial ratios when measuring their financial performance, although to a limited extent. None of the respondents use bankruptcy prediction models. SMEs could benefit from using ratios that have been proven to be the best financial measures as well as the ratios that have worked well for most of the participants. Bankruptcy prediction models known to many of the participants as well as financial software packages should also be considered as they might enhance the success rate of SMEs.

Keywords: bankruptcy prediction models, financial management, financial performance measurement, manufacturing smes, ratio analysis.

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I. Introduction

The lack of managerial skills (including financial performance measurement skills) and training is one of the most widespread causes of general business failure among small and medium enterprises (SMEs) in South Africa (Arasti, 2011, Christian, 2008 & Mbonyane, 2006). Christian (2008) found that 90% of a sample of 1000 entrepreneurs "believe that small businesses fail due to the lack of managerial skills". The problem may become more acute when it comes to the specific financial performance management used in the SME sector, and to the question of whether SMEs are using the available tools (financial ratio analyses and bankruptcy prediction models) for the purposes of performance management. The characteristics common to unsuccessful enterprises are directly related to personal decision-based characteristics of the owner, such as inflexibility and lack of insight; managerial deficiencies, such as lack of management skills and appropriate managerial training; and financial shortcomings, such as no accounting background, cash flow analysis and financial records (Arasti, 2011).

The contribution of SMEs around the globe is undeniable, especially in developing countries, and the SME sector serves as an engine of job creation and economic growth. Creating opportunities for SMEs can advance development and reduce poverty (Ebrahim, Ahmed & Taha, 2010; International Finance Corporation, 2011). Precisely because of the importance of the contribution of SMEs to economies throughout the world and in South Africa in particular, many studies have been conducted on financing these SMEs, or on the obstacles that they face in obtaining finance. It appears, however, that very few studies have been undertaken on how SMEs manage their finances and especially how they measure their financial performance. Even top South African companies do not use the full arsenal of financial tools available to measure their financial performance (Mosalakae, 2007). Financial performance management forms an important part of the business management field, and financial measurement is also crucial for the survival of businesses. It must be noted though, that financial measures alone are not enough to measure companies' performance, since a number of non-financial performance measures also play an important role in their overall performance. However, this article will focus on financial measures only.

The present article has the potential to benefit managers and owners of SMEs by encouraging them to reconsider their current financial performance measurement tools (if any) and consider training on how to use these tools, especially if their businesses are not doing well. It may serve to preserve many of these SMEs from failure. It could help them to foresee failure and change their course of action in time to prevent it. This article could contribute by raising awareness of the importance of studying financial management (as a whole) in the SME context and also persuade researchers to shift the emphasis away from obstacles to accessing finance to financial performance measurement or financial management as a whole.

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Finally, this article may help fill the gap in the literature pertaining to financial performance measurement. The researchers investigated the financial performance measures used by manufacturing SMEs in Pretoria, which, as one of the country's three capital cities, serves as the executive and de facto national capital of South Africa.

II. Literature Background

a) The importance of successful SMEs

SMEs are defined differently across regions or countries. In South Africa, manufacturing SMEs are defined by the National Small Business Act No 102 of 1996, as amended in 2003, as those businesses employing a maximum of 200 full-time employees, with a turnover of a maximum of 51 million rand and a maximum total asset value of 19 million rand (Olawale, Olumuyiwa & George, 2010). As SMEs play an important role in global economies, governments focus on the development of SMEs to promote economic growth. South African SMEs contribute 56% of private sector employment and 36% of the gross domestic product (Olawale & Garwe, 2010). The importance of SMEs in the economy naturally raises the question of their success and failure. According to Statistics South Africa (2012), the number of insolvencies in South Africa ranged from around 120 in 2008 to 700 in 2009, and dropped again to just over 100 in 2012. The number of liquidations was in the region of 150 in 2008, rising to just under 500 in 2009 and dropping again to 200 in 2012. Before they are able to contribute to the economy, SMEs must sustain themselves and grow. This sustainability and growth is generally measured by their financial performance, hence the importance of SME financial performance measurement. Financial performance management forms an important part of business management, and it is also crucial for the survival of businesses. The question in this regard is whether manufacturing SMEs in Pretoria are using the appropriate tools (financial ratio analysis and bankruptcy prediction models), which have been available for many years.

b) Financial management and performance measurement

Financial management focuses on the decision regarding the quantities and types of assets to acquire, how to raise the capital needed and how to run the firm so as to maximise its value (Brigham & Houston, 2012). Jacobs (2001) notes that this is an area that requires knowledge, skills and experience and whose goals include maximising profits and sales, capturing a particular market share, minimising staff turnover and internal conflicts, survival of the firm, and maximising wealth.

According to Codjia (2010), a statement of financial performance is an accounting summary that details a business's revenues, expenses and net income. He goes on to say that "a statement of financial performance is also referred to as statement of profit and loss or statement of income; and a corporation may prepare a statement of financial performance on a monthly, quarterly or annual basis". As part of business management (*Business Dictionary*, 2010), financial performance measurement can be one of the biggest challenges faced by businesses in the SME sector, especially with regard to their survival if management is not trained in how to manage finance and measure performance. Performance measures are the lifeblood of organisations, since without them no decisions can be made (Mosalakae, 2007).

Performance measurement can be split into financial and non-financial measures. Financial performance measurement generally looks at firms' financial ratios (derived from their financial statements) such as liquidity ratios, activity ratios, profitability ratios, and debt ratios. Non-financial performance measurement is more subjective and may involve customer service, employee satisfaction, perceived growth in market share, perceived change in cash flow, and sales growth (Haber & Reichel, 2005).

A business needs to assess whether or not it has performed well over a certain period. From its profit and loss account, analysts can observe the profit it has generated. It is also necessary to know whether a business is in a good short-term financial position, and whether it is in a good financial position for long-term growth. One of the most common means of analysing accounts is the use of financial ratios. According to Jacobs (2001), a ratio is the simplest mathematical expression of two magnitudes which are meaningfully related, and which are expressed in relation to each other (as a quotient). Ratio analysis and interpretation can be used by many different stakeholders, especially those outside the organisation who want to invest. Ratios can also be used to compare an enterprise's current position with its past. Roberts (2012) identifies the four basic types of financial ratios as liquidity ratios, activity ratios, profitability ratios and leverage ratios.

c) Financial ratio analysis

Financial ratio analysis is defined by Lasher (2010) as a general technique based on some relatively standard methods used to analyse information, and developed by people who make judgements about businesses by reading their financial statement. Enterprises measure their financial performance differently, but financial ratio analysis is the traditional approach to analysing and interpreting the financial position of an enterprise (Jacobs, 2001). Ratios are derived from the financial statements of an enterprise and enable analysts to develop a picture of the financial position of an enterprise.

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As early as 1970 Edmister (1970) cited the following ratios as significant predictors of business failure:

1. Current ratio (current assets to current liabilities);
2. Net working capital to total assets;
3. Debt to total assets;
4. Total assets turnover (sales to total assets);
5. Net sales to net working capital;
6. Net operating margin (net working capital to total assets);
7. Earnings after tax to total assets;
8. Market value of equity to book value of total debt;
9. Cash flow to total debt;
10. Trend breaks of net quick assets to inventory;
11. Net quick assets to inventory; and
12. Rate of return to common shareholders.

Of the twelve ratios, Edmister notes that five (iii, ix, x, xi, xii) are generally the best indicators of failure. Daya (1977) in his study also mentions three of these five. Three of the five ratios used by Altman (2000) in the Z-score are also included in the twelve variables mentioned by Edmister. Other popular ratios mentioned in the literature as failure predictors are:

- Retained earnings to total assets;
- Profit after tax (PAT) to total assets;
- Shareholders' funds to total assets;
- Turnover to total assets;
- Operating profit to operating assets;
- Inventory to sales;
- Quick assets to current liabilities;
- Receivables to inventory; and
- Equity/total capital.

Vallely (2008) states that with regard to liquidity difficulties, the most important indicators include liquidity/solvency ratios, particularly the current and quick ratios. A consideration of how these ratios change over time and how they relate to the recommended averages may indicate whether or not a liquidity problem and potential corporate collapse are looming. Over the years, to overcome the shortcomings of financial ratio analysis, some authors (Altman, 1968 and Edmister, 1970) have suggested the grouping of similar ratios to develop meaningful bankruptcy prediction models.

d) Bankruptcy prediction models

Mosalakae (2007) defines a bankruptcy prediction model as a tool that can be used to assess whether or not a firm will be able to continue its operations. These models feature among the tools available for measuring financial performance. A number of researchers have tried to predict company failure based on the company's financial ratios, and ratios have been used to develop bankruptcy prediction models for this purpose. Examples of bankruptcy prediction models are Altman's Z-score and the ZETA credit models. The reason for singling these two out is that the Z-score is widely used and the ZETA credit risk model has a high prediction accuracy up to five years prior to failure. Daya (1977) reports that Altman discusses three generic terms which are often used to describe "corporate problems", these being failure, insolvency, and bankruptcy. He describes failure as represented by the situation where the realised rate of return on invested capital, with allowances for risk considerations, is significantly and continually lower than prevailing rates on similar investments. The state of insolvency exists when a firm cannot meet its current obligations, signifying a lack of liquidity. Bankruptcy can be of two types: the state of insolvency, and the declaration of bankruptcy in court accompanied by a petition to either liquidate the entity's assets or attempt a recovery programme.

i. *Altman's Z-score model*

Professor Altman developed the Z-score more than 40 years ago, and it is still widely used today. He researched 66 companies in the United States that experienced corporate failure between 1946 and 1965 to determine whether or not their failure could have been predicted. The model is used by investors and analysts to assess the financial risk associated with potential investments. In developing his models, Altman chose multiple discriminant analysis (MDA). This technique has been utilised in a variety of disciplines since its first application in the 1930s. During those earlier years, MDA was used mainly in the biological and behavioural sciences. In recent years, this technique has become increasingly popular in the practical business world and in the academic environment. MDA is a statistical technique used to classify an observation into one of several a priori groupings on the basis of the individual characteristics of the observation. It is used primarily to classify and/or make predictions in problems where the dependent variable appears in qualitative form, for example, male or female, bankrupt or non-bankrupt.

ii. *The ZETA credit model (1977)*

In 1977, a second-generation model with several enhancements to the original Z-score approach was constructed. The purpose was to "construct, analyze and test a new bankruptcy classification model which considers explicitly recent developments with respect to business failures" (Altman, 2000). The new study also incorporated refinements in the utilisation of discriminant statistical techniques. The new ZETA model for bankruptcy classification appears to be quite accurate for up to five years prior to failure, with successful classification of well over 90% of the sample one year prior to failure and 70% accuracy up to five years prior to failure. It is also observed that the inclusion of retailing firms in the same model as manufacturers does not seem to affect the results negatively. This is probably due to the adjustments to the data based on recent and anticipated financial

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reporting changes. The ZETA model has been found to outperform alternative bankruptcy classification strategies in terms of expected cost criteria utilising prior probabilities and explicit cost of error estimates (Altman, 2000). Altman (2000) states that in other studies a number of financial ratios and other measures have been found to be helpful in providing statistical evidence of impending failures. The analysis covered 27 variables based on their use in credit analysis. After a careful process of reducing the number of variables, a seven-variable model was selected which not only classifies the test sample accurately, but also proves the most reliable in various validation procedures. That is, adding more variables could not significantly improve on the results, and no model with fewer variables performed as well (Altman, 2000). The seven variables for the ZETA model are: return on assets, stability of earnings, debt service, cumulative profitability, liquidity, capitalisation and size.

These models are used as a basis for ratio analysis and interpretation. They use a combination of similar ratios to give a single score that can be interpreted to efficiently predict business failure. The ZETA credit model has a much higher accuracy than the MDA model more than two years prior to bankruptcy, but the former is a proprietary model, available only to subscribers to ZETA Services Inc.

III. Objectives and Research Design

The main objective of the study reported on in this article was to investigate the financial performance measures used by manufacturing SMEs in Pretoria, South Africa.

The secondary objectives of the research were to:

- identify financial tools currently used by manufacturing SMEs in measuring their financial performance;
- recommend necessary improvements to financial performance measures used by manufacturing SMEs; and
- recommend necessary training interventions for manufacturing SMEs that would be needed to successfully measure financial performance.

This article is based on an exploratory case study approach and qualitative research. However, a mixed qualitative-quantitative method was used in the data analysis. The units of analysis were the members or elements of the population, in this case manufacturing SMEs in Pretoria, South Africa. The units of observation were the people interviewed, namely the managers or owners of the manufacturing SMEs. Taking into account that there is no complete list of SMEs in South Africa, judgement (purposive) sampling (a non-probability form of sampling) was used to select a sample. Ten owners or managers of the selected SMEs were interviewed. There is no ideal sample size for qualitative studies, but the number of participants in this case is in keeping with the guidelines set for both case studies and interviews. Eisenhardt (1989) proposes between four and ten, and Creswell (2002) three to five. Guest, Bunce and Johnson (2006) suggest that between six and twelve interviews should suffice. The small sample is also congruent with the interpretivist research philosophy as proposed by Saunders, Lewis and Thornhill (2009), as is the data collection technique of interviewing. Guest et al. (2006) maintain that saturation, the point at which no new information or themes are added, especially at a meta-theme level, can occur as early as six interviews. The unit of analysis was the individual Generation X participant interviews at the theme level (Babbie, 2007; Perry, 2001). Semi-structured interviews were used to collect data at the premises of the participant SMEs, using an interviewer-administered questionnaire. Information from the interviewed SMEs was gathered, analysed and interpreted. Given the information sought, thematic content analysis appeared to be the most appropriate analysis technique. Qualitative content analysis goes beyond merely counting words or extracting objective content from texts to examine meanings, themes and patterns that may be manifest or latent in a particular text. Qualitative content analysis is mainly inductive, grounding the examination of topics and themes, as well as the inferences drawn from them, in the data. In some cases, qualitative content analysis attempts to generate theory (Zhang & Wildemuth, 2011).

IV. Results

a) *Characteristics of SMEs*

The SMEs studied were from various sectors of manufacturing, classified in terms of the products manufactured; these included steel components and hand tools, automotive parts, industrial ovens, corrugated boxes, rubber, exhaust systems and accessories. Table 1 summarises the profile of the participant SMEs

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Table 1: Characteristics of the participant SMEs

Characteristics of firms	1	2	3	4	5	6	7	8	9	10
Number of employees	40	120	20	26	21	83	16	130	48	15
Years of existence	12	55	20	13	43	13	2	14	53	7
Products manufactured	Industrial ovens	Corrugated boxes	Rock drill, blasting and automotive parts	Steel components	Hand tools	Aluminium and fibre technology heat shields	Manganese metal	Rubber	Exhaust systems and accessories	Steel products
Interval of financial performance measurement	Weekly and yearly	Daily and yearly	Monthly and every 3 months	Monthly	Monthly	Monthly	Weekly	Monthly	Monthly and weekly update	Six months
Current financial performance is satisfying	Yes	Yes	No	No	Yes	Yes	Difficult to say	To be improved	To be improved	Yes
Importance of measuring financial performance	Very important	Very important	Very important	Essential	Very important	Very important	Very	Very	No 1 priority	Very
Use of external or internal financial officer	Both	Both	Both	both	Both	both	Internal	Internal	Internal	Internal
Person interviewed	Financial controller	Financial controller	Owner	Co-owner	Director: Financial and administration	Financial controller	Managing Director	Financial director	Project Manager	Owner

From Table 1, it may be observed that of the 10 SMEs studied, according to their sizes, 7 were small businesses and 3 were medium businesses. Four of the participant SMEs had been operating for over 10 years, one for 20 years, one for over 40 years, two for over 50 years, one for 7 years, and one for 2 years. The fact that these companies had been in business for such a long time means that the information obtained from them can be accepted as meaningful, since the age of the companies could be seen to indicate that they were doing fairly well financially, and could suggest that information gleaned would therefore be helpful to the research objectives. A large majority of the participant businesses reported that they measured their financial performance on a monthly basis on their own, and then discussed the issue with auditors yearly. Two companies reported that measurement was done weekly, one reported that measurement was done daily, and one reported six monthly measurements. The majority of participants reported that they had an internal financial officer and had auditors come in once a year. However, the three medium companies reported that they had auditors in monthly. Half of the participants indicated that their current financial performance was satisfying for the following reasons:

- The business was still profitable, with room for improvement.
- Re-facility margins were improved.
- One of the interviewees explained that the auditors' report was considered an indicator of the business's financial performance, but that it was discussed with top management only. According to the financial controller (interviewee) this was satisfactory, since the company took orders only after performing calculations and ensuring that a particular order would result in an acceptable profit for the business. This strategy had always maintained their finances at a very good level.
- Another owner reported growth of approximately 50% over the previous 18 months, with a net performance of about 15% before tax.
- Four participants indicated that their financial performance was unsatisfactory for the following reasons:
- Two participants said they believed that there was always room for improvement.
- The severe drop in the economy.

One interviewee reported that the business experienced recession during 2009 and 2010 and that because of lower turnover and increased costs, in order to survive in the economy, it had been forced to lay off employees.

Six of the interviewees were financial controllers or financial directors, three were owners or co-owners and one was the person in charge of the financial performance monitoring.

b) Financial performance measurement

Eight of the ten participants indicated that they used financial ratios (they used software packages such as PASTEL and PRO ACC 5). The remaining two stated

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that they did not use them, and that they did not use any of the measures given to them as other options either. All the participant SMEs, irrespective of whether they used financial ratios or not, were familiar with many of the ratios mentioned in the literature and regularly used, such as current ratio, net operating margin and cash flow to total debt. Although familiar with a large number of ratios, those SMEs that used financial ratios made use of just a few of them. Table 2 shows the ratios used by the participants.

Table 2: Financial ratios used by participants

Financial ratios	Number of respondents using them
Cash flow to total debt	6
Current ratio (current assets to current liabilities)	5
Cash flow to total current liabilities	5
Gross profit margin ratio (gross profit to net sales)	4
Inventory turnover (inventory to sales)	4
Operating profit to operating assets	3
Net working capital to total assets	2
Earnings after tax (PAT) to total assets	2
Return on equity (ROE)	1
Net profit ratio	1
Inventory, debtors, creditors' days	1
Times interest earned (income before interest and taxes [EBIT] to interest expense)	1
Net working capital (NWC)	1
Total assets turnover (sales to total assets)	1
Debt ratio (total debt to total assets)	1

In addition to the traditional ratios, one of the SMEs used a further ratio that it had found very useful in maintaining its financial performance, and computed as (sale costs – throughput)/sales where throughput = sale costs – (materials + direct costs). For the business not to be in financial trouble, this ratio should be 50% or more. The business also carefully monitored what it called gross turnover (sales – cost of sales) tendency. If this ratio was constant or showed an increase, management was happy. On the other hand, if it decreased, the business had to consider other alternatives to improve its financial performance by broadening the product range and market segment. The business examined financial ratios once a year with auditors as well to see how to improve its financial performance.

Another participant SME also used other ratios, such as the solvency ratio (total assets to total debt), the supplier days' ratio [(accounts payable*30*period/cost of sales)] and the customer days' ratio [(accounts receivable *30*period/sales)].

In one of the participant SMEs, PASTEL software was used as a financial measuring tool. The owner was very confident about its use and efficiency, and indicated that everything was done with the software. In another participant SME, a complete computer software package called PRO ACC 5 was used to manage the business's assets and financials results. The software uses most of the ratios used by the respondents and provides all the information needed, such as sales, materials required, customer base and orders and inventory holding.

Two of the participant SMEs did not use any of the tools given to them as options to choose from, and used specific tools for measuring their financial performance. One interviewee said that financial ratios were briefly discussed by auditors and top management every month. However, no recommendation was given, suggesting that certain ratios were favoured, but not in fact used to measure the business's financial performance. Only the rand per ton (RPT) method was used by this SME to make sure that the business's financial performance remained satisfactory. In terms of this method, an order from a client is considered, but before being accepted, the rand per ton value of the material to be used to make the product is calculated. Knowing from its database that a ton of material can produce a certain number of boxes of the specified dimensions, the SME is able to determine whether the order is profitable or not. The order is then either accepted or rejected. By following this method, the business makes sure that its cash flow is always good and its financial performance is maintained daily. Thus the business never worries about ratios, bankruptcy prediction models or any other tool. The interviewee went on to explain that auditors gave the business a monthly breakdown of all ratios, the following in particular: total asset turnover (sales to total assets), cash flow to total debt, cash flow to total current liabilities, debt to equity ratio (total liabilities/

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stockholders' equity), profit after tax (PAT) to total assets (return on investment (ROI)) and gross profit margin ratio (gross profit to net sales). There is no recommendation that particular attention should be paid to these ratios, and the business did not use them for measuring its financial performance. As a tool, the RPT method was implemented daily with very good results, as demonstrated by the fact that it was used by the business that had been in existence for 55 years.

One firm used a cash flow system for financial performance measurement. The cash flow was done over a year, but was updated weekly. When any change was made, the system showed whether there would be enough money to implement this change, for instance for the next two months. If the business ever received less than its monthly expenses budget and the system showed that there would not be enough money in the immediate future, management would have to act fast and look for other sources of income so as to maintain the financial performance. The cash flow system was monitored regularly and instant measures were taken whenever the system predicted possible money shortage; in this way, the business kept running.

Table 3 shows the ratios that were found to be most useful by the participants.

Table 3: Ratios found most useful by the participants

Ratios	Number of respondents that found them more useful
Cash flow to total debt	3
Cash flow to total current liabilities	2
Current ratio	2
Net working capital to total assets	2
Net operating margin	1
Income before interest and taxes [EBIT]	1
Operating profit to operating assets	1
Inventory turnover	1
Debt ratio	1
Customer days ratio	1
Acid test ratio	1
Profit after tax (PAT) to total assets	1

c) Reflection of ratio analysis results in actual operations

It is important to realise that the results from financial ratios reflect in the actual operations of SMEs. Otherwise, what would high cash flow ratios mean, for example, if the money were not reflected in the business's account? The responses of the participant SMEs that used ratios were fairly similar.

- One stated that they did reflect in the business;
- Two stated that they were 100% and 80% reflective of the actual operations respectively;
- One indicated that they were very accurate; and
- Two others stated that they provided an accurate reflection of the actual operations and were very good for current business operations.

The question of how helpful the results from the ratios were to the financial performance of participant SMEs is a relevant one, since it would be interesting to know the extent to which ratio analysis contributed to the financial performance of SMEs. The following responses were obtained:

- One participant said that they were good measures for the business's budget and prepared the business for any disruption that might have been signalled.
- Another interviewee indicated that the results of ratio analysis helped to form strategy for the next period by making it possible to take proper measures to correct any trouble shown by significant variations in some ratios.
- An interviewee at another SME acknowledged that the results of ratio analysis helped the business to perform better, not only financially but generally, since financial performance is the driver of the rest.
- The other participants said simply that these results were very helpful.
- The business that used PRO ACC 5 indicated that manufacturing is a long-term process (whether at start-up or after a recession), and it can take years of operations before any return can be seen as a reflection of what emanates from financial ratios. In other words, the business may be growing, but it cannot see the money; only with time will the money become evident.
- Another participant said that many ratios were not often used and that management accounts and cash flow were much better accounting measures for the business's requirements.
- One participant said that ratios are helpful, but would have to be adapted to new business strategies.

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- Seven of the participant businesses indicated that they knew nothing about bankruptcy prediction models. One interviewee said that she knew very little about them. Another said she had some knowledge, but never used them. Yet another said she had never heard of them. Consequently, all the questions about bankruptcy prediction models were not applicable to the participant SMEs, since they could not use what they did not know.

V. Conclusion and Recommendations

The researchers endeavoured to explore and describe the financial performance measures used by manufacturing SMEs in Pretoria. The study was undertaken because so many studies are conducted focusing on obstacles faced by SMEs in obtaining finance, and not enough focus is placed on how these SMEs in fact manage their finances. Studies have revealed that many SMEs find themselves in financial difficulties because their cash flow is not properly managed (Kim & Sohn, 2010).

The objective of identifying financial tools used by manufacturing SMEs in measuring their financial performance was achieved during the field study. The findings revealed the following ratios to be the most widely used by participants:

- Cash flow to total debt (used by six participants);
- Current ratio (used by six participants);
- Working capital to total assets (used by five participants);
- Cash flow to average total current liabilities (used by five participants);
- Gross profit margin ratio (used by four participants); and
- Inventory turnover (used by four participants).

Compared with the ratios identified by various authors in the literature as the best financial measures (Edmister, 1970 and Vallely, 2008), current ratio, networking capital to total assets, and cash flow to total debt are the ratios that appeared to be most widely used by the participants. Compared with the ratios used in the bankruptcy prediction models presented, of the five ratios in the Altman Z-score, only working capital to total assets, and sales to total assets were used by participants. As for the five ratios used to measure predictive accuracy in Daya's second test, only cash flow to average total current liabilities and net income to total assets were used by the participant SMEs. Some ratios were not emphasised by the above authors as being among the best financial measures, but were found to be used by many of the participants. These were:

- Gross profit margin ratio (used by four participants); and
- Inventory turnover (used by four participants).

None of the participants used bankruptcy prediction models. In fact, almost all the participant SMEs knew either nothing or very little about bankruptcy prediction models. The limited use of ratios and non use of bankruptcy prediction models raises the issue of the second objective of the study, which was to recommend necessary improvements on financial performance measurement of SMEs. This will be discussed under recommendations. Interviewees' lack of knowledge of bankruptcy prediction models may necessitate relevant training for the financial officers of SMEs. This touches on the third objective, which will also be discussed under recommendations. The researchers found that most of the participants used financial ratios to measure their financial performance, but to a very limited extent. Very few ratios were used by individual SMEs, and most of the ratios used were not the best indicators identified in the literature. However, some of the interviewees acknowledged the need to use more ratios.

It is recommended that SMEs use the bankruptcy prediction models not necessarily for predicting failure, but as a tool to constantly assess how they are doing financially so as to take appropriate measures should a threat be perceived. It was found that most of the participants knew nothing or very little about the models, which is indicative of a need for relevant training. SMEs would benefit by using more ratios, especially those referred to in the literature section, to improve their financial performance measures. SMEs should probably consider using the six ratios mentioned above as the ratios most widely used by participants, since these seem to be working well not only for the majority of participants, but for businesses in general. The owners and/or managers of SMEs should enrol their financial staff at relevant institutions such as universities for training in bankruptcy prediction models. The models presented in this article may be used by SMEs as well, since they are simple and inexpensive, and should not pose problems to trained financial staff. Those SMEs that can afford it should try to use specialised software (e.g. PASTEL or PRO ACC5), which was found to be effective by the small number of participants who used such packages. The SMEs would then be able to use ratios that are computed from the software.

This article will contribute to filling the gap in the literature on SME financial performance measurement. If taken seriously by SMEs, the information presented will help them in effective financial performance measurement by drawing attention to the various tools that are available to them as well as the necessity of training financial staff in various measures.

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Inventory Management and Control Systems in Covid-19 Pandemic Era: An Exploratory Study of Selected Health Institutions in Anambra State, Nigeria

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Abstract- The content and scope of this study explored inventory management and inventory control in selected health institutions in Anambra state. The study adopted survey research design. Inventory management, was measured by reorder level system, periodic review system and economic order quantity model while inventory control, was measured by optimal stock level. Out of a population of 74 drawn from 7 health institutions, Taro Yamane (1967) formula and stratified sampling technique were used to determine the sample size of 66 respondents. The tests of hypotheses were conducted using Chi-Square test and Spearman Ranked Order Correlation Coefficient. The result of the analysis revealed that Re-order Level System, Periodic Review System and Economic Order Quantity Model which are the systems currently in use have statistically significant influence on the optimal stock level of health institutions and pose challenges significant challenges on usage in the COVID-19 pandemic period.

Keywords: inventory management, inventory control, COVID-19, health institutions, and challenges.

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Abstract- The content and scope of this study explored inventory management and inventory control in selected health institutions in Anambra state. The study adopted survey research design. Inventory management, was measured by re-order level system, periodic review system and economic order quantity model while inventory control, was measured by optimal stock level. Out of a population of 74 drawn from 7 health institutions, Taro Yamane (1967) formula and stratified sampling technique were used to determine the sample size of 66 respondents. The tests of hypotheses were conducted using Chi-Square test and Spearman Ranked Order Correlation Coefficient. The result of the analysis revealed that Re-order Level System, Periodic Review System and Economic Order Quantity Model which are the systems currently in use have statistically significant influence on the optimal stock level of health institutions and pose challenges significant challenges on usage in the COVID-19 pandemic period. This implies that inventory management systems of health institution urgently need to be modified to properly fit the unpredictable changes in demand and supply of medical supplies in the pandemic era. In other words, there is need for hospitals to adopt flexible systems of inventory management as it suits the economic and medical situation of the time. Consequent to the above, this study recommends that among others that the management of health institutions should strive to ensure that the right stock is kept in their warehouses to hedge against excessive holding cost of medical supply inventories and stock-outs which could lead to loss of life/ patronage.

Keywords: inventory management, inventory control, COVID-19, health institutions, and challenges.

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I. Introduction

a) Background to the study

Inventory management and control which revolve around coordination of materials availability, control, utilization and procurement of materials helps firms to maintain the optimum level of inventory at any given time. Issues concerning inventory management generally involve the overall success of an enterprise (Iliemena, Ijeoma & John-Akamelu, 2019). This is because, the revenue and profit capacities of any business depend on its inventory level which also indirectly makes it an issue of concern when the sustainability of a business institution is in discussion. Inventory management is however, not a new concept in itself as there have been past studies in this regard (Bawa, Asamoah & Kissi, 2018; Prempeh, 2016; Mensah, 2016; Mwanzi 2016). Due to the nature of inventory in health institutions, health implication of poor inventory management system and the need to ensure the sustainability of health institutions being one of the basic needs of an economy, we considered it a very necessity to evaluate how effective the old systems of inventory management and control work given the present COVID-19 pandemic emergencies. Owing to this, a lot of developed countries have adopted the use of advanced technologies in inventory management but the case is reverse for developing countries like Nigeria whose poor technological infrastructure and general economic condition may not support the advanced systems (Dedunu & Weerasinghae, 2018). As effective inventory management system is basic to corporate success, the inventory management objective of health institutions in the corona virus era is expected to constantly strike a balance between demand, inventory level (considering availability, perishability and high/low patient turn-up as the case maybe), supply and adequate return on investment. Onikoyi, Babafemi, Ojo and Aje, (2017) did not find it necessary for continuous study on inventory management especially as excess inventory were indications of wealth accumulation but recent events in terms price level changes, current health trend, general economic and health implications

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of COVID-19. There are varied options which an institution can utilize in managing its inventory as a way of achieving improved product and service delivery and efficiency (Wanyoike & Tundura, 2016). Prempeh (2016) opine that the current assets constitute one of the fundamental assets in health institutions, it makes it very vital that the right quantity of inventory is maintained at any given time to avoid stock out, expirations and excess holdings. This could be the challenge with some health institutions that have been found with stock-out situation that they had to refer patients to external sources when prescriptions are made.

b) Statement of Problem

The system of inventory management being used in some hospitals could have their number of challenges presently due to corona virus (COVID-19) pandemic and its implication on health institutions. Some hospitals, thus, find it hard to balance the supply of inventory with current demand though every hospital would want to have enough inventories in medical supplies to satisfy the demands of its patients. Ideally, no hospital would want to hold too much inventory to due to the associated inventory holding cost (Agu, Obi-Anike & Eke, 2016). Previous authors such as Onuorah (2019), Bawa, Asamoah and Kissi (2018), Sporta (2018), Dedunu and Weerasinghae (2018), Atnafu and Assefa (2018), Musau, Namusonge, Makokha and Ngeno (2017), Onikoyi, Babafemi, Ojo and Aje (2017), Mwangi (2016), Etale and Bingilar (2016), Wanyoike and Tundura (2016), Agu, Obi-Anike and Eke (2016), Edwin and Florence (2015), Ogbo and Ukpere (2014), Koin, Cheruiyot and Mwangangi (2014), Anichebe and Agu (2013), and others have all examined the extent to which inventory management affect corporate performance of enterprises. There are abundant local researches in Nigeria that determined the relationship between inventory management techniques and firm profitability before the onset of corona virus disruptions in Nigeria. However, the studies always assumed that the presence of adequate inventory management techniques already presupposes that there is also an appreciable inventory control measure but the COVID-19 pandemic has faulted this assumption. To fill this gap, this study was conducted to explore the inventory management system (proxies by re-order level system, periodic review system and economic order quantity model) and inventory control (proxy by optimal stock level) using selected registered health institutions in Anambra state as cases of reference.

c) Objective of the Study

The broad objective of this study is to explore the inventory management and control systems being used by selected health institutions, and its suitability and challenges in the Covid-19 era using the case of Anambra state, Nigeria. To achieve this, this study specifically sought to:

1. Ascertain the inventory management systems currently being used in health institutions and its level of effectiveness.
2. Determine the extent to which the inventory management systems pose challenges to health institutions in the COVID-19 era.
3. Examine the degree to which inventory management influence optimal stock levels in the COVID-19 era.

d) Research Questions

The following research questions were addressed in this study:

1. What inventory management systems are currently being used in health institutions and how effective are they?
2. To what extent do the inventory management systems pose challenges to health institution in the COVID-19 pandemic period?
3. To what degree do the inventory management systems influence optimal stock levels in selected health institutions in the COVID-19 era?

e) Hypotheses Development

H_{O1}: The inventory management systems currently being used in the COVID-19 pandemic era are not significantly effective.

H_{O2}: The inventory management systems pose no significant challenges to health institutions in the COVID-19 pandemic era.

H_{O3}: Inventory management systems (proxies by re-order level system, periodic review system and economic order quantity model) do not significantly influence optimal stock levels in selected health institutions in the COVID-19 era.

II. Literature Review

a) Conceptual Review

i. Inventory Management and control systems

Inventory management (IM) simply refers to a process that consists of planning, organizing and controlling the flow of stock of materials from their initial purchase unit through internal operations to the service point through distribution to clients or customers. Agu, Obi-Anike and Eke (2016) defined inventory management as the sum total act of coordinating the purchase, manufacturing and distribution functions with a view to meeting the marketing demands and organizational needs of availing the product to its clients or customers. It equally refers to the collection of activities that are put in place in order to ensure that customers have the demanded product or service. Inventory management encompasses the development and management of inventory levels such as raw materials, semi-finished materials and finished goods. The only way of making adequate supplies of goods is

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when the inventory is properly managed. With this, they are made available to meet up with customers' demand and the costs of over or under stocks are lowered in the process. IM refers to all the policies and firm managerial processes of planning, organizing and controlling that relate to how the firm's stock level will be kept or maintained at a level whereby the least cost will be incurred by the firm (Kwadwo, 2016). It is primarily about how best to guarantee the availability of all input materials of production to the firm so that the quantity of the stock in question is at a level where production is not interrupted with the barest operational cost of holding the inventory without prejudice to operation efficiency (Eneje, Nweze, and Udeh, 2012). Onikoyi, Babafemi, Ojo and Aje (2017) averred that IM, which they preferably called stock management, refers to the business activity aspect that comprises the planning for purchase, receiving, handling, storing, and releasing of inventory for use in production or distribution to customers. It is the science-based art of making sure that just sufficient inventory stock is held by a firm for meeting with demand for them. Through IM, hospitals are able to identify items of stock. In the management of inventory, the primary involvements range from being able to specify the size and placement of stocked goods. The goal of IM therefore is to reach a balance in the above requirements which will then result in an effective inventory control process that brings about optimal inventory level. This is often a continuous process that is subject to constant change and therefore requires the organization to respond to market changes on time. IM is used to create inventory purchase plan, and track the existing inventories and their utilization (Muhayimana, 2015). It is impossible to talk of the effectiveness of management in organizations without making reference to how effective the IM of the organization is since inventory control is remains a central part of core management functions in organizations. The critical place of inventory in a firm is so because inventory are resources which in addition to having an economic value have some idle resources tied to it. This is why corporate managers in hospitals try to implement policies and plans that will help them strike a balance between the benefits accruing from holding stock against the cost incurred from holding same (Musau, Namusonge, Makokha and Ngeno, 2017). Atnafu and Assefa (2018) simply defined IM as the act and process that are undergone to record and observe stock level, estimate future request, and settle on when and how to arrange for new order. It is this sort of process and procedures that enables firms to effectively know how to go about the storage and replacement of stock and also how to keep a sufficient amount of stock even as they minimize the cost. Inventory can be managed via re-order level system, periodic review system, economic order quantity model, perpetual inventory system, etc. However, this study focuses on the systems discussed below:

1. Re-Order Level System

According to Onuorah (2019), re-order level system is a way of managing inventory in such a way that a level at which another order is made for inventory is set ahead of time and systematically complied with for every item of inventory. Re-order level system often involves the operational use of two bins for inventory management whereby re-order is made when inventory is exhausted from the first bin. The merits of the re-order level system is that it allows the firm to respond to changes in demand and also enables the organization to generate replenishment order automatically at the designated time simply by a comparison of inventory levels against re-order level. However, the re-order system may be over-loaded if different types of inventories that are jointly used to produce different items reach their re-order at the same time.

2. Periodic Review System

Periodic review system is a method of inventory management whereby stock levels are subjected to some fixed interval reviews usually once every week, month or year, as the case may be. It can be seen as physical counting method of IM where-in inventories are cross-checked and also updated at a fixed interval of time (Onuorah, 2019). This system ensures that all inventory items are reviewed periodically which often provides more possibility of eliminating outdated items or obsolete inventories. Orders for replenishment in periodic review system are follow the same sequence. This singularly facilitates order of different items (of medical use for instance) and attracts large quantity of discounts to the purchasing firm. However, the periodic review system does not fully enable firms to respond to changes in consumption and so stock-out is more likely to occur especially when the usage rate changes shortly after the review. Demand for the inventory item has to be constant before the appropriate periodic review can be determined and this is often taxing.

3. The system of Economic Order Quantity

The economic order quantity theory suggests that the quantity of inventory that ought to be maintained by corporate organizations is the stock level that provides the lowest total holding cost and acquiring cost (Mwangi, 2016). Economic Order Quantity Model is undeniably the most fundamental and also the best-known inventory decision model f which its origin is often dated back to the early 1900s. It is the ordering quantity that minimizes the balance of inventory cost that exists between inventories re-orders costs and inventory holding costs (Ogbo & Ukpere, 2014). The calculation of the EOQ Model is calculated using some assumptions as enlisted below, that; Holding stock is certain and known, Ordering costs is constant, known and certain, rate of demand is known, unit price is

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constant, and that there is no stock-outs . However, the assumptions seem not to be realistic in practice and this system may not be suitable in health sector due to the unpredictable pattern of demand. However, demand for medical supplies seem to be on the increase as more and more persons get sick due to covid-19 and other related diseases. One notable weakness of this system is its failure to consider buffer stocks that should be maintained to accommodate for variations in lead-time and demand for inventory.

ii. *Inventory Control system (ICS) using optimal stock level*

According to the views of Wanyoike and Tundura (2016), inventory control (IC) refers to a set of procedures and techniques that are used to oversee and control ordering, storage and use of inventory resources. Onikoyi, Babafemi, Ojo and Aje (2017) defined inventory control as the process of supervising the storage, the supply and the accessibility of items to ensure an adequate supply of inventory without over or under supply. Inventory control is carried out to make sure that only the adequate amount of inventory are available whenever and wherever required by customers. The distinction between IC and IM is that whilst IM refers to all the activities that are done in the process of procuring, storing, selling, disposing or using inventory while IC is a subset i.e a part of inventory management. However, managers assume that once they are good with inventory management then the firm is safe in terms of the possibility of having under or excess stock level. This is where IC comes in to control the flow of inventory so that only the optimal stock level would be maintained in the firm. The necessity for inventory control is that sufficient and appropriate quantity of inventory is required each time in order to minimize the rate of stock-outs in the firm, and thereby unnecessarily increasing the stock-out cost of the firm which is the cost incurred when the firm is not able to meet current external and internal demand for inventory. IC often reveals the continuity chances of a hospital because a hospital requires some level of stock that will keep the firm running which extant literature have enlisted as cycle inventory, safety inventory, speculative demand inventory and dead inventory (Okerulu, 2019).

Onikoyi, Babafemi, Ojo and Aje (2017) was of the opinion that corporate managers require both reliable and effective control of inventory resources so that the operating cost of the firm will be maximized for the sake of remaining viably competitive. Inventory control practically enhances firm profitability since it can bring about reduction in corporate operating costs that are associated with handling and storage of inventory. This sis further justified by Iliemena and Amedu (2019) which opine that cost reduction strategies should be the focal point of management if sustainable profit is aimed. Thus, it is against the undesirable reality of having excessive inventory or having insufficient inventory that IC has become a very highly placed strategic management technique. Excessive inventory ties down the funds of the organization, increases the possibility of inventory deterioration, obsolescence and theft and also increases holding cost. Still, inappropriateness of insufficient stock is such that it can interrupt the process of production and distribution of goods and services, especially for hospitals and pharmaceuticals firms, proper inventory management and control cannot be over-looked. Thus, hospitals are at all times expected to have an optimal stock level that both caters for customers' demand and minimizes the cost of holding the inventory. Operational efficiency is therefore guaranteed by optimal stock level which eliminates the possibility of stock-out, especially in emergency cases.

iii. *Leveraging inventory Management and Control in Health Institutions in the COVID-19 pandemic period*

Health institutions often make managerial efforts to reach corporate decisions while providing strategies that are required for the effective management of the firm's resources and this has not changed in the period of covid-19 pandemic. Certainly, the stock of medical supplies is one of the institution's resources that critically need to be effectively managed and monitored especially considering the economic times of corona virus and its health implications. Opinion exists that the COVID-19 era is associated with global increase in demand for medical supplies which could possibly lead to stock-out while opinion also exist that even though the pandemic has come with a lot health challenges but due to the poverty induced by the virus and the fear of being compelled to isolation centers, sick persons would want to explore other means like off-the-shelf drugs, herbal treatment and home therapies in managing their health issues, thus culminates into low demand for medical supplies. Low demand for medical supplies put a lot of health institutions at risk of incurring losses if not properly managed. This is due to the expiry nature of their products and services. On the other hand, increase in demand for medical supplies in the COVID -19 pandemic periods if not properly managed could lead to stock-out which has damaging effect on the sustainability and overall corporate performance. However, Dedunu and Weerasinghae (2018), and, Iliemena, Goodluck, and Amedu (2020) are of the opinion that large inventory bunch generates extra costs and this lends credence to the ever growing importance of inventory management through which proper managerial attention could be paid to procedures, techniques or processes. This makes inventory management a very crucial decision area for corporate success of health institutions in the pandemic period. According to Bawa, Asamoah and Kissi (2018), IM is necessary mainly because it is one of the ways for health institutions to minimize operating costs and funds

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invested. This is by reducing the cost of holding stock of inventory so as increase both profit and operating cash flow that simultaneously leads to an improved corporate performance (Iliemena & Amedu, 2019). But the contributions of IM would equal to nothing if proper ICS is not installed to help minimize the very inventory cost for the purpose of maximizing profit margins. Additionally, IM is stronger and more effective when the inventory control procedures have been properly implemented to facilitate an optimal stock level that allows for the best utilization of inventory resource.

No firm will ever be as efficient as it would want when the firm has not implemented sound IM and ICS that would guarantee optimal level of medical supplies (Mwangi, 2016). It is through proper inventory management of stock of drugs that hospitals or pharmaceutical firms can ensure that patient service level is considerably adequate since insufficiency of stock is detrimental and excessive stock is wasteful. There could be reasons for a hospital to hold excessive stock of materials more because of uncertainty in demand by patients for drugs and related products and medical services. The sorts of things that are put into consideration during inventory management and control processes are the modalities for the purchase of stocks that are commensurate with both internal and external demands, changing usage patterns, seasonal variation, and monitoring for expiration and pilferage. This therefore make it necessary that health institutions review their inventory management and control systems periodically especially when there is massive global change like the changes currently induced by the covid-19 pandemic, to ascertain the continuous suitability of the old system in the new structure of events.

b) Theoretical Framework

i. *Theory of Economic Order Quantity Model*

According to Mwangi (2016), the major and first proponent of the economic order quantity (EOQ) model was Haris in 1913 that used the model to determine the optimal level of inventory. In line with the propositions of the first proponent, economic order quantity entails the level of inventory that can both minimize inventory ordering cost and also inventory holding cost. Ziukov (2015) put this in another way when the researcher submitted that economic order quantity as a model is primarily meant to be used when determining an optimal ordering size that will not only minimize ordering but will also minimise the sum of both carrying costs and ordering costs of inventory. There are some assumptions that guide the application of this model to business realities. One of the assumptions is that demand is certain, i.e. demand must equal annual total quantity that is ordered by the firm at any point in time (Ziukov, 2015). Of essence, economic order quantity model puts into consideration a tradeoff between ordering cost and storage cost while making policies and decisions on the quantity to order and use as regards replenishing inventory items. Ordering a larger quantity of inventory practically reduces ordering frequency and by implication reduces total ordering costs but would require a more spacious storage capacity and increases holding or storage cost. There are holding costs that reduce ordering costs increase and vice versa until there is a minimum point on the cost curve where the sum of ordering costs and holding costs will be barest with the best optimal stock level. The costs that are incurred when an additional unit of inventory is procured is called ordering costs carrying costs are the inventory costs that are incurred for storing or holding stock. According to Mwangi (2016), economic order quantity is therefore determined by the intersection of carrying cost line and ordering cost curve, where the total ordering cost equals the total carrying cost (Kumar, 2016).

The relevance of the theory to the study is that economic order quantity model is expected to be useful to health institution in the Covid-19 pandemic era by providing an optimal order quantity of medical supplies that minimizes total inventory cost in stock-out or expiration. This model is applied in inventory management and control that is applicable to the management of not only raw materials but also work-in-progress and finished goods. As a model for inventory control, EOQ model proposes that the purchase and storage of inventory, using either periodic review system and re-order level system, should be carried out in such a way as to make sure that there is no excess or under stocking at a given point in time. To this end, this theory makes a good argument that supports the relationship between inventory control and management and this informed the need to anchor the study upon the theory.

ii. *Lean Theory*

Lean theory proposes that inventory systems should be designed in a way that optimizes costs of inventory. According to Atnafu and Assefa (2018), the lean theory augments the thoughts of Just-in-Time model and puts buffer stock into consideration while it advocates for the minimization of wastages in production procedure. On the note that inventory leanness significantly influences the productivity of health institutions (Iliemena, Goodluck & Amedu, 2020), lean theory is of the view that optimal inventory level should be maintained. Through this theory, the shortcomings of the economic order quantity model are considerably addressed because the lean theory also borrows foundation from the EOQ model that solely seeks to optimize the quantity of any batch of inventory ordered (Musau, Namusonge, Makokha & Ngeno, 2017). Lean theory just like JIT emphasizes that a pull-based system should be put in place to help the organisation align the production and business processes throughout the supply chain and inventory

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planning. Musau, Namusonge, Makokha and Ngeno (2017) submitted that, based on the lean theory, firms can more successfully find ways of optimizing inventory by way of lean supply chain systems and practices in order to achieve a better level of both asset utilization and customer satisfaction that ultimately result in enhancement of organizational profitability, growth, and operational performance.

The relevance of lean theory to this study is because it presented inventory management practices as a vital part of any supply chain regardless of whether the firm operates a product or service supply chain. In the present study, hospitals majorly although not entirely operate a service supply chain but need to match demand and supply in the supply chain while considering uncertainties in the market environment. Analyzing lean theory vis-à-vis the inventory management of hospitals will reveal that most hospitals are beleaguered by ineffective inventory control and the majority of the hospital do not utilize nor implement the basic inventory control concepts and principles for various reasons (Atnafu & Assefa, 2018). Most hospitals rely on imported medical substances or drugs coupled with unnecessary delays and communication problems which all jointly make the calculations of lead time inaccurate. This is the reason lean theory is mostly advocated for as an inventory management tool that best controls the flow of stock for optimal stock levels especially in the corona virus pandemic era.

c) Extant Literature and gaps in studies

A study carried out by Onuorah (2019) ascertained the effect of inventory management system on corporate performance of a pharmaceutical company (Juhel Nigeria Limited) using descriptive research design. The study sample was 41 full time staff of the company while data were gathered using a structured questionnaire. Data gathered for the purpose of their study were tested using Pearson Product Moment Correlation Coefficient and findings showed IMS significantly affects a firm's performance. The study only examined one firm, which makes the finding less generalizable. (Iliemena and Amedu, 2019), studied the effect of inventory turnover period on equity of 22 manufacturing companies quoted on the Nigerian stock exchange from the period 2012 to 2018 using ex-post facto research design. Data from the financial statements of the companies were tested using multiple regression analyses and evidence indicated that inventory turnover period has significant positive effect on equity component. The implication of this to our present study is that health institutions are expected to turn over their inventory of medical suppliers soon enough so it would not culminate to loss of equity capital investment. Sequel to the evidence emanating from the manufacturing sector, this outcome may be said to be debatable. Anichebe and Agu (2013) investigated the effect of inventory management on organizational effectiveness using three companies (Yemenite, Hardis and Dromedas, and Nigerian bottling company) in Enugu State using descriptive research method on a a sample of 248. The data gathered using questionnaires and interviews were tested using Pearson product moment correlation co-efficient and regression method. Evidence emanating from the study showed good inventory management is significantly related to organizational effectiveness. By way of limitation, the study failed to gather evidence relating to challenges in their inventory management system. Ogbo and Ukpere (2014) also using a descriptive research design, evaluated the relationship between effective IM and organizational performance as a case study of 7-up bottling company Nigeria. The study sample was made up of 83 respondents while data gathered were tested using Chi-square method. Findings from this study revealed a relationship between operational feasibility and IM and that flexibility in inventory management is key to good corporate performance. Critically, only one organisation was studied by the researchers which made the findings less generalizable. Furthermore, Koin, Cheruiyot and Mwangangi (2014) invstigated the effect of IM on performance of manufacturing sector using 56 out of 459 business process owners. The descriptive study gathered its data using questionnaires. The outcome of the study revealed that IM and supplier relation both has significant effect performance even though order management was found to have just a mild effect. The study however, failed to consider the effect of inventory management system on optimal stock levels of the selected firms. Edwin and Florence (2015) in their study assessed the effect of IM on profitability of the 6 cement manufacturing firms listed on Nairobi stock exchange in Kenya from 1999- 2014 using secondary data from annual reports. The ordinary least square regression results in multiple analyses revealed a negative relationship existing between inventory turnovers, storage cost and conversion period with profitability as measured using return on asset. Thus, since the system of inventory control in manufacturing firms differs from that of hospitals, there is need to carry-out a similar study using evidence from hospitals. Also in Kenya, Mwangi (2016) further investigated IM, profitability and operating cash flow 6 beer distribution companies in Nairobi for a ten years period ranging from 2006 to 2015. The secondary data gathered for the study was analyzed using ordinary least squares regression analyses and findings revealed a significant relationship between IM, profitability and operating cash flows. By way of criticism, the study focused on inventory management practices such as just in time and material requirement planning and did not consider re-order level system, periodic review system and economic order quantity model. In a related study carried out in Nigeria, Etale and Bingilar (2016) focused

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on examination of IM and profitability of three listed breweries on Nigerian stock exchange from 2005 to 2014. The data for the study were obtained from the annual reports of the companies while analyses were carried out using multiple regression methodology. Evidence revealed in line with most other studies that IM has significant positive effect on profitability. However, the study derived its evidence further emanated from brewery companies and outcome may differ from the health sector. The findings do not fit the realities and peculiarities in the health sector. Agu, Obi-Anike and Eke (2016) in their own study evaluated the effect of ICS on the productivity of Nigerian manufacturing firms using a sample of 285 respondents. The descriptive study generated data using the questionnaire method and statistical analysis were carried out on the data using linear regression coefficients. Findings showed ICS have significant positive relationship with productivity. Also, demand management was found to have a positive relationship with customer satisfaction. Aligning this with our present study, the finding implies that when changes in demands for medical supplies in the COVID-19 pandemic era, are properly managed, patients issues will be well addresses and thus image of the hospital boosted while ensuring continuous patronage. As a limitation however, the evidence emanating from manufacturing firms may need to be re-examined before it can be said to also apply to the health sector. Onikoyi, Babafemi, Ojo and Aje (2017) evaluated the IM practices of a Nigerian cement producing company, Lafarge Africa (WAPCO) plc using the survey design on annual reports from 2005 to 2015. Regression analyses on the gathered data indicated that significant relationship exists between costs of goods sold and value of inventory in stock. This study was however, conducted before the inception of the COVID-19 pandemic in 2019 and it may have affected the current position. Also, the researchers adopted a case study design where only one firm was studied. This reduced the generalizability of the findings.

Still emphasizing on how relevant IM is to corporate success, Bawa, Asamoah and Kissi (2018) conducted an evaluation of IM and performance of 14 companies listed on the stock exchange of Ghana from 2007 to 2016. Regression and correlation co-efficient were used on relevant financial statement information and findings showed no significant effect of IM on selected profitability measures over the period. This evidence even though contradicted earlier views, failed to cover the aspect of IC using optimal stock levels. As a remedy, Sporta (2018) in his study evaluated the IC techniques of medical supply agencies in Ghana using descriptive research design on a population of 100 employees. The result of the correlations and the multiple regression analysis carried out on the qualitative and quantitative data revealed IC techniques significantly affect performance. Thus, the findings are not fittingly applicable to health institutions in Nigeria given the peculiarities.

III. Methodological Steps

This study adopted a descriptive research design to enable the researchers have a comprehensive picture of the phenomenon of interest by surveying the opinions of a sample that is derived from our target population. The full time staff of procurement, stores, emergency, accounting and finance departments (PSEAFD) of seven health institutions formed the study population as shown in table 3.1 below:

Table 3.1: Population of the Study

SN/	Name of Health Institution	No of Staff in PSEAFD
1.	Izunna Hospital, Amansea Junction, Awka	12
2.	Amen Specialist & Diagnostic Clinic, Amaenyi, Awka	11
3.	Crest Specialist Hospital, Enweana, Awka	9
4.	First Hospital and Maternity, Umuokpu Awka	10
5.	Graceland Specialist Hospital & Maternity, Old INEC Road, Awka	12
6.	Okoye Specialist Hospital, Emma Nnaemeka Street, Awka	9
7.	Eldorado hospital, Awka	11
	Total	74

Source: Field Survey, 2022.

The study deployed Taro-Yamane (1964) formula for determination of sample size of finite population. The formula is mathematically represented as $n = \frac{N}{1+N(e)^2}$, Where: n = Sample size, N = Population size, *e* = Sampling error (5%), 1 = Constant. From the calculation after approximation, n = 66. For the determination of the stratum size, the formula expressed underneath was applied and calculated in Table 3.2 below. Stratum size = $\frac{number\ of\ target\ staff\ in\ each\ hospital}{total\ population\ target} \times study\ sample\ size$

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Table 3.2: Stratification of the Sample Participants by specific health institution

SN/Name of Health Institution	Stratum Calculation	Stratum Sample Size
1. Izunna Hospital, Amansea Junction, Awka	$\frac{12}{74} \times 66$	11
2. Amen Specialist & Diagnostic Clinic, Amaenyi, Awka	$\frac{11}{74} \times 66$	10
3. Crest Specialist Hospital, Enweana, Awka	$\frac{9}{74} \times 66$	8
4. First Hospital and Maternity, Umuokpu Awka	$\frac{10}{74} \times 66$	9
5. Graceland Specialist Hospital & Maternity, Old INEC Road, Awka	$\frac{12}{74} \times 66$	11
6. Okoye Specialist Hospital, Ema Emeka Street, Awka	$\frac{9}{74} \times 66$	7
7. Eldorado hospital, Awka	$\frac{11}{74} \times 66$	10
Total	-	66

Source: Field Survey, April, 2022

We obtained primary data for the study using structured and unstructured questionnaires administered to 66 staff as comprised above in table 3.2. The structured questionnaire was designed in using five-point-likert scale as strongly agree, agree, neutral, disagree and strongly disagree. To rightly make sense of the research constructs, the responses were ordered and numbered accordingly as 5,4,3,2 and 1. The internal consistency of the questionnaire was determined by Cronbach alpha that produced a Cronbach co-efficient of 0.81 which made the constructs reliable since the coefficient of reliability exceeded the threshold of 0.7. The test of first and second hypotheses was conducted with the use of Chi-square while the third hypothesis was tested using Spearman Ranked Order Correlation Coefficient which is calculated with the aid of Statistical Package for Social Sciences (SPSS). The choice for this particular statistic for test of hypothesis three was because the collected data were ranked and required a non-parametric tool to produce a more reliable result.

IV. Analyses and Discussion of Results

a) Analysis of Responses Rate of the Questionnaire

Table 4.1: Analysis of Questionnaire

Response	Frequency	Percentage (%)
Well Filled in Questionnaires	63	95.45
Unreturned in Questionnaires	3	4.55
Total	66	100

Source: Field Survey 202

The questionnaire was administered to sixty-six (66) respondents during the field survey by the researcher. However 63(95.45%) were well filled and returned while 3 (4.55%) were not returned.

b) Analysis of Respondents' level of management

Table 4.2: Respondents' Level of Management

Level	Frequency	Percentage (%)
Low	14	22.2
Middle	26	41.3
Top	23	36.5
Total	63	100.0

Source: Field Survey 2022

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Table 4.2 above shows that among the respondents, 14 (representing 22.2%) are low level managers. 26 respondents (representing 41.3%) are middle level managers while 23 (representing 36.5%) are top level managers.

c) Analyses of Research Questions

Table 4.3: Analysis of Responses to Research Question 1

Response	Frequency	Percentage (%)
Re-order level system	11	17.5
Periodic review system	25	39.7
Economic order quantity model	21	33.3
Others	6	9.5
Total	63	100.0

Source: Field survey, 2022

Table 4.3 above summarized the responses to the research question of what inventory management systems are currently being used in health institutions and its efficiency rates. The above table shows that 11 respondents (17.5%) pointed that they use Re-order-level system most frequently in the COVID-19 pandemic period. 25 of the respondents representing (39.7%) opted for Periodic Review System; 21 (33.3%) use Economic Order Quantity; while 6 (9.5%) use other inventory management systems which are currently not of concern to the researchers.

Table 4.4: Analysis of Responses to Research Question 2

Response	Frequency	Percentage (%)
Very Little Extent	15	23.8
Little Extent	11	17.5
Neutral	7	11.1
Great Extent	12	19.0
Very Great Extent	18	28.6
Total	63	100.0

Source: Field survey, 2022

Table 4.4 presented responses to the question of the extent inventory management systems pose a challenge to health institution in the covid-19 pandemic period. The summary table above shows that 15 (23.8%) of the respondents were of the opinion that their inventory management system poses very little challenge to their hospital in the pandemic era. 11 representing 17.5% were of the view that the extent of challenge is little. 7 respondents (11.1%) were undecided on the extent of challenge currently being posed by their inventory management . 12 (19%) opined that the extent of such challenge is great while the rest of the 18 respondents (28.6%) claim that the extent of challenge is very great.

Table 4.5: Analysis of Responses to Research Question 3

Response	Frequency	Percentage (%)
Very Little Degree	10	15.9
Little Degree	3	4.8
Neutral	12	19.0
Great Degree	11	17.5
Very Great Degree	27	42.9
Total	63	100.0

Source: Field survey 2022

Table 4.5 provided a summary of the responses to the research question of the degree to which inventory management systems influence optimal stock levels in the COVID-19 era. The table above shows that 10 (15.9%) of the respondents believe that the degree to which inventory management system enhances optimal stock level is very little. 3 respondents (4.8%) opted for little degree; 12 (19%) were undecided; 11 respondents (17.5%) opined that there is a great degree of influence of inventory management on optimal stock level. Finally, 27 respondents (42.9%) indicated that the degree of such influence is very great.

d) Test of hypotheses

i. *Hypothesis I*

H_{O1}: The inventory management systems currently being used in the COVID-19 pandemic era are not significantly effective.

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Table 4.6: Effectiveness of IMS in COVID-19 pandemic era

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.336[a]	16	.060
Likelihood Ratio	9.443	16	.071
Linear-by-Linear Association	1.911	1	.167
N of Valid Cases	63		

Source: Field survey 2022

Table 4.6 above shows the test of hypothesis of the degree of effectiveness of re-order level, period-review and EOQ in the COVID-19 pandemic era. The result above shows that the Pearson's Chi-Squared Statistical Test result is insignificant (X^2 = 15.336, *p-value* =0.060). To further support the statistical position of the above result, the Likelihood Ratio of the test is 9.44 with a *p*-value of 0.071. Since the p-value of the test (0.060) is greater than 0.05, the null hypothesis was accepted. As a result, the researchers concluded that the inventory management systems being used in selected health institutions in Anambra state are not effective in the COVID-19 pandemic period at 5% level of significance.

ii. *Hypothesis II*

H_{O2}: the inventory management systems pose no significant challenge to health institutions in the COVID-19 pandemic era. Below is the output of the test:

Table 4.7: Challenges of IMS in COVID-19 pandemic era

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	0.6377[a]	8	.001
Likelihood Ratio	0.6132	8	.003
Linear-by-Linear Association	0.8332	1	.074
N of Valid Cases	63		

a. 10 cells (66.7%) have expected count less than 5. The minimum expected count is .44.

Source: Field Survey 2022

The result above shows that the Pearson's Chi-Squared Statistical Test result is significant (X^2 = 0.6377, *p-value* =0.001). To further support the statistical position of the above result, the Likelihood Ratio of the test is 0.6132 with a *p*-value of 0.003. Since the p-value of the test (0.001) is less than 0.05, the null hypothesis was rejected. Consequently, the researchers concluded that IMS pose significant challenges to health institutions in the COVID-19 pandemic era at 5% level of significance. The findings of the study are in tandem with the outcome of the studies earlier carried out by Onuorah (2019); Okerulu (2019);Agu, Obi-Anike & Eke (2016)

iii. *Hypothesis III*

H_{O3}: Inventory management systems (proxies by re-order level system, periodic review system and economic order quantity model) do not significantly influence optimal stock levels in selected health institutions in the COVID-19 era.

The output of the test is given below:

Table 4.8: Correlation Result of Test of Hypothesis III

Spearman's rho		Re-Order Level System	Periodic Review System	Economic Order Quantity Model	Optimal Stock Level
Re-Order Level System	Correlation Coefficient	1.000			
	Sig. (2-tailed)	.			
	N	63			
Periodic Review System	Correlation Coefficient	-.011	1.000		
	Sig. (2-tailed)	.931	.		
	N	63	63		
Economic Order Quantity Model	Correlation Coefficient	.895**	.029	1.000	
	Sig. (2-tailed)	.000	.822	.	
	N	63	63	63	

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Optimal Stock Level	Correlation Coefficient	.267*	.368**	.342**	1.000
	Sig. (2-tailed)	.034	.003	.006	.
	N	63	63	63	63

Source: Field survey 2022

Table 4.8 above shows the test of hypothesis of the influence of Re-Order Level System, Periodic Review System, and Economic Order Quantity Model on optimal stock level of selected health institutions at 5% level of significance. The result above shows that the influence of Reorder Level, Periodic Review System and Economic Order Quantity Model on optimal stock level is positive and significant. 1 unit change in Reorder Level System, Periodic Review System and Economic Order Quantity Model increases optimal stock level by 0.267, 0.368 and 0.342, respectively. Since the p-value of the test (0.001) is less than 0.05, the null hypothesis was therefore rejected. This led to the conclusion that inventory management systems (proxies by re-order level system, periodic review system and economic order quantity model) significantly influence optimal stock levels in selected health institutions. This result is in agreement with the findings of Iliemena, Ijeoma and John-Akamelu (2019). Also in line with the findings of this study is the works of Edwin and Florence (2015), Ogbo and Ukpere (2014), and Anichebe and Agu (2013).

e) Theoretical contribution of Findings and application to wider research

Generally, the outcome of this study re-emphasized the Lean Theory and lean practice for health institutions as in proposed by earlier researches. The theoretical application of the lean theory in medical supplies management was earlier highlighted by Iliemena, Goodluck and Amedu (2020) which viewed inventory management practices as a vital part of any supply chain regardless of whether the firm operates a product or service supply chain. In the present study, hospitals majorly although not entirely operate a service supply chain but need to match demand and supply in the supply chain while considering uncertainties in the market environment like the COVID-19 pandemic.

V. Conclusion, Implications and Recommendations

The overall objective of inventory management is to maintain stock level in a way that reduces cost of inventory. The optimum level of stock depends on some factors which arise from the interest of the management to establish an overall policy for stock taking. An effective inventory management strategy enhances optimal stock level and ensures that the right quantity and quality of the relevant stock is available at the right time and at the right place. Thus, the results of the study provided empirical evidence for managers of health institutions and thus the conclusion that inventory management, proxy by Re-order Level system, Periodic review system and Economic Order Quantity Model, positively influence optimal stock level of medical supplies in health institutions using the case of selected hospitals in Anambra state but currently pose significant challenges in cost minimization due to COVID-19 pandemic. This implies that inventory management systems of health institution urgently need to be modified to properly fit the unpredictable changes in demand and supply of medical supplies in the pandemic era. In other words, there is need for hospitals to adopt flexible systems of inventory management as it suits the economic and medical situation of the time. Consequent to the above, this study recommends that;

1. Management of health institutions should strive to ensure that the right stock is kept in their warehouses to hedge against excessive holding cost of medical supply inventories and stock-outs which could lead to loss of life/ patronage.
2. Given that the utilization of Re-order Level System, Periodic Review System and Economic Order Quantity Model positively influences optimal stock level, management of hospitals should diversify their inventory management system to suit specific needs of considering movements in demand and supply.
3. Management of hospitals and other health institutions should closely monitor and regulate their inventory system as a way of ensuring corporate sustainability due to its influence on performance.

a) Suggestions for Further Studies

Given the limitation of our study based on the scope and area, future research may attempt same topic in such a way that other methods of inventory management and control are subjected to similar tests. Flowing from our research outcome, the following topics of research are suggested for further studies:

1. Inventory Management and Corporate Profitability of health institutions in Nigeria.
2. Inventory Management Techniques and Cost Minimization in the COVID-19 pandemic period as a comparative study of different sectors or comparative study of countries.
3. Inventory Control systems and Financial Performance of listed health institutions.

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Impact of Exchange and Communications Technology on Firm Performance: The Mediation Effect of Supply Chain Capabilities

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Abstract- Network-enabled enterprise systems called interorganizational systems use (IOS) go beyond the walls of an organization, allowing partners in the supply chain to collaborate better by exchanging business information in real time. As a result, the study (Case Study: Sudan Food Industry) examined the Mediating Role of Supply Chain Management Capabilities on the Relationship between Inter-Organizational System Use on Firm Performance, with the purposeful participation of (450) participants, to whom the questionnaire was addressed. The information was then gathered from the supply chain and production management at the Sudanese food processing industry. The data was then coded using SPSS and AMOS 26. After ensuring normality, validity, and reliability, a descriptive analysis was conducted and variable correlation was examined. Path analysis was formerly used to test hypotheses. The findings of the study reveal IOS have a positive and significant impact on SCM capabilities. also, SCM capabilities mediating the relationship between IOS and Performance.

Keywords: inter-organizational systems, supply chain responsiveness, supply chain integration.

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Impact of Exchange and Communications Technology on Firm Performance: The Mediation Effect of Supply Chain Capabilities

Emad Eldeen Abou [α] & Idries Alsiddig [σ]

Abstract- Network-enabled enterprise systems called inter-organizational systems use (IOS) go beyond the walls of an organization, allowing partners in the supply chain to collaborate better by exchanging business information in real time. As a result, the study (Case Study: Sudan Food Industry) examined the Mediating Role of Supply Chain Management Capabilities on the Relationship between Inter-Organizational System Use on Firm Performance, with the purposeful participation of (450) participants, to whom the questionnaire was addressed. The information was then gathered from the supply chain and production management at the Sudanese food processing industry. The data was then coded using SPSS and AMOS 26. After ensuring normality, validity, and reliability, a descriptive analysis was conducted and variable correlation was examined. Path analysis was formerly used to test hypotheses. The findings of the study reveal IOS have a positive and significant impact on SCM capabilities. also, SCM capabilities mediating the relationship between IOS and Performance.

Keywords: inter-organizational systems, supply chain responsiveness , supply chain integration.

I. Introduction

Network-enabled enterprise systems called inter-organizational systems (IOS) go beyond the confines of an organization, allowing partners in the supply chain to interact more successfully and share business information in real time (Bakos, 1991; Chatterjee & Ravichandran, 2004; Hartono, Li, Na, & Simpson, 2010).

Businesses have implemented a variety of IOS uses, such as vendor managed inventory, electronic data interchange, and collaborative planning, forecasting, and replenishment, to enable supply chain partners to communicate in real time and make informed decisions. To gain a competitive edge, interorganizational systems enable efficient management of activities in a coordinated and integrated manner.

According to the resource-based view (RBV) hypothesis, a corporation acquires a competitive edge when it manages and successfully combines resources that are uncommon, valued, heterogeneous, and unique (Barney, 1991; Peteraf & Barney, 2003). Consequently, research in logistics and resource-based theory both demonstrate for the mutual advantage of the supply chain network's participants, inter-organizational systems enable an organization to supplement its internal resources and capabilities with external resources made available to the partners.

The entire supply chain greatly benefits from the usage of IOS (Asamoah, Agyei-Owusu, Andoh-Baidoo, &Ayaburi, 2019; Hartono et al., 2010). However, there are calls for deeper research into the methods by which IOS use improves firm performance and for the supply chain Blackbox to be opened. (Agbenyo, Asamoah, &Agyei-Owusu, 2018; Aydiner, Tatoglu, Bayraktar, & Zaim, 2019; Yu, Chavez, Jacobs, & Feng, 2018). Therefore, through the following research gaps, the study attempts to cover the food industry in Sudan in order to get the benefit of IOS and SCC in Sudanese food processing industry.

The current study thus concentrates on 1) external IOS usage in SCC and 2) the impact of inter-organizational system uses on firm performance. Management's comprehension of the operational dynamics of IOS in the organization is enriched by insights from the investigation of the interaction between IOS use and SCC in improving Firm performance. In this work, we investigate the complex interactions between SCC, Firm performance, and IOS usage.

The remaining sections of this essay are organized as follows. Introduction in Section 1, evaluation of pertinent literature in Section 2, and formulation of hypotheses in Section 3. Section 4 presents the research methodology, while Section 5 summarizes the findings. Finally, our analysis and conclusions in Section 6.

II. Literature Review

a) Inter-organizational information systems (IOS)

Network-enabled information systems known as inter-organizational information systems (IOS) enable enterprises to efficiently coordinate business operations and supply chain activities across many organizations (Asamoah et al. 2021).

Over the past few decades, IOS use and adoption have grown and have moved across numerous industries. According to studies, implementing and utilizing IOS may help achieve the

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following three objectives: facilitate communication, facilitate integration, and facilitate business intelligence (Zhang and Cao 2018; Subramani 2004).

Deploying IOS for business intelligence is more crucial in the present big data era, where large amounts of corporate data are produced every day. Exploring and understanding corporate data can help organizations gain new insights into their processes, customers, and markets, which can pave the way for enhanced performance.

IOS-enabled business intelligence refers to how effectively IOS is used to support learning and business intelligence. IFIP 2021, International Federation for Information Processing A. Kumi et al., "Knowledge Sharing in a Supply Chain Network," Springer Nature Switzerland AG, 2021 (Zhang and Cao 2018). Cooperative knowledge acquisition, shared databases and decision support systems, and artificial intelligence are examples of applications for IOS-enabled business intelligence (Mandal and Dubey 2021).

Implementing IOS enhances a number of outcomes, including firm performance, according to past studies (Hartono et al. 2010, Rajaguru and Matanda 2013, and Firm performance (Cho et al. 2017; Asamoah et al. 2021a).While concentrating primarily on IOS use at the second order level, the present literature on IOS outcomes usually blends a variety of IOS use factors and neglects to examine how certain IOS use dimensions may enhance firm performance. Therefore, it is currently unknown whether and how IOS-enabled business information affects the performance of businesses. Researchers have often encouraged to look into how different IOS use aspects affect performance (Asamoah et al. 2021a; Agbenyo et al. 2018).

Additionally, nothing is known about how IOS-enabled business intelligence enhances company performance. This study closes these research gaps by analyzing the significance of information interchange, coordination, integration, and supply chain responsiveness abilities in explaining the outcomes of IOS-enabled business intelligence. Therefore, we conclude the following hypothesis

H_1 inter-organizational system use IOS with sub-dimension (C-I) has positive impact on Firm performance SCP with sub-dimension (R.E.F).

H_2 inter-organizational system use IOS with sub-dimension (C-I) has positive impact on supply chain capabilities with sub-dimension (I.C.R)

b) Dynamic Supply Chain Capabilities (SCC)

Due to uncertainties and ongoing market and business environment changes, the idea of dynamic capacities has evolved. Teece et al (2017). created the dynamic capabilities hypothesis. In order to adapt to the quick changes in the business environment, firms must be able to develop, integrate, and reconfigure their internal and external resources and competencies. According to Zahra and George (2002), dynamic capabilities allow businesses to update and reorganize their resource base in response to shifting consumer demands and rival strategies. The importance of using dynamic capabilities in the supply chain is rising (Witcher et al., 2008 & Allred et al., 2018).

The establishment of dynamic supply chain capabilities is a result of shifting long- and short-term supply and demand, market dynamics, and consumer demands (Ju et al., 2016). In order to handle these changes, businesses need dynamic supply chain capabilities. Dynamic supply chain skills enable businesses to foresee market demands precisely, forge collaborative relationships with consumers and suppliers, and improve the supply chain's response to those needs (Sanders, 2014). From a supply chain perspective, the dynamic capabilities have been studied by numerous academics.

According to Mathivathanan et al. (2017), the supply chain's ability to build dynamic capabilities is crucial for meeting future demands. Dynamic supply chain capabilities are defined by Oh et al. (2019) as a firm's capacity to recognize and utilize internal and external resources in order to improve supply chain processes effectively and efficiently. They add that information exchange, coordination, integration, and supply chain responsiveness are examples of dynamic supply chain capabilities. According to Ju et al. (2016), in order to meet customer expectations and keep competitiveness in a dynamic environment, dynamic supply chain capabilities are procedures of information sharing, supply chain alignment, and information technology. According to Aslam et al. (2018), dynamic supply chain capabilities include cohesive elements of supply chain agility and flexibility which should be integrated to support supply chain ambidexterity.

A company's capacity to adapt its internal and external resources to market changes depends on its supply chain agility. This skill aids an organization's efforts to seize opportunities or fend off dangers posed by unstable environments (Van Hoek et al., 2001), which may result in the acquisition or preservation of a competitive advantage (Eisenhardt and Martin 2000). According to numerous studies, enhancing supply chain agility capability—that is, becoming more responsive to changes at low costs—has a favorable effect on the performance and competitiveness of businesses (Blome et al., 2013; Chakravarty et al., 2013; Oh ., 2018).

- Supply chain responsiveness is a company's capacity to react swiftly to fluctuations in consumer demands, production and delivery volumes, and product mix, volume, and delivery. Most likely, these modifications will result in improved performance results, such as lower manufacturing costs, higher customer satisfaction, and quicker delivery (Yu et al., 2016). Additionally, studies by Prago and

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Olhager (2016) and Mandal et al. (2016) demonstrate that supply chain responsiveness has a favorable effect on operational performance.

- Collaboration capability refers to a company's capacity to establish a long-term relationship in terms of supply chain operations and the exchange of knowledge, resources, and risk in order to meet shared goals (Bowersox et al., 2002). According to Cao and Zhang (2011), an organization's capacity for information sharing determines its capacity for supply chain collaboration, knowledge and resource, goal consistency. Customer cooperation, supplier collaboration, and internal collaboration are crucial components that make up the collaborative supply chain, according to Yunus (2018). Integrability reflects a company's aptitude to forge strategic alliances and work in tandem with its supply chain partners (Flynn et al., 2010).
- Supply chain integration emphasizes the availability of the appropriate items to the appropriate consumers at the appropriate time and at a reasonable cost (Angeles, 2009). According to Rajaguru and Matanda (2019), supply chain integration entails integrating financial, physical, and informational flows. The ability of a business to adapt quickly to market changes and turbulence in order to better serve its suppliers and consumers is referred to as agility capability (Aslam et al., 2018).

Additionally, supply chain agility is a dynamic process that modifies or reconfigures the current business process to deal with market hiccups and other uncertainties. According to Li et al. (2009), strategic readiness and reaction capability, operational readiness and response capability, and episodic readiness and response capability are key components of supply chain agility. The ability of supply chain partners to react to changes and alterations in the environment is referred to as responsiveness capability (Williams et al., 2013). According to Singh and Sharma (2015), supply chain responsiveness places an emphasis on cutting down on lead times, enhancing service quality, responding quickly to client needs, and optimizing transportation. Shekarian and others,(2020) contend that there are three essential components to supply chain responsiveness: agility to respond to customer requests, flexibility to facilitate the development of new products and entry into new markets, and a reduction in the likelihood of supply chain bottlenecks and interruptions. So, we conclude the following hypothesis

H3 supply chain management capabilities SCMC with sub-dimension (I.S.R) has positive impact on Firm performance SCP with sub-dimension (R.E.F)

c) Firm Performance

Firm performance in a changing environment, with businesses aiming for superior organizational performance and competitive advantages (Rajaguru and Matanda, 2019). pertaining to the effectiveness of the company's internal operations, which may allow the company to increase its profitability and competitiveness in the market (Hong et al., 2019). Operational performance is a multifaceted concept that encompasses the successful conversion of operational capabilities into organizational competitive advantages. Productivity, quality, cost, delivery, flexibility, and customer happiness can all be used to evaluate it (Gambi, 2018). Businesses aim to gain competitive advantages and achieve good organizational performance in a dynamic environment (Rajaguru and Matanda, 2019).

Firm performance is related to the effectiveness of the company's internal operations, which may allow the company to increase its profitability and competitiveness in the market (Hong., 2019). Firm performance is a multifaceted concept that encompasses the successful conversion of operational capabilities into organizational competitive advantages. Productivity, quality, cost, delivery, flexibility, and customer happiness can all be used to evaluate it (Saleh, 2018). Therefore, after reviewing previous studies that confirmed the existence of a relationship between them, we can conclude the following hypothesis

H4 supply chain management capabilities SCMC multi-dimension mediated the positive impact of inter-organizational system use IOS use with multi-dimension on SCP.

III. Research Methods

a) Sampling and data collection

The current study is categorized as both a cause-and-effect and descriptive study. Its goal to testing (ISO, FP, SCCM). The approach begins with a review of the literature in order to compile a profile for assessing supply chain management capabilities SCMC multi-dimension mediated the positive impact of inter-organizational system use IOS use with multi-dimension on SCP. Following that, the information gathered used non-probability sample (Convenience) The data was then coded using SPSS, SMART PLS. After ensuring normality, validity, and reliability, a descriptive analysis and variable correlation checks were conducted.

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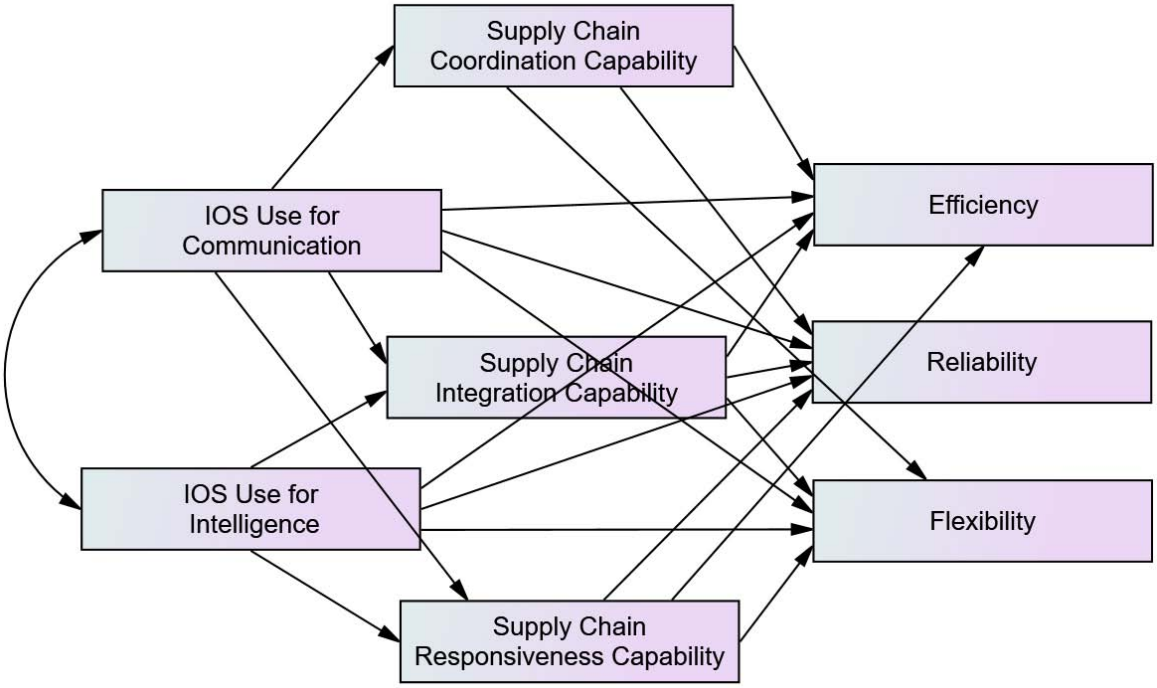


Fig. 1: Conceptual framework

b) Measurement

Measurement instruments for the constructs were obtained from previous studies and adapted to suit the context of this study. IOS Use was adopted from Zhang and Cao (2018), Supply Chain Capabilities was adopted from Wu et al. (2006), and Firm performance was adopted from Kocoglu et al. (2011) and Lee et al. (2007).

c) Empirical strategy

In this work, the proposed model was examined using SPSS and AMOS. The theoretical framework was examined using SEM in order to examine the suggested model. Additionally, it provides accurate estimations of the pathways between constructions by simultaneously analyzing the structural and size models (Chin, 1998). Sarstedt, Ringle, and Hair (2017) argue that SEM is a suitable method for testing mediation and moderation outcomes and examining complex relationships as a result. Last but not least, CB-SEM is often utilized in fields involving number lookups (e.g., Ferraris, Devalle, Ciampi, and Couturier, 2019; Rezvani, Dong, and Khosravi, 2017).

d) Non-response bias and common method bias countermeasures

Countermeasures for non-response bias and common method bias inclination we compared 25% of replies from the first fourteen days of the review period with 25% of responses from the most recent two weeks, as recommended by Armstrong and Overton (1977), and performed a t-test to determine whether our review was free of the NRB problem. Additionally, it was confirmed that there were no disparities in the respondents' responses in the two states using the ANOVA analysis, which revealed that there were no significant differences. We conducted many tests to mitigate the negative effects of normal technique predisposition (CMB). In addition to the programming stacking test by Muthen and Muthen (2007), Harman's single element test (Gomez-Conde et al., 2019), and Podsakoff et al's. (2003) NRB test. These tests showed that our review was liberated from CMB. Besides, we directed pre-testing for the questionnaire to guarantee the understandability of the assertions introduced in that.

IV. Data Analysis and Results

We used SPSS and AMOS v 26 to assess the measurement model and structural model, and a bootstrapping estimation procedure was adopted to investigate the significance of mediation effects.

Table 1: Company profile

		Frequency	Percent
Gender	Male	260	59.1
	Female	170	38.6
	Total	440	100.0

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Age	18 to 24	180	40.9
	25 to 30	210	47.7
	31 to 35	30	6.8
	More than 36	10	2.3
	Total	430	97.7
Academic qualification	B.sc	10	2.3
	M.sc	380	86.4
	PhD	40	9.1
	Total	430	97.7
Specialization	Business	150	34.1
	Management (MIS)	70	15.9
	Supply chain Management	180	40.9
	IT	20	4.5
	Others	10	2.3
	Total	430	97.7
Income	Less than 100000	30	6.8
	In range 100000 to 500000	380	86.4
	Above 500000	10	2.3
	Total	420	95.5
Missing	System	20	4.5
Total		440	100.0

Source: prepared by researcher from data (2022)

a) Factor analysis

i. *Exploratory factor analysis*

EFA used to be done in an organized order and was viewed as such. First, the significance of the issue evaluation, which was evaluated by looking at the correlation matrix of the accumulated statistics, was verified using the Bartlett sphericity test (Hair et al., 2005). Kaiser-Meyer-Olkin (KMO) statistics were employed to calculate sample adequacy at the same time. Sphericity and the KMO value are considered in the Bartlett's grading. Maximum Likelihood Approach to Habits (EFA). The twelve elements that were originally utilized to gauge the dimensions Impact of exchange and communications technology on firm performance: the mediation effect of supply chain Capabilities underwent factor examination. Table 5.6 confirmed the precis of consequences all the gadgets it is above then 0.5. So, the KMO and Bartlett's take a look at equal 0.869 which is full-size (0.00). This end result indicates that the pattern dimension is ample for structural equation modelling (Gaskin, 2012, Kenny and McCoach, 2003).

Table 2: (Pattern Matrix[a]) The pattern matrix to establish convergent and discriminant validity

	Component							
	1	2	3	4	5	6	7	8
Communication 1	-.028	.385	-.388	.019	.456	.082	.083	.150
Communication 3	-.060	.285	-.087		-.315	-.034	.260	.947
Exchange 1	.068	.850	.176	-.119	.210	-.104	-.196	.144
Exchange 2	-.271	.125	-.085	.478	.182	.295	.222	.322
Exchange 3	.158	.011	-.124	.047	.348	.645	.161	-.215
Exchange 4	-.182	.077	.733	-.105	.221	-.025	.237	-.244
Coordination 1	-.164	.074	.838	.072	-.093	.155	-.152	.047
Coordination 2	.571	-.173	.375	.102	.312	.286	-.094	.028
Coordination 3	-.256	.161		.071	.736	-.306	-.253	-.212
Coordination 4	.523	.553	-.151	-.514	-.067	-.018	.110	.221
Integration 1	-.027	-.006	-.025	.198	-.122	-.181	.848	.250
Integration 3	-.056	.232	.139	.745	-.330	.243	-.135	.087
Integration 4	.490	.162	.138	.065	.175	.264	-.256	.277
Responsiveness 1	.141	-.100	-.049	-.183	.887	.142	.040	-.209
Responsiveness 2	-.543	.646	.206	.184	.104	.080	.257	.037
Responsiveness 4	.604	-.072	-.450	.103	.076	.052	-.122	.235
Efficiency 1	.171	-.133	.473	.116	.267	-.352	-.045	.300
Efficiency 2	.081	.688	-.043	.014	-.044	.095	.114	.173
Efficiency 3	.145	-.066	.619	-.265	-.027	-.133	.683	.214
Efficiency 4	-.101	.386	.261	-.080	.713	.021	-.074	-.116

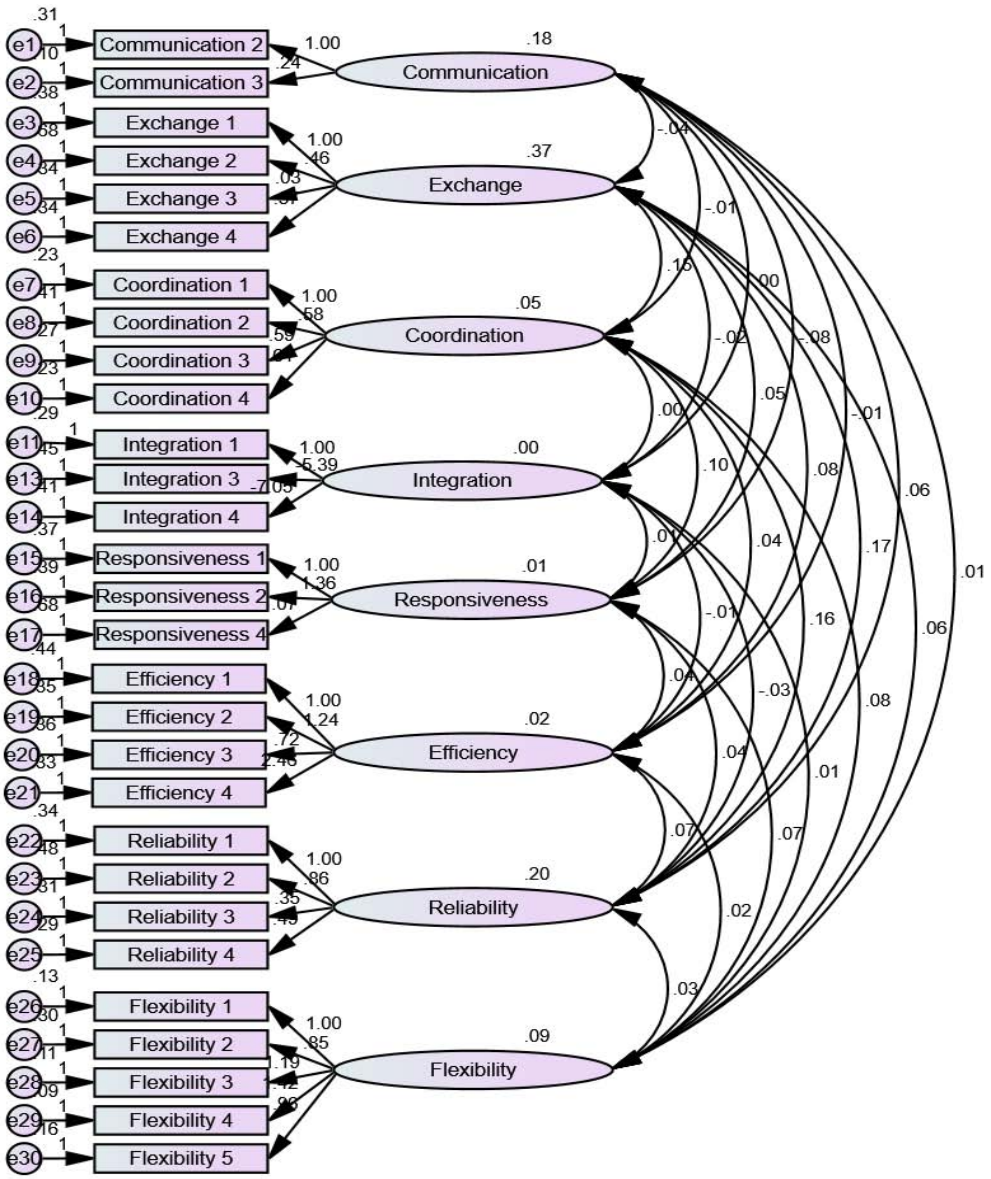
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Reliability 1	.157	-.010	.130	-.076	-.166	.922	-.219	.064
Reliability 2	.291	.262	.089	.115	-.037	.207	.595	-.045
Reliability 3	.431	.385	-.130	.167	.197	-.420	.063	.101
Reliability 4	.326	-.025	.035	.892	-.122	-.359	.137	-.124
Flexibility 1	.256	-.279	-.098	.755	.151	.029	.251	-.012
Flexibility 2	.412	.079	.616	.265	-.183	.094	.060	-.099
Flexibility 3	.861	-.029	-.088	.051	-.030	.086	.092	-.073
Flexibility 4	.388	.573	-.067	.086	.076	-.086	-.100	-.598
Flexibility 5	.875	.172	.091	.039	-.192	.159	-.084	-.174

The results were found substantial, and hence the result of factor analysis was accepted (Hair et al., 2005).

ii. *Confirmatory factor analysis (CFA)*

Confirmatory factor analysis (CFA) was used to examine the validity and reliability of the records measuring tool, respectively. A multi-dimensional CFA model in (Figure 1) has been hypothesized and tested for its psychometric qualities in order to confirm the degree of correspondence between the apparent variables and latent aggregate of the trImpact of exchange and communications technology on firm performance.



Following Fornell and Larcker (1981), we performed a confirmatory component evaluation (CFA) to determine the constructs in phrases of convergent validity, discriminant validity, and reliability. The effects of the CFA confirmed pretty desirable

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Table 3: Fornell and Larcker (discriminant validity)

Exchange	Communication	Coordination	Integration	Responsiveness	Efficiency	Reliability	Flexibility
0.426							
-0.162	0.485						
1.157*	-0.115	0.288					
-0.649	-0.15	0.152	0.374				
0.83	-1.718†	4.360*	1.048	0.158			
0.875	-0.194	1.113	-1.449	2.423	0.347		
0.642*	0.316	1.634**	-1.137	0.787	0.962	0.453	
0.331	0.105	1.216**	0.388	2.141*	0.46	0.251	0.651

The fit statistics: $\chi 2(59) = 112.329$, RMSEA=0.067, NFI=0.90, CFI=0.95, IFI=0.95, GFI=0.92, and SRMR=0.052. We used composite reliability (CR) and Cronbach's alpha to determine the reliability of all constructs. As proven in Table 3, all values of CR (ranging from 0.695 to 0.814) are greater than 0.7, suggesting sufficient reliability (Fornell and Larcker, 1981)

Table 4: Reliability and validity

	CR	AVE	MSV	MaxR(H)
Exchange	0.780	0.181	1.34	0.551
Communication	0.757	0.235	2.951	0.413
Coordination	0.651	0.083	19.012	0.274
Integration	0.699	0.14	2.099	0.349
Responsiveness	0.685	0.025	19.012	0.073
Efficiency	0.713	0.12	5.872	0.385
Reliability	0.688	0.205	2.67	0.532
Flexibility	0.779	0.423	4.584	0.818

iii. *Structural models and hypotheses test results*

In the current study, the hypotheses have been tested through constructing structural model using SEM. Structural model provides a dirct effect on the output file as unstandardised and standardised

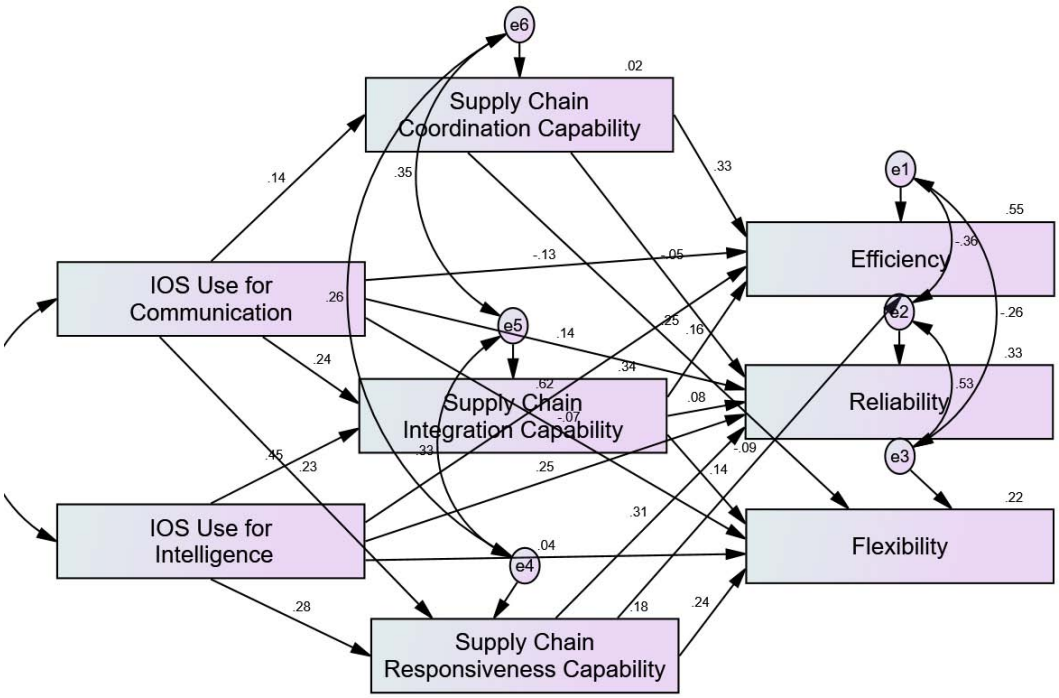


Figure 3: Shows the estimation results of the structural model. The goodness of fit indices were $\chi 2=(2.277)$, DF=2, CMIN/DF= 1.138 with RMSEA=0.026, NFI=0.92,CFI=0.96, IFI=0.96,GFI=0.94, and SRMR=0.041, suggesting an acceptable fit.

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Table 5: Direct Hypotheses Testing

			Estimate	S.E.	C.R.	P	Result
Coordination	<---	Communication	0.128	0.135	0.947	0.344	Not Supported
Integration	<---	Communication	0.222	0.128	1.735	0.083	Not Supported
Responsiveness	<---	Communication	0.18	0.118	1.529	0.126	Not Supported
Integration	<---	Exchange	0.484	0.154	3.149	0.002	Supported
Responsiveness	<---	Exchange	0.245	0.146	1.681	0.093	Not Supported
Efficiency	<---	Communication	-0.126	0.114	-1.103	0.27	Not Supported
Reliability	<---	Communication	0.13	0.134	0.965	0.334	Not Supported
Flexibility	<---	Communication	-0.084	0.175	-0.481	0.631	Not Supported
Efficiency	<---	Exchange	0.7	0.16	4.389	***	Supported
Reliability	<---	Exchange	0.272	0.188	1.452	0.146	Not Supported
Flexibility	<---	Exchange	0.053	0.244	0.217	0.828	Not Supported
Efficiency	<---	Coordination	0.362	0.139	2.61	0.009	Supported
Reliability	<---	Coordination	-0.054	0.163	-0.332	0.74	Not Supported
Flexibility	<---	Coordination	0.316	0.212	1.494	0.135	Not Supported
Efficiency	<---	Integration	0.162	0.148	1.097	0.273	Not Supported
Reliability	<---	Integration	0.078	0.174	0.448	0.654	Not Supported
Flexibility	<---	Integration	0.175	0.226	0.775	0.439	Not Supported
Efficiency	<---	Responsiveness	-0.12	0.156	-0.769	0.442	Not Supported
Reliability	<---	Responsiveness	0.377	0.184	2.05	0.04	Supported
Flexibility	<---	Responsiveness	0.352	0.239	1.471	0.141	Not Supported

*** Significant at .001 level ** Significant at .01 level NS Not Significant

After doing a statistical study on the hypothesis, it was determined that the findings were statistically significant (95% confidence interval, 5,000 bootstrapping). The key details about the potential relationship routes are presented in Table 5. Some hypotheses were supported when the P value for statistical significance was used (P value 0.05), which supports the corresponding hypothesis. The other pathways showed statistically insignificant impacts, therefore their predicted linkages were unsupported.

From the data in the above table, we can derive the following results

- *Communication do not have a positive influence on Coordination*
- *Communication do not have a positive influence on Integration*
- *Responsiveness do not have a positive influence on Communication*
- *Exchange has a positive influence on Responsiveness*
- *Exchange has a positive influence on Integration*
- *Communication does not have a positive influence on Efficiency*
- *Communication does not have a positive influence on Reliability*
- *Communication does not have a positive influence on Flexibility*
- *Exchange has a positive influence on Efficiency*
- *Exchange does not have a positive influence on Reliability*
- *Exchange does not have a positive influence on Flexibility*
- *Coordination has a positive influence on Efficiency*
- *Coordination does not have a positive influence on Reliability*
- *Coordination does not have a positive influence on Flexibility*
- *Integration does not have a positive influence on Efficiency*
- *Integration does not have a positive influence on Reliability*
- *Integration does not have a positive influence on Flexibility*
- *Responsiveness does not have a positive influence on Efficiency*
- *Responsiveness does not have a positive influence on Reliability*
- *Responsiveness does not have a positive influence on Flexibility*

iv. *The mediation tests: indirect effects using the bootstrap approach*

The indirect effects using the bootstrap approach (Bollen and Stine, 1990, Preacher and Hayes, 2004, Shrout and Bolger, 2002) it's different from Baron-Kenny (1986) approach. the evidence are shows in the next Table.

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Table 6: The Regression Path Coefficient for Indirect Effects

	Exchange	Result	Communication	Result
Coordination	...		...	
Flexibility	.250	No mediation	.356	No mediation
Reliability	.770	No mediation	.608	No mediation
Efficiency	.015	Full mediation	.551	No mediation

Table 7: Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Exchange	Result	Communication	Result
Integration	...		...	
Flexibility	.032	Full mediation	.048	Full mediation
Reliability	.264	No mediation	.213	No mediation
Efficiency	.052	No mediation	.100	No mediation

Table 8: Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Exchange	Result	Communication	Result
Responsiveness	...		...	
Flexibility	.024	Full mediation	.087	No mediation
Reliability	.020	Full mediation	.087	No mediation
Efficiency	.878	No mediation	.753	No mediation

- Coordination did not mediate the relationship between Exchange on Flexibility
- Coordination did not mediate the relationship between Communication on Flexibility
- Coordination did not mediate the relationship between Exchange on Reliability
- Coordination did not mediate the relationship between Communication on Reliability
- Coordination mediates the relationship between Exchange on Efficiency
- Coordination did not mediate the relationship between Communication on Efficiency
- Integration mediates the relationship between Exchange on Flexibility
- Integration mediates the relationship between Communication on Flexibility
- Integration did not mediate the relationship between Exchange on Reliability
- Integration did not mediate the relationship between Communication on Reliability
- Integration did not mediate the relationship between Exchange on Efficiency
- Integration did not mediate the relationship between Communication on Efficiency
- Responsiveness mediates the relationship between Exchange on Flexibility
- Responsiveness did not mediate the relationship between Communication on Flexibility
- Responsiveness mediates the relationship between Exchange on Reliability
- Responsiveness did not mediate the relationship between Communication on Reliability
- Responsiveness did not mediate the relationship between Exchange on Efficiency Responsiveness did not mediate the relationship between Communication on Efficiency

Table 9: Global Test

	X^2	DF
Unconstrained	15.089	2
Constrained	53.396	22
Difference	38.307	20
P-Value	0.008	

Interpretation: The p-value of the chi-square difference test is significant; the model differs across groups.

Table 10: Local Tests

Path Name	Male Beta	Female Beta	Difference in Betas	P-Value for Difference	Interpretation
Communication → Coordination.	0.218	0.096	0.123	0.841	NO

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Communication → Integration.	0.159	0.301	-0.142	0.558	NO
Communication → Responsiveness.	0.091	0.415*	-0.323	0.193	YES
Exchange → Integration.	0.431†	0.493**	-0.062	1.000	NO
Exchange → Responsiveness.	0.101	0.380*	-0.279	0.365	YES
Communication → Efficiency.	-0.147	-0.085	-0.062	1.000	NO
Communication → Reliability.	0.054	0.118	-0.064	0.764	NO
Communication → Flexibility.	-0.370*	0.188	-0.558	0.112	YES
Exchange → Efficiency.	0.748***	0.553**	0.195	0.913	NO
Exchange → Reliability.	0.241	0.100	0.141	0.760	NO
Exchange → Flexibility.	-0.296	0.115	-0.410	0.286	NO
Coordination → Efficiency.	0.258	0.294†	-0.036	0.722	YES
Coordination → Reliability.	0.239	-0.226	0.466	0.192	NO
Coordination → Flexibility.	0.441*	0.187	0.254	0.453	YES
Integration → Efficiency.	-0.161	0.592**	-0.753	0.010	YES
Integration → Reliability.	0.037	0.106	-0.069	0.825	NO
Integration → Flexibility.	0.116	0.185	-0.070	0.786	NO
Responsiveness → Efficiency.	0.045	-0.418†	0.464	0.073	YES
Responsiveness → Reliability.	0.047	0.532†	-0.485	0.166	YES
Responsiveness → Flexibility.	0.171	0.172	-0.001	0.956	NO

YES = there is difference, NO =No difference

- The positive relationship between Responsiveness and Communication is only significant for Female.
- The positive relationship between Responsiveness and Exchange is only significant for Female.
- The negative relationship between Flexibility and Communication is only significant for Male.
- The positive relationship between Efficiency and Coordination is only significant for Female.
- The positive relationship between Flexibility and Coordination is only significant for Male.
- The positive relationship between Efficiency and Integration is stronger for Female.
- The negative relationship between Efficiency and Responsiveness is stronger for Female.
- The positive relationship between Reliability and Responsiveness is only significant for Female.

V. Discussion

The results of the study provide initial verification of the effectiveness of the IT artefact in explaining the level of Firm performance of firms.

First: the relationship between IOS Use for Intelligence (exchange) has positively and significant influence on firm Performance (Efficiency, Reliability and Flexibility)so, the rationale is to allow company to obtain information and then use it and exchange to get the benefit from the coordination and integration capabilities as it is supposed. In addition, companies are working to enhance the capabilities of information that helps business to became strong in their performance, which is directly reflected in the supply chain of companies. Therefore, this result is consistent with the results of previous studies that noted that the use of IOS in general enhances the ISO of supply chain management in general (Agbenyo et al. 2018; Asamoah et al. 2019; Asamoah et al. 2021a).

On the contrary, we find that IOS Use for Communication has not positively and significant influence on firm Performance (Efficiency, Reliability and Flexibility). consequently, this indicates that refer to Dal Foods industry is not leading to a staggering improvement in supply chain management capabilities specifically in IOS Use for (Communication). However, Communication were not correlated with higher supply chain response.

The results provide empirical support for prior studies on the IOS (exchange) in predicting the level of Firm performance of firms (Asamoah et al., 2019;

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Hartono et al., 2010; Lee et al., 2014). The findings of the study revealed that the effect of IOS use on SCM performance was partially positive and significant. Accordingly, we find that the availability of integrated supply chain management systems for the company works to take advantage of opportunities to obtain insights from inside and outside the organization.

Second: the relationship between SCC (Responsiveness, Integration and Coordination) have not positively and significant influence on firm Performance (Efficiency, Reliability and Flexibility) Where confirmed (Williamson, Harrison, & Jordan, 2004). higher SCC can be leveraged to propel attainment of higher levels of Firm performance. on the complex interrelationship of IOS use and SCM cap- abilities in driving Firm performance, it is important for managers and business practitioners to aim at concurrently managing and deploying their IOS implementations and SCM capabilities, as this should create highest possible benefits in terms of Firm performance.

This result is confirmed by the results of the analysis of the mediator variable. Supply Chain Capabilities mediate the Inter-Organizational System use on firm Performance

a) Implications

We have proposed and confirmed the construction by relying on structural equation modeling. Building the model consists of eight dimensions, and we found a positive relationship between inter-organizational system use (ISO) on the firm performance through the mediation of the supply chains capabilities. Therefore, company managers need to rely on such models because they have a positive impact on the performance of companies, and also the need to rely on the capabilities of supply chains because they positively affect performance. Finally, since SCMC mediates the relationship between ISO and firm performance, company managers must pay attention to these capabilities and for the purpose of learning about the value of ISO implementation.

b) Limitations and future research

There were some limitations to the work. IOS use, SCC, onfirm performance. The complementary effect may not be linear and further examination of a potential non- linear relationship would provide additional insights. Also, as the study utilized data from only one context naduS in Africa, specifically Dall group future research may explore the phenomenon examined over multiple contexts.

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Financial Reporting Destined to External Third Parties as a Tool for Analyzing Credit Worthiness: Usefulness and Limitations. The Italian Case

By Maria Silvia Avi

Abstract- Financial reporting to external third parties is the primary document based on which, at least in theory, a company's creditworthiness should be assessed. Income, capital, financial and sustainability performance should be understood through a thorough analysis of the financial reporting and sustainability report data. Here, we will focus exclusively on Financial reporting. As we will see, Financial reporting intended for the outside world is characterised by an information gap that tends to preserve the company's right to information and privacy. The main objective of Financial Reporting for External Purposes is to ensure that all Financial Reporting prepared by a nation's companies is consistent in structure and thus comparable. The spread of IAS/IFRS makes it no longer a national but a supranational objective. The significant unsolvable problem is that such financial statements, precisely in order to guarantee the privacy of certain information of a strategic nature or the disclosure of which could be detrimental to company management, are characterised by a lack of information that prevents an indepth analysis of the situation with a global company.

Keywords: financial reporting, communication, creditworthiness analysis, static and dynamic analysis, disclosure limits of the financial statements for external parties.

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Financial Reporting Destined to External Third Parties as a Tool for Analyzing Credit Worthiness: Usefulness and Limitations. The Italian Case

Maria Silvia Avi

Abstract- Financial reporting to external third parties is the primary document based on which, at least in theory, a company's creditworthiness should be assessed. Income, capital, financial and sustainability performance should be understood through a thorough analysis of the financial reporting and sustainability report data. Here, we will focus exclusively on Financial reporting. As we will see, Financial reporting intended for the outside world is characterised by an information gap that tends to preserve the company's right to information and privacy. The main objective of Financial Reporting for External Purposes is to ensure that all Financial Reporting prepared by a nation's companies is consistent in structure and thus comparable. The spread of IAS/IFRS makes it no longer a national but a supranational objective. The significant unsolvable problem is that such financial statements, precisely in order to guarantee the privacy of certain information of a strategic nature or the disclosure of which could be detrimental to company management, are characterised by a lack of information that prevents an in-depth analysis of the situation with a global company. Static analysis employing classic ratios and dynamic analysis using the determination of cash flows can only be carried out partially. The results are often unsatisfactory because there is so much missing data to render the analysis almost useless. To this must also be added the circumstance that, if this is true for ordinary financial statements, it is even more true for the abridged financial statements associated with small and medium-sized enterprises, for micro- or tiny enterprises comma one cannot even speak of financial statements as an information instrument intended for the outside world because the eh content of such a document is so limited that third parties cannot understand anything about the company's condition. Whoever applies for a loan from a bank OA a lender, and therefore, it is desirable to add to the balance sheet data intended for the outside and regulated by law, other data internal to the company point. If this does not happen, the lender will be forced to draw deductions from partial, incomplete and often impossible-to-interpret data. In this case, the answer to the financing will probably be the negative point we do not intend here, to enter into the problem of the widespread practice worldwide, which is connected to the constant request for personal skulls by the bank or the lender even in the presence of balance sheets eh that presents optimal income, financial and patrimonial company positions point collateral or personal guarantees are generally always requested by the lender, for greater protection of its credit. It can be said that only in very few cases is financing granted solely and exclusively based on balance sheet data. Despite this, the balance sheet remains one of the main elements on which decisions are made as to whether or not to accept an application for a credit line. However, the decision is also strongly influenced by the ability of the borrower of the potential loan to provide additional collateral of a real or personal nature.

Keywords: financial reporting, communication, creditworthiness analysis, static and dynamic analysis, disclosure limits of the financial statements for external parties.

I. External Financial Reporting: Potential Disclosure Limits[1]

Financial reporting identifies the primary economic-financial communication tool intended for users outside companies.

The subject of our interest will be the 'information potential' of financial reporting regulated by the Italian Civil Code. However, similar considerations to those illustrated in the following pages also apply to financial statements prepared by IAS/IFRS adopter companies.

The information limitations of financial reporting deposited at the company registrar's office can be grouped into three different categories:

1. Inherent limitations of financial reporting which, as such, cannot be overcome;
2. Disclosure limitations arising from the adoption of accounting behaviour that does not adhere to proper financial reporting postulates;
3. Disclosure limitations arising from the specific content of the statutory financial reporting requirements.

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[1] To facilitate reading, I have decided not to include in the text, except in exceptional cases, the names of the scholars who have dealt with the subject under analysis since the bibliography is endless, I have opted not to indicate all the terms of the scholars in the text because this would have meant a continuous interruption of the reading of the complete sentence in which I express my thought.

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Inherent limitations of financial reporting that, as such, cannot be overcome

In addressing the issue of the so-called 'inherent limitations of financial reporting, it is appropriate to recall two peculiarities of financial reporting that, although they may be considered potential limitations, are inherent to financial reporting itself and, consequently, must be interpreted, not as 'shortcomings or limitations of the financial statements, but rather as elements characterising that document.

The two distinctive elements of financial reporting mentioned above can be summarised as follows:

1. Since management is characterised by what is commonly called economic unity, financial reporting breaks down into annual periods, which is, by its nature, indivisible. While the company's total income (i.e. the income produced from the beginning of the company's life until its liquidation) is an objective value, the profit/loss and capital determined at the end of each administrative period, due to the presence of estimated quantities (i.e. approximations to the 'true'), and conjectured values (i.e. subjective representations of the 'true'), identify aggregates lacking an objective 'absolute truth'. For this reason, concerning financial reporting, instead of speaking of 'truth', the terms 'reliability' or 'veracity' of accounting values are used. This intrinsic feature of financial statements, identifying an element inherent in the balance sheet and profit and loss, cannot, however, be counted among the informational limitations of this document as it identifies
2. Another distinctive element of financial reporting concerns the type of data recorded therein: the accounting values recorded in the balance sheet and the profit and loss are actual quantities, although the presence of forecast aspects also characterises them. This is a direct consequence of the presence, in the balance sheet, of subjective values, the determination of which depends, not on a mere ascertainment of facts that are now past and concluded, but on an estimation/planning of future events. Consider, for example, the determination of depreciation. The annual depreciation charged to the financial year also depends on considerations regarding the future use of the long-term asset. Similar considerations can be developed concerning quantifying all provisions for future liabilities and charges.

Even though the determination of balance sheet and profit and loss accounting values implies the consideration of future events, there is no doubt that the documents constituting financial reporting for the year are of a consumptive nature.

Although the assessment of creditworthiness cannot disregard the analysis of the company's prospects, the final aspect of financial reporting does not bring this element within the so-called "disclosure limits of financial statements". The circumstance that the values recorded in the balance sheet and the profit and loss are data referring to the closing date of the financial year rather than a limitation represents, therefore, a distinctive trait of financial reporting that, as such, must be accepted and, consequently, interpreted not as a shortcoming but as an intrinsic requirement of such a document.

Concerning the undoubted interest that every user external to the company (shareholders, employees, the community, scholars, etc.) has in information regarding the company's prospects, it must be emphasised that Article 2428, paragraph 3 of the Italian Civil Code establishes that, in any case, the management report must include information on the foreseeable evolution of operations. This specific point will be further discussed in the following pages.

Disclosure limitations resulting from accounting behaviour that does not fully adhere to correct financial statement postulates

The list of 'limitations' of financial reporting, understood as a tool for assessing creditworthiness, may include so-called 'information limitations arising from the application of accounting behaviour that does not perfectly adhere to correct financial statement postulates'.

For obvious reasons, we do not intend to refer to the hypothesis that, voluntarily, the accounting data are distorted by false disclosures of objective values implemented to carry out unlawful balance sheet policies.

Regardless of the objectives of manipulating financial statement data, implementing such operations renders the balance sheet, profit and loss, report of the notes to financial statement report on operations, and documents devoid of any informative consistency. Of little relevance for our analysis appears the consideration of the informative consequences on the determination of the company's creditworthiness, deriving, for example, from the inclusion in the accounts of incorrect objective values as the result of not recording revenues or balance sheet items, the recording of inexistent costs; the recording of assets that do not exist in the company; etc. In this case, however, it seems inappropriate to include such a hypothesis among the "limits" of financial reporting, since the desire to communicate a company condition that is different from the "real" one by falsifying the accounting values does not appear to be an informative limitation of the financial statements, but rather a fraudulent practice that, like any other operation carried out to mislead third parties, renders financial reporting invalid and, in the cases provided for by Article 2621 of

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the Italian Civil Code, transcending the civil field, and to all intents and purposes, falls within the criminal field.

While leaving aside the transactions described above, it is appropriate to address an issue that identifies a widespread practice in companies.

Analysing the financial statements of companies and delving into company practice concerning the determination of financial reporting values that require a subjective valuation intervention, it can be seen that an 'accounting habit' is widespread, which, if not adequately considered in the interpretation phase of the accounting values, can lead to erroneous convictions concerning the company's income and financial situation.

We intend to refer to the often implemented osmosis between tax data and economically (and therefore civil law) correct values.

As is well known, the balance sheet, the profit and loss, the report of the notes to financial statements and the financial statement, i.e. the four documents that, in Italy, constitute the financial reporting destined for the outside world of the company, should only contain civil law correct data, i.e. economically actual accounting values. Since, by its very nature, the civil code contains only very concise rules, the opinion has been consolidated over time that the legal articles should be supplemented/completed/interpreted in light of what is illustrated by the accounting principles.

As noted above, our focus is on financial reporting civil law and, consequently, the accounting standards 'supplementing/completing' the legal norm are those issued by the OIC (Organismo Italiano di Contabilità) even if, in the absence of explicit contradictions with Italian law, there is nothing to prevent the application of international accounting standards (IAS/IFRS).

If the purpose of income values is in determining taxable income, the rules to which reference must be made are the tax provisions whose primary objective is to limit the taxpayer's discretion in determining taxable income.

Therefore, it is possible to identify a precise dividing line between valuation principles applicable to determining financial reporting data and tax criteria since the two regulations are characterised by profoundly different objectives.

Even though most companies are aware of this, in many entrepreneurial realities of our country, financial statements marked by a trib-veridicality, i.e. by a 'truthfulness' influenced by tax assessments, can frequently be identified. In other words, widespread practice is the 'importation' into the civil sphere of the valuation criteria identified by the tax legislator. Implementing such accounting behaviour causes what is generally referred to as 'tax interference in financial'.

It appears evident how, when such a hypothesis occurs, the external communication implemented through the financial statements is distorted by the presence, in the profit and loss and balance sheet, of values that have nothing to do with the economically correct measurement of the events, accounted for.

There is no need to elaborate further to understand how, if implemented, tax interference, understood in the sense described above, can distort the income, financial and patrimonial situation communicated to users outside the company, first and foremost, the lenders who, based on the financial statements, assess the company's creditworthiness.

In order to provide a complete view of reality, it should note that the application of tax valuation criteria in the civil sphere occurs, in most cases, in full awareness of the implementation of incorrect accounting behaviour. However, there are cases where the party responsible for quantifying year-end valuations implements so-called tax interferences in the belief that it is adopting a legally unobjectionable principle. In the occurrence of such a circumstance, which is especially prevalent in small businesses, the implementation of a policy of tax pollution of year-end financial reporting occurs, albeit voluntarily, in terms that we could define as 'unconscious', that is, in the mistaken belief that this corresponds to the dictate of the law regulating financial reporting.

In order to understand the impact on external information resulting from the implementation of so-called fiscal interference, consider, by way of example, the cost corresponding to the depreciation of a plant.

Let us assume that the tax depreciation amounts to 200 while the economically correct value is 70 and that, for tax reasons, a value of 200 is recognised in the balance sheet. In this case, since the value recognised in general accounting exceeds the correct amount, it is evident that the costs are overstated in economic reality. The costs recognised in profit and loss are not actual. The consequences of such incorrect recognition are easy to imagine.

It is evident that, in the opposite hypothesis, the repercussions on the decision-making process could be even more severe. If the economically correct depreciation amounted, for example, to 600 against a tax-deductible cost of 200, the recognition in financial reporting of the tax value would result in a total cost underestimated compared to the actual company situation. A circumstance that would cause easily intuitable consequences on assessing the company's creditworthiness.

It should be noted that both of the above-mentioned hypotheses (economic value higher or lower than the fiscal value erroneously entered in the general accounts and, therefore, in the financial statements) often occur in the entrepreneurial reality of many companies in that, the double calculation of costs and revenues, relevant respectively in the civil/economic and fiscal sphere, causes a sort of 'duplication' of

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administrative work with a simultaneous increase in the complexity of the calculations aimed at determining taxable income and civil law income.

Although we are aware that such behaviour may give rise to doubts as to the legitimacy of financial reporting under civil law, and even though the impact of such accounting practice on the informative capacity of financial statement data is evident, there appears to be a widespread tendency to carry out such interference, frequently leading to internal financial reporting analyses conducted on such data being distorted by assessments that have nothing to do with the veracity of the financial statements.

This is not the appropriate place to analyse the legal and internal company management consequences of the fiscal pollution of financial reporting caused by the osmosis between tax valuation criteria and statutory principles.

Since the object of our interest is to identify possible informational limitations of financial reporting that, directly or indirectly, may influence the assessment of the creditworthiness of companies, it seems relevant to emphasise the possibility that such an accounting practice may distort the income/financial/asset data being analysed.

Although it is difficult to understand whether tax valuations pollute financial reporting data, it should be emphasised that the presence of certain circumstances may facilitate the verification of the implementation of such an accounting practice. The indication, for example, that depreciation and amortisation, annual accruals to provisions for risks and charges, closing inventories, and other items of tax interest included in financial reporting coincide perfectly with the data used to determine taxable income should give rise, in this regard, to some doubt as to the economic veracity of the assets, liabilities, and income components recognised in the financial statements. While it cannot, a priori, be ruled out that economically correct values may coincide with tax values, the doubt as to the implementation of tax interferences is legitimate if, over the years, such identity continues unabated.

Whenever any uncertainty arises about possible tax interferences, those assessing the company's creditworthiness should investigate this 'information issue' to have any valuable cognitive element for the correct understanding of the company's income/financial-patrimonial situation.

Communication limitations arising from the objective of the legal regulations on corporate financial reporting

The last category of information limitations that, at least theoretically, may characterise financial reporting specifically concern the content of financial reporting governed by Articles 2423 et seq. of the Civil Code.

In order to understand how financial reporting can be profitably utilised as a tool for assessing creditworthiness, it is necessary to bear in mind the objectives that the civil legislator wishes to achieve through the legal regulation of the balance sheet, profit and loss, the notes to the financial statements, the cash flow statement and the directors' report, which, although not part of the financial statements, is mandatory for all corporations.

The primary objective of the legislation is, on the one hand, to guarantee the communication to the outside world of values that are economically, financially and patrimonial, correct, truthful and clear, and, on the other hand, to homogenise, formally, this communication by limiting the discretion of companies in the phase of 'creation' and disclosure of accounting data.

Over time, the legislator has identified a series of rules that, at least according to the vision of those who promulgated the laws, should combine two fundamental needs: the uniformity of corporate disclosure intended for third parties and the recognition of dutiful and appropriate confidentiality concerning corporate data deemed sensitive.

Homogenising external disclosure is, without a doubt, one of the main objectives of the civil legislator, the OIC accounting standards, and the IAS/IFRS. Indeed, this element facilitates the understanding of accounting data for external users of companies.

However, this consideration must be interpreted in light of two elements that cannot be underestimated. Firstly, it must be remembered how the law and accounting standards correctly consider the need to guarantee the company a fair right to confidentiality that not even the broader 'stakeholder vision' of the company can deny.

Specific information cannot be extracted from financial reporting as it identifies sensitive data and, although theoretically valuable for those who must assess the company's economic-financial situation, it cannot and must not be disclosed. Without referring to apparent elements such as, for example, the disclosure of data concerning the research and development of new products (even though c. III of Art. 2428 of the Civil Code III c., requires that research and development activities must, in any case, be disclosed in the management report), it is possible to identify other values that, although sensitive, do not identify striking cases such as the one mentioned above. Consider, for example, the requirement to disclose in the financial statements revenues and income, costs and expenses net of returns, discounts, allowances and premiums, as well as taxes directly related to the sale of products and provision of services (Article 2425 bis of the Civil Code). This provision prevents the company from being obliged to disclose data concerning its sales policy that, in

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theory, could be used by competitors in a way that would harm the company's strategy.

In contrast to these examples of sensitive data, the non-disclosure of which is rooted in the company's right to confidentiality, there are disclosure limitations in publicly available financial reporting that create difficulties in interpreting accounting data without a fundamental right to privacy of the company being attached to them.

Consider, for example, the fact that while there is an obligation to disclose the short-term and long-term portion of all debts (aggregate D, balance sheet liabilities), there is no similar obligation in respect of provisions for risks and charges and severance pay liabilities.

This is not the appropriate place for a doctrinal disquisition on the motivations that led the legislature to adopt certain decisions regarding the content of financial statements.

There is no doubt, however, that the dictates of Articles 2424, 2424 bis, 2425, 2425 bis, 2427, 2427 bis and 2428 of the Italian Civil Code entail a series of limitations on the disclosure of information to the outside world that, directly or indirectly, may prevent a constructive and correct analysis of the company's financial and balance sheet data.

In these cases, it appears correct to refer to 'disclosure limitations of financial reporting publicly because, unlike the limitations analysed above (intrinsic limitations and limitations arising from incorrect application of the valuation principles governed by the Civil Code), the inability of the external user to access certain valuable information for corporate analysis, derives from an actual legislative imposition resulting, on the one hand, from the need to guarantee corporate confidentiality on sensitive data or, on the other, from legal choices that, for a series of more or less understandable reasons, the legislator has deemed correct than others. For an overall view of the operational consequences of such disclosure limits in financial reporting, the reader is referred to the following paragraph.

II. Financial Reporting to Third Parties External to the Company: Analysis by Parties External to the Company; Objectivity vs. Subjectivity of the Profit and Financial Indicators Determined

The assessment of a company's creditworthiness must be based on a careful study of financial reporting data combined with an equally in-depth analysis of the company's prospects.

In this regard, it is worth emphasising how, nowadays, the performance of a correct, complete and structured financial reporting analysis is often considered an 'obsolete' operation and the result of theoretical knowledge that is now definitively outdated. Commercial motivations to develop new products push towards creating tools with fancy names that implicitly place financial reporting analysis among the technical tools of secondary importance.

Nothing is more deviant and dangerous. The analysis of financial reporting or, better still, of the latest financial statements (studying the trend of values is more meaningful than dwelling on the punctual data of a single financial year) can never be considered obsolete or replaceable by 'more innovative and/or refined' means of research.

Every value can be studied through various 'reading lenses' and the search for constant improvement of the classic study tools must be a common objective but, in no case, can balance sheet and profit and other investigative tools replace loss analysis since everything the company represents in economic and financial terms is summarised in the accounting values recorded in the financial reporting for the year.

Our investigation will focus on the problems that an external operator (such as a lender wishing to assess a company's creditworthiness) encounters in applying the so-called 'classical analysis tools to the financial reporting filed with the commercial register office.

What distinguishes us from other authors is that, in our opinion, the term 'classic' must be associated with a positive valence, unlike those who, in order to allow the dissemination of fanciful, as much as dangerous, theories, consider this locution as a synonym for 'outdated, obsolete and therefore, no longer usable'.

In every company, everything is reflected in the accounting data of the balance sheet. In reality, every policy, every action, and every decision is summarised in the company's balance sheet and financial and income figures. Even the debate on so-called corporate social responsibility frequently focuses on the inter-relationship that can be identified between the implementation of sustainable socio-environmental policies and the maximisation, in the medium and long term, of operating income.

This assumes fundamental relevance in the assessment of creditworthiness.

In order to understand, on the one hand, the degree of difficulty an external user encounters in analysing a published financial report and, on the other hand, the degree of objectivity of the aggregates/indicators determined based on the findings of such a document, it is necessary to identify the elements based on which it is possible to make a judgement on the income, financial and asset situation of a company.

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It is a well-known fact that the financial reporting output of the general accounts, if not properly processed, prevents any judgement on the company's condition. In this document, the values recorded in the balance sheet and profit and loss are entered randomly.

Only a proper re-aggregation of these values, followed by the identification of valid performance indicators, allows the development of a reliable and consistent analysis of the company's economic-financial situation.

It is not within the scope of this work to delve analytically into the subject of financial reporting reclassifications and the identification of the grid of indicators indispensable for understanding the 'real' company situation.

Here, we will 'only' investigate the theoretical possibility of implementing a complete and objective analysis of the financial reporting data published at the company registry office.

Concerning the problem of the reaggregation of balance sheets and profit and loss values, it should be emphasised that the doctrine has developed a plurality of reclassification schemes. In the face of such a plurality of models, the analyst's choice, whether internal or external to the company, must fall on the scheme deemed most consistent with the objective of the analysis.

In the writer's opinion, the model that best succeeds in investigating the trend of the company's income and financial values is the integrated information system, as it is characterised by integration, formal and substantial, vertical and horizontal, of every part of the system which, on the contrary, is lacking in any other theoretical schematisation.

Since, however, the objective of this work is to identify the degree of complexity encountered by an external operator in analysing the accounting data recorded in financial reporting, it seems appropriate, instead of focusing on the structures envisaged explicitly by the integrated system, to attempt to identify the points in common of the various analysis schemes proposed by the doctrine. This makes it possible to assess, albeit in general terms, the main obstacles that any external analyst encounters when investigating a financial reporting public, regardless of the theoretical structures applied.

It appears evident how an external analyst can only perform a complete and objective analysis of financial reporting if the reclassifications imposed by the Italian Civil Code allow for the passage, automatically and free of any subjective evaluation element, to the regrouping schemes of the values chosen as reference for the calculation of the economic-financial indicators.

Concerning the balance sheet, comparing the various schematisation proposed by scholars to analyse the financial and equity situation of companies, it is possible to identify a characteristic that tends to permeate every reclassification structure.

Generally speaking, the reclassifications proposed by the doctrine envisage, at the very least, the subdivision of assets and liabilities according to a liquidity/exploitability criterion. According to this principle, assets, liabilities and shareholders' equity are interpreted as items that will be transformed into cash inflows or outflows in the future. Since the objective of any asset reclassification is to assess the short- and long-term financial equilibrium, the reclassified assets and liabilities/equity must be 'time-split', i.e. divided according to the maturity of the liquidity/expendability of the individual items. Conventionally, the separation time space taken as a reference is one calendar year. According to this logic, the accounting items are broken down as follows:

Reclassified Assets: Items that will translate into future income

Short asset: Items that will result in future revenue within 12 months

Long-term asset: Items that will result in future income beyond the next 12 months

Total reclassified assets are generally referred to as invested capital (IC)

Reclassified Liabilities: Items that will result in future cash outflows.

Short Liabilities: Items that will result in future cash outflows within 12 months

Long-term liabilities: items that will result in future cash outflows in a period beyond 12 months after the closing of accounts

Reclassified Shareholders' Equity: Items that will result in future cash outflows (in theory, the company's last outflow before liquidation) and which, at the same time, identify the 'real' net wealth available to the company.

The reclassified liability total is generally defined as total sources.

On the other hand, as far as profit and loss are concerned, the various schematisation proposed by scholars, while presenting profound differentiation, generally provide for the determination of two particular aggregates:

1. The income produced by the company's ordinary operations. This value derives from the contraposition between typical revenues (sales revenues) and characteristic costs (i.e. production, administrative, commercial, and research and development costs). This income is identified by various acronyms: ROGC (Characteristic Operating Income), GOP (Gross Operating Profit), etc.
2. Income from operations. This aggregate derives from the contraposition of the costs and revenues concerning the company's core business, the

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income components deriving from asset management (income components inherent in the assets invested in speculative and/or purely investment activities) and, lastly, the revenues connected with active financial management (revenues deriving from receivables and foreign exchange management). Operating income is generally identified by the acronym RO (Operating Income) or OP (Operating Profit)

As already emphasised, the systems of analysis prepared by the doctrine and considered as a whole, present profound substantive and formal distinctions. Here, however, given the objective of our study, we shall focus our attention only on the aggregates listed above, which, transversally, can be identified in almost all the reclassification structures proposed by the various scholars, albeit in the full knowledge that, even within the scope of the determination of these values, certain theoretical differentiations can be identified. In our investigation, we shall adhere to what has been indicated in the preceding pages because, in the writer's opinion, the content of the items illustrated therein represents the best compromise obtainable from a comparison of the various doctrinal positions expressed on the issue analysed here.

Only the objective and automatic placement of civil law items (Articles 2424, 2424 bis, 2425, 2425 bis of the Italian Civil Code) in the aggregates illustrated above, guarantees the determination of impartial and subjectivity-free indicators.

Even with regard to the calculation of the indicators, the solutions proposed by doctrine and practice appear extremely varied.

Among the various ratios identified by scholars and practitioners, the ratios that most frequently present similarities, in terms of quantitative determination, can be summarised as follows:

Current ratio: short-term assets/short-term liabilities. It is used to assess the static short-term financial balance

Quick ratio: short-term assets net of inventories and non-core short-term investments/short-term liabilities. This indicator is used to investigate the static financial balance in terms of liquidity (cash, bank and receivables)

Debt ratio: invested capital/equity. Another formula used: (Short-term liabilities+Long-term liabilities)/ Shareholders' equity. This ratio shows the company's degree of indebtedness

ROE: operating income/equity. ROE quantifies the company's overall profitability, i.e. the profitability of the company's equity

ROA: operating income/invested capital. ROA, considering both the numerator and the denominator, the operational management, i.e. the totality of the company's characteristic, capital and financial assets, is used to express an opinion on the company's operating performance

ROI: income from core business operations / capital invested in core business operations (i.e. total invested capital stripped of all items not related to the company's core business)

ROS: income from ordinary operations/typical revenues. ROS, or return on sales, measures the degree of profitability of the company's turnover.

The indicators mentioned above identify only a fraction of the ratios identified by the various systems of analysis proposed by doctrine and practice. Despite this, however, it is possible to state that, albeit with some differentiations, the ratios illustrated are 'transversal', and therefore present, in every theoretical schematisation.

The objectivity of the indicators, which are calculated on the basis of the values of the financial reportingpublicly available at the company registry office, depends on the possibility of unambiguously placing the items provided for by the Civil Code in the aggregates identified above.

The more the phase of regrouping the book values is characterised by subjective assessments of the analyst, the greater the danger of determining approximate, partial and arbitrary ratios.

To conclude this brief introduction, it must be emphasised that interpreting reclassification as a mere automatic operation devoid of considerable importance in analysis results in the potential determination of aggregates marked by significant theoretical errors.

Those who underestimate the relevance of the re-aggregation of financial reporting data and, consequently, delegate this operation to non-experts often believe that the 'noble' part of the analysis is confined to the interpretation of the indicators determined based on those re-aggregations.

If the starting basis for calculating the indicators is incorrect, determining the economic/financial indices/flows/aggregates will also lead to false and, consequently, misleading results.

Merely by example, we can analyse an account that frequently has a conspicuous and absurd posting in the wrong aggregate in the restatements: advances from customers.

This value appears in the having section in a balance sheet output of the general ledger (and thus, not reclassified). Hence, in the statutory scheme, the recognition of this item in the aggregate D) Payables.

One of the most frequent errors made by inexperienced analysts is to place advances from customers as a deduction from the item receivables.

Such a placement results from a misinterpretation of the item. Advances do not represent, like the allowance for doubtful accounts, an adjusting item to receivables already entered in the

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reports, but rather identify an article that, in the event of successful contracts, will result in a reduction in future receipts (compared to the value shown on the invoice) deriving from the sale of products or services.

The error inherent in recognition of advances to customers is easily understood by considering this example:

1/6/n receipt of advances from customers for 1000 + VAT: recognition, in General Ledger., of advances from customers for 1,000, debit VAT for 220, cash entry for 1,220;

1/7/n sale invoice issued in connection with the preceding advance for 10,000 + VAT: recognition, in General Ledger .., of revenue for 10,000 with simultaneous closure of advance payments from customers and recognition of the receivable from customers for an amount equal to revenue (10,000) + VAT (1,980 or both 22% of 9,000) net of the advance payment (1,000) which, at the same time, is closed. The credit to the customer is credited in the amount of 10,980.

This simple example shows how the presence of an advance from customers in debit is incompatible with recognising the associated trade receivable in debit. If the passage exists, the receivable from customers cannot have been opened while, on the contrary, the existence of the trade receivable implies that the advance account has been closed. For this reason, customer advances cannot relate to trade receivables recognised in debt and, consequently, can never be deducted from trade deferred cash or long-term assets.

When analysing reclassified financial statements for analytical purposes, it can see that another frequent error is the recognition of customer advances in either short-term or long-term liabilities.

This placement is not always acceptable. Advances from customers represent an item whose reclassification presupposes an analysis of the contracts associated with the advance.

For the reclassification to determine the significant aggregates, it is necessary to distinguish advances according to whether the contract to which they refer is supposed to be successful or, on the contrary, subject to potential termination and/or cancellation. Secondly, it is necessary to consider certain peculiarities of the individual hypotheses. If the advance relates to contracts with a definite term, it must distinguish the case of advances concerning tangible goods from that in which the passages relate to services. On the other hand, if the advance was paid by customers whose contracts are supposed to be terminated, it is necessary to subdivide the advance payments according to whether there is an obligation to repay the amount paid by the debtor.

This subdivision of advances is necessary because each type of advance corresponds to a specific reclassification. In particular:

1. Advances from customers related to contracts subject to hypothetical future termination or cancellation with the right to repayment of the amount paid must be included in short-term non-financial liabilities if repayment to the customer is expected within the following year, or in long-term non-financial liabilities, if repayment is expected beyond the following year.
2. Advances from customers in connection with contracts subject to hypothetical future termination or cancellation without the right to reimbursement of the amount paid cannot, on the other hand, be included in short-term or long-term liabilities because they will not transform such advances into future outflows precisely because of the absence of the customer's right to reimbursement. Since the retained advancement will turn into out-of-period income, the monetary flow of which has already occurred previously (at the time recognised in advance), the item in question is characterised by the absence of future impact on the cash/bank. Therefore, the advances from customers under analysis will result in neither future income nor expenditure. For this reason, to avoid reclassification leading to the determination of non-significant aggregates, it is deemed appropriate to recognise this item within sources, taking care not to include it in any of the sums constituting the liability side of the balance sheet. Therefore, while forming part of the "breakeven total" recognised on the debit side of the reclassified balance sheet, these advances do not form part of either short-term or long-term liabilities or shareholders' equity. They, therefore, constitute a separate item, forming part of the general total of the debit side of the balance sheet, the recognition of which in the reclassified balance sheet is necessary to reconcile needs and sources.
3. Advances from customers related to contracts not subject to hypothetical future termination and/or cancellation concerning the supply of goods with materiality cannot be included in the short or long-term liabilities as they will not result in future outgoings.

   Nor can this item be recognised, with a negative sign, within the accounts receivable from customers. When the sale of products is recorded, the debit item "advances from customers" is eliminated, without giving rise to any disbursement, to show the residual receivable from customers in the accounts and thus net of the amount already paid.

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On the other hand, advice from customers in connection with contracts that are not subject to hypothetical future termination and/or cancellation must be deducted from liquid assets.

In this regard, it should note that inventories are included in short-term assets because it is believed that income at least equal to the financial reporting valuation of the stocks can be derived from the sale of the inventories. However, suppose the customer has already made a down payment. In that case, the monetary income from the stock sale will be at least equal to the financial reporting value of the inventories, less the down payments made by the customer.

The situation may be more problematic if the amount of the down payments exceeds the value attributed to the inventory (a particularly unusual hypothesis). Should this circumstance occur, it must deduct the amount of the down payments up to the value of the stock itself from the stock. On the other hand, the considerations made above regarding advance payments from customers in connection with contracts are subject to hypothetical future termination or cancellation without the right to refund the amount paid to apply. In this case, as well, it is deemed that, due to the impossibility of recognising the item within the asset and liability aggregates illustrated above, the item should be recognised within sources, taking care, however, not to include it in any of the aggregates constituting the liability side of the balance sheet. Therefore, even though these advances will form part of the sources, they will not form part of either the short-term or long-term liabilities, nor will they form part of shareholders' equity. They will therefore constitute a separate item whose recognition in the reclassified balance sheet is necessary to reconcile requirements and sources.

4. Advances from customers in connection with contracts not subject to hypothetical future termination and/or cancellation concerning the provision of services cannot be included in short-term or long-term liabilities because they do not represent future expenditures.

   The circumstance that the services to which the advances refer are not recognisable as assets make it impossible to deduct them within the scope of liquid assets.

   Their inclusion in the context of short-term or long-term liabilities or assets with a negative sign would lead to determining insignificant aggregates.

   For these items, the considerations outlined above for advances to customers not recognisable in any of the aggregates of current/long-term assets and current/long-term liabilities/equity also apply. Even in this case, these amounts will constitute a separate item whose recognition in the total of the "debit" section of the reclassified balance sheet is necessary to ensure the document's balance.

This simple example, to which many others could be added, shows how the reclassification of financial reporting data requires in-depth accounting expertise in what seems trivial, evident and obvious. The choice for this demonstration has fallen on advances from customers, not because this item, in the financial statements, assumes a particular relevance, but because it identifies an accounting item that, in the face of an apparent reclassification triviality, hides a complexity that only an expert analyst can understand, address and overcome.

The list of items potentially creating considerable problems during the data regrouping phase is exceptionally long. However, this is not the appropriate forum to investigate such a problem in depth.

The brief considerations above aim 'only' to understand whether an analyst outside the company, in possession of only the published financial reporting, can identify objective income and financial-equity indicators or whether, on the contrary, subjective intervention is required for the correct placement of accounting items in the reclassification schemes from which, directly, the quotients and other aggregates indispensable for assessing the creditworthiness of a company arise.

As already pointed out, the objectivity of the indicators is guaranteed by the presence of two conditions:

1. The party responsible for reclassifying financial reporting data must possess a high level of technical expertise;
2. All the information required for correctly reclassifying accounting items must be present in the financial reporting.

Assuming that the first condition is observed (which, in reality, is not always the case), our attention must focus on the existence of the second condition.

Given the nature of this work, it is not possible to perform an analysis of every civil law item.

However, let's compare the civil law reclassification structures, supplemented by the contents of the report of the notes to the financial statements of the management report, with what is required by a regrouping of the accounting values carried out for analysis. It is possible to find some specific information gaps. Merely by way of example one may, for instance, note that:

Article 2424 of the Civil Code does not require the indication of the short-term and long-term portion of provisions for future risks and charges. The transposition of the civil item in the reclassification for analysis inevitably implies a subjective intervention by the party responsible for regrouping the balance sheet data. It is evident that, in the absence of specific

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information, the breakdown of all provisions can only occur based on assumptions that, if they do not reflect the company's reality, lead to the determination of non-significant aggregates.

In addition to these considerations, it must also emphasise t identifying future expenditures, but instead, turn into lower revenues or even lose any element of financial impact. Take, for example, the product guarantee fund. The portion corresponding to the value of spare parts in the warehouse should, hopefully, be deducted from the stock amount just as it would be correct to remove from inventory the portion of a customer premium fund corresponding to goods produced within the company itself. If, then, it could reasonably assume that the funds would turn into contingent assets (e.g. due to rulings of tax commissions, judgments of merit or legitimacy, etc.), the item, in the absence of any future financial impact, would have to be recognised in an aggregate that, although part of the breakeven total or invested capital, cannot, of course, influence the short or long term liabilities/assets. Consider the case where a tax provision.is connected to a tax dispute that is the subject of a ruling in favour of the taxpayer issued concerning a situation similar to the one for which established the provision In such a case, the tax provision, in anticipation of its cancellation with the simultaneous recognition of a contingent asset, must necessarily be recognised in an aggregate of separate items which, although forming part of the section total (in this specific case, the total assets section), cannot be recognised in any short and/or long term asset/liability aggregate since, in connection with this item, no future cash inflows or outflows will realise. Still, it will be implemente in a mere scriptural operation of cancellation of the provision. It is clear that the total absence of such information in the civil law context prevents the provisions for liabilities and charges from being correctly allocated. This circumstance, which, in the presence of conditions characterised by significant amounts, can significantly affect the results of the financial statement analysis. In this regard, it should note that point No. 4 of Article 2427 of the Civil Code requires that, in the notes to the financial statements, 'the changes that have occurred in the consistency of the other items of assets and liabilities; in particular, for equity items, for provisions and severance pay, the formation and utilisation . Point No. 7 of the same article emphasises that the report of the notes to the financial statements must also indicate 'the composition of the items "accrued income and prepaid expenses" and "accrued expenses and deferred income" and the item "other provisions" in the balance sheet, when their amount is appreciable, as well as the composition of the item "other reserves"'.

Based on the statutory provision, at least in theory, it might be possible to derive useful information about the timing of the collectability of requirements. For this regulatory provision to allow for the perfect and objective allocation of the short-term and long-term portions of all requirements (including the part that must necessarily be recognised as a separate item), it must observe three contextual conditions:

1. The analyst must reclassify the financial reporting in light of the information contained in the report of the notes to the financial statements;
2. In this document, all accounting operations performed on the individual provisions for risks and charges must be illustrated, in detail and with specific reference to each type of provision included in the three aggregates B Provisions for risks and costs (1 for pensions and similar obligations; 2 for taxes, including deferred taxes; 3 others), with particular reference to utilisations (specifying the reasons for utilisation), provisions, accounting reversals, etc.;
3. The operator carrying out the analysis must have the financial report of the financial year following that, which identifies the last year to which the index analysis refers. In other words, if the years being analysed are N, N+1, and N+2, the analyst must also be able to consult the financial report of the year N+3. In the absence of this possibility, the funds reported in the financial information for the period N+2 cannot be objectively placed even if the conditions set out in points 1 and 2 were perfectly observed. It seems appropriate to emphasise that, by definition, if the last financial year considered was the year before the period still to run, the condition set out in this point is, technically, not feasible.

The simultaneous fulfilment of the above three conditions appears to reflect, rather than reality, mere wishful thinking. In particular, the conditions identified in points 2 and 3 appear to be very difficult to observe due, on the one hand, to the conciseness of the information that, in general, characterises the report of the notes to financial statements, and, on the other, to the frequent technical impossibility of analysing the financial report of the financial year following the last one being analysed as it is, often, still in progress. While not excluding, therefore, the theoretical possibility of objectively placing the provisions for risks and charges in the reclassified profit and loss, it seems arduous to affirm that such a hypothesis is frequently realised or even, can be found in the reality of financial reporting analyses carried out exclusively from outside the companies.

Article 2424 of the Italian Civil Code requires the recognition of the termination indemnity liability (aggregate C) without requiring the simultaneous indication of the short-term and long-term portion. In the absence of this reference (e.g. analysis of the company's most recent financial reporting), it is impossible to divide the item into the short and long

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term. Unlike the provisions for liabilities and charges, however, the specific expression of the TFR portion about the year and the total amount of the TFR debt allows, by cross-referencing the two data, to objectively determine the breakdown of the short-term and long-term portion of the debt. However, this can only be done if the analyst also possesses accounting data for the year after the analysis.

As an example, let us assume the analysis of the financial statements of financial years n and n+1. Financial reporting year n: termination benefit liability 100; accrued termination benefit 20. Financial reporting year n+1: termination benefit liability 104; accrued termination benefit 10. If at 1/1/n+1, the TFR payable is 100 and the TFR accrual in year n+1 is 10, at 31/12/n+1, one would expect a TFR payable of 110. Since it is instead 104, it can state that in year n+1, it paid out termination benefits in 6. Consequently, in the financial reporting of year n, the termination benefits payable is short-term in the amount of 6 and long-term in the amount of 94. On the other hand, in the absence of the data for year n+2, it is impossible to identify the short-term and long-term portion of the TFR debt existing at 31/12/n+1.

It is evident how the analysis of the data of a financial report published, therefore, if not in the presence of the financial reporting of the following year, may lead to an inappropriate allocation of the item in question with the potential consequences easily identifiable on the results of the analysis.

Since no. 4 of Article 2427 of the Italian Civil Code also refers to the liability for termination indemnities, the considerations set out above in respect of provisions also apply, in total, to the item considered here..

Article 2424 of the Civil Code does not require the specific recognition of certain advances. Suffice it to think of advances on severance pay, an item that, in some companies (e.g. co-operative societies), may be characterised by relatively high amounts. In the Civil Code, such advances are recognised indistinctly, with all other receivables. In the context of the reclassification carried out for analysis, the inclusion of this item under either short-term or long-term assets would constitute a severe logical error since the advance given to workers will not be transformed into future income but instead will result in a lower outflow. The passage on severance pay must, therefore, necessarily be deducted from the short-term or long-term liabilities, depending on the maturity date connected with the employee's severance pay liability to which part of the severance pay has been advanced. In the presence of such advances, the transition from financial reporting civil to reclassified reporting for analysis purposes entails the determination of aggregates that, potentially, could be insignificant. It should also note that, even though the individual amounts are available for advances to customers and suppliers, information is absent from the published financial reporting that, while in many cases is of little interest, in others, may be very important. We intend to refer to the issue related to down payments that, in all likelihood, will not result in less revenue or expenditure (as is the case with contracts that are assumed to be successful) but will be subject to write-off due to probable termination/termination of the contract. When these cases occur, checking whether the advance payment is expected to be repaid necessary. If not, it is essential to assume recognition of the entry in the separate items of the debit (advances to suppliers) or debit (advances from customers) column. The information required for this purpose is not included in the data prescribed by the Civil Code. In the case of small amounts, this absence does not affect the analysis results. In the presence, on the other hand, of significant quantities, the lack of such information could, at least theoretically, seriously affect the correct reclassification of the item.

Article 2424 of the Civil Code does not require specific recognition of own bonds, i.e., bonds purchased by the issuing company. Such securities must, indistinctly, be recognised under securities (B III 3; C III). Should such values have the company for cancellation of the same, the recognition of such amounts under assets would result in the determination of incorrect aggregates since, as is the case for severance indemnity advances, in the event of future cancellation of the bonds, the value is to be recognised, not under assets, but as a deduction from liabilities. Again, failure to disclose the presence of own obligations may be a harbinger of potential reclassification errors.

Article 2425 of the Italian Civil Code provides that ordinary capital gains (arising from the sale of deferred assets) and ordinary contingent assets (arising, for example, from valuations of events to which the funds are connected that have turned out not to be following reality) are to be recognised in item A5. In this item, characteristic revenues from the sale of company by-products, rents receivable and so-called 'other revenues' must also be entered, with a separate indication only of operating grants. In item B 14, on the other hand, ordinary capital losses and contingent liabilities are also to be recognised indistinctly regarding sundry operating costs. This circumstance makes it impossible to identify the total amount of regular capital gains/losses/ out-of-period expenses, which, by definition, in the reclassification of profit and loss carried out for analysis purposes, do not form part of either ordinary or operating management. Such an information gap can, in the presence of such items, represent the element that radically impedes the determination of income from normal business activities and operating income. Often, the indistinguishable indication, concerning other revenues and expenses, of typical

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gains/losses and out-of-period income causes items A 5 and B 14 to be recognised, for their total amount, in expected revenues and expenses, with grave detriment to the informative capacity of these aggregates.

Based on the above considerations, the degree of objectivity/subjectivity of the indicators listed in the preceding pages and determined based on the mere results of the financial reporting to be disclosed to third parties outside the companies are as follows:

Current ratio: subjective determination as it is not possible to objectively determine current assets and current liabilities

Quick ratio: subjective determination, as it is not possible to objectively determine short-term liabilities

Debt ratio: subjective determination in that particular item which, on regrouping, must be deducted from the opposite column (e.g. advances from customers, specific provisions for risks and charges with particular characteristics, advances on termination indemnities, own bonds destined for cancellation, etc.) are not shown in the statutory schemes

ROE: objective determination since, from the financial reporting public, it is possible to quantify, in a precise manner, both operating income and shareholders' equity

ROA: subjective determination as neither operating income nor invested capital can be determined objectively

ROI: subjective determination as it is not possible to determine, objectively, either the income from operating activities or the invested capital

ROS: subjective determination as it is impossible to objectively determine income from core business activities.

The above highlights just some of the reclassification problems encountered by a user outside the company.

Since financial reporting civil analysis represents a fundamental element of knowledge for multiple users (credit institutions, potential customers, existing customers who need a new assessment of the company's creditworthiness, etc.), it appears not only legitimate but indispensable to find solutions to the obstacles created by the information gaps in financial reporting civil analysis. The external operator must, therefore, necessarily make subjective choices regarding items lacking the specific legal indications that would guarantee a correct and objective placement in the reclassification schemes.

Acknowledging the existence of obstacles does not mean that it is impossible to proceed with the analysis of external financial reporting.

As in the case of certain infirmities, according to Sigmund Freud's authoritative statement, the patient's 'consciousness of illness' represents a decisive step towards the solution of the medical problem, even in the field of our interest, the perception of the limits of the instrument used for analysis identifies the critical element for overcoming the difficulties connected with the study and for correctly interpreting the results which, in an ineluctable manner, arise from the subjective choices made by the analyst.

The perception of the subjectivity of the aggregates determined based on what is imposed by the civil code and the consequent recognition of the lack of objectivity and neutrality of the indicators selected based on such regrouping allows, at the very least, for the interpretation of the results obtained, more coherently and correctly than would be the case if one were to attribute to such values, unrealistic impartiality and equanimity.

The significance of the analysis carried out on the financial reporting published at the company registry office depends on the ability to ensure that the analysis's subjective choices reflect the management reality of the company being examined.

Unfortunately, in this specific context, the most relevant obstacle is represented by the circumstance that, if one relies exclusively on statutory data, it is not possible to assess the degree of subjectivity of the restatements and, consequently, there is the impossibility of expressing a judgement on the soundness of the indicators identified as a result of the analysis carried out from outside the companies.

From the above, it can understand that it is perfectly conceivable that the indicators, identified from the outside, correctly represent the business reality of which they are an emanation.

For the same reason, however, it is equally possible that the results of the analysis carried out on the financial reporting are distorted by incorrect interpretations of the values, which, necessarily, must be subjectively re-aggregated by the analyst.

Unfortunately, it is not known when either case occurs.

Of course, it can resolve any potential interpretative problems by gathering specific information, which, hopefully, should be provided directly by the company subject to the creditworthiness assessment.

Therefore, the analysis can only be correct and objective if the company is willing to provide all the data for implementing the balance sheet analysis, not included in the information set provided by the statutory legislator. For the results of the research to be reliable, it is, however, necessary that the willingness of the client company to communicate is accompanied, on the one hand, by the desire of the analyst to supplement, what is provided for by the code with supplementary information, and, on the other hand, by verifying that the person charged with carrying out the analysis is endowed with a vast knowledge of the problems

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connected with the reclassification of accounting documents and the determination of the quotients. All too often, even in economically significant realities, the analysis is delegated to operators who, despite having general expertise, show deficiencies in the specific area covered by this discussion.

III. The Management Report, Which is not Part of Financial Reporting but is a Mandatory Document, can make up for the Informational Limitations of Financial Reporting Intended for Third Parties Outside Companies?

In the previous pages, we have shown how the determination of aggregates and financial-patrimonial-income indicators carried out based on financial reporting intended for outside the company (and, in Italy, published at the company registry office)can hide pitfalls that, at least in theory, can lead to erroneous considerations about the company's situation and, consequently, about the creditworthiness of that business entity.

A superficial reading of Art. 2428 c.c. could mistakenly lead one to believe that the informational limitations of financial reporting civil illustrated in the preceding pages can be overcome by what must be, obligatorily, contained in the management report.

Indeed, Article 2428 c.c., in I and II c., states that "financial reporting must be accompanied by a directors' report containing an accurate, balanced and comprehensive analysis of the company's situation and the performance and results of operations, as a whole and in the various sectors in which it has operated, including through subsidiaries, with particular regard to costs, revenues and investments, as well as a description of the principal risks and uncertainties to which the company is exposed.

The analysis referred to in the first paragraph shall be consistent with the size and complexity of the company's business and shall contain, to the extent necessary for an understanding of the company's situation and the performance and result of its operations, financial and, where appropriate, non-financial performance indicators relevant to the company's specific business, including information about the environment and personnel. The analysis shall contain, where applicable, references to the amounts reported in the financial reporting and additional clarifications on them."

The explicit reference to the requirement to include "financial performance indicators", if misinterpreted, could instil in the reader the certainty that, from reading the annual report, information can be derived, which, as provided by the company, is marked by the absence of the interpretative problems illustrated in the preceding pages.

To assess the external informational impact of the management report, it seems appropriate to point out that Article 2428 of the Civil Code requires the disclosure of a series of news, the objective identification of which is difficult to achieve.

The prescriptions in I c. of Art. 2428 c.c. Concerning, for example, "the faithful, balanced and exhaustive analysis of the company's situation and the trend and result of management as a whole and in the various sectors in which it has operated" and "the description of the main risks and uncertainties to which the company is exposed," identify in fact, concepts whose schematization is subject to such a degree of subjectivity that, inevitably, makes the boundary between exhaustive/correct information and incomplete disclosure of company data very haphazard.

This feature is accentuated when considering the additional information that, by law, must be disclosed through the management report. The use of the locutions financial performance indicators (Which ones? Constructed in what way? Based on what reclassification? etc.) and, where appropriate (When, in pragmatic terms, does this need arise?), non-financial ones (Which indicators? Determined according to what logic? Based on what doctrinal assumption of analysis?) relevant to the company's specific business, including information about the environment and personnel (Specifically, what information about the environment? And through what form of communication should such information be disclosed? Through subjective evaluations, quantitative determinations, or even economic-financial assessment?), points out that the content of the management report, as governed by Article 2428 of the Civil Code, is far from being free of evaluative elements of a purely subjective nature. Indeed, the above identifies a list of information, the exact connotation of which takes on contours that cannot technically identify objectively.

If subjectivity inevitably characterises the preparation of any financial statements, the degree of "personal evaluation" in the drafting of the management report reaches its apex.

Apart from these general introductory considerations, to clear the field of misunderstandings, it is necessary, first of all, to clarify that the phrase "financial performance indicators" refers not to ratios, whose task is to delve into the company's financial situation, but to all quotients of a financial, income and equity nature. On the other hand, "non-financial indicators pertinent to the company's specific business" refer to the various ratios that measure efficiency, development, productivity, innovation, customer relations, strategic and/or market positioning, etc...

The obligation to disclose financial and non-financial indicators could, mistakenly, be interpreted as

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the "missing" objective information element in the financial reporting published at the corporate registry office (financial reporting for third parties).

Apart from the problematic theoretical nature of determining the list of indicators to be included in the report (doctrine and practice have identified a plurality of indices, and selecting those considered "most significant" is not a simple matter due to the divergent doctrinal opinions on the concept of "relevant and significant"), it is necessary to deal with an additional problem. Indeed, from a comparison of the various doctrinal opinions shows that the same index is often given different titles, and the same acronym identifies a plurality of ratios, profoundly different from each other.

To understand the impact of this issue, it is helpful to refer to two values that unquestionably play a crucial role in financial statement analysis: the debt ratio and the net financial position.

The value assumed by the debt ratio assumes considerable importance in understanding the degree to which the company depends on external borrowing sources. This ratio, however, can be determined according to various formulations:

1. Capital Employed/Equity
2. (Total short-term liabilities + total long-term liabilities) /Equity
3. Equity/invested capital
4. Equity/ (Total short liabilities + total long liabilities).

The various technical formulas pose no problems interpreting the data as long as the analyst knows the relevant procedure. Stating, for example, that the debt ratio amounts to 3.2 in itself does not provide any information about the company's autonomy from external sources if, upstream, there is no knowledge of how the ratio is calculated.

The net financial position, an aggregate to which, in recent years, has been attributed an ever-increasing informative capacity, also poses the same interpretative problems. In this regard, enlightening is the analysis carried out By the Research Institute of Certified Public Accountants and Bookkeepers (henceforth RICPAB) in Paper No. 22 of 2013 entitled "The Recording of Indicators in the Management Report. The net financial position." The paper states, "business-economics doctrine has not devoted ample space to the issue in question; nevertheless, interpretative positions can be found that are sometimes not entirely convergent, leading to the formulation of different configurations of Net Financial Position. The issue is mainly attributable to the consideration (and related interpretation) of the items that become part of the computation: one alludes, in particular, to the declination of non-liquid/liquidate financial assets given that while one part of scholars seems to exclude them, others vice versa seems to advocate it." After conducting a theoretical survey of the doctrinal proposals considered of more outstanding merit, IRCDEC concludes by stating that "the review conducted so far makes it possible to highlight how, on a theoretical and methodological level, there coexist a variety of approaches identifying the net financial position, although there is no prevailing representation. Rather, the utmost attention should be paid to the correct interpretation of this quantity, specifying the calculation methods on the occasion undertaken, as these are strictly instrumental to the related cognitive needs."

In the face of such a varied composition of doctrinal, theoretical proposals, there is also an equally multifaceted overview of the reference models used by the practice. After pointing out how, often, from official IAS/IFRS documents, CESR, Assonime, etc., differentiated locutions are used to identify what the RICPAB identifies as net financial position, document No. 22/2013 it is emphasized how each body has seen fit to propose a differentiated quantification of the aggregate as mentioned above. At the end of this examination, the RICPAB offers a conceptualization of the net financial position that, at least in the intentions of the research institute, should represent a theoretical synthesis of what is illustrated in the document using substantial "reasoned" adherence, with the consequent contribution of modifications, to the approach proposed by a part of the doctrine defined, by the research institute as "the most accredited".

Following this synthesis, the RICPAB arrives at the following determinations/definitions:

1. Liquid and readily liquid assets (< 3 months)
2. Short-term financial assets (< 12 months)

Short-term financial receivables
Short-term securities
Short-term financial receivables from subsidiaries/ associates
Other short-term financial assets
Short-term (financial) accrued income and prepaid expenses.
(...)

3. Medium- to long-term financial assets (> 12 months)

M/l-term financial receivables
M/l-term securities
M/l-term financial receivables from subsidiaries/ associates
Other m/l-term financial assets
Multi-year accrued income and prepaid expenses (financial)
(...)
TOTAL FINANCIAL ASSETS (a+b+c)

4. Short-term financial liabilities

Current account overdrafts
Short-term financial liabilities

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Payables to/from factoring companies
Payables to/from leasing companies
Short-term payables to other lenders
Short-term accounts payable to subsidiaries/associates
Short-term accrued expenses and deferred income (financial)
(...)

5. Medium- to long-term financial liabilities

Payables vs banks
Debenture loans
M/l-term interest-bearing payables to shareholders
Financial liabilities to subsidiaries and affiliates
Debts to/other lenders
Debts vs/leases
Long-term accrued liabilities and deferred income (financial)
(...)

TOTAL FINANCIAL LIABILITIES (d+e)

SHORT-TERM net financial position
Net financial position Level I = (a-d)
Net financial position level II = (a+b) - d
LONG-TERM net financial position
Net financial position level I (a) - (d+e)
Net financial position level II (a+b) - (d+e)
Total net financial position = (a+b+c) - (d+e)

More than the composition of the net financial position proposed by the RICPAB, the conclusion reached by this research institute is of considerable significance. After highlighting the proposed determination of the net financial position above, the RICPAB states verbatim that "it constitutes only one of the possible approaches that can take."

All this demonstrates that well alive is the awareness that the locutions used by doctrine and practice to identify financial (and income) aggregates will continue to be marked by substantive and formal differentiations about their composition and determination.

What has been given above as an example to demonstrate the impossibility of attributing unambiguous meanings to locutions identifying aggregates and/or indicators applies, in reality, to any accounting value resulting from reaggregations and/or comparisons between values.

The indicators derived from the various positions, doctrinal and/or proposed by practice, take on different meanings depending on how the data is constructed, with the apparent consequence that associating a given result with a specific acronym, in the absence of analytical indications on how both the indicator and the essential aggregates used to determined that indicator, may prove to be a useless or, even, dangerously misleading operation.

This, of course, leads to a severe problem of communication with the outside world. The absence of specific information regarding the composition of the data disseminated through the management report may render the value insignificant.

The above considerations, regarding both the structuring of the indicators and the reclassification basis to which these ratios refer, have caused authoritative scholars and prestigious study centres and/or institutions to highlight the need to accompany financial performance indicators with the supplementary information mentioned earlier.

It should be noted, however, that despite the solicitations from various organizations/bodies/scholars, the indicators provided in the reports, in the majority of cases, are not accompanied by any specification as to how the ratio is calculated, resulting in a reduction or, even, nullification of the informative capacity of the data disclosed to third parties outside the companies.

Even if the problem identified above was overcome by comprehensive disclosure of how the ratios are constructed to attribute the correct meaning to the indicator's performance, it is still necessary to overcome a further difficulty, which is undoubtedly the most difficult.

The significance of each indicator is directly related to the correctness with which the individual items have been regrouped and reclassified. The incorrect recognition of an item can distort the results derived from the calculation of the ratios.

Any incorrect reclassification of accounting items must, therefore, be stigmatized, regardless of the consequences that this unacceptable accounting behaviour causes on the amount of financial performance indicators.

The recognition, within the reclassified financial reporting, of advances from customers in the liabilities, of advances from severance pay, in the assets, of provisions in the long liabilities, of provisions for depreciation in the liabilities, of own shares in the assets, and so on, also appears very frequent. Circumstances can lead to unmeaningful results in underestimation and overestimation of the dangers and/or positive elements identifiable in the company's income, financial, and asset situation.

Since we have not researched a statistically relevant sample, we do not claim to identify and generalize correlations between events with certain degrees of probability. Each of our statements, therefore, represents an element of knowledge that may indicate certain caveats/appropriate/inappropriate behaviours, the existence of which must be verified on a case-by-case and company-by-company basis.

However, there is no doubt that the frequency of such reclassification errors is incredibly significant, especially in small and medium-sized companies. A circumstance which follows, is the possibility that, in the presence of such logical/technical errors, any

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consideration based on such values is not meaningful and, therefore, misleading.

The previous highlights the difficulty or, rather, the impossibility of considering the management report as a document that directly can fill the information gaps in the financial reporting of the financial year published at the Registrar of Companies office relating to individual accounting items.

Since art. 2428 c.c., in III c, imposes that the report must, in any case, show the foreseeable development of operations; one might lead to assume that, at the very least, concerning this element, beneficial information can be drawn to assess the creditworthiness of a company. Here, too, the hope often runs up against a different reality from what, in theoretical terms, might be assumed from the tenor of the legal standard.

The information regarding the company's prospects is usually substantiated by a very general analysis of the trend of the reference markets with generic indications about the company's economic-financial planning.

There is no doubt that, concerning this issue, the company must recognise a broad right of confidentiality since the disclosure of sensitive data could backfire on the company itself. A reading of management reports highlights the general tendency of companies, especially if they are medium-sized, to disclose generic data, in reality lacking any informative weight regarding the assessment of creditworthiness.

As evidence of this, it can be borne in mind how, assuming the assessment of a company's creditworthiness, a business plan is required to be prepared, which, very rarely or, more correctly, practically never, is included in the management report. The imposition of the preparation of such a document that is not present in financial reporting in documents attached to the latter demonstrates, if ever there was a need, that the papers published at the business registry office be considered a valid basis of information to assess creditworthiness, must be supplemented by a range on the information provided, directly, by the company subject to analysis.

Assuming that it is possible to judge a company's situation based solely on published documents can identify unrealistic operations unless the internal corporate culture is so high that it perceives communication to external operators as a fundamental element of an ethical/social and strategic nature. In listed or large companies, disclosure unimaginable in other categories of companies is implemented. The financial reporting culture in such large companies, often having a global impact, is not comparable to what is experienced daily in smaller companies.

It is always a mistake to make apodictic statements. To believe that public financial reporting can guarantee a complete, exhaustive and perfect analysis of a company's earnings-financial-equity situation would identify an incorrect peremptory position.

To think, however, that, on the contrary, considering especially non-multinational and not very large companies, financial reporting public and management reports can provide some aspects for correct, complete and exhaustive creditworthiness assessment seems even more misleading..

IV. The Financial Reporting of So-Called Small and Medium-sized Enterprises: Abbreviated Financial Reporting and other Disclosure Limits

The Italian Civil Code stipulates that so-called "small enterprises," understood according to the legal meaning governed by Article 24235 bis, can draw up a more concise financial reporting than that controlled by Articles 2424, 2425, 2425 bis, and 2427 of the Civil Code.

In the specific case, in the legal context, companies are considered minor and medium-sized enterprises, which, not having issued securities traded on regulated markets in the first fiscal year or, subsequently, for two consecutive fiscal years, have not exceeded two of the following limits:

1. Total balance sheet assets: 4,400,000 euros;
2. Revenue from sales and services: 8,800,000 euros;
3. Employees employed on average during the fiscal year: 50.

The facilitation of financial reporting decades if companies, for the second consecutive fiscal year, have exceeded two of the limits specified in the first paragraph. Upon such a circumstance, it must prepare financial reporting in the ordinary form.

As is well known, the concept of small and medium-sized enterprises is not unambiguous. However, it is worth mentioning that the document issued in November 2012 by the National Council of Certified Public Accountants and Accounting Experts, entitled "The Preparation of Financial Reporting of Smaller Companies: Regulatory Provisions and Critical Issues," pointed out that the one hand, the preparation of simplified financial reporting is a critical issue for small companies and, on the other hand, smaller companies constitute the main economic-productive force at the national and European level, representing 99.9% of all companies operating in the European Union area, to touch 99.95 per cent of Italian companies.

Not all small and medium-sized enterprises, determined according to "economic-business" canons, fall into the category of companies governed by the 2435 bis civil code. Despite this, the quantitative limits identified by the civil law legislature are such that financial reporting is abbreviated widely.

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There is nothing to prevent the preparer of the financial reporting abbreviated, according to "voluntaristic" criteria or to apply better the postulate of clarity imposed by art. 2423 c.c., from supplementing the minimal information set indicated by art. 2435 bis c.c. Companies that opt for financial reporting abbreviated, however, are unlikely to adopt communication strategies that differ from what the code requires. Those who perceive the need to provide the market with a broader disclosure than that governed by Article 2435 bis tend to opt for "ordinary" financial reporting. Preparing financial reporting abridged form is, in fact, a voluntary choice of the company and not a legal obligation. Consequently, there is nothing to prevent a company, while having the option to prepare financial reporting in an abbreviated form, from opting for the full version of the balance sheet, profit and loss, report of the notes to financial statement the management report.

Companies that choose the abridged version of financial reporting tend, therefore, to apply what is identified in Article 2435 bis. However, there is no shortage of examples of companies that, although they have opted for abridged financial reporting, communicate externally additional information to what is required by statutory legislation.

The following simplifications mark abbreviated financial reporting:

1. The balance sheet includes only those items marked in Article 2424 with capital letters and Roman numerals; items may include A and D of assets in item CII; from items, BI and BII of assets, depreciation and amortization must be deducted in an explicit form; item E of liabilities may be included in item D; in items, CII of assets and D of liabilities, receivables and payables due beyond the next financial year must be shown separately.

Based on these indications, the condensed balance sheet takes the following structure:

ATTIVITA'	PASSIVITA' E PATRIMONIO NETTO
B) Fixed Assets	A) Equity
I Intangiblefixed assets - accumulatedamortization - otherwrite-downs	I Share capital II Share premium reserve III Revaluationreserve
II Tangiblefixed assets - accumulateddepreciation - otherwrite-downs	IV Legal reserve V Statutoryreserves VI Reserve for treasury stock in the portfolio
III Financial fixed assets	VII Otherreserves VIII Retainedearnings (losses) carriedforward IX Profit (loss) for the year X Negative reserve for own share
C) Current Assets	B) Provisions for risks and charges
I Inventories	C) Severancepay
II Receivables (includingreceivables from shareholders for payments still due, accruals receivable and discount on loans)	D) Accounts payable (includingaccruedexpenses and loaninterest)
III Financial assets that do notconstitutefixed assets	

2. Profit and loss may include the following groupings of the items required by Article 2425 of the Civil Code.

(a)items A2 and A3
(b)items B9(c), B9(d), B9(e)
(c)items B10(a), B10(b), B10(c)
(d)items C16(b) and C16(c)
(e)items D18(a), D18(b), D18(c)
(f)items D19(a), D19(b), D19(c)
(g)item E20 separate disclosure of capital gains is not required
h)item E21 is not required to disclose capital losses and taxes related to previous years separately.

Based on the provisions of Article 2435 bis of the Civil Code, profit and loss can be abbreviated as follows:

Production value:

1. Revenues from sales and services
2. Changes in inventories of work in progress, semi-finished and finished goods and changes in contract work in progress

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3. Increases in fixed assets for internal work
4. Other revenues and income, with operating grants shown separately

Costs of production:

5. For raw, ancillary and consumable materials and goods
6. For services
7. For the use of third party assets
8. For personnel:
   (a) Wages and salaries
   (b) Social security charges
   (c), (d), (e) severance, retirement and similar benefits and other costs
9. Depreciation and amortization:
   (a) amortization of intangible assets, depreciation of tangible assets and other write-downs of fixed assets
   (d) write-downs of receivables included in current assets and cash and cash equivalents
10. Changes in inventories of raw materials, supplies, consumables and merchandise
11. Provisions for risks
12. Other provisions
13. Miscellaneous operating expenses
    Difference between value and cost of production (A - B)

Financial income and expenses:

14. Income from equity investments, with separate disclosure of income from subsidiaries and affiliated companies
15. Other financial income:
    (a) From receivables recorded as fixed assets, with a separate indication of those from subsidiaries and affiliated companies and those from parent companies
    (b), (c) from securities included in fixed assets that are not equity investments and from securities included in current assets that are not equity investments
    (d) Income other than the above, with separate disclosure of income from subsidiaries and affiliates and income from parent companies
16. Interest and other financial charges, with separate disclosure of those from subsidiaries and affiliates and parent companies
    17bis) foreign exchange gains and losses. Total (15 + 16 - 17 +/- 17a)

Value adjustments of financial assets:

17. Revaluations:
    (a), (b), (c) of equity investments, of financial fixed assets that are not equity investments, and of securities under current assets that are not equity investments;
18. Write-downs:
    (a), (b), (c) of equity investments, financial fixed assets not constituting equity investments, and securities under current assets not constituting equity investments
    Total adjustments (18 - 19)

Extraordinary income and expenses:

19. Extraordinary income
20. Extraordinary charges
    Total extraordinary items (20 - 21)
    Income before taxes (A - B +/- C +/- D +/- E)
21. Income taxes for the year, current, deferred and prepaid
22. Profit (loss) for the year

Without prejudice to the indications required by the third, fourth and fifth paragraphs of Article 2423 ("If the information required by specific provisions of law is not sufficient to give a true and fair view, it shall provide additional information necessary for the purpose. .....No need to comply with the obligations on recognition, measurement, presentation and disclosure when compliance with them would have insignificant effects on giving a true and fair view. Obligations regarding the regular maintenance of accounting records remain unaffected. Companies shall explain in the report of the notes to financial statements the criteria by which they have implemented this provision. If, in exceptional cases, the application of a provision of the following articles is incompatible with true and fair representation, it shall not be the provision. The report of the notes to financial t apply statements must give reasons for the exemption and indicate its influence on the representation of the financial position, financial position and results of operations. Any profits arising from the waiver must be entered in a non-distributable reserve except to the extent of the value recovered"; from the second, fifth and sixth paragraphs of Article 2423-ter (Items preceded by Arabic numerals may be further subdivided, without elimination of the overall item and the corresponding amount; they may be grouped only when the grouping, because of their amount, is irrelevant for the purposes indicated in the second paragraph of Article 2423 or when it promotes the clarity of the financial statements. In the latter case, the report of the notes to financial statements must contain the items subject to grouping separately.....; for each item of the balance sheet and profit and loss, it must indicate the amount of the corresponding item of the previous year. If the items are not comparable, those for the previous year must be adjusted; the non-comparability and the adjustment or impossibility thereof must be reported and commented on in the notes to the financial statements..... Matching offsets are prohibited. In those cases where offsetting is permitted by law, the gross amounts subject to offsetting shall be indicated in the report of the notes to the financial statement."), by the second paragraph of Article 2424 ("If an item of assets or liabilities falls under more than one item of the schedule, in the report of the notes to financial statement shall be noted, if this is necessary for the

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understanding of the financial statements, that it also belongs to items other than the one under which it is entered.", from the first paragraph, numbers 4) (4) fixed assets consisting of equity investments in subsidiaries or associated companies may be valued, concerning one or more among said companies, instead of according to the criterion indicated in number 1), for an amount equal to the corresponding fraction of the shareholders' equity resulting from the last financial reporting of said companies, after deducting dividends and making the adjustments required by the principles of preparation of the consolidated financial reporting as well as those necessary for compliance with the regulations indicated in articles 2423 and 2423-bis.

When the equity investment is recorded for the first time under the equity method, the acquisition cost over the corresponding value of the equity reported on the date of acquisition or resulting from the latest financial reporting of the subsidiary or an associated company may be recorded as an asset, provided that the reasons for this are stated in the notes to the financial statements. To the extent attributable to depreciable assets or goodwill, the difference must be amortized.

In subsequent years, the capital gains resulting from the application of the equity method, compared to the value indicated in the financial reporting of the previous year, shall be recorded in a non-distributable reserve),)and (6), (6) goodwill may be recorded as an asset with the consent, if any, of the Board of Statutory Auditors, if acquired for consideration, within the limits of the cost incurred for it. Goodwill is amortized over its useful life; in exceptional cases where it can reliably estimate its useful life, it is amortized over a period not exceeding ten years. In the report of the notes to the financial statement an explanation of the period of amortization of goodwill) of Article 2426, the report of the notes to financial statement shall provide the information required by the first paragraph of Article 2427, numbers 1)(1) the criteria applied in the valuation of items in the financial statements, in value adjustments and the conversion of values not initially expressed in a legal tender in the State;), 2)(2) the movements of fixed assets, specifying for each item: the cost; previous revaluations, depreciation and write-downs; acquisitions, transfers from one item to another, disposals occurred during the year; revaluations, depreciation and write-downs made during the year; total revaluations concerning fixed assets existing at the close of the fiscal year), 6)(6) separately for each item, the amount of receivables and payables with a remaining term of more than five years, and payables backed by collateral on corporate assets, with specific indication of the nature of collateral and with specific breakdown according to geographical areas;)), for the latter limited only to debts without indication of geographic breakdown; 8)(8) the amount of borrowing costs charged during the year to the values entered in the assets of the balance sheet, separately for each item;), 9)(9) the total amount of commitments, guarantees and contingent liabilities not resulting from the balance sheet, with indication of the nature of collateral provided; existing commitments in respect of pensions and similar commitments, as well as commitments made to subsidiaries, affiliates, as well as parent companies and companies controlled by the latter shall be disclosed separately;), 13)(13) the amount and nature of individual items of income or expense of exceptional magnitude or incidence;)), 15)(15) the average number of employees, broken down by category)for the latter also omitting the breakdown by category, 16) 16) the amount of remuneration, advances and credits granted to directors and auditors, cumulatively for each category, specifying the interest rate, the main conditions and any amounts repaid, cancelled or waived, as well as the commitments made on their behalf as a result of guarantees of any kind given, specifying the total for each category ;))(, 22-bis)(22-bis) the transactions carried out with related parties, specifying the amount, the nature of the relationship and any other information necessary for the understanding of financial reporting relating to such transactions, if the same have not been concluded at normal market conditions. Information relating to individual transactions may be aggregated according to their nature, except when their separate disclosure is necessary for understanding the effects of such transactions on the company's financial position and results of operations;)), 22-ter) the nature and economic purpose of agreements not shown on the balance sheet, with an indication of their effect on the company's financial position, financial position and results of operations, provided that the risks and rewards arising from that place are significant and the disclosure of the same is necessary for assessing the company's financial position and results of operations for the latter also omitting the indications regarding the equity, financial and economic effects, 22-quarter), 22-sexies)), for the latter also omitting the indication of the place where the copy of the financial reporting consolidated is available, as well as by the first paragraph of Article 2427-bis, number 1).

Companies may limit the disclosures required under Article 2427, first paragraph, number 22-bis to transactions carried out directly or indirectly with their major shareholders and those with members of the management and control bodies, and limit the disclosures required under Article 2427, first paragraph, number 22-ter to the nature and economic purpose.

The number and par value of both treasury shares and shares or quotas of parent companies purchased or disposed of by the company, during the fiscal year, including through trust companies or intermediaries, with an indication of the corresponding portion of capital, the consideration and the reasons for

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purchases and disposals. 4) If the companies specified in the first paragraph provide in the report of the notes to financial statements the information required by numbers 3) and 4) of Article 2428, they are exempt from preparing the management report. Small and medium-sized enterprises, falling within the range provided for in the Civil Code, are, therefore, not required to prepare the report on management if, in the notes to the financial statements, the number and par value of both the company's shares and the shares or quotas of parent companies held by the company, including through trust companies or intermediaries, are indicated, with an indication of the corresponding portion of capital.

The structure of abbreviated financial reporting governed by Article 24235 bis of the Civil Code makes this document unsuitable for developing a meaningful income-equity-financial analysis. Faced with a sufficiently analytical profit-and-loss, companies that opt for the abbreviated financial reporting may draw up a balance sheet that, due to its extreme conciseness, does not offer the necessary information cues so that a severe in-depth analysis of the company's situation can be carried out.

In fact, should the financial reporting abbreviated be prepared according to the provisions of Article 24235 bis, in addition to the information absent in the financial reporting ordinarily highlighted in the previous pages, the following data would also be missing:

1. Breakdown, based on the principle of liquidity/expendability, of each asset and liability item
2. Information about the amount of receivables from shareholders for payments still due
3. Composition of fixed assets (intangible, tangible and financial) and current assets (inventories, receivables, current financial assets and cash and cash equivalents)
4. Composition of total payables
5. Composition of total provisions for risks and charges
6. News about any significant events, which occurred after the closing of the accounts that could affect, in a material way, the assessment of creditworthiness because, potentially, they may have radically changed the final situation reflected in the financial reporting of the closing financial year
7. Foreseeable developments in operations.

Earlier it was pointed out that, to conduct a financial statement analysis, financial reporting values must be reaggregated to determine certain vital quotients to deepen the company's situation.

For the reasons already fully explained, the aggregates and ratios on which we have focused our attention are as follows:

Aggregations:

1. Short-term assets
2. Short-term liabilities
3. Long-term assets
4. Long-term liabilities
5. Net worth
6. Income from the conduct of the enterprise's ordinary activities
7. Operating income.

Ratios:

1. Current ratio
2. Quick ratio
3. Debt ratio
4. ROE
5. ROI
6. ROA
7. ROS.

In the preceding paragraph, we have pointed out how, in the presence of financial reporting civil drawn up in ordinary form, some of the essential information to determine the ratios listed above does not allow their objective determination.

To complete the analysis of the informational limitations of financial reporting published in the corporate registry office, it is necessary to understand whether, in the presence of financial reporting abbreviated, the rules characterizing financial reporting ordinarily are subject to such an amplification that a severe and complete analysis of the accounting data is not feasible.

To this end, it can be stated that in the hypothesis that the financial reporting object of analysis is the abridged one prepared according to Article 2435 bis of the Civil Code, the aggregates and indicators considered above are marked by the following characteristics.

1. Short-term assets: not determinable unless assumptions are made that are so subjective as to make the aggregate insignificant
2. Short-term liabilities: not determinable unless assumptions are made that are so subjective as to make the aggregate nonsignificant
3. Long-term assets: not determinable unless assumptions are made that are so subjective as to make the aggregate nonsignificant
4. Long-term liabilities: not determinable unless assumptions are made that are so subjective as to make the aggregate nonsignificant
5. Net worth: not determinable unless assumptions are made that are so subjective as to make the aggregate nonsignificant
6. Income from the performance of the firm's characteristic activities: not determinable unless assumptions are made that are so subjective as to make the aggregate nonsignificant

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7. Operating income: not determinable unless assumptions are made that are so subjective as to make the aggregate insignificant.
    1) Current ratio à: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant
    2) Quick ratio: not determinable unless assumptions are made that are so subjective as to make the ratio nonsignificant
    3) Debt ratio: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant
    4) ROE: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant
    5) ROI: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant
    6) ROA: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant
    7) ROS: not determinable unless assumptions are made that are so subjective as to make the quotient nonsignificant

From this, it follows that the degree of reliability of the ratios identified above is as follows:

As pointed out earlier, it is up to each company to supplement the minimal disclosure governed by Article 2435a with the revelation of non-mandatory data. The closer the abbreviated financial reporting comes to the ordinary structure, the more significant the reduction of the limits univocally connected to the summary structure will be.

Even if the financial reporting from outside the company is prepared in an ordinary form, the analysis conducted from outside the company will be marked by the insurmountable limits illustrated in the preceding pages.

Only the company's practical cooperation can ensure that the analysis carried out on its accounting data is complete, exhaustive and, above all, meaningful insofar as it adheres to the reality it intends to investigate.

In assessing creditworthiness, financial reporting analysis assumes a key role so that the lender understands the "real" income-financial-equity situation of the loan applicant. For this to occur, however, the financial reporting data must be intended for third parties outside the company. Be supplemented by a range of information held only by the company's internal managers. Conducting financial reporting analyses based exclusively on the content of public documents can lead to results that are perfectly consistent with the investigated business reality. Due to the informational deficiencies of statutory financial reporting, it is equally possible that the results of the accounting investigation are not meaningful and, therefore, misleading. As has already been pointed out, the irresolvable problem is related to the impossibility of assessing in which situation the financial reporting analysis carried out on mere public data falls.

V. Corporate Financial Dynamics Analysis as the Cornerstone of Creditworthiness Analysis: Financial Dynamics as a Complementary Element to Static Analysis

As is well known, in financial reporting, equity and financial "stock" values referring to a precise instant are contrasted with income "flow" data whose determination implies the analysis of a period. In this sense, operating income represents a "flow value" whose dynamicity is relative since it is determined only by the presence, in profit and loss, of nonpoint values.

"Income dynamism" should not, however, be confused with "financial dynamism," the analysis of which, transcending the static view crystallized in the values recorded in the balance sheet, is capable of capturing the interweaving of flows of a monetary-financial nature that, incessantly, are created and consumed in the flow of business management.

Therefore, the deepening of the "dynamics" of accounting values is marked by a dual representation. Against an analysis of negative and positive components-flows of income, it must implement an 'investigation of a financial nature.

As is the case with the income analysis, the investigation of financial dynamics cannot be implemented through the mere consideration of balance sheet and profit-and-loss values, especially when aggregated according to statutory logic. Integrating financial reporting findings with information that cannot be drawn from balance sheets, and financial and income accounting data identifies a necessary operation to conduct the determination and interpretation of flows correctly and profitably.

Dynamic analysis by flows constitutes a fundamental cognitive element in assessing creditworthiness.

The amendment principle of the new standard OIC 10 Tthe Cash Flow Statement emphasizes, in this regard, that the informational benefits of the cash flow statement, i.e., the document that summarizes all flows created and consumed by the company's operations, are multiple in that this statement makes it possible to assess:

1. The cash generated/absorbed by the income operation and how it is used/covered;
2. The ability of the company or group to meet short-term financial commitments;

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3. and the power of the company or group to finance itself,

Shareholders, workers, customers, and lenders are interested in understanding whether the company can produce monetary-financial flows such that dividends are paid, salaries are paid, and debts are settled regularly. For these reasons, each of the above categories is interested in investigating the cash flow statement.

The creditworthiness assessment identifies the study of the flows generated and consumed by management as the pivotal element in understanding whether lending represents a viable and profitable avenue or, on the contrary, identifies a dangerous operation that is a harbinger of potential default.

The assessment of creditworthiness can never, therefore, disregard the analysis of cash flows.

To understand the complexity of studying the financial dynamics of an enterprise, it is necessary, first of all, to differentiate between two concepts:

1. Cash flows understood in a broad sense (i.e., including values related to payables and receivables);
2. and monetary cash flows.

Understanding the divergences between these concepts is crucial to avoid dangerous misunderstandings.

In the various doctrinal theorizing concerning financial statement analysis, there is often a lack of formal and substantive integration, which, on the contrary, should be considered a fundamental element of any accounting investigation. As we have already needed to point out, attributing similar meanings to different concepts or, on the contrary, other acronyms to values that are, essentially, identical creates an environment conducive to making decisions that are inconsistent with the "real" business situation that, when such conditions occur, is poorly represented by information systems lacking essential and fundamental congruity between the constituent parts.

The integrated information system of analysis, ensuring complete integration, vertical and horizontal, among all elements that make up the complex structure of production/communication of values, does not present the above operational problems.

In such a system, the concept "financial" is, as far as possible, linked to credit, debit and/or liquidity relationships.

The phrase "liquidity," on the other hand, refers only to items subject to monetization. This makes the concept of liquidity part of the broader notion of a "financial" relationship.

Given this juxtaposition, it can be understood how cash flows, understood in a broad sense, include accounting elements related to the arising of debts and credits, as well as impacting liquidity. While monetary liquidity flows analyze only the values that directly change the amounts present in the cash and bank.

If the focus is on financial flows understood broader than monetary flows, it must choose the "dimension" to be investigated. Generally, when one intends to verify the intertwining of flows created by management in terms other than cash, the reference value is the so-called characteristic net working capital. Since working capital is derived from the juxtaposition of short-term assets and liabilities, characteristic (or typical) net working capital (henceforth CNWC) strips this aggregate of items not about the company's characteristic activities. Leaving aside the critical accounting issues related to this aggregate, it can be said that, in simplified form, Characteristic net working capital (henceforth CNWC) is formed by the algebraic sum of cash and bank assets, trade receivables, inventories, and accounts payable. Any value affecting at least one of these accounting items identifies a CNWC cash flow.

At the state of the art, doctrine and practice believe, almost unanimously, that the only useful analysis to investigate the financial dynamics of companies is that conducted in terms of liquidity.

Liquidity flows represent an indispensable element of information since, to understand the overall financial situation of companies, it is essential to supplement punctual data referring to precise instants with information concerning events that occurred between those moments. In other words, comparing the situation existing as of 12/31 for a plurality of fiscal years allows the trend of accounting data to be traced. But such an analysis, nothing says about what occurred within each administrative period. For example, consider the assumption that two given values are identical at 12/31/n and 12/31/n+1. The trend shows a perfectly constant pattern. This, however, does not imply a denial that the value that is the subject of interest during the year n+1 may have undergone profound changes that led, at 12/31/n+1, to the determination of a value equal to that present in the accounts at 12/31/n. This information limit is all the more relevant the longer the duration of the period under consideration (fiscal year, bimonthly, quarter, semester, month, week, day).

From the above, it can be understood how a time limitation of the period considered can, albeit in reduced terms, circumscribe the overhead information obstacle.

In the face of such a possibility that indirectly makes it possible to reduce the information gap related to the trend analysis of financial ratios, there is, however, a limitation that cannot overcome since it is intrinsic to the ratios themselves. Even if the financial study were conducted in a systematic, systematic, and integrated manner, only employing ratios or other static aggregates, the results associated with such in-depth

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analysis could never be considered complete, exhaustive, and reliable.

All this assumes particular relevance in assessing the creditworthiness of companies.

Suppose lenders and accounting investigations were implemented only using static indices and aggregates. In that case, the possibility of lending to unworthy firms or denying credit to firms with perfect financial and income balances appears very high.

For example, consider the scenario where the loan applicant is a service enterprise lacking inventory and uncharacteristic investments. In such a context, the ratio that contrasts short-term assets with short-term liabilities (availability ratio) shows an ideal financial situation if it falls within the range of 1 to 1.5. Assume that, in the enterprise analyzed, this quotient is 1.5 and offers a constant trend over time. Assume, for simplicity, that the short-term assets consist of inventory and customers and that the liabilities identify the annual portion of a loan. Based on this information, it could argue that the availability ratio's value represents a solid assurance of an excellent short-term financial position.

Let us now assume that we supplement the above with the information that, in the following period, the firm believes that it will liquidate its short-term assets and that it will have a single additional relevant income corresponding to obtaining a new mortgage against outlays related to the payment of short-term liabilities and wages.

It is evident how such information calls into question the apparent financial balance that could have been assumed by considering the mere availability ratio.

In fact, in the face of a harmony of the static values recorded at the time of closing the accounts, if a company is forced to take out a bank loan (an income that, by definition, is occasional, i.e., non-recurring within each financial year) to cope with recurring outgoings for payment of salaries and annual instalments of financial loans, it is not possible to consider that there is an overall financial balance.

This consideration sheds new light on the interpretation of ratios. Although implemented systemically and systematically, the analysis by quotients does not allow for studying the type of business income and expenditures.

As already noted, this limitation cannot be overcome in the context of analysis by ratios since it is an intrinsic element of such instruments. The financial quotient is, in fact, static and devoid of informative elements regarding the characteristics of income and expenditure related to the period under consideration. The index analysis is, therefore, limited and deficient in itself and, as such, needs to be supplemented by further insights into financial dynamics.

Leaving aside any technical considerations about the difficulties an analyst encounters in determining cash flows, it is possible to state that only a balance between recurring sources (i.e., revenues that recur over time) and recurring needs (i.e., non-occasional outgoings) ensures financial soundness for the company.

In fact, in the presence of recurrent needs financed by occasional sources, the enterprise cannot be said to be financially balanced.

On the occurrence of the opposite hypothesis (financing occasional needs with sources of a recurring nature), financial balance is transformed, on the other hand, into a situation of superior stability. Using sources that are bound to recur periodically over time to meet occasional outlays represents, in fact, the achievement of maximum dynamic financial soundness.

Also, in this context, as highlighted in index analysis, the correct interpretation of data requires the cooperation of the company under investigation.

By way of example, consider dividend distributions or severance payments. Generally, these items are deemed recurring because it is assumed, on the one hand, that the allocation of dividends, tends to be constant over time to avoid negative impacts on the ownership structure and, on the other hand, that the physiological turnover of workers, causes a substantial repetitiveness of the payment of severance pay liabilities. However, there is nothing to prevent that, within a given enterprise, such items should be considered occasional. This may occur, for example, in small- to medium-sized enterprises in which there is extremely low worker turnover and in which the distribution of dividends represents an event of an occasional nature as a result of the need for re-investment of profits in the company. Upon the occurrence of these specific assumptions, the requirements, from potentially recurring, would become occasional.

Specific information regarding certain peculiarities of the enterprises can, as a result, cause the judgment to veer from positive to negative or vice versa.

Therefore, in this case, as with ratios, the interpretation of data is facilitated by the possession of a complete information set concerning the company that must be provided voluntarily by the company itself.

In conclusion, it is worth noting that, at the state of the art, doctrine and practice unanimously hold that cash flows are more significant than cash flows expressed in characteristic net working capital. As we have already needed to point out, the latter flows include every transaction that, directly or indirectly, has impacted at least one item constituting this capital (cash bank, customers, inventory, suppliers). Characteristic revenues, for example, generate a CNWC cash flow equal to their total amount. This income component can be subject to immediate collection or deferred collection. Since cash and accounts receivable are part of CNWC, revenue generates a total flow equal to its

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amount. To understand the informational insignificance of the flow expressed in terms of CNWC, imagine that a firm, during year N, carried out only two transactions: sales for 1,000: deferred receipt 990, ready cash 10; raw material purchases for 300: deferred payment 10; cash balance 290.

Given these figures, if focused attention on CNWC's cash flows, the company could be considered to have a perfectly balanced financial situation. Against a recurring source of 1000 (10 collected, 990 deferred), there is, in fact, a recurring requirement of 300 (of which 290 is paid in cash). According to a broad financial view, expressed in terms of CNWC, the credit rating should be positive.

The reality is, however, quite different. While it is true that the broad conception of the locution "CNWC financial flow, at least in theory, has its raison d'être, there is no doubt that the result of such an analysis has no utility in assessing the ability of a company to meet, regularly, the payment of its debts.

Despite the presence of a recurring financial source (1000) significantly higher than the needs of a similar nature (300), the company shows, in reality, a clear economic imbalance understood in the strict sense, that is, expressed in monetary terms, since, a recurring liquid income of 10 contrasts with a recurring liquid expenditure of 290.

In the standard OIC 12 Composition and financial reporting formats of mercantile, industrial and service enterprises, issued in 2005, while recognizing cash flows as having a greater signalling capacity of the financial situation, it was pointed out how the statement expressed in terms of CNWC continued to retain its validity. In the past, while highlighting the greater significance of monetary flows, it was still considered valid also to determine CNWC flows. Instead, the later version of standard 12 OIC highlights the need to determine only cash flows and not CNWC flows since they lack real significance-.

On the other hand, the current situation sees doctrine and practice converging toward a specific position that considers working capital flows an element devoid of any interest. Even the principle OIC 10 IL cash flow statement highlights how cash flows represent an increase or decrease in the amount of cash and cash equivalents. This statement, which echoes what is stated in IAS 7 Statement of Cash Flows ("cash flows are inflows and outflows of cash and cash equivalents"), identifies, in cash flows, the only changes worthy of recognition and disclosure.

According to the view prevailing today, flows expressed in terms of characteristic net working capital are not counted among the valuable financial information to internal managers and users outside companies.

VI. Alternative Forms of Cash Flow Statement: from the Lacunae of the Civil Code to Doctrinal and OIC/IAS-IFRS Guidance

Even though cash flows (understood in a sense and/or expressed in terms of liquidity) represent a fundamental cognitive element for anyone interested in assessing the financial situation of a company, civil law merely mandates the preparation of the cash flow statement as the fourth part of financial reporting. Still, it does not illustrate particular ways of structuring the report, except to point out that the results of operating and investing must indicate financing activities. The code, therefore, as required by existing regulations in Italy, regarding the peculiarities of the substance and form of the statement refers to the principles issued by the Italian Accounting Board, which, with principle No. 10, The cash flow statement, explains, in a very analytical manner, how this document should be prepared.

If the imposition of the cash flow statement in Italy is relatively recent, the international situation is different.

Quite a different situation is found, in fact, in the IAS/IFRS international accounting standards.

Indeed, IAS 1 Presentation of Financial Statements states that "a complete set of financial statements comprises:

1. A statement of financial position as of the end of the period;
2. A statement of profit or loss and other comprehensive income for the period;
3. A statement of changes in equity for the period;
4. A statement of cash flows for the period;
5. Notes, comprising a summary of significant accounting policies and other explanatory information;

5.1 Comparative information in respect of the preceding period as specified in paragraphs 38and 38A; and

6. A statement of financial position as at the beginning of the preceding period when an entity applies an accounting policy retrospectively or makes a retrospective restatement of items in its financial statements, or when it reclassifies items in its financial statements..."

From this, it can be deduced that, unlike what is indicated by the OIC standards, the IAS/IFRS considers the cash flow statement to be a mandatory part of the company's disclosures intended for an external business. The principle is also underscored in the Conceptual Framework for Financial Reporting, where in § OB20 Financial performance reflected by past cash flows it points out that "information about a reporting entity's cash flows during a period also helps users to assess the entity's ability to generate future net cash

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inflows. It indicates how the reporting entity obtains and spends cash, including information about its borrowing and repayment of the debt, cash dividends or other cash distributions to investors, and other factors that may affect the entity's liquidity or solvency. Information about cash flows helps users understand a reporting entity's operations, evaluate its financing and investing activities, assess its liquidity or solvency and interpret other information about financial performance."

Companies that, even in the absence of a regulatory requirement, wish to supplement their external reporting by disclosing the cash flow statement may disclose this data by opting for the formal structure that, in their sole opinion, best illustrates the intertwining of financial needs and sources.

Those preparing the statement can choose from three alternatives:

1. Apply what is outlined in IAS 7 Statement of Cash Flows;
2. Refer to what is outlined in the standard OIC 10, The Preparation of the Statement of Cash Flows;
3. Use a format proposed by national and/or international doctrine.

IAS-adopting companies should use what is stated in the IAS 7 Statement of Cash Flows.

Any other company, without any constraint or limitation, may, on the other hand, refer to any formal structure.

The IAS 7 Statement of Cash Flows and the OIC 10 standard, The Cash Flow Statement, identify the theoretical bases that must be applied when determining flows without imposing specific formal reporting formats.

The IAS 7 Statement of Cash Flows and the OIC 10 the Preparation of the Cash Flow Statement present a partial overlap in that the objective of the OIC document is to introduce, as much as possible, in the national context what is established by the international standards. Despite some differentiations, the similarity of the primary logical scheme of the two standards is, in fact, evident.

In summary terms, IAS 7 Statement of Cash Flows requires that, in the statement of cash flows, cash flows be presented, and divided between operating, investing and financial management.

IAS Standard No. 7 specifies the above concepts and explains their contents as follows:

Operating management

Cash flows generated by operating management are derived from the main revenue-generating activities of the enterprise. Therefore, they are usually derived from the other facts and transactions involved in determining profit or loss for the year. Examples of cash flows from operations are:

1. Receipts from the sale of products from the provision of services;
2. Collections from royalties, fees, commissions and other income;
3. Payments to suppliers of goods and services;
4. Payments to and on behalf of employees;
5. Collections and payments from an insurance company for premiums and claims, annuities, and other benefits under the policy;
6. Payments or refunds of income taxes-unless they can be made explicitly under financial and investment management;
7. Collections and payments arising from contracts entered into for commercial trading purposes.

Certain transactions, such as selling an item or plant, may give rise to gains or losses that should include recognition of profit (loss) for the year. Cash flows related to such transactions are cash flows from investing activities. However, cash flows from operating activities are cash payments to produce or acquire assets held for lease to others and subsequently held for sale as described in paragraph 68th of IAS 16 Property, Plant, and Equipment. Receipts from leases and subsequent sales of such assets are also cash flows from operating activities.

IAS 7 also points out that an entity may hold securities and loans for trading or trading purposes; in this case, they are treated as inventories purchased specifically for resale. Therefore, cash flows from the purchase and sale of securities held for trading or trading purposes are part of operating activities. Similarly, cash advances and loans from financial institutions are usually classified as operating activities since they relate to the entity's principal revenue-generating activity.

Investment management

Distinguishing information about cash flows from investment management is essential because these amounts represent a measure of costs incurred to acquire resources intended to produce future income and cash flows. Examples of cash flows arising from investing activities are:

1. Payments to acquire property, plant and equipment, intangibles, and other fixed assets. These payments include those related to capitalized development costs and internally constructed property, plant machinery;
2. Income from the sale of property, plant machinery, intangible assets and other fixed assets;
3. Payments for the acquisition of equity securities or debt securities of other enterprises and interests in joint ventures;
4. Collections of equity securities or debt securities of other enterprises and interests in joint ventures;
5. Advances and loans made to third parties;
6. Collections from the repayment of advances and loans made to third parties;

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7. Payments for forward delivery contracts, futures contracts, premium contracts and exchange contracts except when the contracts are held for trading purposes or payments falling under financial management;
8. Collections from forward delivery contracts, forward contracts, and premium contracts exchange contracts except when the contracts are held for commercial trading, each supply falling under financial management.

Financial management

Separate disclosure of cash flows from financial management is crucial as it is essential in forecasting demands on future cash flows from those who provide capital to the enterprise. Examples of cash flows arising from financial management are:

1. Cash receipts from the issuance of shares or other equity securities;
2. Payments to shareholders to acquire or release the company's shares;
3. Collections from the issuance of bonds, loans, notes, fixed-income securities, mortgages, and other short-term or long-term loans;
4. Loan repayments;
5. Payments by the lessee to reduce existing liabilities related to a finance lease.

The OIC 10 principle the cash flow statement, in a partially similar way, considers that the cash flow statement, cash flows should be recognized and aggregated according to the following logic:

Operations management

Cash flows from operations management, referred to as income management in an early version of the document, generally include flows that arise from the acquisition, production and distribution of goods and the provision of services and other flows not contained in investing and financing activities.

Some examples of cash flows generated or absorbed by so-called operations reported in the OIC 10 standard are:

- Cash receipts from the sale of products and the provision of services;
- Receipts from royalties, commissions, fees, insurance reimbursements and other revenues;
- Payments for the purchase of raw materials, semi-finished products, goods and other inputs
- Production factors;
- Payments for the acquisition of services;
- Payments to and on behalf of employees;
- Payments and refunds of taxes;
- Payments for financial charges;
- Receipts for financial income.

Investing activities

Cash flows from investing activities include:

- Purchasing and selling property.
- Plant and equipment.
- Intangible assets.
- Financial assets are not held as fixed assets.

By way of example, the cash flows generated or absorbed by investing activities disclosed in principle OIC 10 arise from:

- Purchases or sales of buildings, plant, equipment or other tangible assets (including tangible assets of internal construction);
- Purchases or sales of intangible assets, such as patents, trademarks, and concessions; these payments also include those relating to capitalized deferred charges;
- Acquisitions or disposals of investments in subsidiaries and affiliates;
- Acquisitions or disposals of other equity investments;
- Acquisitions or disposals of other securities, including government securities and bonds;
- Disburse advances and loans made to third parties and collections for repayment.

Financing activities

Cash flows from financing activities include flows that result from obtaining or returning cash from venture capital or debt capital.

By way of example, according to OIC Principle 10, cash flows generated or absorbed by financing activities financing are:

- Cash receipts from the issuance of shares or units representing risk capital;
- Payment of dividends;
- Payments for the repayment of risk capital, including in the form of the purchase of treasury shares;
- Collections or payments arising from the issuance or repayment of bonds, fixed-income securities, bills of exchange, taking out or repayment of mortgages and other short-term or long-term loans;
- Increase or decrease in other debts, including short- or medium-term debts of a financial nature.

At the end of this brief examination of the guidance provided to prepare the cash flow statement, companies may opt for a reporting structure proposed by doctrine in the absence of precise legal regulations.

In this regard, scholars have proposed a plurality of reference schemes. In the opinion of the writer, the formal structure with the most significant informative value is the statement submitted within the integrated information system because, unlike other schemes, this document, on the one hand, is an integral part of a coherent and integrated system, vertically and horizontally, with every other accounting helpful tool for business analysis and planning (e.g., reclassifications, ratios, financial and income aggregates, analytical values of product/area/sector, etc.) and, on the other hand, provides a piece of clear and intelligible information set on cash flows even to subjects who are not exceptionally expert.

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Cash flow statement prepared as part of an integrated analysis/programming system

Operations Description	Needs	Sources
Cash flow from carrying out characteristic activities (characteristic cash flow) Long-termtangible and intangible asset management * * * Financial management * * * Severance management * Asset management * * * Provision management * * * Non-characteristic management by definition * * * Tax management * * Net worth management and dividends * * * Delta cash and bank		

Against such a scheme, it can identify many other equally appreciable technical structures proposed by the doctrine.

This is not the appropriate place to illustrate all the positions scholars take regarding the formal drafting of the statement.

It is relevant to point out that any structure proposed by any author does not identify "The cash flow statement" but merely identifies one of the many structural forms such a document can take. And it is precisely for this reason that accounting standards, national and international, rather than identifying a structured formal scheme, have found it more appropriate to limit themselves to illustrating the principles that must underlie the preparation of such a document.

On the other hand, the formal scheme proposed under the integrated information system has a predefined structure in that it identifies one part of a more extensive set of elements that must be marked by perfect consistency and integration at the legal and substantive levels. Hence the need to indicate a binding structure that, in the writer's opinion, succeeds in communicating valuable information to the user that other schemes do not provide for dissemination.

VII. Valutazione Del Merito di Credito Delle Aziende: Cash Flow Statement vs. Mera Determinazione Del Cash Flow

As pointed out in the previous pages, the assessment of creditworthiness cannot be separated from the analysis of cash flows.

In this regard, however, the question must ask whether the determination of the so-called cash flow can identify sufficient information elements to make a valid judgment on the dynamic financial situation of a company. The determination of this aggregate represents, in fact, very often the only component that companies provide to those who request quantitative determinations about the cash flows produced/consumed in a given financial year.

First, it should point out that this locution does not have an unambiguous meaning. In contrast to those who interpret cash flow in terms of the cash flow

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produced by typical operations, some attribute to this aggregate a broader financial sense that, often, converges toward a conception of flow that, although produced by characteristic activity, is expressed in terms of net working capital. Those who interpret cash flow in a broader sense tend to make, however, a second technical step to highlight, in addition to the aggregate thus determined, the cash flow coming from the performance of the company's typical activity.

By way of example, consider the following example:

Characteristic short-term assets and liabilities:

	31/12/N	31/12/N+1		31/12/N	31/12/N+1
Customers	100	400	Suppliers	100	200
Inventories	50	100			
Total characteristic short-term assets	150	500	Total short-term liabilities characteristic	100	200

Profit and loss es. N

Characteristic costs includingpurchase of rawmaterials, wages, contributions, purchase of services, consulting, commissions, miscellaneousoperating costs	1100	Characteristic revenues including sales and service revenues	2800
Inventories 1/1	50	Inventories 31/12	100
Depreciation and amortiztion**	400		
Financial chargers	200		
Severancepay and provision for risck and charges**	300		
Totatalexpensens	2050		
Net profit	850		
Total	2900	Total	2900

*Characteristic operating expenses and revenues may be paid/collected in year n+1, or they may be, in part, paid/contained in year n+1, and the amount be subject to deferred payment/collection. To understand, with reference, for example, to sales revenue, how much has been collected and how much has been deferred to customers, it is sufficient to look at the difference between customers at 12/31/n and customers at 12/31/n+1. In our example, customers increased by 300, which means that, for 300, it did not collect the revenue recognized in profit and loss. The total revenues then (2,800) can be conceptually divided into revenues collected for 2,500 and revenues subject to a deferral for 300(i.e., revenues that only generated a credit but no cash receipts). This concept also applies, of course, to suppliers. Using the same reasoning, we can say that characteristic costs for the purchase of raw materials, wages, contributions, purchase of services, consulting, commissions, and miscellaneous operating expenses were paid in cash in the amount of 1,000 while in the amount of 100 they were subject to deferred payment (i.e., a debt arose but no impact on money)

** non-cash costs identify costs arising from year-end valuations. These costs are charged on an accrual basis and have no impact on cash, the bank. They are just "scriptural" accounting items with no financial impact whatsoever (neither in the broad sense self in terms of liquidity).

Poiché il capitale circolante netto caratteristico identifica la variazione derivante dalla sommatoria algebrica dell'attivo e passivo a breve caratteristico, in base ai dati sopra esposti, il CNWC ammonta a:

	31/12/N	31/12/N+1
Customers	100	400
Inventories	50	100
(suppliersi)	-100	-200
characteristic net working capital (CNWC)	**50**	**300**

As can be seen, the CNWC increased by 250. It will explain the significance of this change in the following pages.

In operational terms, the financial characteristic cash flow broadly understood, that is, interpreted as the algebraic sum of typical expenses and revenues that impacted net working capital, amounts to:

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Posta contabile	Importo	
Characteristic revenues including sales and service revenues*	2800	*non importa se oggetto di incasso immediato o dilazionato in quanto entrambi i valori (cassa e clienti) sono compresi nel CNWC
Inventories 31/12	100	
Characteristic costs includingpurchase of rawmaterials, wages, contributions, purchase of services, consulting, commissions, miscellaneousoperating costs**	(1100)	**non importa se oggetto di pagamento immediato o dilazionato in quanto entrambi i valori (cassa e fornitori) sono compresi nel CNWC
(Inventories 1/1)	(50)	
Characteristic cash flow understood in the broadfinancialsense(orfinancial cash flow expressed in terms of CNWC)	**1750**	

Financial cash flow, understood in a broad sense (or cash flow of CNWC), represents a flow that includes, in itself, also the share of cost and revenue related to receivables and payables. This cash flow, in the broad sense, amounts to 1,750. To understand the monetary impact of this flow, it is necessary to consider net working capital. Net working capital is like a sponge immersed in liquid: if the sponge increases in volume, it has absorbed the liquid. If the sponge is "squeezed," it decreases in volume because it releases liquid. In technical terms, corporate liquidity (cash and bank) is the above liquid. Therefore, if net working capital increases, liquidity has been drained, while if it decreases, it implies liquidity has been created. The more significant the increase in net working capital, the smaller the flow expressed in terms of liquidity.

Therefore, if cash flow is 1750 and net working capital has increased by 250, it means that liquidity of 250 has been drained. The cash flow (or characteristic monetary cash flow) is less than the financial cash flow by an amount equal to 250. And, the monetary cash flow (which can also be calculated simply by contrasting monetary costs (i.e., that we paid = 1000) vs monetary revenues (i.e., that we collected= 2500)) amounts to 1500.

The characteristic monetary cash flow can, therefore, be represented as follows.

Accounting items	Amounti
Core revenues including sales and service revenues	2800
Closing inventories	100
Characteristic costs includingpurchase of rawmaterials, wages, contributions, purchase of services, consulting, commissions, miscellaneousoperating costs	(1100)
(Opening inventories)	(50)
Characteristic cash flow understoodin abroadfinancialsense	**1750**
Δ CNWC	**(250)**
Cash flow characteristicmonetary	**1.500**

Characteristic monetary cash flow is derived from the logical summation of the portion of characteristic revenues collected and the amount of typical costs subject to prompt cash payment. It can also quantify characteristic monetary cash flow without the prior determination of financial cash flow broadly. For this reason, it can also determine cash flow from the performance of the typical business activity in the following technical manner:

Accounting post	Importo	
Core revenues comprising sales and service revenues collected on a prompt cash basis	2500*	*thisamountisderived from the contrastbetweentotal revenue (2800) and Δ customers (300), the increase of whichidentifies a deferred payment granted to customers
Characteristic costs comprisingpurchase of rawmaterials, wages, contributions, purchase of services, consulting, commissions, miscellaneousoperating costs paid for on a cash basis	(1000)**	**thisamountisderived from the contrastbetweentotal costs (1100) and Δ suppliers (100) whoseincreaseidentifies a deferred payment obtained from suppliers
Characteristic cash flow	**1500**	

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As pointed out in the previous pages, the doctrine and accounting standards focus unanimously on cash flows. In contrast to those who prefer to highlight financial cash flow understood in a broad sense and Δ CNWC, some favour the determination of cash flow by contrasting "monetary" costs and revenues (i.e., the shares of positive and negative income components that impact cash/bank). Regardless of the chosen solution, there is no doubt that the ultimate goal is consistently identified in determining cash flow.

In conclusion of these brief methodological remarks regarding the quantitative calculation of the characteristic cash flow, it seems appropriate to mention that it can determine this value by applying two different logical, quantitative methodologies: direct or indirect.

Direct determination involves contrasting characteristic "monetary" costs and revenues (i.e., the shares of positive and negative income components that impacted cash/banking), with or without the "intermediation" of financial cash flow andΔ CNWC. The numerical examples above illustrate the direct calculation of cash flow.

Against this technique, there is the indirect determination of the aggregate that is the subject of interest. In this case, cash flow is derived from the summation of profit, and all costs and revenues that are non-cash by definition (such as depreciation and amortization, allowances for provisions, etc.) and are not part of core business (such, for example, finance charges, tax costs, capital gains, etc.).

In the above example, the indirect determination of cash flow would result from the following summation:

Posta contabile	Importo
Utile di esercizio	850
+ ammortamenti	400
+ TRF e acc.tia fondi rischi e oneri futuri	300
+ oneri finanziari	200
Cash flow caratteristico in senso finanziario	1750
+/- Δ CNWC	(250)
Cash flow monetario caratteristico	1500

In the writer's opinion, the direct calculation methodology is preferable because it is immediately understandable. The indirect calculation, on the other hand, while achieving the same accounting result, may appear difficult to interpret because it derives a monetary value from the summation of data that, by definition, do not represent liquid values.

After this brief methodological analysis, it is necessary to understand whether knowledge of the characteristic monetary cash flow is sufficient in the context of creditworthiness assessment or whether, on the contrary, full reporting is required.

The cash flow resulting from the performance of typical activities (or characteristic monetary cash flow) is an indispensable element of knowledge for those who must assess a company's financial situation. Indeed, this aggregate highlights, in a dynamic sense, the liquid source that should identify the primary "source" of liquidity.

Therefore, creditworthiness assessment is strongly influenced by knowledge of this value. Since civil regulations do not require the disclosure of such a figure, it seems relevant to understand whether it can determine such an aggregate based on the indications in the financial reporting published at the business registry office.

One of the most significant obstacles that an external operator encounters in determining characteristic monetary cash flow is related to the impossibility, already noted in the preceding pages, of identifying typical costs and revenues. Indeed, the conformation of profit and loss governed by Article 2425 of the Civil Code does not allow the identification of such items. Determining such flow on the exclusive basis of publicly disclosed data appears, therefore, a complicated operation unless one opts for very obvious simplifications (such as, for example, the inclusion in the characteristic cash flow of any ordinary capital gains, ordinary capital losses, rental income, ordinary contingencies, etc.). For this reason, the calculation of the above flow should be facilitated by the direct cooperation of the enterprise under analysis.

Even if the analyst does not attach particular importance to the characteristic monetary cash flow and opts for the sole determination of the cash flow from income management, as identified by IAS 7 or OIC 10, they would encounter the same obstacles mentioned above.

As is the case with ratios, the determination of cash flow calculated based on financial reporting published values may be perfectly true, just as it is possible, on the contrary, to contain matters that do not pertain to the calculation in question. Unfortunately, even in this case, the external operator cannot assess the degree of correctness/accuracy of the quantitative determination of the flow determined based on mere financial reporting intended for third parties external to the enterprises.

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Beyond the considerations regarding the difficulty an outside operator encounters in calculating cash flow or earnings management flow and imagining that companies voluntarily provide such an aggregate, the question must ask whether knowledge of this aggregate can replace the requirement to prepare the complete statement.

The answer is negative because, although it may give the characteristic monetary cash flow essential relevance, dynamic financial analysis requires the judgment of the company's situation based on verifying the balance between sources and recurrent needs. Only a thoughtful balance between income and expenditure that tend to recur periodically in the business environment can ensure financial stability for the enterprise.

Knowledge of the mere monetary characteristic of cash flow does not allow such an analysis. It is conceivable that, even with a significant cash flow, the financial dynamics show a set of recurring needs (e.g., taxes, finance charges, payment of severance pay, repayment of financial loan instalments, etc.) such as to make the above aggregate, insufficient to guarantee balance and solidity to the company.

Such a situation would be created even if the external operator owns only the flow deriving from income management (as per IAS 7 and principle OIC 10). In this case, since some recurring values are included in determining the flow, the abovementioned problem might be less disruptive. Unfortunately, however, even in this hypothesis, the mere knowledge of this flow would not allow, in any case, to judge the enterprise's ability to meet recurrent needs with sources marked by similar time characteristics.

The assessment of creditworthiness, therefore, inescapably requires the analysis of the complete statement referring to the period under investigation.

It is unnecessary to dwell on this to understand how those outside the companies prevent the drafting of such a document. Regardless of the formal structure chosen, the statement's drafting requires knowledge of information known only to corporate management.

Even in this case, it is not possible to rule out the possibility that an external party would be able to draw up a complete statement since; theoretically, it is conceivable that, for example, the report of the notes to financial statements the management report would contain a range of information, provided for in the code, that would allow the determination of all cash flows.

If it could prepare such a statement based on the data that can be drawn from the published financial reporting publicly available, there would be no need to question whether the report should be compulsorily prepared/disseminated. Such a consideration reflects mere wishful thinking, far from the practice followed by companies. And this is evidenced, quite clearly, precisely by the doctrinal and legal debate concerning the advisability of including the statement among the documents with compulsory dissemination.

Therefore, the assessment of creditworthiness cannot disregard the requirement of drafting the cash flow statement, otherwise is the possibility of making wrong decisions regarding the company's ability to repay its debts regularly.

In conclusion, it seems appropriate to emphasize that the assessment of creditworthiness implemented based on mere actual values identifies a hazardous operation. These planned values need to be set out in the general business budget to place the analyst in a position to determine prospective ratios and flows. Indeed, the prospects of the company appear to be a fundamental element of knowledge so that the decisions of potential and/or existing lenders are harmonious concerning the actual conditions of the companies being evaluated.

To understand the relevance of the cash flow statement in the context of creditworthiness assessment, assume that a firm, at the request of lenders, in year N, provides an income and equity budget for year N+1, which shows an excellent static income and financial situation:

Economic Budget:

Sales revenues	18.400
Total characteristic revenues	**18.400**
Depreciation and amortization	530
Opening inventoriesfinishedgoods	400
Wages and contributions	1.600
Trade costs	280
Depreciation costs	1.300
Ind.costs	4.500
Miscellaneouscharacteristic costs	1.500
severancepay	160
Rawmaterialpurchases	6.193

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(Finishedprod. inventories)	- 1.648
Total characteristic costs	**14.815**
Operating incomegenerated by characteristicoperations	**3.585**
Interestincome	200
Dividends	100
Financial charges	(1.728)
Income taxes	(1079)
net profit	**1.078**

Patrimonial Budget:

Assets		Liabilities and equity	
Cash	50	banks	9.959
inventories 31/12	1.648	Suppliers	1.651
Short-term customers	3.680	Short-termdebt	100
Speculative securities	14.000	Short-termportion of loan	100
		Tax payables	1.079
Total short-term assets	**19.378**		
		Total short-term liabilities	**12.889**
Buildings	11.000		
Plant	13.000	Loan	12.385
(depreciation fund)	(8.530)	Long-term liability for severancepay	460
Controllinginterests	1.000		
		Total long-term liabilities	**12.845**
Total long-term assets	**16.470**		
Assets		Share capital	8.221
		Revaluationreserve	100
		Profit for the year	1.078
		Profit reserves	715
		Equity	**10.114**
Net Assets	**35.848**	Total	**35.848**

From the above data, we can determine the following ratios:

Current ratio: current assets/short-term liabilities = 19,378/12,889 = 1.50

Debt ratio: invested capital/equity = 35,848/10,114 = 3.54

ROE: operating income/shareholders' equity = 1,078/10,114 = 10.65%.

ROI: operating income from ordinary operations/capital invested in characteristics operations = 3,585/20,848 = 17.19%

Based on the indices mentioned above, one could erroneously assume the existence of an ideal prospective situation in terms of income and finance (naturally within the limit that the analysis of a single financial year can allow). Particularly exceptional values mark ROI and ROE, and the two ratios of availability and indebtedness show an extraordinarily stable and balanced financial situation, both short-term and overall. To express an opinion on creditworthiness, however, it is also necessary to analyse the cash flow statement to verify the balance between needs and recurring sources.

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Let us assume that the company presents the following planned statement, determined based on a comparison between actual data and prospective values summarised in the budget above.:

	Needs	sources
CASH FLOW OF CHARACTERISTIC BUSINESS MANAGEMENT (OR CASH FLOW IN STRICT SENSE	502	
LONG TERM TANGIBLE AND INTANGIBLE ASSET MANAGEMENT *purchase of plant *purchase of buildings	 5600 3000	
FINANCIAL MANAGEMENT * obtaining bank loan * obtaining new loan * annualloanrepayment *repayment of short-termdebt *payment of financialcharges	 300* 3000* 1728*	 9659 12.085
ASSET MANAGEMENT * purchase of securities * purchase of participations *receipt of interestincome * collection of dividends	 12000 1000	 200* 100*
MANAGEMENT OF NON-TAX EXPENSE PROVISIONS AND RISK PROVISIONS *		
TAX MANAGEMENT * tax payment	 700*	
NON- CHARACTERISTIC MANAGEMENT BY DEFINITION		
SEVERANCE PAY MANAGEMENT * payment of severancepay	 50*	
EQUITY MANAGEMENT AND DIVIDENDS * share capital increase * dividenddistribution	 500*	 6336
Δ CASH AND ACTIVE BANK		
TOTAL	28380	28380

An asterisk has been affixed to recurring needs and sources to facilitate the interpretation of the data.

An analysis of the statement shows that:

1. The characteristic monetary cash flow, which should represent the recurring source par excellence, causes, on the contrary, a need;
2. Total recurring requirements are 6,278 (not including requirements from typical operations) against frequent sources, amounting to 300.

As can be seen, the company does not produce a positive cash flow. The flow produced by the typical management, instead of bringing liquidity to the company, drains cash flow abundantly.

It is clear how, in the presence of a negative cash flow, the recurring sources are considerably, less than the non-occurring needs. This circumstance points to a significant dynamic financial imbalance.

Pivotal to the assessment of creditworthiness is the analysis of the company's ability to pay its debts regularly. The lack of characteristic incoming cash flow and the significant excess of recurring requirements over the amount of sources of a similar nature identify two pieces of information that should cast doubt on the existence of an absolute financial equilibrium.

Any judgement pronounced without carrying out an accurate analysis of the cash flow statement can, therefore, potentially lead to erroneous assessments of companies' 'real' creditworthiness since what the flows show cannot be extrapolated from any other information tool.

Analyses developed only through ratios, or other static aggregates are harbingers of possible significant problems. In this case, too, as is the case with the static analysis of financial reporting published at the company registry office, the greatest interpretative obstacle is the impossibility of assessing the degree of reliability of the valuations made in the absence of precise information on the company's financial dynamics

VIII. Conclusions

From what has been said above, it is clear that it must verify the assessment of a company's creditworthiness through an in-depth analysis of the entire financial report for the year and any statements

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that may be complementary to it, such as in Italy, the management report, i.e. the report that, although not part of the financial reporting, can provide beneficial information on the company's income, equity, financial and action situation in the context of sustainability. The analysis of the balance sheet of the profit and loss of the cash flow statement of the report of the notes to financial statement represents, however, the focus of the in-depth analysis by a lender wishing to assess a company's creditworthiness. As we have been able to highlight in the preceding pages, the financial report destined externally is often characterised by information limits deriving from a problem of company privacy point the structure of the financial report destined externally has, in fact been studied at least in Italy, but this is the case in all European countries, to provide information that is comparable between the various countries belonging to Europe or countries that intend to use international standards. The objective is not to offer every neolithic and peculiar information on the company's situation as this would go against the interest of the company, which, necessarily, must be considered as a subject characterised by the right not to disclose information of a strategic or other nature that could negatively affect its management due to the disclosure of information to competitors, customers and suppliers. Static analysis through ratios and dynamic analysis through flows may be prevented by the structure of the externally-directed financial report precisely because of the lack of such information. In this case, assessing the creditworthiness of a company becomes very difficult. Suppose the company does not provide the lender or bank with further details. In that case, it is often impossible to comprehensively analyse the company's situation. Therefore it is almost impossible to make a meaningful judgement on a company's creditworthiness based solely on the data in the externally-directed financial report. This is all the more true if one considers that in Italy and most other countries, there are for small and medium-sized companies financial reporting structures that are short and therefore characterised by a reduction of information to be disseminated to third parties outside the company. For micro-enterprises, i.e. tiny enterprises, the problem of external communication does not even arise because financial reporting contains so little information that it cannot at least be considered an instrument for communicating financial assets to the outside world. It will therefore be up to the borrower to decide whether or not to formally tell the potential lender the information that supplements the information gleaned from the financial reporting destined by law to third parties outside the company. In the absence of such information, the lender will probably have severe difficulties in assessing the company's creditworthiness and comma in this case, the denial of the loan itself will be high eh probable to conclude this summary on analysis that the reality is not doctrinal in which everything is decided based on the results of financial reporting, but often, loans are only provided in the presence of collateral, real or personal comma that the recipient can give point. It can also happen that such guarantees are not requested; for example, it is unnecessary to ask for guarantees for start-ups or companies that show such a development. In percentage terms, it can say that this happens in about 5% of cases of bank loans.

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Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.



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- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

Materials may be reported in part of a section or else they may be recognized along with your measures.

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.



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Content:

- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:

- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:

As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:

If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:

The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

The Administration Rules

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Please note that following table is only a Grading of "Paper Compilation" and not on "Performed/Stated Research" whose grading solely depends on Individual Assigned Peer Reviewer and Editorial Board Member. These can be available only on request and after decision of Paper. This report will be the property of Global Journals.

Topics	Grades		
	A-B	**C-D**	**E-F**
Abstract	Clear and concise with appropriate content, Correct format. 200 words or below	Unclear summary and no specific data, Incorrect form Above 200 words	No specific data with ambiguous information Above 250 words
Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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