

ANALYSIS OF INFLUENCES ON PERFORMANCE AND RISKS IN THE ROMANIAN PRINTING INDUSTRY

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Abstract

In an economic environment characterized by rapid changes and significant technological innovations, the printing industry in Romania is undergoing a period of transformation and adaptation. Although traditional, this industry plays a vital role in the national economy by contributing to the production and distribution of cultural and commercial goods. In the face of these transformations, risk management becomes a critical component for ensuring the sustainability and competitiveness of firms in this sector. In our study, we will evaluate the economic performance and associated risks of the top 20 companies operating in the Romanian printing industry, registered under the NACE code 1812, selected based on their turnover in 2023. The analysis covers a seven-year period from 2017 to 2023, providing a detailed assessment of the evolution of these companies. This comparison allows for a deep understanding of the sector's dynamics and how different companies manage risks and optimize their financial performance. The study is structured around three main classes of indicators: economic, profitability, and risk. Each class of indicators is analyzed to identify significant trends and variations in company performance, as well as to assess the impact of risk management strategies. Within the analysis of risk and profitability indicators, modern methods and techniques for risk mitigation and profitability enhancement are introduced, aiming to provide practical and innovative solutions for companies in the industry.

Keywords: performance, risks, economic indicators, printing industry, AI.

Clasificare JEL: D23, G 11, G 23, E 37.

1. Introduction

The identification of influence factors on risks and profitability is a broadly addressed topic in the specialized literature of risk management. These factors can vary considerably depending on the economic environment and the specifics of each business. Generally, the literature identifies several main categories of factors that influence the risks and profitability of an organization, as follows: economic factors which include fluctuations in interest rates, inflation rates, economic growth, and capital market conditions; political and legislative factors such as environmental regulations and trade policies; social factors like shifts in consumer preferences or aspects related to work ethics and organizational culture; technological factors that can disrupt existing markets, creating risks for companies that do not adapt, but also opportunities for those that invest in new technologies; environmental factors include risks related to climate change, natural disasters, and other environmental conditions that can directly affect a company's operations and supply chains.

The dynamics of the impact of these factors are continually changing, influenced by globalization, technological advances, and changes in global and local policies. Recent studies show an increasing importance of factors related to sustainability and corporate social responsibility, as consumers become more aware of the social and environmental impact of the companies they support. To effectively manage these factors, companies utilize various risk management strategies, including portfolio diversification, insurance, and strategic planning, aiming to minimize negative impacts and maximize opportunities.

The printing industry in Central and Eastern Europe (CEE) has undergone significant changes in recent years, reflecting global digitalization trends as well as local market specifics.

Company performance in this sector varies based on several factors, including adopted technology, innovation capacity, and market demand adaptation strategies. These markets have experienced increased demand for more sustainable packaging solutions and a greater integration of digital technologies in production processes.

In Romania, the printing industry has traditionally focused on offset printing services, but has recently begun adapting to digital technologies. Many small and medium-sized enterprises are now expanding into print-on-demand and customization services, allowing them to more effectively meet customer requirements. However, the market remains fragmented, with intense competition among many small to medium-sized companies. The adoption of automation and AI technologies is on the rise, though at a slower pace compared to other European regions. Companies investing in these technologies have reported improvements in operational efficiency and cost reductions, enhancing overall performance.

The report "The Future of European Printing up to 2027" by Smithers (2022) paints an uncertain picture for the printing industry over the next five years. As inflation impacts consumers, economic recession and uncertainty are affecting marketing and printing budgets. The war in Ukraine has had a devastating impact on Ukrainian suppliers of printing and packaging, as well as a decrease in Russian volumes. There are knock-on effects in Eastern Europe, and the impact of sanctions on Russia along with uncertainty regarding the availability and prices of energy are affecting the supply of printing across Europe.

In the rest of Central and Eastern Europe, the printing industry is diversified, with larger markets like Poland, Czech Republic, and Hungary showing significant advancements in digital technology adoption. These countries benefit from more substantial foreign investments and better access to advanced technologies, enabling them to be competitive not only in domestic markets but also in international contracts. Unlike Romania, some CEE countries have large-scale players who can operate at an industrial level, providing printing services across Europe. Their efficiency is enhanced through automation and AI-based optimization, maintaining a high level of competitiveness.

The performance of printing companies in the analyzed countries largely depends on their ability to integrate new technologies and efficiently respond to the dynamically changing market demands. Companies that embrace innovation and sustainability are better positioned to thrive in the current and future economic landscape. Artificial Intelligence (AI) has begun to significantly transform the printing industry, changing how companies approach design, production, and customization of printed products. Using AI to automate the graphic design process is one of the major transformations. AI tools can automatically generate designs for brochures, flyers, magazines, and other printed materials, saving time and costs and allowing designers to focus on more creative and complex aspects.

By using historical data and predictive models, AI can help printing companies understand market trends and anticipate changes in the demand for printed products. This enables companies to proactively adjust their marketing and production strategies, thereby improving their performance. Through these multiple applications, AI not only streamlines existing processes in the printing industry but also opens new possibilities for innovation and customization, redefining expectations for both producers and consumers of printed products. New technologies not only streamline production processes but also enhance user experiences, offering more customization options and quick responses to their requirements.

Aguirre and Rodriguez (2017) emphasize that the use of Robotic Process Automation (RPA) for compliance assurance can reduce the legal and financial risks associated with non-compliance with regulations. Hughes et al. (2019) argue that the security provided by blockchain can significantly reduce cyber risks, which are a major concern for modern organizations.

In our view, this perspective is particularly relevant, considering the increasing number and complexity of cyberattacks. The use of blockchain can provide organizations with a robust method

of protection against these threats. Zheng et al. (2020) highlight that using blockchain for identity verification can accelerate processes and reduce costs associated with compliance. This is a pertinent observation, given the constant pressures on organizations to reduce costs and improve operational efficiency.

Iansiti and Lakhani (2017) argue that smart contracts can radically transform the way organizations manage contractual relationships and associated risks. We believe that this innovation has the potential to significantly improve efficiency and security in contract management. Lee and Lee (2015) consider that the use of IoT for monitoring equipment has led to a significant reduction in downtime and an improvement in operational efficiency. This clearly shows that the implementation of IoT can bring tangible benefits by reducing operational risks and optimizing equipment performance. One of the greatest advantages of IoT is its ability to support preventive risk management. By continuously monitoring data, organizations can anticipate and prevent problems before they occur.

2. Methodology and results

Quantifying the marginal impact of risks on profitability is a key aspect in the literature on risk management and corporate finance. This involves assessing how changes in risk exposure affect a company's marginal profit. Various models and techniques are used for this assessment, and authors in the field often discuss ways to integrate risk management into strategic financial planning. We consider that evaluating the effectiveness of risk strategies is essential for all organizations, as it allows them to monitor and continuously improve risk management.

Jorion (2007) underscores the need for an integrated and comprehensive approach in managing all sources of risk, such as market, credit, and operational risks. Spulbar (2008) suggests that financial risk management should focus on each individual risk as well as on the collective array of risks, with management by types of risks being conducted within the various functional structures of the organization. This approach underscores the importance of an integrated risk management strategy that not only isolates individual risks for targeted management but also considers the interplay and aggregate impact of all risks across the organizational landscape. By doing so, it aligns risk management efforts with the specific functions and operational areas within the organization, facilitating a more coherent and effective approach to mitigating potential financial disturbances.

Lam (2014) advocates the use of statistical tools for corporate risk management and believes that their use can help organizations improve capital allocation decisions, optimize risk profiles of portfolios, and increase transparency in financial reporting. Stulz (2014) highlights the importance of evaluating financial performance in a manner that considers the risks undertaken to assess investment efficiency and more informed choices regarding capital use. Froot et al. (1993) argue that companies can create value by implementing risk management policies that reduce financing costs and minimize the adverse effects of cash flow volatility. Risk management should include considering both the cost of capital and the risks associated with specific investments. This involves adjusting the cost of capital based on the risk profile of the investment. The analysis also extends to how a risk-adjusted cost of capital directly influences shareholder value.

Froot and Stein (2022) consider that by adjusting the cost of capital to the specific risks of a project, companies can ensure that the financed projects are those that provide the greatest added value, after adjusting for risks. This approach can also contribute to the overall increase in corporate efficiency in risk management. Damodaran (2022) also highlighted the importance of adjusting the cost of capital to reflect different levels of risk, while Fabozzi (2011) explored the adjustment of the cost of capital in the context of bond portfolios and other types of assets, emphasizing the role of credit risk and other types of risk.

In an economic environment characterized by rapid changes and considerable technological innovations, the printing industry in Romania is in a period of transformation and adaptation.

Although traditional, this industry plays a vital role in the national economy, contributing to the production and distribution of cultural and commercial goods. Facing these transformations, risk management becomes a critical component to ensure the sustainability and competitiveness of companies in this sector.

This study aims to assess the economic performance and associated risks of the top 20 companies operating in the printing industry in Romania, registered under the CAEN code 1812 and selected based on their turnover in 2023, according to the database provided by www.targetare.ro. The analysis covers a seven-year period, between 2017 and 2023, providing a detailed assessment of these companies' evolution, with a comparative analysis for Tipografia Prod Com SRL, a company I manage and for which I wish to identify the factors influencing profitability and risks to be integrated into a future risk management strategy. This comparison allows for a deep understanding of the sector's dynamics and how different companies manage risks and optimize their financial performance.

The primary hypothesis was formulated as follows: Does the analysis and interpretation of selected performance indicators provide the informational support needed for risk management to adapt to current and future environmental conditions? This exploratory hypothesis arises because, although the literature is plentiful, it lacks sufficient empirical evidence regarding the analyzed relationship, and the study conducted on Romania's printing industry is not commonly found in existing literature.

The study is structured around three main classes of indicators: economic, profitability, and risk. Each class of indicators is analyzed to identify significant trends and variations in company performance, as well as to evaluate the impact of risk management strategies. In the analysis of risk and profitability indicators, modern methods and techniques for risk reduction and profitability enhancement are introduced, aiming to provide practical and innovative solutions for the industry.

Through this approach, the research not only offers a comprehensive picture of the current state of Romania's printing industry but also proposes directions for development and improvement of risk management, thereby contributing to the specialized literature by bringing to the forefront detailed analyses and updated perspectives on risk management and economic performance practices in the printing sector.

Financial data for 20 companies in the printing industry from 2017 to 2023 were used, including turnover, profit, number of employees, debt, liquidity, fixed assets, current assets, inventory, receivables, equity, and share capital. The calculated and interpreted indicators were grouped as follows: economic indicators (turnover, profit, debts, fixed assets, and current assets); financial indicators (ROA, ROE, profit margin, self-financing rate, and investment rate); risk indicators (bankruptcy risk, debt ratio, quick liquidity, general liquidity, and solvency).

Following the evaluation of economic indicators, a variable evolution of turnover was observed in the analyzed companies, as well as significant volatility. Notably, there were spectacular increases in the first part of the interval and dramatic declines in the pandemic and post-pandemic context, which demonstrate challenges in maintaining consistent growth, but also a notable capacity for rapid adaptation and recovery. On the other hand, some companies exhibited steady and stable growth, indicating an effective adaptation strategy and a lower risk of volatility.

Profit is essential for assessing the financial health of a company. The results show a variable evolution of profitability with significant fluctuations caused by the COVID-19 pandemic, indicating challenges in maintaining consistent growth and adapting to changing economic conditions. In some cases, stronger recovery trends were noted as well as a consistent increase in net profit throughout the analyzed period, indicating an effective adaptation strategy and efficient cost management, contrasting with the high variability of some companies in the sample. Also highlighted are some consistently negative developments in net profit, with ongoing losses and major difficulties in managing operations and costs.

From the second category of indicators, we will next present a summary of the results for ROA (Return on Assets) and ROE (Return on Equity). The first indicator is essential for assessing a company's financial performance; a higher value indicates that management is efficiently using assets to generate profit and is useful for comparing companies in the same sector regardless of their size, as it shows how well resources are managed. The second measures a company's ability to generate profits from the equity invested by shareholders; a higher value indicates better financial performance and efficient management of own resources.

Significant fluctuations in ROA between 2017 and 2023 indicate difficulties in maintaining operational efficiency and profitability. Some companies in the printing industry have had less stable performance, while others have demonstrated efficient use of assets, reflecting strong financial performance and efficient asset management.

We believe that the printing industry could adopt a series of techniques and strategies aimed at optimizing the use of assets and increasing profitability through an integrated approach that combines optimizing operations, diversifying products, and more efficient financial resource management. A first step would be optimizing asset utilization. Reviewing inventory to reduce storage costs and prevent overstocking would be essential. Implementing an inventory management system, such as Just-In-Time (JIT), could help minimize costs and increase efficiency. Additionally, investing in new equipment and modern AI-based technologies could improve productivity and reduce long-term operating costs, thus allowing increased production capacity and product quality. Reducing operational costs is another crucial aspect. Automating production and administrative processes would not only reduce errors and accelerate production time but would also decrease labor costs. Moreover, conducting regular audits to identify and eliminate unnecessary expenditures could lead to significant savings and improve net profit.

Product portfolio diversification could also positively impact ROA. Expanding the product range to attract new market segments and offering customized products and value-added services such as design consulting or logistics services could increase profit margins and attract premium customers. Moreover, efficient financial management should be a priority. Optimizing working capital by more effectively managing receivables and liabilities would ensure necessary liquidity and minimize financing costs. Additionally, accessing financing sources with lower costs and more flexible structures would support necessary investments without placing excessive pressure on company resources.

ROE fluctuations have also been significant, indicating challenges in maintaining operational efficiency and profitability. Some companies have demonstrated highly efficient use of equity, reflecting strong financial performance and effective resource management, while downward trends indicate lower efficiency in using equity. Some companies have experienced significant ROE fluctuations but have managed to maintain higher performances than others, while some have recorded negative or low performances, indicating major difficulties in efficiently using equity.

To improve ROE, cost optimization is essential by reducing unnecessary expenses and automating processes, which would increase operational efficiency and profitability. Diversifying revenue through the introduction of new products and services or expanding into new markets can bring additional income sources and reduce dependence on a single product type. Efficient capital management, by optimizing the cash conversion cycle and negotiating more favorable terms with suppliers and customers, can free up capital for other profitable investments. Investments in modern technologies and efficient equipment can enhance productivity and reduce operational costs, contributing to an increase in net profit. Also, reducing dependence on external financing by reinvesting profits and using equity to fund growth projects can reduce interest costs and improve equity profitability.

The third category analyzed, financial risk indicators, shows that Z-scores indicate a medium bankruptcy probability for most of the analyzed companies, with fluctuations in the firm's

financial stability. To improve the Z-score and reduce the risk of bankruptcy, some companies could adopt various methods and techniques, including advanced use of technology and Artificial Intelligence (AI), the Internet of Things (IoT), and Robotic Process Automation (RPA). These technologies can optimize operations, reduce costs, and increase efficiency. Implementing AI in financial and operational management processes can help in real-time financial data analysis, risk and opportunity identification, and management decision automation. For example, AI algorithms can forecast financial trends and customer behavior, providing a solid foundation for strategic planning and investment decisions.

Fluctuations have also occurred concerning the leverage ratio, indicating periods of financial stability and others of difficulty. Reducing the leverage ratio indicates an improvement in the financial structure, similar to the need to better manage financial resources to reduce dependence on external financing.

To reduce the leverage ratio and improve financial stability, some companies should improve cash flow management by reducing the collection period for receivables and extending payment terms for suppliers. This will ensure better liquidity availability for covering short and medium-term debts. Refinancing existing debts is another effective strategy. Another effective strategy for reducing the leverage ratio is increasing equity through profit reinvestment or raising capital through stock issuance. This will reduce dependence on external financing and improve the company's financial health. Reducing operational costs is also essential. Companies should identify and implement measures to reduce operational costs, such as optimizing production processes, reducing procurement costs, and improving energy efficiency. Cost reduction will free up financial resources that can be used for debt repayment. Diversifying income sources should also be explored.

Regarding Tipografia Prod Com SRL, which I manage, the financial performance analysis for the period between 2017 and 2023 highlights significant volatility in both turnover and net profit. Turnover registered impressive increases of 30.1% in 2018, 40.3% in 2019, and 19.8% in 2020, followed by a decline of 17.1% in 2021 and subsequent recoveries. Similarly, net profit exhibited a notable increase of 75.0% in 2018 and 152.9% in 2019, but experienced declines in subsequent years, with a recovery of 32.2% in 2023. These data reflect challenges in maintaining consistent growth and a strategic adaptation to fluctuating economic conditions. Compared to other companies in the field, the evaluated company has demonstrated a more predictable and stable management of current assets, indicating a prudent and efficient financial strategy.

The analysis of ROA, which decreased from 5.72% in 2019 to 1.18% in 2023, indicates a significant deterioration in the firm's ability to use assets to generate profit. This decline could suggest problems in resource management or changes in market conditions that have negatively impacted the company's performance. Similarly, ROE decreased from 16.63% in 2019 to 2.31% in 2023, showing difficulties in efficiently using equity.

To improve these indicators, the company could consider several strategies. Cost optimization through the reduction of unnecessary expenses and automation of processes could increase operational efficiency. Additionally, revenue diversification through the launch of new products and services, expanding into new markets, or optimizing working capital management by improving the cash conversion cycle and negotiating favorable terms with suppliers and clients are essential.

In summary, it is assessed that Tipografia Prod Com SRL must address the identified challenges by adopting a strategic plan that includes cost optimization, revenue diversification, and investments in technology. These measures could help the company improve operational efficiency and profitability in a continuously changing economic environment. Implementing such strategies could ensure a more stable market position and improved long-term profitability.

From the risk indicator analysis, it emerges that Tipografia Prod Com SRL faces significant fluctuations in its financial performance, requiring the implementation of robust strategies to

improve the Z-score and minimize the risk of bankruptcy. In this context, the company could significantly benefit from adopting advanced technologies such as AI, IoT, RPA, cloud computing solutions, and blockchain technology. These technologies promise to optimize operations, reduce costs, and improve overall efficiency. Moreover, AI can revolutionize financial and operational management through real-time data analysis, identifying financial trends and customer behavior, and automating critical decisions. This would allow more informed strategic planning and could lead to more precise investment decisions. Concurrently, IoT could transform equipment management by monitoring their performance and resource consumption, thus reducing downtime and maintenance costs.

The analysis of the leverage ratio shows variations between 48.10% and 65.61%, underlining the need for more efficient management of financial resources. Reducing the leverage ratio is crucial and can be addressed by optimizing cash flow, refinancing existing debts to obtain more favorable terms, and increasing equity through profit reinvestment or raising capital through stock issuance. Additionally, reducing operational costs through optimizing production processes and improving energy efficiency is fundamental. Diversifying income sources by exploring new markets and launching new products could provide financial stability and reduce the risk associated with reliance on a single business line. Fluctuations in quick liquidity, varying between 34.17% and 61.34%, also show the need to stabilize the ability to cover short-term debts. More efficient inventory management, optimizing the cash conversion cycle, and prudent use of short-term credit lines could improve this situation.

In conclusion, to achieve financial stability and avoid the risk of bankruptcy, Tipografia Prod Com SRL must adopt a multifaceted approach, integrating advanced technologies and effective financial strategies. This transformation would not only improve the Z-score and reduce the risk of bankruptcy but would also position Tipografia Prod Com SRL as an innovative leader in the printing industry.

The general conclusion is that to improve their performance, the analyzed companies need to adopt techniques and strategies designed to optimize overall activity. An integrated approach that combines operation optimization, product diversification, and more efficient financial management could yield significant benefits. Moreover, investments in new equipment and modern technologies based on AI can enhance productivity and reduce long-term operating costs, thereby increasing production capacity and product quality. The adoption of modern methods and techniques, including the advanced use of technology and AI, IoT, and RPA, can optimize operations, reduce costs, and increase efficiency.

The implementation of AI in financial and operational management processes can aid in real-time financial data analysis, risk and opportunity identification, and management decision automation. IoT can enhance equipment and resource management through real-time monitoring of machine performance and resource consumption. RPA can automate time-consuming and repetitive processes, such as invoice management, financial reporting, and inventory management. Using blockchain technology, Tipografia Prod Com SRL can ensure the integrity and verifiability of financial transactions and goods flows, reducing the risk of fraud and errors. Additionally, adopting an ERP system can centralize and optimize business processes, improving efficiency and reducing costs. A well-implemented ERP provides complete visibility over operations and aids in informed and swift decision-making. Furthermore, cloud computing enables rapid access to IT resources and services, reducing the need for costly hardware infrastructure investments, while blockchain can offer increased transparency and security in financial transactions and supply chain management.

3. Conclusions

The study conducted provides a comprehensive overview of the current state of the printing industry in Romania and suggests directions for the development and improvement of risk management. It contributes to the specialized literature by highlighting detailed analyses

and updated perspectives on risk management and economic performance practices within the printing sector.

The results of the research could raise awareness among managers regarding the impact of artificial intelligence on risk management. Furthermore, the sequential findings and the general conclusion derived from the quantitative analysis of the influencing factors impacting the performance and risks of companies in the Romanian printing industry could also aid in making appropriate decisions regarding risk management.

This research emphasizes the importance of integrating advanced technological tools such as AI in risk assessment and management processes. By leveraging these tools, companies can gain a more accurate understanding of potential risks and implement more effective strategies to mitigate them, thus enhancing their overall resilience and competitiveness in a rapidly evolving industry landscape.

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