

Measuring Adobe Company performance from the perspective of a Complex Adaptive System

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Abstract. *Strategic management is a key component in any business. It represents the continuous process of creating, implementing and evaluating decisions that help the organization to be more productive, by guiding the allocation of resources to achieve goals. Depending on the strategy that a company wants, which aims to create a competitive advantage, several techniques are used. Making a correct diagnosis using the optimal ways to achieve this is a key element in any analysis. Viewed as a cybernetic system, the company must be analyzed from the point of view of the efficiency and effectiveness of internal processes, as well as from the perspective of analyzing the factors in the environment in which it operates. In this research, the diagnosis was made by Adobe using SWOT analysis, one of the most used analysis techniques, but correctly interpreted and performed is still one of the most accurate techniques. The identification of key performance indicators and their analysis is another topic that we address in this article.*

Keywords: SWOT analysis, key performance indicators, BCG matrix.

JEL Classification: A10, G12, G17, L25, M2.

1. Introduction

Living in an age of digitization and the large volume of data and information, in which the environment is constantly changing, and given the explosive development of society associated with the limited nature of resources, it becomes increasingly difficult to adapt and co-evolve units economic. The theory of complex adaptive systems, through the properties they offer, is an important aspect in deepening and understanding the functioning of economic units as complex adaptive systems. Over time, there have been several researchers in the field who have contributed to the development of the literature, offering numerous definitions and presenting the properties of CAS adapted to companies, banks, financial markets, national economic systems or even the global economy.

The analysis and diagnosis of economic systems focuses and capitalizes on a series of knowledge in various fields such as: operational research, decision theory, management, finance, applied informatics, statistics, mathematics. In a broad sense, the analysis and diagnosis of economic systems represents the totality of approaches to systems, exact scientific methods and heuristic methods of investigation, diagnosis, modeling, design and solution on this basis of real-world problems, focused on the systemic approach, in an environment characterized by risk and uncertainty, in order to improve the quality of decisions for the efficient management of economic systems.

When a diagnosis of an economic system is made, it must be analyzed from the point of view of the component parts, but also from the cybernetic perspective in the sense of analyzing the environment in which the economic system carries out its activities. Aristotle gave the first definition of the notion of system, by stating “the whole is more than the sum of its components”. A system is a set of elements that interact both with each other and with the environment of which the system is part, with respect for rules, laws and principles, in order to achieve a meaning, objective, purpose

In this research, SWOT analysis was presented as the usual technique for analyzing an economic system by identifying strengths, capitalizing on opportunities and reducing or eliminating weaknesses and threats. When it comes to launching a product, for example, it is important that the business unit takes competitiveness into account and that strategic decisions are made to promote a competitive advantage. For this, the importance of the Boston Consulting Group matrix was presented. The last part of the research analyzes the Adobe Company in terms of key performance indicators that correctly identified and evaluated can contribute to the stability and increase of the company's performance. Before any analysis it is necessary to know the organization in this way, for this purpose the SWOT analysis was performed for the analyzed company.

2. Complex Adaptive System in enterprise

The enterprise is an obvious example of a complex adaptive system. This is due to the fact that they have several properties, the most important being the following:

Connectivity: The ways in which the agents of an enterprise are interdependent and relate to each other are of major importance for the survival and prosperity of the enterprise, as

they lead to certain regulatory processes necessary for the existence of the enterprise. Relationships between agents have a higher significance than the agents themselves.

Self-organization: There is no central command and control entity in a complex adaptive system. However, there is an ongoing process of reorganization given the discovery of the best model in relation to the environment.

Coevolution: All businesses exist and are an integral part of their environment. As a consequence, with the change of the environment, companies also change so as to ensure the best possible fit with it. However, when they change, so does the environment, so change happens all the time.

Necessary variety: The greater the variety of an enterprise, the stronger it is. After all, uncertainty and obscurity are high in companies, which use contradictions to co-evolve with other systems in the environment.

Hierarchical systems: Most enterprises are structured and represent subsystems of larger systems. For example, a bank branch is a system that has a management, employees and customers. At a higher hierarchical level, it belongs to the network of bank branches in a certain country, which is part of an international banking group.

Emergency: Planned and controlled interactions take place between the agents of an enterprise, but rather randomly. As a result of these interactions, behaviors that are characteristic of the company's agents emerge and shape the company's behavior as a whole.

Simple rules: It can be said that companies do not have a high degree of complexity. Emerging models can take many forms, but the spectrum of rules that govern the enterprise is relatively simple. For example, how a product changes its market price is a result of maintaining a balance between supply and demand.

Sensitivity to initial conditions: Small changes applied to the initial conditions in an enterprise can have significant consequences after going through an emerging process such as a feedback mechanism. Certain shocks in a financial network can lead to the bankruptcy of a commercial bank and could have a domino effect on the international economy, triggering a new economic crisis.

Suboptimality: Perfection is not necessary for an enterprise to thrive in its environment. It just needs to be a little better than its competitors and any extra effort in the initiative to become the best leads to a waste of energy.

Operation at the limit of chaos: Chaos has a special place in the theory of complexity because any system with the capacity for self-organization operates far from balance, i.e. at the limit of chaos. A system that is in equilibrium does not have its own dynamics that give the system the ability to respond appropriately to its environment and will gradually dissolve. A chaotic system actually loses its system characteristic. The state in which the system manifests its highest productivity is on the verge of chaos, when creativity and variety make their presence felt at the highest levels, leading the company to new opportunities.

3. Analysis and diagnostic techniques applied in an enterprise

Strategic management allows a company to be more proactive in shaping its own future, helping to generate competitive advantages by increasing the likelihood of choosing the best strategy.

3.1. Analysis and diagnostic techniques applied in an enterprise

An important stage in the strategic management process is the external and internal analysis called SWOT analysis. Through the external one, the company identifies the threats and critical opportunities in its competitive environment. In addition, it examines how competition in the same environment evolves and analyzes the future implications for the threats and opportunities that economic unity may face. Internal analysis helps to identify the strengths and weaknesses of the organization. This helps the company to understand what its resources and characteristics can be an advantage over the competition and which of them would rather be disadvantages. With the help of the SWOT matrix, companies can resort to the appropriate strategies. Strategic choices can be associated with the mission, objectives, vision, and internal and external analysis of the organization. It is important that after the elections have been made, these strategies are implemented. According to Barney and Hesterly (2006), the implementation of strategies occurs when an organization adopts organizational practices and policies in accordance with its strategies. The completion of the process described by the strategic management is rendered by gaining advantages over competitors.

SWOT analysis is a tool used for strategic planning and strategic management in organizations. Used efficiently, it is a rigorous technique for building organizational and competitive strategy at the company level.

SWOT analysis is a process that involves four components (strengths, weaknesses, opportunities and threats) and two dimensions (internal and external environment). Weaknesses and strengths are attributed to internal factors, the organization, while opportunities and threats are attributed to external factors attributed to the environment.

The SWOT analysis, as a rule, is drawn in a box with four dials that allows a summary that is organized according to the four sections. In this case, the company manager must contribute to balancing the strengths and weaknesses of the organization with the opportunities and threats from the external environment, so as to arrive at the selection of the successful strategy.

The strengths of the company: they are highlighted by the characteristics that add value to the analyzed company compared to others. Thus, the strengths represent a positive, favorable and creative component of a company. They play an active role in achieving organizational goals because, through their analysis, the company knows and understands its business potential. In addition, companies must respond to external environmental threats by using their strengths.

Weaknesses of the company: in this case, the issues identified here mean that there is something more disadvantageous compared to competition, i.e. the situation where the current system and the company's capacity is weaker compared to others, the weakness of

the organization being a negative feature. Thompson and Strickland (1989) state that a weakness is something that one organization lacks compared to others or a condition that puts it at a disadvantage.

It is just as important for any organization to know its strengths as well as its weaknesses. No strategy can be built on weaknesses, which have the potential to lead the organization to inefficiency and inefficiency. Therefore, they need to be known and improved.

Environmental opportunities: means identifying a condition or situation that is considered appropriate for a business activity. Opportunity is an advantage, a positive feature, favorable to organizations. For organizational management, an opportunity is the convenient time or situation that the environment presents to the organization to achieve its goals.

Environmental threats: the threat is a situation or condition that endangers the development of an activity, being a disadvantageous situation for the organization. For this reason, it is a negative feature that should be avoided. Environmental factors that can impede organizational efficiency and effectiveness are threats. The new world order formed as a result of globalization involves both opportunities and threats. This system that improves opportunities as well as threats guides organizational management to be more careful and act more strategically in terms of developments inside and outside their environment.

External opportunities and external threats refer to economic, social, cultural, demographic, environmental, political, legal, governmental, technological and competitive trends and events that could bring significant benefits or harms to an organization in the future. Strengths and internal weaknesses are the controllable activities of an organization.

SWOT analysis is a valuable technique for planning and decision making, being used in the last fifty years in the field of strategic management. In this process, a number of analysis techniques are used to achieve the long-term goals of an organization.

3.2. Boston Consulting Group Matrix

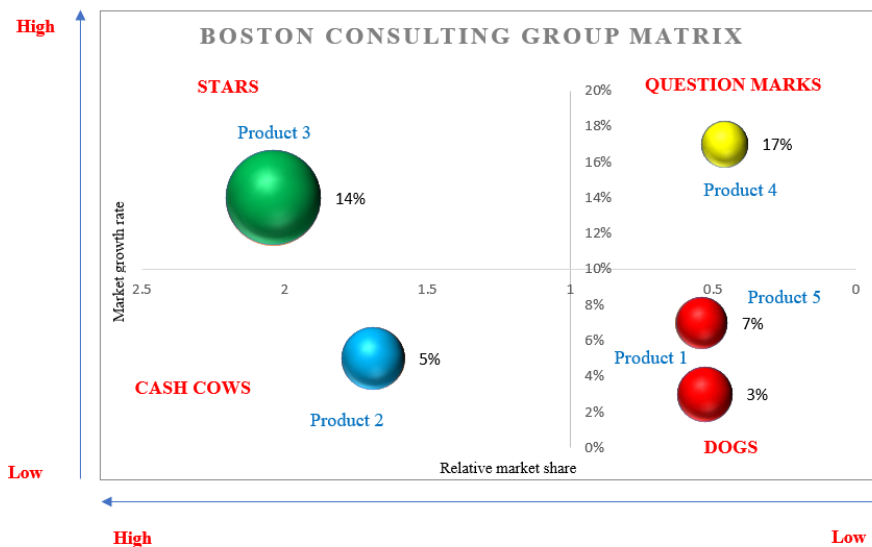
Today, sustainable business improvement faces various challenges for global economic competition. Business models focus on providing products and services that are profitable today, but also try to identify changes in offers that will keep the company profitable in the future. A useful tool in strategic management, which has been used to analyze the environment of an economic unit and to suggest more resource allocation strategies based on the growth rate of the industry and the market force of the organization is the Boston Consulting Group matrix. Also known as the growth quota matrix, the BCG matrix provides a framework for analyzing products based on growth and market share. It is used to help companies obtain information about products that would best help capitalize on market share opportunities.

Boston Consulting Group helps companies increase their efficiency in terms of successful business activities. To this end, the matrix plays an important role because it is a useful tool for strategic product performance planning at industry and company level. The matrix was introduced in 1970 by Bruce Doolin Henderson, president and CEO of Boston Consulting

Group, and has since been used by many corporations to improve their ability to run their business efficiently and profitably.

To help companies analyze their assets in the medium and long term, the BCG matrix segments products into four classes/quadrants:

Figure 1. Example of Boston Consulting Group Matrix



Source: The design is done by the authors.

Dilemmas or Question Marks: Indicates products with high market growth and low market share.

The Stars quadrant shows that both the growth of the market and the market share reach high values.

The Cash Cows dial is formed when market growth is low, but the market share remains high.

The Dogs/Millstones quadrant shows that the products in this class have a small market share and an almost insignificant market growth.

According to Temmerman (2011), the BCG matrix provides a simple two-dimensional analysis of strategic business units such as industry growth rate and relative market share. The vertical axis represents the growth rate of the industry, and the relative share on the horizontal axis.

For a concrete explanation of the matrix, we will represent in the figure below five products in the quadrants of the matrix, according to the market shares and the related growth rates. To build the matrix it is necessary to know several notions such as market growth, relative market share and market share.

In the figure above you can see that the products were divided into the following categories: Dilemma (Product 4), Star (Product 3), Cash Cows (Product 2) and Dogs/Millstones (Product 1 and Product 5).

The analyzes will be based on the following premises:

- Market share can be obtained through investments in the marketing sector.
- Market share gains will always create cash surpluses.
- Excess cash is generated when the product is in the maturity stage of the life cycle.
- The best opportunity to build a dominant position in the market is in the growth phase.

Dilemmas or question marks form the quadrant that collects business units that have a small market share in a high-growth market. These units do not try to manage a lot of cash in their industry and the products in this class, such as product 4, are called question marks or dilemmas because the organization has to decide whether to invest in them using a rigorous strategy such as market access, market development or product development, or eliminate them because these products can either be turned into star products or move into the millstone dial. Although the product 4, according to the matrix, has a high demand, the realized profit is small due to the reduced market share. There is no clear strategy for this business. In reality, most businesses start out in question because companies are trying to enter a high-growth market with no market share. If dilemma products are ignored, they become millstones but, on the other hand, have the potential to become stars and eventually dairy cows when market growth slows.

The products in the star quadrant are indicated by obtaining a large market share in a fast-growing market. According to the literature, these are considered the best opportunities for the growth and benefits of the company. The stars are business leaders, but they still need a lot of support. In this regard, they create large sums of cash to support a strong market share. In our example, product 3 is a star product. With this product, the organization makes real money. When the market share becomes very high, the industry matures and the market growth rate decreases and the star product turns into a cash cow.

Cash cows are the quadrant of products that have a large market share in a mature period of a slow-growing industry. This dial is called cash or milking cows because it produces excess cash over the needs of these products. They require very little investment and create significant cash to grow other businesses. According to the above matrix, product 2 is a cash cow product. Its development is an attractive strategy to gain a competitive advantage. Even capital reinvestment is necessary to maintain the current market share. Many products in this dial have been stars in the past. Although cash cows are less attractive in terms of growth, they are valuable in an enterprise.

The class of millstones or dogs are business procedures that have weak growing market shares and cannot generate a large amount of cash due to weak business strategies. Both product 1 and product 5 are in this dial. They face disadvantages caused by the costs of a small market, their poor quality or inefficient marketing. According to the literature, these products are often liquidated or reduced. To avoid this, these products need to start distributing cash.

The BCG matrix needs a systematic classification rule, being an exploratory analysis tool based on interactions, so as to obtain the consensus between different managers and the analysis of the personalized classification scenario. The matrix provides recommendations for the development of strategic resource allocation and strategy development in the typical multi-business company. It is argued that relative competitive position and growth are the two fundamental parameters that must be taken into account when determining the strategy that an individual business must follow when viewed in the context of the company's overall business portfolio.

4. Case study: Diagnosis and analysis of key performance indicators in Adobe

Adobe Inc. is an international software company that aims to provide the tools and solutions needed to create, design and deliver the best digital experience for its customers. The analyzed company represents one of the main players in this industry with a turnover of over 11 billion USD (2019) and over 20,000 employees globally (2020).

Adobe Inc. (formerly Adobe Systems Inc.) was founded in 1982 by John Warnock and Charles Geschke in Mountain View, California. The founders decided to start this company to bring the PostScript language to market because their previous employer, Xerox, did not want to do so. Steve Jobs wanted to buy Adobe, but the founders turned down the option. However, Jobs managed to buy 19% of the company's shares at a price 5 times the actual valuation and a 5-year, pre-paid PostScript license. Thus, Adobe became the first company in the Silicon Valley area to make a profit in its first year of operation. PostScript was later used in laser printing and dominated the market in the publishing industry. The company was listed on the US NASDAQ in 1986 and launched the PDF document format in 1993. In 1996, the company moved its headquarters to San Jose, California. Over the years, Adobe has distributed creative software either developed in-house or taken over through the acquisition of certain companies. Many of these software products are famous, such as Acrobat Reader, Photoshop and Creative Cloud. The company currently has offices in more than 25 countries, more than 20,000 employees globally and a turnover of more than \$ 11 billion in 2019 alone.

4.1. Product history

The first products that Adobe hit were the PostScript language and the PDF format based on that language. The company provided PostScript licenses to other printing companies, and soon after became one of the main languages used for printing in the 1990s. The PDF file format was created to store all the information needed to display any document on any type of personal computer. Adobe later turned PDF into a free standard that was adopted internationally in 2008 and is now the basic format for all shareable documents.

Adobe began launching creative software in the late 1980s with its main creative product, Photoshop. This product was intended for use in graphics and image manipulation and soon dominated the market after its launch in 1989. Other popular products were launched in the following years: Premiere in 1991, Acrobat Reader in 1993, After Effects in 1994 and Dreamweaver in 2005. It is noteworthy that some of Adobe's products have been taken

over from the acquisition of its competitors. In 2003, Adobe released Creative Suite 1 (CS1), a suite of creative activity applications bundled together to pay the one-time license. Adobe continued to sell software suites until the CS6 version in April 2012. This business model allowed Adobe to sell not only software licenses, but also software suites.

A radical transformation was made by Adobe by launching Adobe Creative Cloud in 2012 to move from a license-based business model to a monthly subscription. The paradigm shift was abrupt as subscription-based models were relatively unknown to the market at the time. In May 2013, Creative Cloud was announced as the main access platform for its creative products and that individual products and suites will no longer be sold. Nearly 3 years after its launch, Creative Cloud accounted for 75% of the company's revenue, valued at approximately \$ 3 billion, and in 2019 sales were \$ 7.2 billion, or approximately 63% of revenue for this year.

With the advent of new technologies such as artificial intelligence (AI), virtual reality (VR) and the Internet of Things (IoT), Adobe has improved its existing products to better serve its customers in these areas. Updates have recently been released for Premiere and After Effects programs that use artificial intelligence to match colors and audio volume. Improvements have also been added for creating virtual reality applications. Adobe has also implemented a software program that allows companies to track user activity across multiple types of devices, giving them a personalized experience. Until then, this aspect was not known, and companies continued to show users the same ads for a long time.

Creative Cloud is Adobe's software creation and design suite that is based on a monthly subscription. It is intended for those who have these activities as hobbies, but also for industry professionals. The purpose of this product family is to be the best software for photo, video, graphics and content creation.

Experience Cloud is the software suite used for marketing and advertising. It is aimed at companies that want better tools for customer interaction by providing solutions for advertising, analysis, content, data management and marketing campaigns.

Document Cloud is a set of tools focused on working with PDF documents. This suite is aimed at businesses, but certain features are also available to the general public. Its purpose is to better interact and manage PDF documents through features such as editing, commenting and signing them.

4.2. Market position

Adobe operates in three sectors: Digital Media, Digital Experience and Publishing. The first two of these are part of the company's long-term growth and represent the areas in which it aims to attract investment and create solutions for the market.

The Digital Media sector is Adobe's most profitable and active area, providing solutions and tools that enable individual consumers, but also small and medium-sized businesses to create, publish, promote and monetize their content in digital form. It is the segment in which the Creative Cloud and Document Cloud products are found, with revenues of 7.71 billion USD in 2019, representing 69% of this year's turnover.

The Digital Experience industry is Adobe's second line of business. Here is the Experience Cloud product. The services and solutions in this segment aim at creating, managing, executing, measuring and optimizing digital advertising and marketing activities. This sector recorded revenues of 3.21 billion USD in 2019, i.e. 28.7% of turnover.

The publishing industry is Adobe's smallest market segment. It addresses the opportunities that have arisen in connection with the authorization and publication needs related to the technical and business aspects of companies. For 2019, revenues of USD 257 million were recorded here, representing 2.3% of total revenues.

Figure 2. Share of revenues of each sector in turnover

		f	2019	f	2018	f	2017	f	2016	f	2015	f	2014	f	2013
+	Digital Media NAICS: 51121		69%		70%		69%		67%		65%		63%		65%
+	Digital Experience NAICS: 51121		29%		27%		28%		30%		31%		33%		30%
+	Publishing NAICS: 51121		2.3%		2.9%		3.6%		3.0%		4.0%		4.5%		4.9%

Source: Refinitiv Eikon Thomson Reuters.

4.3. SWOT Analysis

Strength points:

- Global presence: Adobe has a diverse global presence in countries in Europe, Asia, North America and South America. Its distribution channels are represented by retailers, independent software vendors and original equipment manufacturers.
- Successful transition to the subscription-based business model: Adobe started with a renewable license-based business model and then introduced the subscription-based model. The company introduced the Adobe Creative Cloud platform, replacing Adobe Creative Suite. This transition has led to an increase in recurring annual income, helping to maintain the stability of its main source of income.
- Large portfolio: Adobe provides a wide range of products and services in the digital media and digital marketing segments. They are available to customers such as businesses, freelancers, marketers or individual consumers.
- Perfect in design: No other graphic design software on the market compares to Adobe Photoshop. Adobe also provides specialized products for different niches, such as the gaming, video or media industries, or web development.
- Trustworthy: Adobe products have proven to be reliable, and the brand has proven that it can get the job done. Adobe has been on the market for decades and has slowly but surely gained significant market share for design software products.

Weaknesses:

- Significant debts: At the end of fiscal year 2019, Adobe had debts of \$ 4.1 billion. These debts require a large part of the capital flow and limit the flexibility in terms of planning and responding to changes in the market.
- General feedback: Over time, users have complained that Adobe does not take their requirements into account when launching new software products.
- Relatively expensive subscriptions: Adobe creative and design software packages may be considered too expensive by some customers, making them less attractive to them. It applies in particular to emerging markets such as Eastern Europe, Asia and South America.

- Weak presence on the video animation market: Adobe has a very weak presence in the 3D video animation market, which is dominated by the products of its competitors 3ds Max and Sony Vegas. In this area, Adobe operates on the market with Adobe Premiere Pro, but is not as specialized in the development of three-dimensional structures such as 3ds Max or Sony Vegas.

Opportunities:

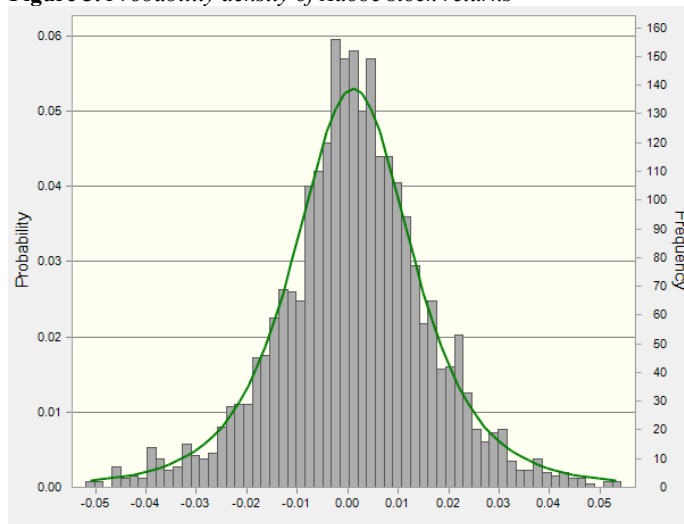
- Promising prospects for cloud computing: The demand for cloud computing services is growing compared to previous years. This is influenced by capital and reduced operating costs, resulting from a subscription-based model that contains only the services requested by the customer.
- Growth in the digital marketing sector: Expenditure on digital marketing has increased globally due to the widespread adoption of mobile phones and internet access. Adobe is looking to increase its revenue from cloud marketing solutions.
- Partnership with Microsoft: Adobe and Microsoft have formed a strategic partnership to help each other in their digital transformation efforts. Thus, Microsoft Azure became Adobe's main cloud platform, and Adobe Marketing Cloud, Adobe Document Cloud and Adobe Creative Cloud were chosen as the main creation and design tools by Microsoft. Thus, Adobe will have a richer customer base by increasing the sales of its top products.

Threats:

- Piracy: Adobe's main threat is piracy of its software products due to torrent sites and illegal downloads of older versions available on the Internet. In emerging markets (Eastern Europe, Asia, South America), piracy in particular is reaching astronomical levels.
- Free software: There are several free design software products available on the market. GIMP is a good alternative to Photoshop for amateur designers. There are also free alternatives to Dreamweaver or other Adobe products. Free software products are not generally used by professionals for commercial purposes, but they capture a large part of the market share.
- Competition: Adobe products and services are in intense global competition. Innovative technologies have allowed other participants to perform in the market, increasing competition. This can lead to price competition, which has a negative impact on Adobe's profit.
- Security threats: Adobe has confidential information about its customers, which has always been a target for hackers. Computer attacks also constantly damage the system. These potential security breaches will need to be taken seriously by Adobe to keep the brand image on a positive note.

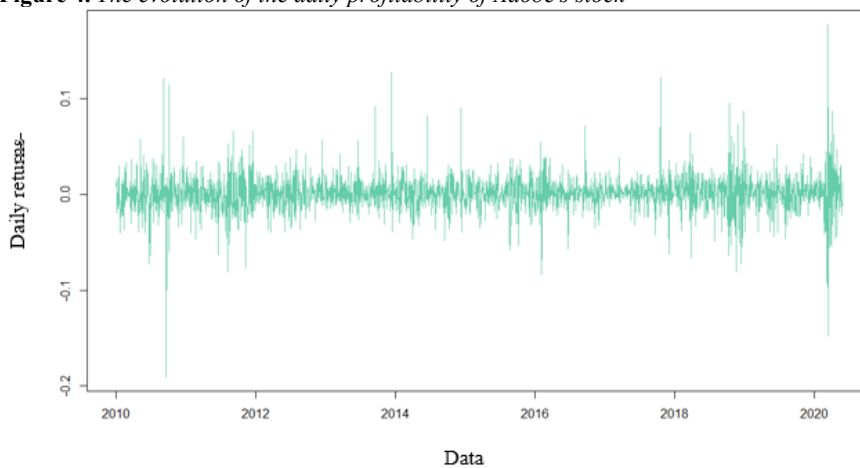
4.4. Analysis of key performance indicators of Adobe

To perform this analysis, we used Adobe share price data from January 4, 2010 to May 28, 2020, and based on these we determined the daily returns, average returns, risk and Sharpe rate. These indicators will be detailed and interpreted below.

Figure 3. Probability density of Adobe stock returns

Source: Processing authors in Crystal Ball.

The daily returns of the Adobe stock are best represented as a Student t distribution. This classification was based on the Anderson-Darling statistical index, in this case a value of 0.8331, i.e. the Student t distribution is true for specific data daily returns. Moreover, from the analysis of the histogram, the asymmetry coefficient is 0.07, so we have an almost perfectly symmetrical distribution, and the flattening coefficient is 16.02, i.e. the distribution is leptokurtic, so that, in general, recorded small daily variations, with increases and decreases in price around 1%.

Figure 4. The evolution of the daily profitability of Adobe's stock

Source: Processing authors in R Studio.

Thus, based on the correlation and the Augmented Dickey-Fuller stationarity test, found in Figure A.1. (Appendix A), we can conclude that the profitability of the Adobe share is

presented in the form of a stationary time series. At the same time, the most significant price movements were in the following data:

▪ **September 22, 2010**

An Adobe board conference call was held on September 21, highlighting the weak sales of the Creative Suite 5 software package and the declining adoption of Adobe products in Japanese education, a very important segment for Adobe. This event had the effect of lowering the share price by 19% the next day.

▪ **March 13, 2020**

The share price of Adobe was forecast to rise to \$ 375 next month by analysts at JP Morgan Chase, which resulted in a positive outlook for investors, which led to a 17% increase in the share price the next day.

▪ **March 16, 2020**

An analysis conducted by Wells Fargo & Co. estimated that it expects a drop from \$ 335 to \$ 315, but this had an even greater effect as investors decided to sell the shares in even greater numbers, resulting in a price of \$ 286 and a 15% decrease for the next day.

Figure 5. *The evolution of the annual profitability of the Adobe share*

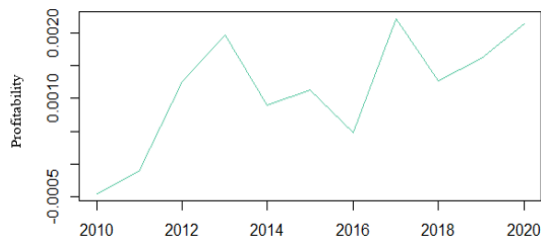


Figure 6. *The evolution of the annual risk of Adobe's action*

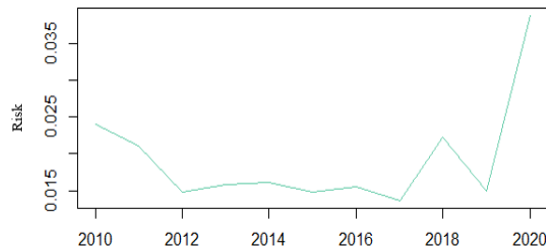
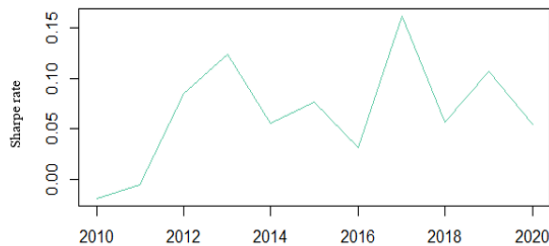


Figure 7. *Evolution of the annual Sharpe rate of Adobe stock*

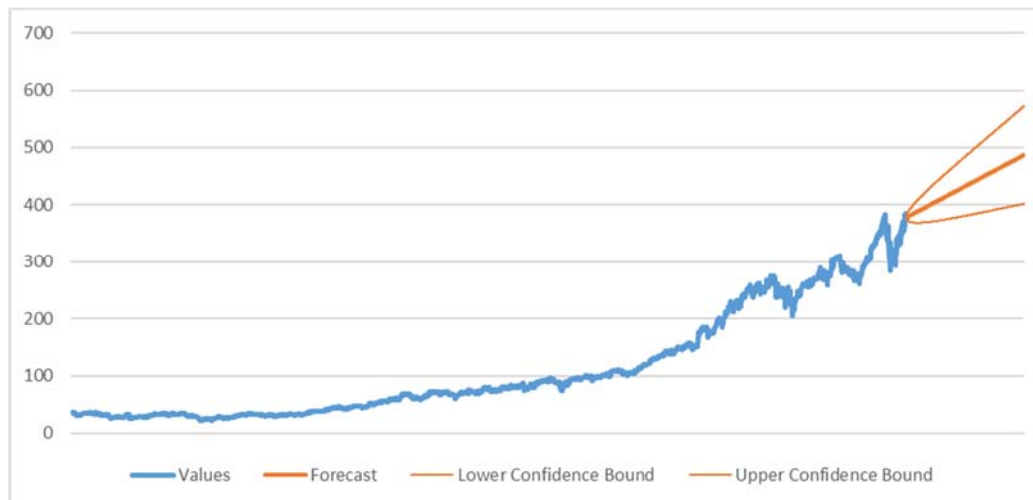


Source for Figures 5, 6 and 7: Processing authors in R Studio.

The previous graphs show the evolution of the average annual returns, the annual risk and the annual Sharpe rate from 2010 to 2019 specific to Adobe. There is a close correlation between the evolution of the average annual profitability and the annual Sharpe rate. We also see some increases in average profitability in 2013 (due to the change in the subscription-based business model, replacing the model based on annual licenses) and 2017 (experiencing one of the largest annual increases in revenue, 25% as following the explosion of the digital media sector, on which the company relies most). Regarding the company's risk (volatility), until 2019 it remained at a stable rate of approximately 1%. In addition, the year 2020 started in full force, but with the start of March, the actions started to decrease dramatically as a result of the crisis caused by the COVID-19 virus in March and April. However, things started to return to normal in May, when policies were adopted that involve employees being able to work remotely for an indefinite period, thus facilitating the development and maintenance of Adobe solutions and further ensuring a pleasant customer experience.

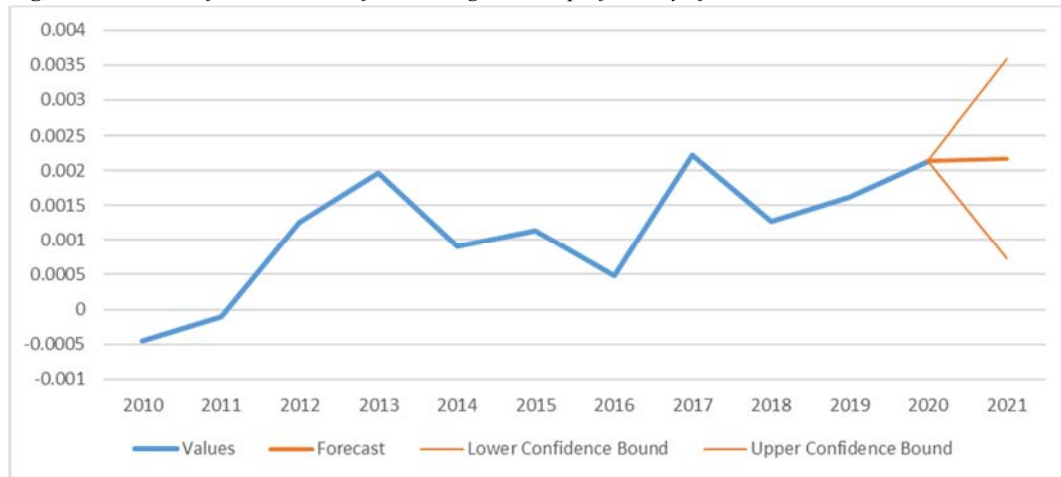
We also made some predictions regarding the price of the Adobe stock and the indicators presented. The stock price forecast was made on the basis of data from 1 January 2010 to 29 May 2020 for 30 May 2020 to 30 May 2021, using the simple exponential smoothing method, and the limits were set, based on a confidence interval of 95%. Thus, given the following figure, the price of the Adobe stock would have an upward trend, reaching \$ 487 at the end of the period, with a range of \$ 401.88 - \$ 572.14 (Figure 8).

Figure 8. Forecast of Adobe stock price evolution



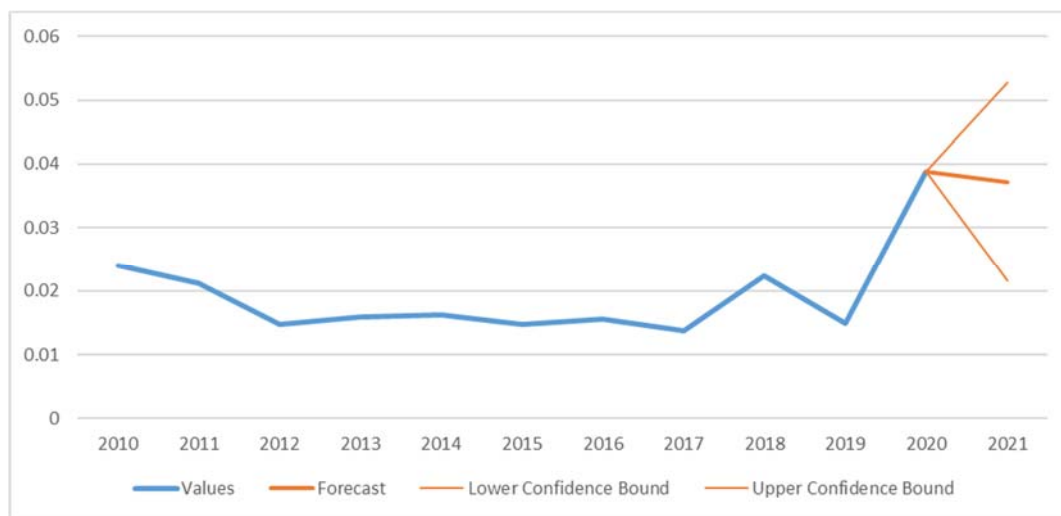
The forecast for the average return on Adobe shares in 2021 is estimated at 0.0021, with a probability of 95%, a stable value in relation to historical data, the confidence interval being 0.0075-0.0035 (Figure 9).

Figure 9. Forecast of the evolution of the average annual profitability of Adobe's stock

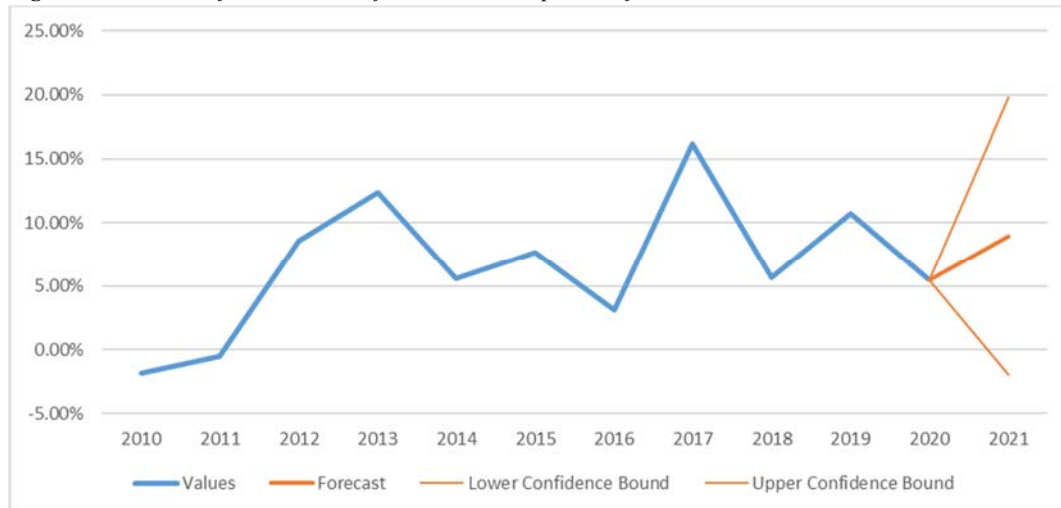


The risk for 2021 was estimated at 0.047, also with a probability of 95%, having as limits the range 0.022-0.052. Thus, it can be said that the risk is generally expected to be lower than in 2020, which may be an incentive to buy Adobe shares (Figure 10).

Figure 10. Forecast of the evolution of the annual risk of Adobe's action



Regarding the Sharpe rate, it was estimated at 9% for 2021, with a probability of 95%, falling between the limits -2% - 20%. Considering the above about the average annual return and the annual risk, the Sharpe rate is indeed an optimistic forecast for a potential buyer (Figure 11).

Figure 11. Forecast of the evolution of the annual Sharpe rate of Adobe stock

5. Conclusions

Performance analysis is one of the main concerns of a company's management, because only by analyzing the activity and identifying problems in the processes can maximize profit. Thus, it is necessary to select the most appropriate methods according to the company's objectives.

This research illustrated the purpose of performance management which has the role of creating and developing an organizational structure capable of achieving it, stimulating consistent decisions and ensuring the convergence of different objectives of the company to established performance indicators.

When analyzing the performance of a company, you must take into account three basic notions: economy (procuring the necessary resources at the lowest cost), efficiency (maximizing the results obtained, starting from a given amount of resources, or minimizing the amount of resources for a predetermined result) and effectiveness (the results obtained to achieve the expected results).

Living in an age of digitalization in which the world is changing and adapting to the complex systems of society, businesses must always be prepared with the tools necessary for adaptation.

The need to identify useful tools that would help improve or increase performance is relevant and of great interest to all organizations. Experiencing a world in which we are surrounded by a multitude of data, the need to maintain the strategic direction set by a company, to reduce the uncertainty of making the right decisions, exists.

KPIs should be understood and used there and when needed and help to complete the performance management framework. In this research, several key performance indicators were chosen to create a first view of Adobe's performance management.

The second part of the case study completes the first part of it, building a complex research to make a diagnosis of Adobe. The analysis and diagnostic techniques highlighted the very favorable ecosystem for the company, especially from a social and economic point of view, which strengthens Adobe's position as an important player in the digital and cloud technologies market. According to the analysis of key indicators, the company's profitability is also on an upward trend and is expected to follow this trend in the next two years.

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Appendix A

Figure A.1. Time series stationary analysis using correlation and Augmented Dickey-Fuller test

Date: 06/15/20 Time: 23:04
 Sample: 1/04/2010 5/28/2020
 Included observations: 2618

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob	
		1 -0.144	-0.144	54.349	0.000	Null Hypothesis: RENTABILITATE has a unit root
		2 0.022	0.002	55.662	0.000	Exogenous: Constant
		3 -0.004	-0.000	55.695	0.000	Lag Length: 0 (Automatic - based on SIC, maxlag=27)
		4 -0.033	-0.034	58.515	0.000	
		5 -0.007	-0.017	58.642	0.000	t-Statistic
		6 -0.049	-0.053	65.075	0.000	Augmented Dickey-Fuller test statistic
		7 0.043	0.029	69.883	0.000	-59.11574
		8 -0.063	-0.055	80.405	0.000	0.0001
		9 0.047	0.029	86.225	0.000	Test critical values:
		10 -0.016	-0.008	86.914	0.000	1% level
		11 -0.008	-0.012	87.098	0.000	5% level
		12 0.032	0.025	89.829	0.000	10% level
		13 -0.069	-0.059	102.45	0.000	
		14 0.012	-0.012	102.86	0.000	*MacKinnon (1996) one-sided p-values.
		15 -0.039	-0.033	106.80	0.000	Augmented Dickey-Fuller Test Equation
		16 0.064	0.051	117.63	0.000	Dependent Variable: D(RENTABILITATE)
		17 -0.020	-0.004	118.70	0.000	Method: Least Squares
		18 -0.004	-0.010	118.74	0.000	Date: 06/15/20 Time: 23:01
		19 0.001	-0.011	118.74	0.000	Sample (adjusted): 1/05/2010 5/28/2020
		20 -0.037	-0.030	122.31	0.000	Included observations: 2617 after adjustments
		21 0.032	0.014	125.06	0.000	
		22 -0.051	-0.035	131.84	0.000	Variable
		23 0.037	0.017	135.44	0.000	Coefficient
		24 -0.001	0.011	135.44	0.000	Std. Error
		25 0.007	0.006	135.57	0.000	t-Statistic
		26 -0.016	-0.023	136.27	0.000	Prob.
		27 0.003	0.002	136.29	0.000	RENTABILITATE(-1)
		28 0.021	0.009	137.42	0.000	-1.144020
		29 -0.030	-0.010	139.75	0.000	0.001223
		30 0.019	0.004	140.71	0.000	0.019352
		31 -0.054	-0.046	148.50	0.000	0.000367
		32 0.031	0.013	151.07	0.000	3.329992
		33 0.006	0.009	151.17	0.000	0.0000
		34 -0.016	-0.011	151.86	0.000	R-squared
		35 0.009	-0.006	152.05	0.000	0.571990
		36 -0.006	0.003	152.16	0.000	0.571826
						Mean dependent var
						1.53E-06
						S.D. dependent var
						0.028659
						S.E. of regression
						0.018753
						Akaike info criterion
						-5.114149
						Sum squared resid
						0.919642
						Schwarz criterion
						-5.109663
						Log likelihood
						6693.864
						Hannan-Quinn criter.
						-5.112524
						F-statistic
						3494.670
						Durbin-Watson stat
						1.999362
						Prob(F-statistic)
						0.000000

Source: Authors computation.