



Performance and sustainability assessment of listed companies

A comparative study between Portugal and Brazil

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Abstract

In a context of multiple recent financial crisis, bankruptcy has become common and it's study a vital issue in corporate finance, since it constitutes a legal mechanism that allows creditors to take control when a company default (Brealey, 2020). As a consequence, the importance of deepening the investigation about a company's performance and financial continuity becomes evident, aiming at measuring corporate operational and financial risks, and verifying the overall financial health and sustainability of companies.

This dissertation seeks to carry out a comprehensive bibliographic review on the concepts and main indicators of business performance and financial sustainability, as well as to apply the content obtained in a comparative study between selected samples of public listed companies of Portugal and Brazil, with a focus on the Construction, Communication and Pulp & Paper sectors.

This work explores the meaning of performance and sustainability inside a business context, as well as the main concepts that are related to these subjects, conducts the collection and study of the most relevant indicators and methods to evaluate the performance and the sustainability of the public listed companies, and finally carries out the implementation of this knowledge using economic and financial information of each corporation selected, being able to draw comparisons inside the geographical, sectoral and temporal dimensions.

It was found that, although very different situations could be observed between companies inside same countries (and therefore same economic, political, cultural, social contexts) and sectors of activity, related to their internal situation, the macroeconomic environment exerts very relevant influences on the economic and financial performance of these corporations, as well as the nature of their activities (sector), have significant impacts on their capital and financial structures.

In relation to the Construction sector, the major difference between Brazil and Portugal's situation was brought by a sector-specific crisis in the first country, caused by a bribery scandal inside one major corporation of this sector, in 2016, that placed Brazilian Construction companies in a more difficult situation for the period analyzed. As for the Pulp & Paper sector, a significant deterioration of the Brazilian sample could also be observed between 2017 and 2020, related to the political and economic turmoil of the country during this period, with higher impacts felt by the industrial sector. Finally, in relation to the Communications sector, which depicts the situation of a service-oriented segment, a common decline in both countries' metrics was witnessed in 2019 and 2020. However, a more favorable circumstance for the Brazilian sample was observed in almost all dimensions, through the 10 fiscal years analyzed.

Keywords: Performance, sustainability, going concern, financial, companies, bankruptcy

Resumo

Num contexto das recentes e múltiplas crises financeiras, a falência tornou-se comum e o seu estudo vital dentro das finanças empresariais, na medida em que constitui um mecanismo legal que permite que os credores tomem o controlo quando uma empresa se torna inadimplente (Brealey, 2020). Como consequência, a importância de aprofundar o estudo e realizar análises sobre a *performance* e continuidade financeira empresarial torna-se evidente, procurando mensurar riscos empresariais operacionais e financeiros, e observar a sustentabilidade das empresas.

Esta dissertação procura realizar uma abrangente revisão da literatura sobre os conceitos e principais indicadores relacionados com a *performance* e à sustentabilidade financeira de empresas, assim como aplicar o conteúdo obtido num estudo comparado entre as empresas cotadas em Portugal e no Brasil, com foco em particular para os setores de Construção, Comunicações e Papel e Celulose.

Este trabalho explora o significado de desempenho e sustentabilidade dentro do contexto empresarial, bem como os principais conceitos relacionados, realiza a recolha e estudo dos indicadores e métodos mais relevantes na avaliação do desempenho e da sustentabilidade empresariais, e por fim, conduz a implementação deste conhecimento a partir das informações económico-financeiras de cada empresa seleccionada, sendo capaz de traçar comparações dentro das dimensões geográfica, sectorial e temporal.

Constatou-se que, embora possam ser observadas situações bastante distintas entre empresas dentro de um mesmo país (e, portanto, do mesmo contexto económico, político, cultural, social) e setores de atividade, em relação à sua situação interna, o ambiente macroeconómico exerce influências muito relevantes sobre o desempenho económico-financeiro das empresas, bem como a natureza das suas actividades (sector), têm impactos significativos sobre os suas estruturas de capitais e financeiras.

Em relação ao setor da Construção, a grande diferença entre a situação do Brasil e de Portugal foi trazida por uma crise setorial no primeiro país, causada por um escândalo de subornos numa grande empresa do setor, em 2016, que colocou as construtoras brasileiras numa situação mais difícil para o período analisado. Quanto ao setor de Papel e Celulose, também foi observada uma deterioração significativa da amostra brasileira entre 2017 e 2020, relacionada à turbulência política e económica do país nesse período, com maiores impactos sentidos pelo setor industrial. Por fim, em relação ao setor de Comunicações, que retrata a situação de um segmento voltado para serviços, observou-se declínio comum nas métricas de ambos os países em 2019 e 2020. No entanto, uma circunstância mais favorável para a amostra brasileira foi observada em quase todas as dimensões, ao longo dos 10 anos fiscais analisados.

Palavras-chave: Performance, sustentabilidade, continuidade, financeiro, empresas, falência

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List of Abbreviations

BADF – *Bases para a Apresentação de Demonstrações Financeiras* (Bases for Presentation of Financial Statements)

CCI – *Código de Contribuição Industrial* (Industrial Contribution Code)

CFC – *Conselho Federal de Contabilidade* (Federal Accounting Council)

CRCs – *Conselhos Regionais de Contabilidade* (Regional Accounting Councils)

CS – Corporate Sustainability

CVM – *Comissão de Valores Mobiliários* (Securities and Exchange Commission)

EBIT – Earnings Before Interest and Taxes

EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization

Er – Expected Return

EVA – Economic Value Added

FY – Fiscal Year

GDP – Gross Domestic Product

IASB – International Accounting Standards Board

IFRS – International Financial Reporting Standards

H – Healthy

LT – Long-term

MVA – Market Value Added

NOPAT – Net Operating Profit After Taxes

N – Non-healthy

NPS – Net Promoter Score

NWC – Net Working Capital

POC – *Plano Oficial de Contabilidade* (Official Accounting Plan) (POC)

ROA – Return on Assets

ROC – Return on Capital

ROE – Return on Equity

ROIC – Return on Invested Capital

SNC – *Sistema de Normalização Contabilística* (Accounting Standardization System)

ST – Short-term

STI – Short-term Investments

1 Introduction

The global financial crisis of 2007-2008 resulted from a long period of generous and permissive credit policies and where the guarantees given and the real capacity to settle the debt with creditors were evaluated with little rigor, marked the beginning of a period where credit is not only very expensive but also scarce (Peres, 2014).

Subsequently, a series of financial sector bailouts in 2008 sparked a full-blown sovereign debt crisis in Europe, and sovereign credit risk, which was virtually non-existent in developed economies prior to 2007, became a major concern (Kräussl, Lehnert and Stefanova, 2016).

The European sovereign debt crisis brought several lasting implications for the financial market in the euro area. First, it led to a major setback in the financial integration goal of the Eurozone. The intra-euro flight of private capital out of stressed countries left deeply fragmented equity and corporate bond markets. Second, the sovereign debt crisis had a deep impact on the value of the common currency, contributing significantly to the euro crash risk and challenging the stability of the monetary union (Kräussl, Lehnert and Stefanova, 2016).

Currently, the world faces another global economic crisis that started in 2020, due to the pandemic of Coronavirus (Covid-19), threatening the activities of several companies around the world and generating uncertainty regarding the healthy continuity of the markets (Aifuwa, Saidu & Aifuwa, 2020; Musa & Aifuwa, 2020).

In this context, the going concern, or more specifically, the bankruptcy has become a vital issue in corporate finance, constituting a legal mechanism that allows creditors to take control when a company default (Brealey, 2020).

Therefore, the importance of deepening the study and making analysis of a company's performance and financial continuity becomes evident, aiming at measuring corporate operational and financial risks, and verifying the sustainability of companies.

This work aims to study those themes and apply the content obtained, through financial indicators and predictive models, evaluating a group of public listed companies in Portugal (Euronext Lisbon) and Brazil (B3).

2 Problem definition and objectives

This dissertation seeks to carry out a comprehensive review of the bibliography on the concepts and main indicators of business performance and financial sustainability, as well as to apply the content obtained in a comparative study between public listed companies of Portugal and Brazil, with a focus on the Construction, Communications and Pulp and Paper sectors.

It seeks to answer the following main questions:

- I. What does performance and sustainability mean inside a business context, and what main concepts are related to these subjects?
- II. Which are the most relevant indicators and methods to evaluate the performance and the sustainability of the public listed companies in question?
- III. What is the current situation of the companies analyzed compared to their own past and to their competitors?
- IV. Are there any significant differences between similar companies or business sectors in Portugal and Brazil?

3 Literature review

3.1 Accounting

Accounting is a social-factual science, and its social nature is reflected in the concern with understanding the way in which individuals create, modify, and interpret accounting phenomena, about which they inform their users (Schmidt, 1998). In this way, Accounting is influenced by the environment in which it operates, and the different cultures, values, histories, economic and political structures influence the accounting practices of each country.

In Brazil, a landmark in the country's accounting history occurred in 1946, when Decree-Law No. 9,295 was enacted, which determined the creation of the Federal Accounting Council (CFC) and the Regional Accounting Councils (CRCs), intended to supervise the practice of the professions of accountant (Bachelor of Accounting) and bookkeeper (accounting technician). (Hermes, 1986).

In 1976, Law No. 6,404, known as the Brazilian Corporation Law (*Lei das Sociedades por Ações*), was passed, initiating a new phase in the history of national accounting with the introduction of revaluation at market value, the creation of the unrealized profit reserve, the separation between commercial accounting and tax Accounting, and the consolidation of the financial statements of the same group, or of investments in companies considered as controlled. (Bugarim and Oliveira, 2014).

In the same year, the Securities and Exchange Commission (CVM) was created, with the objective of inspecting, regulating, disciplining, and developing the securities market in Brazil, and regulated by Law No. 6,385 / 1976. (Silva and Martins, 2006)

Later, in 1981, through Resolution CFC nº 530/81, the Federal Accounting Council approved the Brazilian Accounting Standards, which, in turn, in 1993, were renamed "Fundamental Accounting Principles" by Resolution CFC nº 750 / 93, concretely consisting of the principles of the Entity, Continuity (Going Concern), Opportunity, Registration at Original Value, Competence, Prudence and Monetary Update - the latter being revoked by Resolution CFC nº. 1,282 / 2010. These principles support the essence of the doctrines and theories related to Accounting Science in the country and are detailed in Table 1.

In order to modernize and harmonize the provisions of Brazilian corporate law with the best international practices, in 2007 Law 11,638 was published, which reformulated the accounting portion of the Brazilian Corporate Law (Law 6,404 / 1976), in order to meet the need for greater transparency and quality of accounting information.

In Brazil, the convergence towards international accounting standards had as a legal landmark the enactment of this legislation, that explicitly determined the adoption of international accounting standards in the Brazilian regulatory framework (Bugarim and Oliveira, 2014), or, in other words, through the gradual adoption of the standards issued by the International Accounting Standards Board (IASB), known as International Financial Reporting Standards (IFRS), which was already occurring in more than 100 countries, including all the nations of the European Community (Braga and Almeida, 2008).

As in Brazil, the accounting standardization process in Portugal only started in the middle of the 20th century, and went through the following stages: (Guimarães, 2011):

- I. Approval of the Industrial Contribution Code (CCI), in 1963;
- II. Approval of the first Official Accounting Plan (POC), in 1977;
- III. POC approval in its second version, adjusted in 1989;
- IV. Approval of the Accounting Standardization System (SNC), in 2009.
- V. Reformulation of the SNC through the publication of Decree-Law No. 98/2015, on June 2nd. (Saraiva, Alves and Gabriel, 2015).

The first stage of normalization in Portugal begins with the approval of the CCI, which has become the basis for calculating the real profit of companies, with reference also being made, for the first time, to accounting professionals - designated as "accountants". Being active until 1988, and from 1929 until the date of its creation, the taxation of companies was carried out based on the presumed profits, passing with its introduction, to be carried out based on the real profit, reinforcing the relevant role of accounting (Saraiva, Alves and Gabriel, 2015)

The first Official Accounting Plan (POC) was created in 1974, approved by Decree-Law 47/1977. In addition to marking the second stage of the standardization process, it established the future creation of the Accounting Standardization Commission (CNC), with the objective of monitoring and perfecting it. CNC, created in 1980, with the definition of its respective attributions, organization, and operation system; however, it was not actually created until 1983. (Saraiva, Alves and Gabriel, 2015).

The third stage emerged with the publication of Decree-Law 410/89, revoking Decree-Law 47/77 and other complementary legislation, based on the introduction of changes related to Portugal's accession to the European Union. The new POC applied to entities covered by the Commercial Companies Code, excluding banks, insurance companies and entities in the financial sector.

In European terms, with the publication by the EU of Regulations 1606/2002 and 1725/2003, Portugal came to establish that only listed companies use IAS / IFRS, allowing unlisted companies to continue using national standards. However, all companies, whether listed or not, should continue to draw up their accounts in accordance with national rules, for taxation purposes, with some companies having to draw up two systems of records in parallel.

The need for a new Accounting Standardization System (SNC) was due to the recognized insufficiency of the POC, in relation to the entities with the highest qualitative requirements, in terms of financial reporting, and to the fact that it lacked technical review, regarding aspects of conceptual nature, namely valuation criteria, concepts of assets, liabilities and results, since the IASB and POC rules were not consistent with each other. (Saraiva, Alves and Gabriel, 2015).

Thus, in 2009, the fourth stage of accounting standardization in Portugal began, with the publication of Decree-Law 158/2009, which approved the SNC and other complementary legislation. After the

introduction of the first POC, the introduction of the SNC was the most relevant and significant change in Portuguese accounting standardization, being a model based on the IASB regulations, but guaranteeing compatibility with the Community Directives (Saraiva, Alves and Gabriel, 2015).

The fifth stage starts in 2015, through Decree-Law nº 98/2015, and implies the redefinition of the concept of Micro Entities, Small Entities and Large Entities, as well as the classification of economic groups and groups of large, medium, and small dimension (Saraiva, Alves and Gabriel, 2015). In addition, it recognizes the subscribed share capital as a constituent of Equity, and subscriptions receivable as a constituent of Assets (Macedo, 2017).

In conclusion, it is possible to observe that, despite having different processes for the formation of accounting standards and practices, both Brazil and Portugal currently adopt an accountability process closely linked to the international standards of the IASB, especially when related to non-financial listed companies - a fact that facilitates the comparison between the financial reports of companies from these two countries. It is also relevant to observe, that, as show in Table 1, a lot of similarities can be found between the accounting principles of Brazil and Portugal.

Table 1: Comparative framework of Accounting Principles - Brazil and Portugal (Source: own elaboration)

Accounting Principles	
Brazil (CFC Resolution No. 750/93)	Portugal (Decree-Law No. 408/89)
<p>1. Entity It recognizes Equity as an object of accounting and affirms equity autonomy: the need to differentiate a particular Equity in the universe of existing equities, regardless of belonging to a person, a group of people, a society or institution of any nature or purpose, for-profit or non-profit. Consequently, in this sense, the Equity is not to be confused with those of its partners or owners, in the case of a company or institution.</p>	<p>1. Matter (substance) over shape The accounting of the normal operations of the company must be done considering its substance and its reality, namely the financial reality and not just its legal shape. Accounting for transactions should be as realistic as possible.</p>
<p>2. Going Concern (continuity) It assumes that the Entity will continue to operate in the foreseeable future, generally related to the time horizon of one year, and, therefore, the measurement and presentation of the equity components take this circumstance into account.</p>	<p>2. Going Concern (continuity) The company is considered to operate continuously, with unlimited duration. In this way, it is understood that the company has no intention or need to go into liquidation or to significantly reduce the volume of its operations.</p>
<p>3. Opportunity It refers to the process of measuring and presenting the equity components to produce complete and timely information, determining that the record of changes in equity be made immediately and to the correct extent, regardless of the causes that originated them.</p>	<p>3. Consistency It is considered that the company does not change its accounting policies from one year to the next. If it does so and the change has materially relevant effects, it must be referred to in accordance with the annex (note 1).</p>
<p>4. Registry at Original Value It determines that the equity components must be initially recorded at the original values of the transactions, expressed in national currency.</p>	<p>4. Historical cost Accounting records should always be based on acquisition costs or production costs. These in turn must be expressed in nominal currency units and in constant currency units so that a uniform, regular and historical record is obtained</p>
<p>5. Accrual It determines that the effects of transactions and other events are recognized in the periods to which they refer, regardless of receipt or payment. The Accrual Principle presupposes the simultaneous confrontation of revenues and related expenses.</p>	<p>5. Specialization (or Accrual) Income and costs are recognized when obtained or incurred, regardless of their receipt or payment, and must be included in the financial statements of the periods to which they refer.</p>
<p>6. Prudence This principle presupposes the use of a certain degree of precaution in exercising the judgments necessary to the estimates in certain conditions of uncertainty, in the sense that assets and revenues are not overestimated, and that liabilities and expenses are not underestimated, attributing greater reliability to the process of measurement and presentation of equity components.</p>	<p>6. Prudence It means that it is possible to integrate a degree of caution in the accounts when making the required estimates in conditions of uncertainty without, however, allowing the creation of hidden reserves or excessive provisions or the deliberate quantification of defective assets and income or excess liabilities and costs.</p>
	<p>7. Materiality The financial statements must highlight all the elements that are relevant and that may affect assessments or decisions by interested usufructuaries.</p>

3.2 Performance

The evaluation of performance, from a financial perspective, has traditionally been based on accounting information from Financial Statements, such as the Balance Sheet, the Income Statement, and the Cash Flow statement, endorsing the importance of the accounting concepts discussed previously. It is important to mention, however, that this analysis has some limitations, especially when performed by an external analyst, as he does not have all the information elements, so his sensitivity is necessary to identify any inconsistencies in the financial statements. Some of these issues relate to the classification of items in the short and medium / long term, influencing the results of the analysis and the correct diagnosis of the company (Macedo, 2017). It can also be related to the so-called Creative Accounting, which, according to Naser (1993) "is the transformation of financial accounting figures from what they actually are to what preparer desires by taking advantage of the existing rules and/or ignoring some or all of them".

The performance evaluation provides a set of information allowing to characterize the company's activity, providing a global view of the results achieved, allowing to verify whether the decisions were made in accordance with the expected results, quantifying the deviations to later take the necessary corrective measures. Through this methodology, the company will be able to become more efficient and profitable, contributing to guarantee and solidify its continuity (Macedo, 2017).

In the current business context, characterized by innovation and global competitiveness, performance analysis in all its fullness and naturally with a particular focus on finance, as well as the creation of value, assumes increasing importance in the decision making of companies (Macedo, 2017).

In a business context, the Oxford Business English Dictionary (Parkinson and Noble, 2006) defines "performance" as "how far a company or an investment makes a profit". That is, the performance of a company can be directly associated to the magnitude of its profits (or possibly losses), in each instant or period. To evaluate a business performance in a most comprehensive and effective manner, however, it is also necessary, more than access the company profitability (computing all financial indicators related), to compare it to its own past and to other similar businesses. Performance will be here segregated into four distinct classes: technical, financial, economic and market.

According to Parkinson and Noble (2006), "technical efficiency" is defined as "a situation in which a machine or a business produces at the highest possible amount or quality of goods or services with a particular amount of resources". In this sense, for the purpose of this project, the technical performance of a business will be defined as one closely related to its main activity efficiency (how fast can the company produce and deliver its products or services, or how well it uses its available labor or the capacity of its machines) and efficacy (what is the percentage of defective products produced or how many of them are delivered correctly and on time).

Finance, in a business context, is defined as "the activity of managing money, especially by a commercial organization or government" (Parkinson and Noble, 2006). As a result, Financial Performance is here defined as a subjective measure of how good the company is at managing its money, generated from its primary mode of business - being closely related to the activities of

investment and financial funding. It can be segregated between short-term and long-term financial performance, being the first one related to current assets and liabilities, and the second being related to long-term assets and liabilities.

Parkinson and Noble (2006) define an economic business as one producing enough profit to continue, being the term “profitable” a synonym. In this context, for the purpose of this project, the Economic Performance concept will be observed exclusively related to how good the company is at generating results from its primary mode of business, being related to its products/services sales, profit margins and cost structure.

Finally, market performance is defined as “the amount of trade in a particular type of goods, services, investments, etc.” (Parkinson and Noble, 2006). Market performance, therefore, can be here related to the behavior of all companies inside a specific segment (e.g., Manufacturing Industries) or also the behavior of the whole national market. It can be given by stock indexes, segment indexes and changes on the gross domestic product (GDP).

3.3 Key Indicators

3.3.1 Financial Indicators

Through information from Financial Statements, such as the Balance Sheet, the Income Statement, and the Cash Flow statement, it is possible to obtain information for calculating the financial indicators (Macedo, 2017).

According to Brealey, Myers and Allen (2020), shareholder value depends on two major types of decision: investment and financing. The scheme below (Figure 1) provides an overview of how common financial ratios relate to the ultimate objective of value added for shareholders, serving as a road map for the following proposed main financial indicators.

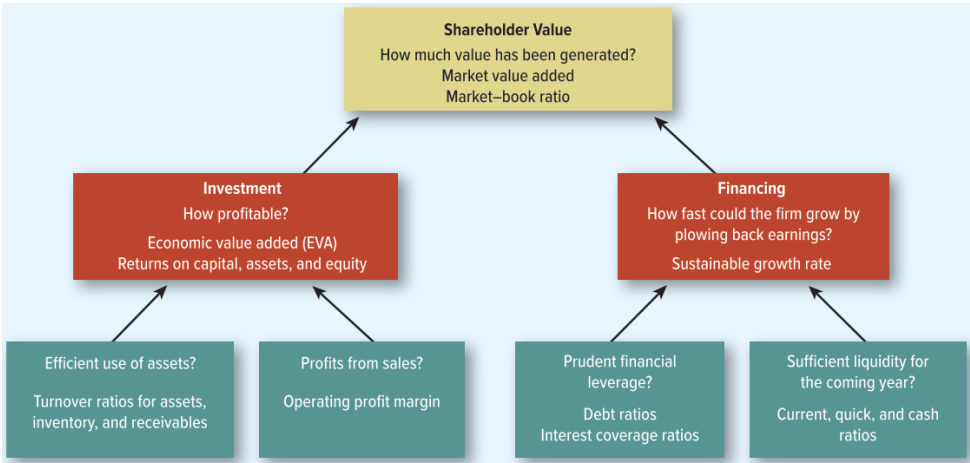


Figure 1: How common financial ratios relate to shareholder value (Brealey, 2020)

Brealey, Myers and Allen (2020) also propose a segregation of these ratios into four types of measurements: Performance, Efficiency, Leverage and Liquidity. They present a set of main relevant indicators, detailed below:

Performance Measures

Inside performance measures, the main ratios included are: Return on Capital, Return on Equity, Return on Assets, Market-to-book ratio, Earnings per Share and Price-to-Earnings.

The Return on Capital (ROC), or Return on Invested Capital (ROIC) ratio, is used to assess a company's efficiency at allocating its capital to profitable investments. ROC gives a sense of how well a company is using its money to generate returns and comparing it with the company's weighted average cost of capital (WACC) (which will be further detailed later at the topic of Value Creation) reveals whether invested capital is being used effectively. It is equal to the total profits that the company has earned for its debt and equity holders, divided by the amount of money that they have contributed with (Brealey, 2020).

$$\text{ROC} = \frac{\text{NOPAT}}{\text{Total Capital}} = \frac{\text{After Tax Interest} + \text{Net Income}}{\text{Long-Term Debt} + \text{Total Equity}} \quad (1)$$

Total long-term capital, here called total capital and known as total capitalization, is the sum of long-term debt and shareholders' equity, and it is smaller than the value of total assets as it does not include current liabilities. Inside NOPAT (Net Operating Profit After Taxes), the reason that the tax shield is subtracted on debt interest is that it allows to calculate the income that the company would have earned with all-equity financing. The tax advantages of debt financing are picked up when we compare the company's return on capital with its weighted-average cost of capital. WACC already includes an adjustment for the interest tax shield, while often, financial analysts ignore this refinement and use the gross interest payment to calculate ROC. It is only approximately correct to compare this measure with the weighted average cost of capital (Brealey, 2020).

Return on Assets (ROA), on the other hand, measures the income available to debt and equity investors per dollar of the firm's total assets. According to Rakićević *et al.* (2016), it is considered as an overall measure of profitability, and it measures how efficiently a management utilizes company's assets to generate earnings. They also point out a potential drawback of ROA indicator, as its measurements include all business's assets, including those borrowed from creditors as well as those which arise out of contributions by investors. In that sense, a company could have a high ROA, but still be in financial straits because most of the assets were paid for through leveraging. For this reason, many investors turn their attention to the other major profitability ratio - return on equity ratio (ROE).

$$\text{ROA} = \frac{\text{NOPAT}}{\text{Total Assets}} \quad (2)$$

The Return on Equity (ROE) ratio is measured as the income to shareholders per dollar invested and it needs to be compared with the company's cost of equity. Contrary to ROA, which remain relatively unaffected by a company's choice of capital structure - the choice of using debt versus equity to fund operations, ROE measures how efficiently the company is utilizing its equity, and the higher its value, the better. This is of great importance to investors, since their return on investment is directly related to ROE (Rakićević *et al.*, 2016).

According to Walsh (2006), at the level of the individual business, a good return on equity will keep in place the financial framework for a thriving, growing enterprise. At the level of the total economy, return on equity drives industrial investment, growth in gross national product, employment, government tax receipts and so on. It is, therefore, a critical feature of the overall modern market economy as well as of individual companies.

$$\text{ROE} = \frac{\text{Net Income}}{\text{Equity}} \quad (3)$$

Exploring market values, the market-to-book ratio measures how much value has been added for each dollar that shareholders have invested. Market-to-book ratio is usually calculated by dividing the market value of equity by the book value of equity but can also be obtained by dividing the stock price by the book value per share. As a rule of thumb, highly regarded firms have high market-book ratios which means they are low-risk and high-growth firms (Tugas, 2012).

Market-to-Book ratio is a great tool to quickly determine whether a company is under or overvalued. If the company has a low market to book ratio, it is most likely undervalued and could be considered a good investment opportunity (Rist and Pizzica, 2015).

$$\text{Market-to-Book ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}} \quad (4)$$

According to Walsh (2006), one of the most widely quoted statistics when there is a discussion of a company's performance is the earnings per share ratio (EPS). It is important to note the profit used in the calculation is the figure after all preferred dividends have been distributed, known as Net Income Available to Common Shareholders. The ratio can be calculated by dividing this amount by the number of common shares:

$$\text{Earnings per Share (EPS)} = \frac{\text{Net Income Available to Common Shareholders}}{\text{Number of Common Shares}} \quad (5)$$

Also, according to Walsh (2006), it serves no purpose in comparing the earnings per share of one company with another since an enterprise can elect to have many shares of low denomination or a smaller number of a higher denomination. A company can also decide to increase or reduce the number of shares on issue. This decision will automatically alter the earnings per share. As example, we cannot say, therefore, that a company with an earnings per share value of 50¢ is any better than one with a value of 40¢. While the absolute amount of earnings per share tells nothing about a company's performance, the growth in EPS over time is a very important statistic. Indeed, many chairpersons stress it as a prime target in annual reports. Furthermore, growth in earnings per share has a significant influence on the market price of the share.

Finally, another widely used parameter of share value is the Price-to-Earnings (P/E) ratio, which, differently from the Earnings-per-Share, is better suited for comparing one stock's value with another's, according to Fridson and Alvarez (2011). It can be calculated by simply dividing the share price of a

company by its EPS figure, and the answer gives the number of year's purchase that the price bears to earnings (Walsh, 2006).

$$\text{Price-to-Earnings (P/E)} = \frac{\text{Stock's Price}}{\text{Earnings per Share}} \quad (6)$$

According to Walsh (2006), while the calculation of the ratio is based on figures from the past, its value is determined by investors whose focus is on the future, as they are primarily interested in the prospects for earnings growth. It is important to notice that the company has no direct control over the P/E ratio. Although it may influence it over the short-term by a good public relations exercise, in the long-term it must deliver a good return to the shareholder's equity to secure a continued high rating.

The advantages of a high price to earnings ratio value are considerable, as the wealth of the company's owners is increased in proportion and new funds can be raised at a favorable price. The possibility of a successful hostile takeover bid is much reduced, and most importantly, the company has the means to make acquisitions on more favorable terms by using its 'paper' (shares), as opposed to cash (Walsh, 2006).

Efficiency Measures

The main efficiency measures that can be pointed out are asset turnover, inventory turnover, days in inventory, receivables turnover, average collection period, net profit margin and the operating profit margin.

Asset turnover, also known as sales-to-assets ratio, measures the sales generated per dollar of assets and is an indication of how efficient the company is in utilizing assets to generate sales. Asset-intensive companies such as mining, manufacturing, and so on will generally have lower asset turnover ratios compared to companies that have fewer assets, such as consulting and service companies. (Rist and Pizzica, 2015).

Generally, the higher this ratio is, the more effective the assets are being managed. (Tugas, 2012). It is important to notice that this ratio compares a flow measure (sales over the entire year) with a snapshot measure (assets at a point in time). Frequently, analysts use the average of the firm's assets at the start and end of the year. The idea is that it better measures the assets that the firm had to work with during the year (Brealey, 2020).

$$\text{Asset Turnover} = \frac{\text{Net Sales}}{\text{Average Total Assets}} \quad (7)$$

The inventory turnover shows how many times a company's inventory is sold and replaced over a given period. It can be calculated as cost of goods sold over average inventory for that period. (Rist and Pizzica, 2015)

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}} \quad (8)$$

Days in inventory, also known as Inventory Period ratio, is directly and inversely related to inventory turnover, and measures the average number of days the company holds its inventory before selling it to customers. Usually, the lower the number of days in inventory, the better the position of the company as cash is not tied up in inventory (Rist and Pizzica, 2015).

$$\text{Inventory Period} = \frac{\text{Average Inventory}}{\text{Costs of Goods Sold}} \quad (9)$$

The receivables turnover ratio measures the firm's sales as a proportion of its receivables - which correspond to the sales for which the company has not yet been paid. It shows how many times during the period (year) is a unit of receivable converted into sales. If customers are quick to pay, unpaid bills will be a relatively small proportion of sales and the receivables turnover will be high. According to Fridson and Alvarez (2011), a decline in the ratio may signal that the company's customers are paying more slowly because they are encountering financial difficulties. Alternatively, the company may be trying to increase its sales by liberalizing its credit standards, allowing its salespeople to do more business with less financially capable customers.

$$\text{Receivables Turnover} = \frac{\text{Net Sales}}{\text{Average Accounts Receivable}} \quad (10)$$

Average collection period, also known as Receivables Collection Period and Accounts receivable period, indicates the amount of time (in days) it takes a company to convert its receivables into cash (Rist and Pizzica, 2015).

The company's credit terms will have a significant impact on the average collection period: the better the credit terms, the higher the average collection period. An increase in the average collection period could indicate an increased risk of the company's customers not being able to pay for their purchases. A possible result is that the company will have to hold greater levels of current assets as a reserve for potential losses or bad debt expense. Most large companies (nonretail) do not handle many cash sales. Therefore, when looking at financial statements, it can be assumed that total sales do not include any cash sales. However, in smaller companies and in retail businesses, cash sales can be a significant part of the total sales (Rist and Pizzica, 2015).

$$\text{Accounts Receivable Period} = \frac{\text{Average Accounts Receivable}}{\text{Net Sales}} \times 365 \quad (11)$$

The operating profit margin constitutes an alternative measure of profit margin, adding back the after-tax debt interest to net income, and it is especially useful when comparing companies with different levels of debt finance. Operating margin shows how well management has run the business - buying and selling wisely and controlling selling and administrative expenses - before considering financial policies (which largely determine interest expense) and the tax rate (which is outside management's control) (Fridson and Alvarez, 2011). As a rule of thumb, a higher operating margin is preferred since lower operating margin (as compared with similar firm) may mean higher operating costs (Tugas, 2012).

$$\text{Operating Profit Margin} = \frac{\text{NOPAT}}{\text{Net sales}} \quad (12)$$

At last, the profit margin ratio, or return on sales (ROS), measures the proportion of sales that finds its way into profits. It measures, therefore, the effectiveness with which profit is generated from revenue through the value-add management process (Bull, 2008). The profit margin is the ratio of net income to sales, and as a rule of thumb, a higher profit margin is preferred since lower profit margin (as compared with similar firm) may mean higher interest charges because of higher debt (Tugas, 2012).

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{Net Sales}} \quad (13)$$

Leverage Measures

The main leverage measures include: the long-term debt ratio, the total debt ratio, the time-interest-earned indicator, the cash coverage ratio and the debt-to-equity ratio.

Financial leverage is usually measured by the ratio of long-term debt to total long-term capital. The long-term debt ratio, also known as capital structure ratio or capitalization ratio, indicates the debt component of a company's capital structure or how much of the company's financing is represented by long-term debt. The amount of leverage that is right for the company varies based on the industry in which the company operates and the maturity of the company as well as other factors. What is optimal for one company might not be right for another. However, low debt and high equity levels in the capitalization ratio generally indicate lower risk for investors. (Rist and Pizzica, 2015).

$$\text{Long-Term Debt Ratio} = \frac{\text{Long-Term Debt}}{\text{Long-Term Debt} + \text{Equity}} \quad (14)$$

The total debt ratio, also known as debt to asset ratio, shows the proportion of a company's total debt relative to its assets and its measure gives an idea as to the leverage of the company along with the potential risks the company faces in terms of its debt-load (Rist and Pizzica, 2015). It is especially useful when dealing with a company that is a regular short-term borrower, and it becomes necessary to consider all liabilities in the debt ratio. Usually, the higher this indicator, the higher the level of debt and the associated risks.

$$\text{Total Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}} \quad (15)$$

Additionally, the cash coverage ratio constitutes another method of assessing the extent to which interest obligations are covered by earnings and is useful for determining the amount of cash available to pay for a borrower's interest expense. Since depreciation is deducted when calculating the firm's earnings, even though no cash goes out the door, it is first necessary to add back all non-cash expenses included in EBIT (such as depreciation and amortization), obtaining the amount also known as EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization), and then divide by the interest expense.

$$\text{Cash Coverage} = \frac{\text{EBITDA}}{\text{Interest Payments}} \quad (16)$$

Finally, the debt-to-equity ratio, according to Walsh (2006), is one of the most fundamental measures in corporate finance and it is a great test for the financial strength of a company. The purpose of the ratio is to measure the mix of funds in the balance sheet and to make a comparison between those funds that have been supplied by the owners (Equity) and those which have been borrowed (Debt). It can be obtained by simply dividing the Total Debt of a company (Short and Long-Term Debt) by its Total Equity:

$$\text{Debt to Equity} = \frac{\text{Short Term Debt} + \text{Long Term Debt}}{\text{Equity}} \quad (17)$$

The Debt/Equity or leverage decision is one of great importance to management since there is a risk return trade-off. The impulse to achieve high returns for the shareholders must be restrained by the company's risk profile, and even a very well-managed company can suffer an unexpected deterioration in its financial position either from a default on the part of a major debtor or a general worsening of business conditions. Such deterioration can be very difficult to recover from and it is prudent to keep some liquidity in reserve to guard against such an eventuality (Walsh, 2006).

Liquidity Measures

The most immediate danger faced by a lender is the risk that the borrower will suffer illiquidity - an inability to raise cash to pay its obligations (Fridson and Alvarez, 2011). A company must maintain sufficient cash resources to pay all legitimate bills as they arise, and one that cannot do so has run out of liquidity and is in a very serious financial condition. Ironically, this is so even if it is currently generating good profits (Walsh, 2006).

Inside Liquidity ratios, there are four mains included: Net-Working-Capital-to-Total-Assets, Current, Quick, and Cash ratios. Before discussing these, however, it is necessary to understand other three measures closely related to liquidity: net working capital, net working capital requirements and net cash.

First, the net working capital concept assumes that permanent capital should cover short-term items related to the exploration cycle and not covered by the exploration itself (suppliers), since they have "immobilization" characteristics (continuous renewal). It corresponds to the difference between current assets and current liabilities, where current assets include cash, marketable securities, inventories, and accounts receivable, that are mostly liquid. Following the rule of minimum financial balance, net working capital must be, overall, positive (Breia, 2014).

$$\text{Net Working Capital} = \text{Current Assets} - \text{Current Liabilities} \quad (18)$$

The net working capital requirements, in turn, correspond to the Working Capital value associated with the financing of the exploration cycle, which can be given by the difference between cyclical operating requirements (inventories, credits granted to customers and recoverable taxes) and cyclical operating resources (debts to suppliers and taxes payable) (Breia, 2014).

$$\text{Net Working Capital Required} = \text{Cyclical requirements} - \text{Cyclical resources} \quad (19)$$

Short-term assets and liabilities, therefore, have a cyclical component (recurring) and an acyclic component (not directly dependent on the exploitation cycle). Net cash, as opposed to the net working capital requirements, corresponds to the difference between the acyclic components (Acyclic requirements less Acyclic resources), and can be equated to the following equation (Breia, 2014):

$$\text{Net Cash} = \text{Net Working Capital} - \text{Net Working Capital Required} \quad (20)$$

From the previous formulation the higher the working capital requirements, the greater the potential pressure (and the potential risk) on net cash. When there are, for example, high customer balances (receivables), either in terms of amounts or receipt periods, significant continued delays may cause not only net cash stresses, but also serious solvency risks, in case stable permanent capital reinforcement is not possible (Breia, 2014).

Listed as the first liquidity ratio, the Net-Working-Capital-to-Total-Assets ratio compares the net liquid assets to the total assets of the firm and helps to determine the short-term company's solvency.

$$\text{Net-Working-Capital-to-Assets Ratio} = \frac{\text{Net Working Capital}}{\text{Total Assets}} \quad (21)$$

Whatever the underlying cause, illiquidity manifests itself as an excess of current cash payments due, over cash currently available. The current ratio gauges the risk of this occurring by comparing the claims against the company that will become payable during the current operating cycle (current liabilities) with the assets that are already in the form of cash or that will be converted to cash during the current operating cycle (current assets) (Fridson and Alvarez, 2011). The current ratio can depict how many times the firm would be able to pay its current liabilities if it converts all its current assets to cash and it is simply the ratio of current assets to current liabilities.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (22)$$

Analysts also apply a more stringent test of liquidity by calculating the quick ratio, or acid test, which considers only cash and current assets that can be most quickly converted to cash (marketable securities and receivables) (Fridson and Alvarez, 2011). It deducts the least liquid component from the current assets (inventories, or possibly also long-term receivables) and divides the result by current liabilities. It is therefore very useful in industries, where high level of stock must be held. The higher the acid test ratio, the safer a position the company is in (Rist and Pizzica, 2015).

$$\text{Quick Ratio} = \frac{\text{Cash} + \text{Marketable securities} + \text{receivables}}{\text{Current Liabilities}} \quad (23)$$

Ultimately, the cash ratio, also called as absolute liquidity ratio, can show how many times the firm would be able to pay its current liabilities using its most liquid assets (cash and marketable securities). This

number can be compared to industry averages or other companies to compare liquidity (Rist and Pizzica, 2015).

$$\text{Cash Ratio} = \frac{\text{Cash} + \text{Marketable Securities}}{\text{Current Liabilities}} \quad (24)$$

The DuPont method

According to Rakićević et al. (2016), the DuPont analysis, also known as the DuPont method or DuPont scheme, is a common form of financial ratio (statement) analysis that decomposes profitability ratios into its multiplicative components. This decomposition enables the analyst to perceive the sources of a firm's superior/inferior return. The famous are DuPont decompositions of two profitability ratios, already mentioned above: Return on Assets (ROA) and Return on Equity (ROE) ratios.

Using DuPont analysis, ROA can be decomposed into the product of two components: net profit margin (NPM) and asset turnover ratio (ATR), also already mentioned:

$$\text{ROA} = \text{NPM} \times \text{ATR} = \frac{\text{Net Profit}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Total Assets}} \quad (25)$$

To achieve a certain level of ROA, companies with low profit margins tend to have high asset turnover, while those with high-profit margins have low asset turnover (Rakićević *et al.*, 2016).

Carrying DuPont disaggregation technique, ROE can also be decomposed into two components - ROA and financial leverage ratio (FLR). Further, through decomposition of ROA, the ROE is decomposed into three components - net profit margin, asset turnover, and financial leverage ratio. The financial leverage ratio is a measure of how much assets a company holds relative to its equity. A high financial leverage ratio means that the company is using debt to finance its assets (Rakićević *et al.*, 2016). Therefore, the DuPont decomposition formula for ROE is:

$$\text{ROE} = \text{NPM} \times \text{ATR} \times \text{FLR} = \frac{\text{Net Profit}}{\text{Revenue}} \times \frac{\text{Revenue}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Shareholders' Equity}} \quad (26)$$

Financial ratios overview

Table 2: Financial ratios overview (source: own elaboration)

Type	Measure	Formula	Rule of thumb
Performance	Return on Capital (%)	NOPAT / Total (long-term) capital	Higher, better
	Return on Assets (%)	NOPAT / Total assets	Higher, better
	Return on Equity (%)	Net income / Equity	Higher, better
	Market-to-Book Ratio	Market value of equity / Book value of equity	Higher, better
Efficiency	Asset Turnover	Net sales / Average total assets	Higher, better
	Inventory Turnover	COGS / Average inventory	Higher, better
	Inventory Period (days)	Average inventory / Daily COGS (365 days)	Lower, better
	Receivables Turnover	Net sales / Average accounts receivable	Higher, better
	Accounts Receivable Period (days)	Average accounts receivable / Average daily sales (365 days)	Lower, better
	Profit Margin (%)	Net income / Net sales	Higher, better
Leverage	Operating Profit Margin (%)	NOPAT / Net sales	Higher, better
	Long-term Debt Ratio (%)	Long-term debt / (Long-term debt + Equity)	Lower, better
	Total Debt Ratio (%)	Total liabilities / Total assets	Lower, better
	Times-Interest-Earned	EBIT / Interest payments	Higher, better
	Cash Coverage	EBITDA / Interest payments	Higher, better
	Debt to Equity	Total liabilities / Equity	Lower, better
	Liquidity	Net Working Capital	Current Assets - Current Liabilities
Net Working Capital Requirements		Cyclical requirements - Cyclical resources	Lower, better
Net Cash		Net working capital - Net working capital requirements	Higher, better
Net-Working-Capital-to-Assets		Net working capital / Total assets	Higher, better
Current Ratio		Current Assets / Current Liabilities	Higher, better
Quick Ratio		(Cash + marketable securities + receivables) / Current liabilities	Higher, better
Cash Ratio		(Cash + marketable securities) / Current liabilities	Higher, better

3.3.2 Non-financial Indicators

Besides the indicators used for measuring technical performance, such as the utilization rate, the capacity utilization rate, and the defect rate, two main additional and more common non-financial indicators can be pointed out: Net Promoter Score (NPS) and Market Share.

The Net Promoter Score is an index ranging from -100 to 100 that measures the willingness of customers to recommend a company's products or services to others, where 100 would represent the highest satisfaction of customer and, therefore, the highest probability of recommendation to others. A score from 1-10 that qualifies promoters (usually 9-10) and detractors (under 6), where:

$$NPS = \frac{\# \text{ of Promoters} - \# \text{ of Detractors}}{\text{Total \# of Responses}} \quad (27)$$

Market share, in its turn, constitutes the percent of total sales in an industry generated by a particular company. Market share is calculated by taking the company's sales over the period and dividing it by the total sales of the industry over the same period. Investors and analysts monitor increases and decreases in market share carefully as this can be a sign of the relative competitiveness of the company's products or services. As the total market for a product or service grows, a company that is maintaining its market share is growing revenues at the same rate as the total market. A company that is growing its market share will be growing its revenues faster than its competitors (Hayes, 2021).

$$\text{Market Share} = \frac{\text{Total Sales of the Company}}{\text{Total Sales of the Market}} \times 100 \quad (28)$$

Market share increases can allow a company to achieve greater scale with its operations and improve profitability. A company can try to expand its share of the market, either by lowering prices, using advertising, or introducing new or different products. In addition, it can also grow the size of its market share by appealing to other audiences or demographics (Hayes, 2021).

3.4 Sustainability

The concept of sustainability is accompanied by widely differing interpretations in a business context (Lankoski, 2016). For example, it has been defined as requiring “a permanent improvement of the business's performance in economic, ecological and social terms” (Figge et al., 2002), “the progressive maintenance of the life-supporting capacities of the planet's ecosystems” (Milne and Gray, 2013), or that “corporate value is maximized and does not decline over time” (Hediger, 2010).

For this current project, the last definition will be the one worked with and explored: the ability of a company to provide long-term profitability, and it will also be addressed as financial sustainability. It can be equated to the definition of corporate sustainability (CS) brought by Hediger (2010): “Corporate sustainability (CS) requires that the corporate value is maximized and does not decline over time. This implies a non-declining total contribution of current corporate activities to immediate and future profits over time ($dt (H_t) \geq 0$) at the highest possible level ($\max H_t$) for all t .” Where:

$$H_t = H(x_t, k_t, y_t) = y_t + \varphi \cdot \dot{k}_t \quad (29)$$

y_t = instantaneous income (profit, dividend) distributed to shareholders

k_t = current stock of capital

\dot{k}_t = intertemporal variation of the firm's productive capacity (net capital accumulation) accumulation)

$x_t = f(k_t, g_t)$ = corporate activities at time t

g_t = variable inputs

In this sense, H_t can be viewed as the future or long-term profit effect of x_t . It accounts for the fact that capital accumulation serves the aim of enhancing corporate profits in the future. H_t represents the overall profit prospect of the various corporate decision options, conditional to the current choice of activity (cf. Chiang, 1992).

CS, therefore, is defined with respect to a company's productive capacity and its development along the intertemporally optimal trajectory of long-term profit maximization, given the company's initial capital endowment (productive capacity). Because of the current stage of corporate development (capital stock and capital productivity), instantaneous profits and profit prospects may first increase and then decline in course of the business cycle. Thus, corporate sustainability will require adequate investment of current profit shares into diversification of activities to substitute for old ones to compensate for anticipated income losses at the later phase of market development. (Hediger, 2010).

3.4.1 **Going concern**

Going concern is defined as the expected to continuity of a business or an activity for a long period of time. (Parkinson and Noble, 2006). When the bankruptcy of a company subject to statutory audit occurs, it is immediately sought to ascertain whether the Statutory Auditor had alerted in its audit reports to this eventuality, extremely damaging to all stakeholders (shareholders, workers, suppliers, customers, the etc.) and for society. (Carvalho, 2013)

The assessment of the company's going concern assumption requires great consideration and care, as it is a very sensitive matter. If the auditor does not alert you to the possibility of bankruptcy and it occurs (type I error), it is said that he has failed. If, on the contrary, he warns about the possibility of bankruptcy and it does not occur (type II error), the auditor is criticized for launching a false suspicion, seriously damaging the company's reputation and making it difficult to access bank credit and suppliers. The auditor's opinion can even become a self-fulfilling prophecy and influence the company's going concern, bringing it to bankruptcy (Carvalho, 2013).

From the bases for presentation of financial statements (BADF) of Portugal, presented in Decree-Law nº 158 of 2009 (Ministry of Finance and Public Administration, 2015), the following item is exposed regarding the principle of Going Concern:

“When preparing the financial statements, the management body must assess the entity's ability to proceed, considering it as a going concern. The financial statements must be prepared on the assumption of the entity on an ongoing basis unless the management body intends to liquidate the entity or cease trading or has no realistic alternative but to adopt one of these alternatives... The management body must, in general, disclose material uncertainties related to events or conditions that may cast significant doubt on the entity's ability to proceed as a going concern. When the financial statements are not prepared on the assumption of continuity, that fact should be disclosed, together with the rationale for which the financial statements were prepared and the reason why the entity is not considered to be a going concern.

For that reason, the Statutory Auditor must rely on tools that help him to issue opinions in a sustained manner, being the bankruptcy prediction models a main example. In addition to credit institutions, the auditor can also use bankruptcy forecasting methods to validate and comment on the companies' going concern, overseeing assessing whether the financial statements are in accordance with the assumption of continuity and whether there is material uncertainty regarding events or conditions that could jeopardize continuity (Macedo, 2017).

3.4.2 **Bankruptcy prediction models**

The first model of bankruptcy prediction emerged in the 1960s, by Beaver (Macedo, 2017). According to the studies conducted by Aziz and Dar (2004), Bellovary et al. (2007), Pereira, Basto, Gómez and Albuquerque (2010) and Peres (2014), statistical models are the most used for predicting bankruptcy, in addition to being frequently used as a basis for the development of other models and that they can

be subdivided into Univariate and Multivariate Analysis, where inside the last one, the main methods used are Multiple Discriminant Analysis (MDA) and Logit analysis.

Correia (2012), in agreement with Hughes (1993), suggests that the problem with univariate analysis stems from the fact that each ratio is examined separately. Consequently, the analysis has the problem of deciding in isolation whether a particular ratio is good or bad. Altman (1968) exemplifies this problem by indicating that “a firm with a poor profitability and / or solvency record may be regarded as a potential bankrupt. However, because of its above average liquidity, the situation may not be considered serious”.

In this context, Altman (1968) indicates that the Multiple Discriminant Analysis technique not only has the potential to correctly reformulate the problem of bankruptcy forecasting, since it consists of a different approach to the traditional analysis of financial ratios, but also, given its characteristics and descriptive qualities presented, was selected as the most suitable for the study of business bankruptcy.

It is important to highlight that Carvalho das Neves (2012) indicates the existence of two types of errors presented by the forecasting models. Type I consists of the classification of bankrupt companies as non-bankrupt, and Type II that characterizes non-bankrupt companies as bankrupt. Peres (2014) indicates that the first error is considered more serious, since it will lead the user of the information to invest in a company that does not have sufficient conditions for survival, and less serious the second error, as at most it will include in the model a degree of prudence and conservatism such that it classifies relatively “healthy” companies as bankrupt, thus preventing the decision maker from investing.

The MDA method covers Z-Score models such as Altman (1968), Matias (1982) and Carvalho das Neves e Silva (1998), and according to Santos (2000), it is a multivariate statistical method that seeks in a generic way to classify a variable based on the observation of a set of several independent variables.

Altman’s Model: Z-Score (1968)

According to Sousa and Oliveira (2014), Correia (2012) and Nunes (2012), Altman (1968) was a pioneer in the MDA analysis, through the development of the Z-Score model, where he combines measures of return and risk. According to Silva (2011) and Mares (2001), in 1968 Edward Altman developed an indicator called Z-Score, composed of five discriminating factors related to liquidity, profitability, leverage, solvency and activity.

Barros (2008) and Correia (2012) indicate that Altman analyzed a paired sample of 66 US companies, which was equally divided between bankrupt and non-bankrupt, in the period from 1946 to 1965. For the intended approach, he used a group of 22 ratios economic and financial, as they are considered the most relevant and referred to in the literature.

According to Carvalho das Neves (2012) and Sousa and Oliveira (2014), the discriminating function of the model, called the Z-Score, was limited to 5 explanatory variables, in the form of ratios:

$$Z_1 = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.99X_5 \quad (30)$$

$X_1 = \text{Net Working Capital} / \text{Total Assets}$

$X_2 = \text{Retained Earnings} / \text{Total Assets}$

$X_3 = \text{Operating Income (EBIT)} / \text{Total Assets}$

$X_4 = \text{Market Value of Equity} / \text{Total Liabilities}$

$X_5 = \text{Net Total Sales} / \text{Total Assets}$

According to Altman (1968), with the application of this model, companies with an indicator below 1.81 are classified as bankrupt and above 2.99 are financially healthy. However, if the results obtained are in the range of $1.81 < Z_1 < 2.99$, it is said that the company does not have a defined classification and finds itself inside the called "gray area". Altman, however, later revisited this concept and determined the most efficient point to be 2.67-2.68, which he considered it as the cutoff point of the model. This last approach will constitute the one used in this project, since it provides greater punctuality and allows a better comparison with the other models.

Matias' Model (1982)

According to Nunes (2012), Alberto Borges Matias, a Brazilian researcher in Finance, developed in 1976 a model based on discriminant analysis, having been perfected in 1982. The author used a sample of 100 companies from different sectors of activity, 50% of which were classified as bankrupt and the rest not bankrupt.

According to Matarazzo (2003), the model's basic structure is constructed in the following form:

$$Z_2 = 23.792M_1 - 8.260M_2 - 9.868M_3 - 0.764M_4 + 0.535M_5 + 9.912M_6 \quad (31)$$

$M_1 = \text{Total Equity} / \text{Total Assets}$

$M_2 = \text{Financing and Bank Loans} / \text{Current Assets}$

$M_3 = \text{Accounts Payable to Suppliers} / \text{Total Assets}$

$M_4 = \text{Current Assets} / \text{Current Liabilities}$

$M_5 = \text{Operating Income} / \text{Pretax Income}$

$M_6 = \text{Cash and Cash Equivalent} / \text{Total Assets}$

Further according to Matarazzo (2003), this model's critical point is zero. If $Z_2 > 0$ it indicates that the company is healthy and if $Z_2 < 0$ then the company is in bankruptcy. The model obtained a 70% success rate for the classification of solvent companies and 77% for insolvent companies.

Carvalho das Neves and Silva's Model (1998)

According to Macedo (2017), Carvalho das Neves and Silva (1998) carried out their investigation with the objective of contributing, in the Portuguese market, to the development of a 2-year warning system

on companies' credit risk. To do this end, they used data from 1994 of 187 companies, of which 87 went into bankruptcy, and 100 were in normal situation.

Having recognized the lack of any theory as to which ratios are most suitable for the timely identification of probability of default, they analyzed 70 economic-financial ratios collected in the main studies published on this subject in financial journals, like Blum (1974), Beaver 1966), Altman (1968, 1974, 1984), Deakin (1972), and added 11 ratios normally used by financial analysts in Portugal (Macedo, 2017).

$$Z_3 = - 0.950 + 2.518C_1 + 1.076C_2 + 5.566C_3 - 0.00254C_4 + 0.156C_5 \quad (32)$$

C_1 = Retained Earnings / Total Assets

C_2 = Current Assets / Total Assets

C_3 = Cashflow / Total Assets

C_4 = State and Other Public Entities / Sales * 365

C_5 = Financing and Bank Loans / Current Assets

For this function, the author defined the critical point at $Z_3 = 0.37$. Companies with a value of $Z_3 > 0.37$ will be classified as being in a normal situation and those below this value will be classified as bankrupt. This model has a rating effectiveness rate of 66.3% for companies in difficult situations and 85.9% for companies considered to be in financial health, with an implicit Type I error of 33.7% and an error of Type II of 14.1% (Peres, 2014).

4 Data and Methodology

The following chapter presents the sources and the sample space of data to be used in the study and the proposed methodological approach, sourcing existing methodologies from literature.

4.1 Data sources and sample space

To meet the objectives of this dissertation, the study of both macroeconomic and microeconomic data was required. To obtain macroeconomic data for the Portuguese and Brazilian economies, the Bloomberg platform was used. To obtain the financial and economic data corresponding to the companies of Euronext Lisbon and B3 (“Brasil, Bolsa, Balcão”), the financial reports of each of the 18 corporations, for the years 2010 to 2020, were collected and analyzed. These 180 reports were read and interpreted and based on the data from the financial statements and their respective explanatory notes, a harmonized set of new financial statements, which could be more easily compared among themselves and consolidated according the IFRS standards, was constructed.

4.2 Methodology choice

Creswell (2018) suggests the segregation of research approaches in three different types: qualitative, quantitative, and mixed methods; highlighting that the first two should not be viewed as rigid, distinct categories, as instead, they represent different ends on a continuum.

Mixed methods research, in this context, is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the integration of qualitative and quantitative data yields additional insight beyond the information provided by either the quantitative or qualitative data alone (Creswell, 2018). Mentioning research designs (types of inquiry within qualitative, quantitative, and mixed methods approaches that provide specific direction for procedures in a research study), Creswell focuses on three types for mixed methods:

1. **Convergent mixed methods:** a form of mixed methods design in which the researcher converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. In this design, the investigator typically collects both forms of data at roughly the same time and then integrates the information in the interpretation of the overall results. Contradictions or incongruent findings are explained or further probed in this design.
2. **Explanatory sequential mixed methods:** one in which the researcher first conducts quantitative research, analyzes the results, and then builds on the results to explain them in more detail with qualitative research. It is considered explanatory because the initial quantitative data results are explained further with the qualitative data. It is considered sequential because the initial quantitative phase is followed by the qualitative phase. This type of design is popular in fields with a strong quantitative orientation (hence the project begins with quantitative

research), but it presents challenges of identifying the quantitative results to further explore and the unequal sample sizes for each phase of the study.

3. **Exploratory sequential mixed methods:** the reverse sequence from the explanatory sequential design. In the exploratory sequential approach, the researcher first begins with a qualitative research phase and explores the views of participants. The data are then analyzed, and the information used to build into a second, quantitative phase. The qualitative phase may be used to build an instrument that best fits the sample under study, to identify appropriate instruments to use in the follow-up quantitative phase, to develop an intervention for an experiment, to design an app or website, or to specify variables that need to go into a follow-up quantitative study.

In this context, this project will use an exploratory sequential mixed method approach, based on a literature review and the analysis of financial and economic data from public listed companies in Portugal and Brazil, as this research design should provide a better basis to obtain and discuss the in the richest way the quantitative data collected.

4.3 Methodology steps

The methodology of this dissertation is divided into five main stages:

1. Qualitative research

A literature review will be conducted to identify the main concepts and indicators related to the themes of performance and financial sustainability. The prime platform of research to be used will be the B-ON (Online Knowledge Library), as it covers multiple databases such as: ERIC, Medline, and Web of Knowledge (ISI Web of Science).

2. Quantitative assortment

The second stage will involve the collection of accounting and extra-accounting information, from 2010 to 2020, from the public listed companies and market segments detailed below:

- (i) Brazilian listed companies inside the market segment of Communications (Media, Telecommunications and Fixed Telephony);
- (ii) Brazilian listed companies inside the market segment of Pulp and Paper production;
- (iii) Brazilian listed companies inside the market segment of Construction Industry;
- (iv) Portuguese listed companies inside the market segment of Communications (Media, Telecommunications and Fixed Telephony);
- (v) Portuguese listed companies inside the market segment of Pulp and Paper production;
- (vi) Portuguese listed companies inside the market segment of Construction Industry

3. Data refinement

The third stage will involve the refinement of both qualitative and quantitative data, based on a survey (collection) of the most used indicators in financial analysis, in Brazil and Portugal, (which will be used within the isolated analysis as well as within bankruptcy forecasting models), and based on the conception of a harmonized set of new financial statements.

4. Data processing

The fourth step is constituted by the application of the selected financial indicators, and the bankruptcy forecasting models, to each company and market segment detailed in stage 2. It is important to highlight that the bankruptcy model's application's main objective is to provide a guidance of potential continuity problems inside each company analyzed.

5. Results assessment

The fifth and last stage will involve consolidating the results obtained and carrying out a detailed analysis congregating both qualitative and quantitative information based on three concomitant perspectives:

- (i) Horizontal Analysis: comparative framework between the present and the past of the evaluated company itself.
- (ii) Vertical Analysis: comparative framework between the present of the analyzed company and its competitor(s).
- (iii) International Analysis: comparative framework between Portugal and Brazil for each economic activity sector analyzed.

It is important to mention, that during this stage, any collection of additional relevant quantitative and qualitative information, to support the analysis of results obtained, is also present.

5 Results presentation and discussion

5.1 Companies overview

Data was gathered, filtered, and analyzed, from 2010 to 2020, for all companies presented in the following tables (Tables 3, 4 and 5), where six public listed corporations were chosen for each sector (three for each country), totaling 18 companies. All financial statements were obtained from each corporation's website, being standardized, and converted, for the case of Brazilian companies, to the euro currency (following the conversion table presented at the Appendix section).

Table 3: Construction companies' overview (source: annual reports; own elaboration)

CONSTRUCTION SECTOR COMPANIES			
Country	Company	Ticker	Description
Portugal	Conduril Engenharia S.A.	CDU PL	Conduril Engenharia S.A. is a Portuguese company dedicated to the performance of Civil Engineering and Public Works. The Company constructs dams, bridges, highways, roads and sanitation infrastructures, as well as provides hydraulic works, groundwater and geotechnical works. It was founded on 14 February 1959, and its shares were admitted to trading at the Stock Exchange in Lisbon in 1990.
	Mota-Engil SGPS S.A.	EGL PL	Founded in 1946, the Mota-Engil Group is a multinational company with operations focused on construction and infrastructure management, in the segments of Engineering and Construction, Environment and Services, Transport Concessions and Energy. Mota-Engil is a leader business in Portugal with a consolidated position in the rank of the 30 largest European construction groups. It became listed in the Lisbon Stock Exchange Market in 1987.
	Teixeira Duarte S.A.	TDSA PL	Teixeira Duarte Group comprises a wide range of subsidiary companies in six sectors as different as Construction, Concessions and Services, Real Estate, Hotel Services, Distribution and Automotive. It was founded in 1921 and is listed at Euronext Lisbon since 1998. Representing the origin of the Teixeira Duarte Group, construction is not only the core business of the group as a whole, but also of one of its biggest and most emblematic companies: "Teixeira Duarte – Engenharia and Construções, S.A."
Brazil	Azevedo e Travassos S.A.	AZEV BZ	Azevedo & Travassos is a Brazilian company that operates, mainly, in the civil construction sector. The Company structures its business into four areas: heavy and civil construction; electromechanical assembly; drilling and completion of wells and real estate development. It was founded in 1922 and became a public listed company in 1984.
	Direcional Engenharia S.A.	DIRR BZ	Direcional Engenharia SA is a Brazil-based company, founded in 1981 and engaged in the residential real estate sector. The Company focuses on development and construction of residential housing projects, targeting the low-income segment and it mainly builds multifamily homes that constitutes a residential district. It made its Initial Public Offering in 2009.
	Tecnisa S.A.	TCSA BZ	Tecnisa is one of the largest developers of residential projects in Brazil, founded in 1977, and operates through a complete business platform, which allows it to segment the totality of real estate development activities and execute in a fully integrated manner all the stages of development of its projects: acquisition of the land bank, development, sales and construction, the latter activities being carried out with its own team and contracted third parties. It concluded its Initial Public Offering in 2007.

Table 4: Pulp & Paper companies' overview (source: annual reports; own elaboration)

PULP & PAPER SECTOR COMPANIES			
Portugal	Altri SGPS S.A.	ALTR PL	Altri SGPS SA (Altri) is a Portugal-based holding company primarily involved in the production of bleached paper pulp from eucalyptus. The Company operates through a numerous subsidiaries, which are active in the production and sale of paper pulp, such as Caima, Celbi and Celtejo, and as various subsidiaries active in the management of forest resources, including Altri Florestal SA. Altri was incorporated in 2005 as a result of the restructuring process of Cofina through a spin-off of its industrial assets, a completed its IPO also in 2005.
	INAPA S.A.	INA PL	Founded in 1965, Inapa is a Portugal-based holding company mainly engaged in the distribution of paper. The Company operates through three business segments. In the Paper division it provides various paper products, including coated, offset, digital and carbonless paper, as well as cardboard and envelopes. In the Packaging division is active in the distribution of packaging products, including boxes, tapes, ribbons, bags and sticker. In the Visual Communication it offers products and services for large format digital printing, such as printers, toners, software and technical assistance. The company made its IPO in 1980.
	The Navigator Co. S.A.	NVG PL	Navigator Company SA, formerly Portucel SA, is a Portugal-based company primarily engaged in the paper manufacturing operations. The Company's activities are divided into four segments: Paper, Pulp, Energy and Forestry. The Paper segment offers uncoated printing and writing paper. The Pulp division provides bleached eucalyptus pulp. The Energy area mainly produces power from biomass fuels in the process of cogeneration, as well as produces heat for internal consumption. Finally, the Forestry segment is responsible for the maintenance of eucalyptus nurseries. The company was founded in 2001 and completed its IPO in 2006.
Brazil	Irani Papel e Embalagem S.A	RANI BZ	Irani Papel e Embalagem SA, formerly known as Celulose Irani SA, (Irani) is a Brazil-based company primarily engaged in the paper industry and was founded in 1941. The Company's activities are divided into three business lines: Corrugated Carboard Packaging segment (PO Packaging), which manufactures boxes and sheets of corrugated cardboard; Packaging Paper segment, which produces high- and low-weight Kraft paper and recycled paper; RS Forest and Resins segment, through which the Company cultivates pine, sells wood and produces resin extracted from pine. The company completed its IPO in 1977.
	Klabin S.A.	KLBN BZ	Klabin S.A. operates in segments of the paper and pulp industry, supplying the domestic and foreign markets with wood, packaging paper, paper sacks, corrugated cardboard boxes and pulp. The Company's segments include Forestry, Paper, Conversion and Pulp. It was founded back in 1899 and completed its IPO in 2001.
	Suzano S.A.	SUZB BZ	Suzano SA was founded in 1924, headquartered in Salvador, Brasil, and produces and sells eucalyptus pulp and paper products - both nationally and internationally. The company offers coated and uncoated printing and writing papers, paperboards, tissue papers, and market and fluff pulp; and lignin and its byproducts. It also engages in the leasing of reforestation land; operating port terminals; power generation and distribution business; road transport of freight; commercialization of equipment and parts; biotechnology research and development; and commercialization of computer paper and materials.

Table 5: Communications companies overview (source: annual reports; own elaboration)

COMMUNICATIONS SECTOR COMPANIES		
Portugal	NOS SGPS S.A.	NOS PL NOS, SGPS, S.A. is a telecoms and entertainment group in Portugal and it was created as a result of a merger between ZON Multimedia Servicos de Telecomunicacoes e Multimedia SGPS SA (ZON) and Optimus - SGPS SA (OPTIMUS). It offers latest generation fixed and mobile phone, television, Internet, voice and data solutions for all market segments, being a leader in Pay TV, new generation broad band services and in cinema distribution. It was founded as TVCabo in 1994.
	Pharol SGPS S.A. *	PHR PL PHAROL, SGPS S.A., formerly Portugal Telecom, SGPS, S.A., is a Portuguese open company founded in 1994. PHAROL's assets include Oi, S.A. and debt securities of Rio Forte Investments S.A. (Rio Forte).
	Sonaecom SGPS S.A.	SNC PL Sonaecom SGPS SA is a Portugal-based company primarily engaged in the telecommunication industry. The Company divides its business into two main units: Optimus, which is an integrated telecommunications operator, and the unit of Software and Systems Information Services (SSI). Additionally, the Company is active in the Online & Media sector, which includes the daily newspaper Publico and the online auction Website Miau.pt. The company was founded on June 6, 1988 and is headquartered in Maia, Portugal.
Brazil	Oi S.A. *	OIBR BZ Oi was created in 1998 as a result of the privatization of the national Telebrás System, covering 64% of the Brazilian territory. In 2008, the Company launched its mobile telephone services in the state of São Paulo. In 2009, Oi acquired BrT and, once becoming the controlling shareholder in 2010, began covering 100% of the Brazilian territory. In 2012, after the conclusion of its corporate restructuring process, Oi S.A. listed its shares for the first time on the São Paulo Stock Exchange and the New York Stock Exchange. In 2016 the company filed for bankruptcy protection.
	Telefonica Brasil S.A.	VIVT BZ Telefónica Brasil SA, trading as Vivo, is a Brazilian telecommunications group, subsidiary of Spanish Telefónica. It entered the Brazilian market in 1998, when the restructuring and privatisation of Telebrás was taking place. Later, in 2002, Telefónica and Portugal Telecom created a Joint Venture to operate in the Brazilian mobile market and they began their commercial operations under the name Vivo in April 2003. In 2012, Telefónica culminated the process of integration and transformation of the company in Brazil, with the launch of Vivo as a national commercial brand for all its services in the country. In 2015, Telefónica Brasi has closed the acquisition of GVT and has become the leading Brazilian integrated operator.
	TIM S.A.	TIMS BZ Tim SA is a Brazil-based telecommunications company, subsidiary of Gruppo TIM, an Italian telecommunications company. It was founded in 1995 and provides mobile and fixed telephony services and access to the Internet via modems, tablets, and mobile phones running on the 3G and 4G technologies to both individual and business customers. Its shares started being traded at the São Paulo Stock Exchange – Bovespa in 1998.

It is important to note that the pair of communications companies Pharol SGPS S.A. and Oi S.A. (both marked with an asterisk in Table 5 above) were removed from all sector's indicators calculations, as they presented a specific and compromising situation: in 2010 Pharol became a major shareholder of Oi S.A., that later in 2014 filed for bankruptcy. That situation not only degenerated both companies' financial statements information, but also induces a major correlation between both corporations that undermine any comparison analysis.

5.2 Macroeconomic overview

Macroeconomic factors constitute the broad indicators of financial growth, or decline, that affect a whole country's economy, and Dewi (2019) highlights that the performance of a business cannot be separated from the influence of those factors. In this context, to better understand each nation's circumstances and map the possible influences of these elements in the reality of each company, two main factors are analyzed: the real Gross Domestic Product's year-over-year percentage change, that congregates both GDP's and Inflation's evolution, and the progression of each country's main Stock Exchange indexes, depicting the overall price scenario of public listed companies.

Coming from the global financial crisis of 2008, both Portugal and Brazil end the year of 2010 with an apparent relevant upside in their real GDP (Figure 2), but which is partially caused by a rebound effect due to the low base of comparison it comes from. From this year onward, however, each country faces very different growth situations, until the global recession of 2020, due to Covid-19's pandemic. While Brazil was able to maintain significant increases of its real GDP (more than 3% average growth) until 2013, Portugal faced a recession period, mostly related to the Sovereign Crisis, with decreases in its real GDP until 2013.

In 2014, a very interesting event happens, as it constitutes an inflection point where both GDP's rates meet. While Brazil enters a recession period during 2015 and 2016, originated by a bribery scandal involving big national companies (inside Oil and Construction sectors, mainly) and which culminated in a political crisis that resulted in the impeachment process of its then president, Dilma Rousseff, Portugal is able to set foot in a growth period of its economy, sustained until 2019. While Brazil is able to show some recovery already in 2017, its GDP development keeps restrained to lower growth levels than those formerly observed. This conjunction of factors, from 2015 to 2017, is also known as the Brazilian Financial Crisis.

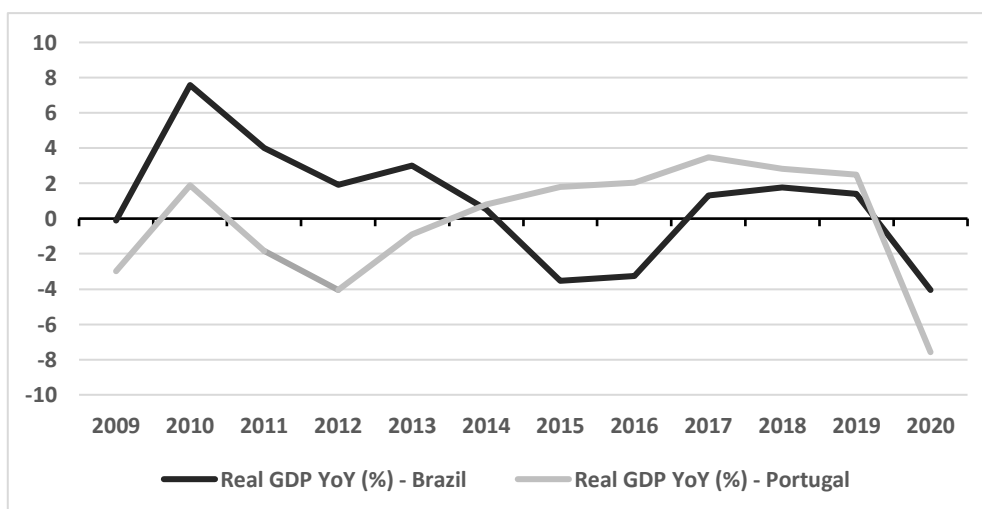


Figure 2: Gross Domestic Product of Brazil and Portugal - Year-over-year percentage change (source: Bloomberg)

Although Equity's prices are directly correlated to one country's GDP, as it reflects the growth of the national economy and, therefore, the potential growth of all companies inside the nation, they can also

be influenced by other factors. For example, the growth of risk perception by investors or the opportunity cost brought by higher national treasury's yield rates can decrease stock prices, while the opposite situation may also cause the inverse effect. This situation becomes evident as Portugal's PSI 20 Index (Figure 3) was not able to follow the GDP's recovery during 2015-2019. Also, as Brazil's Ibovespa (IBOV) Index (Figure 4) was unable to grow alongside its economy during 2010-2013.

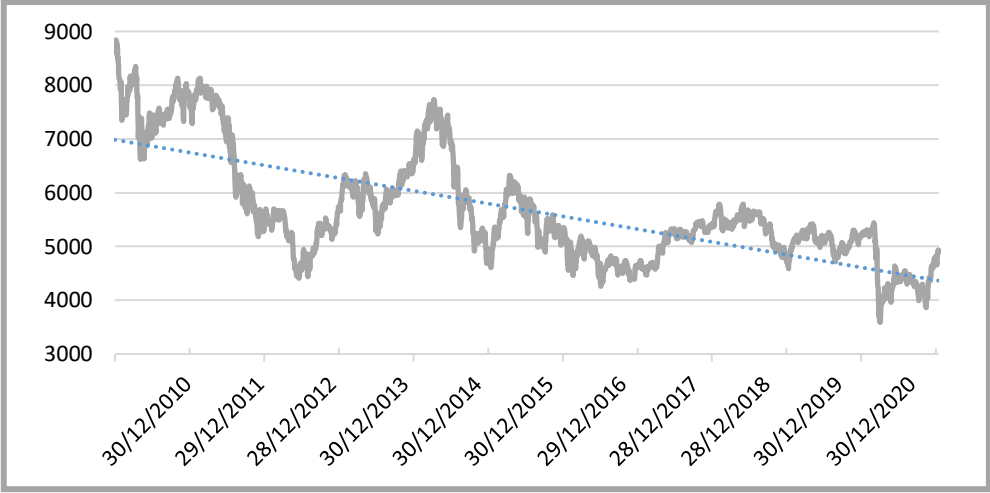


Figure 3: PSI 20 Index in euros, from jan-2010 to dec-2020 (source: Bloomberg)

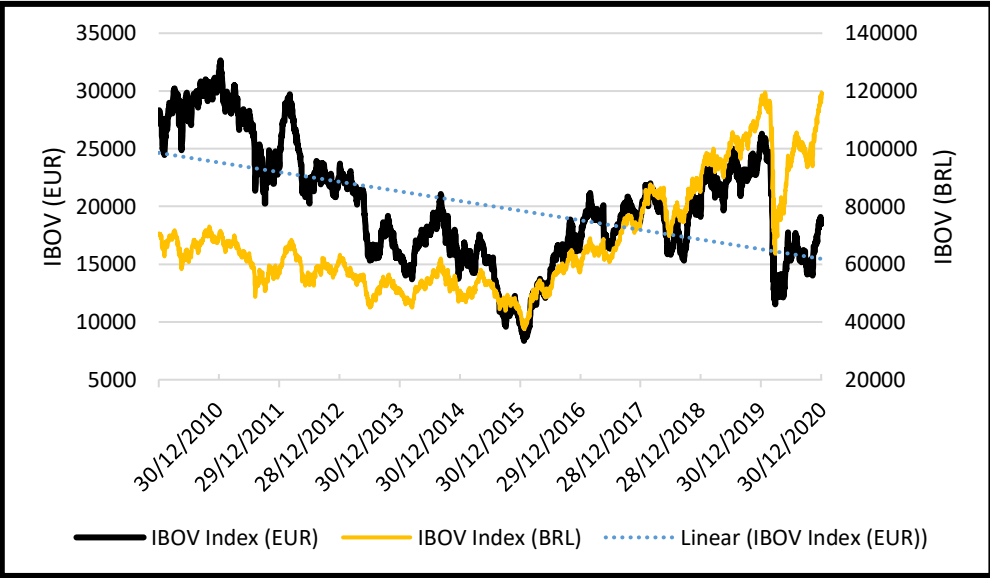


Figure 4: IBOV Index in euros and in local currency, from jan-2010 to dec-2020 (source: Bloomberg)

In a similar way to both countries' economies, it is clear that stock prices, in each context, follow reasonably distinct paths. It is important to highlight, however, that both Brazil and Portugal share a descending trend of their Equity market prices, for the period analyzed. Additionally, it is important to notice how the currency conversion factor can significantly impact the evolution of prices, depicted in Figure 4, and why the definition of standards is so relevant to a comparison study, especially when considering Brazil's highly volatile currency.

5.3 Construction Sector

5.3.1 Performance Indicators

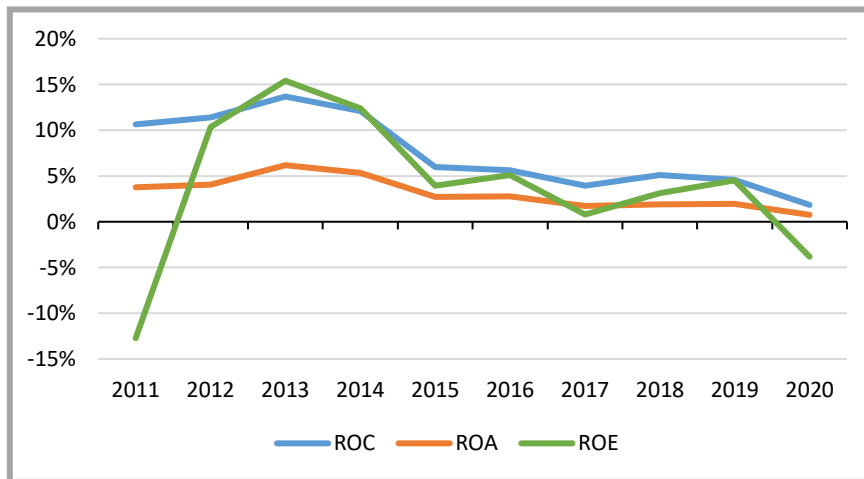


Figure 5: Average ROC, ROA, and ROE for selected construction companies in Portugal

First, analyzing the Portuguese construction companies, it is important to mention that all the analyzed corporations follow the same pattern observed in the average return ratios depicted in Figure 5: substantially higher figures during the 2011-2014 period, followed by an important reduction from 2015 on - with Teixeira Duarte's ROE being an outlier in 2011, due to a highly negative net loss connected to a major abnormal loss generated by unrealized investments (non-operating activities). As these ratios are directly related to the companies' earnings, this behavior can be connected to the substantial decrease in investments depicted in the following chart (Figure 6). Even though the decrease can be seen already in 2012, its impacts are usually felt in long-term periods, as they are associated projects with long maturity cycles.

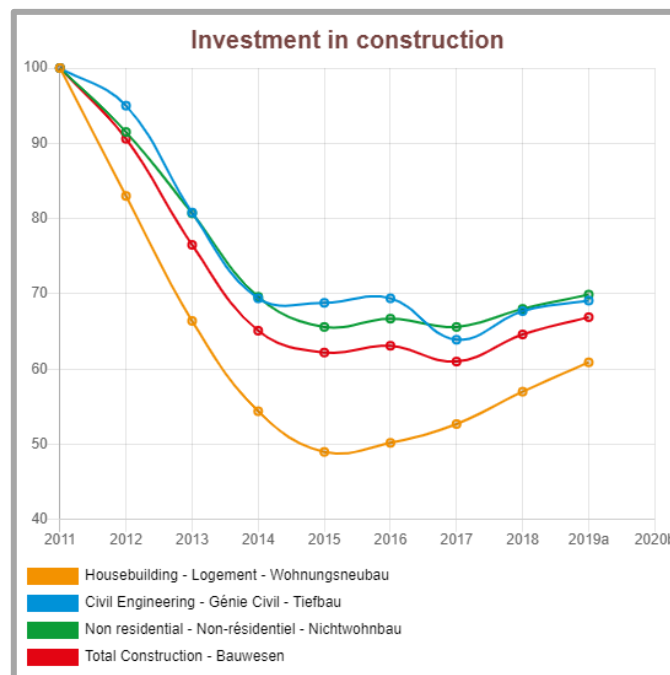


Figure 6: Investment in construction in Portugal, with 2011 levels as reference (source: FIEC, 2020)

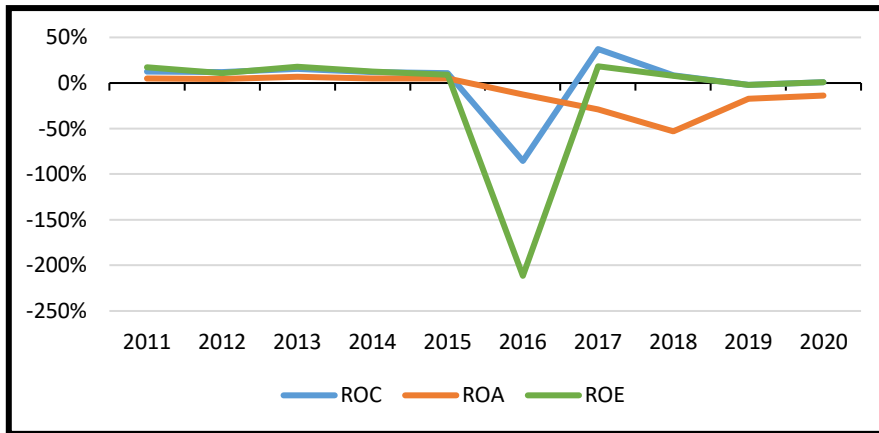


Figure 7: Average ROC, ROA, and ROE for selected construction companies in Brazil

Relative to the Brazilian companies (Figure 7), in turn, relatively constant levels can be observed until 2015, but with a major one-off downside in 2016 for ROC and ROE, while ROA present a lower and gradual deterioration, staying in the negative field for the rest of all year analyzed.

The first important aspect to note is that Azevedo & Travassos is the major responsible for this trend, as its negative net earnings are combined with a rapid decrease in its Equity level. However, this behavior can be connected to a relevant event inserted into the Brazilian Financial Crisis, that affected all the construction segment: the bribery scandal involving a major construction firm called “Odebrecht”, brought to light by the “Lava Jato” federal criminal investigation, which negative repercussions spilled over all this sector.

The second important point is that the mitigated, but prolonged, decrease in ROA ratio, can be related to the illiquid aspect of these construction companies’ assets. As they rely on big and longer projects, the loss of assets is limited, but with an extended recovery period required after.

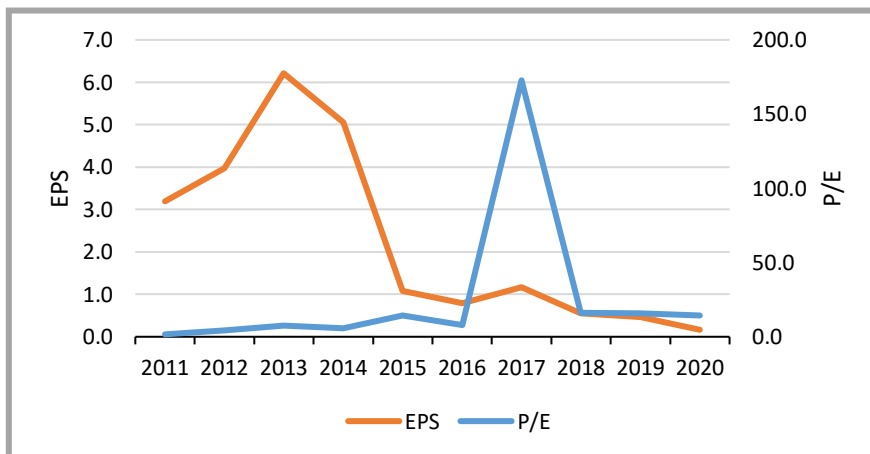


Figure 8: Average EPS and P/E for selected construction companies in Portugal

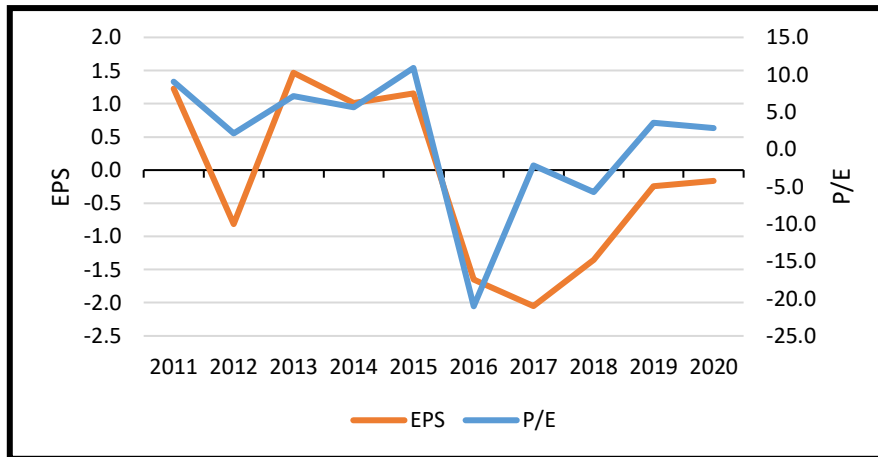


Figure 9: Average EPS and P/E for selected construction companies in Brazil

As the number of outstanding shares do not change so frequently, or so abruptly, the Earnings-Per-Share ratio changes are majorly caused by the fluctuations in the average net earnings, and therefore are also correlated to the return ratios discussed above. Even though the Price-to-Earnings ratio also shows some connection with the companies' income, it presents much more volatility due to the directly relation with market share prices. While a similar drop in the EPS ratio can be observed in both Portuguese (Figure 8) and Brazilian companies (Figure 9), in 2015 and 2016, respectively, the scenario is much worse for Brazil, as negative values are reached and maintained until the end of the period studied. This depicts that not only Brazilian companies presented net losses that were proportionally significant (around -2€ per share), but that it represents a structural rupture in their performance, as they were not able to effectively recover from this event.

As for the Price-to-Earnings ratio, two important points can be mentioned. First, for the set of Portuguese companies, its relatively constant levels in comparison to the EPS ratio evolution (with the exception caused by Mota-Engil, in 2017, due to a significant drawdown in earnings accompanied by an increase in prices) can be explained by the highly correlated movements between stock prices and the net earnings results for each period. Secondly, as for the Brazilian companies, however, this correlation is much more diffused, depicting some of the externalities and even irrationalities present on stock markets. In fact, as prices reflect not only past results but also future expectations, the anticipated movement of the P/E ratio, in comparison to EPS, may depict exactly this scenario. Overall, both ratios, therefore, depict a worse recent performance situation for the Brazilian sample.

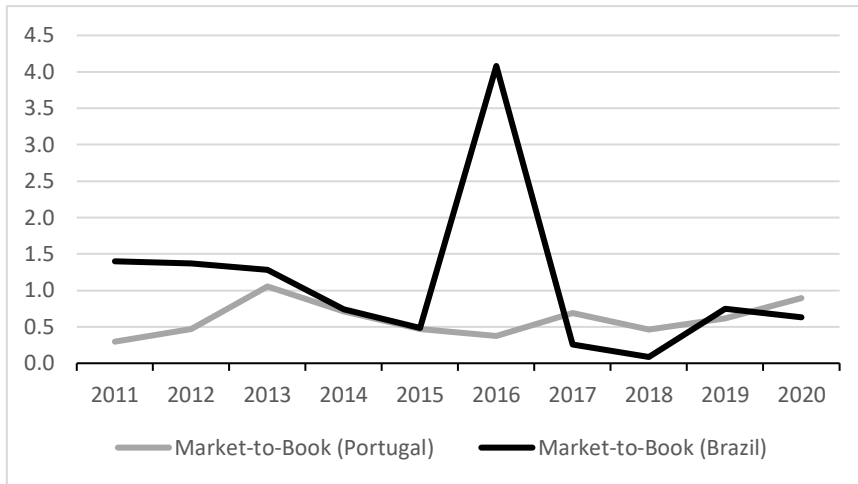


Figure 10: Average Market-to-Book Ratio for selected construction companies in Portugal and Brazil

Finally, relatively similar ranges (between 0.5 and 1.5) of market-to-book values (Figure 10) can be observed for both countries, with an exception brought in 2016 by Azevedo & Travassos inside the Brazilian sample (for the same reason mentioned in relation to the acute drawdowns in average ROC and ROE previously shown) and a distinction between trends at the end of the timeline: while Brazil's companies shown a descending behavior since 2016, Portugal's enterprises go in the opposite direction. This shows a special positive aspect for the Portuguese corporations when considering that PSI20 Index (Figure 3) presented a negative trend in these years, depicting some "extra" attractiveness of this sector to the market in 2020. In this context, although not clear conclusion can be obtained from the first half of the period analyzed, Portuguese companies not only depict a better level (and therefore better market-based perspectives), but also a better trend of their Market-to-Book ratio in the recent years.

5.3.2 Efficiency Indicators

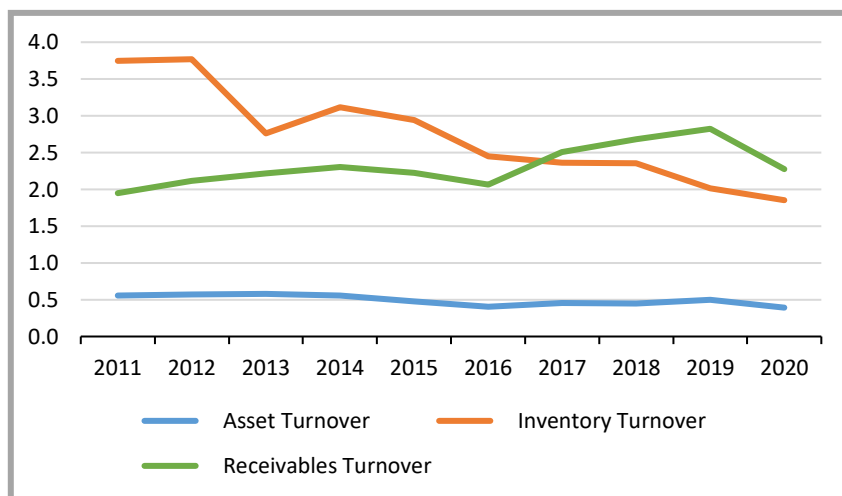


Figure 11: Average turnover ratios for selected construction companies in Portugal

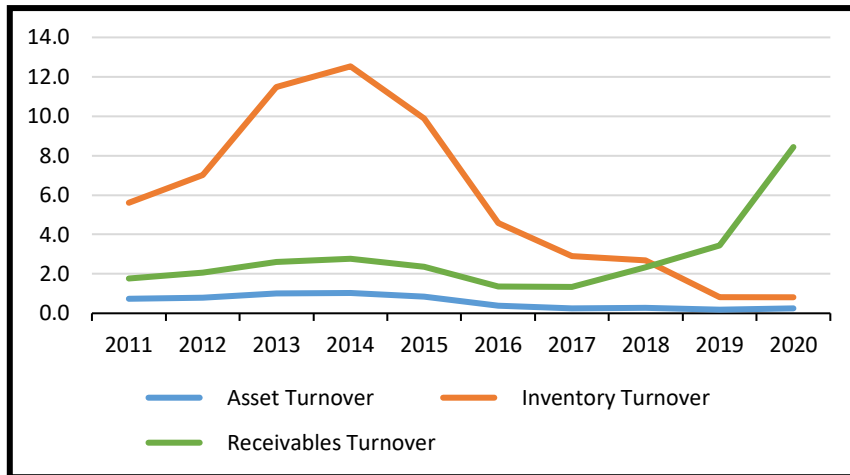


Figure 12: Average turnover ratios for selected construction companies in Brazil

While relatively similar levels can be observed for Asset and Receivables Turnover ratios for both countries (Figure 11 for Portugal, and Figure 12 for Brazil) in the first half of the period analyzed, the major difference relies on the Inventory Turnover ratio: although Brazilian companies show significant higher levels, these figures are only related to incredibly low inventories in Azevedo & Travassos. Were this company's data to be ignored, a similar structural/sectoral condition can be pointed out: with similar nature of activities, relying on high inventory levels and low turnover related to long-maturity projects, both countries present similar turnover levels, being the Asset Turnover ratios always the lowest one.

This set of efficiency indicators, however, depict also some deterioration of the Brazilian sample's situation from 2016 forward. Not only the Asset Turnover and the Inventory Turnover ratios suffer a reduction, mostly connected to the decrease in net earnings and COGS, but the Receivables Turnover ratio suffers a relevant increase, depicting the resultant reduction of average accounts receivables due to the suppressed sales. Again, it confirms the more difficult recent situation of the Brazilian Construction sample.

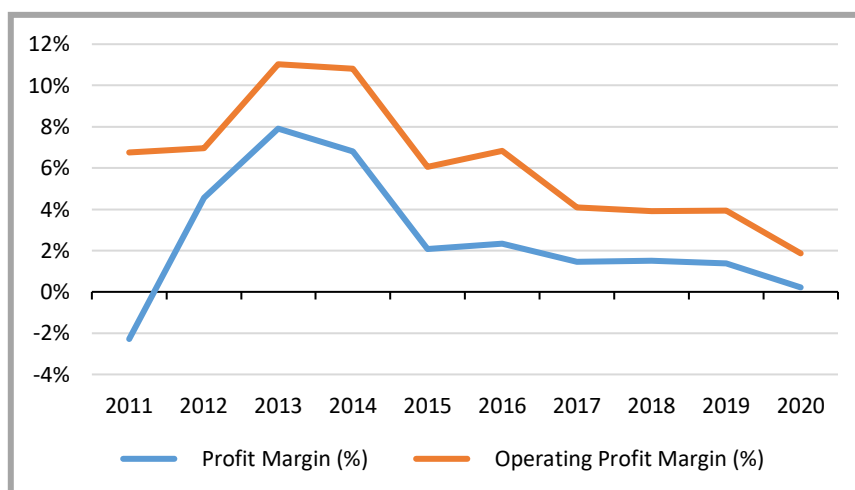


Figure 13: Average profit margins for selected construction companies in Portugal

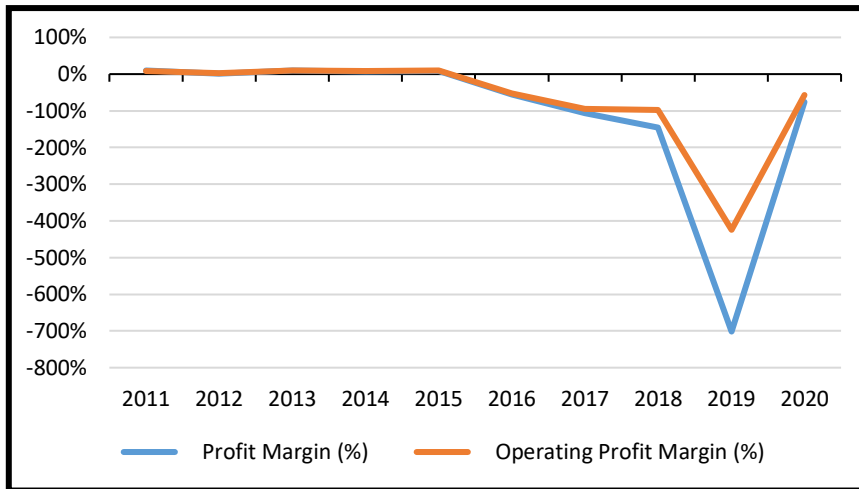


Figure 14: Average profit margins for selected construction companies in Brazil

The Profit Margins depict a major distinction between Portuguese (Figure 13) and Brazilian (Figure 14) construction sectors scenarios: while the first one remain with much less volatile and with positive values (even though with a descending trend), the second one depicts a much more alarming situation from 2016 forward: all Brazilian companies reach negative net income values, with a relevant gap between operating profit and net profit mostly related to an increase in interest expenses, that are directly correlated to the growth of debt levels. This scenario confirms all the results discussed about the performance and efficiency indicators discussed before, depicting in a direct way the relevant drop in net earnings of Brazilian companies in the second half of the period analyzed.

5.3.3 Leverage Indicators

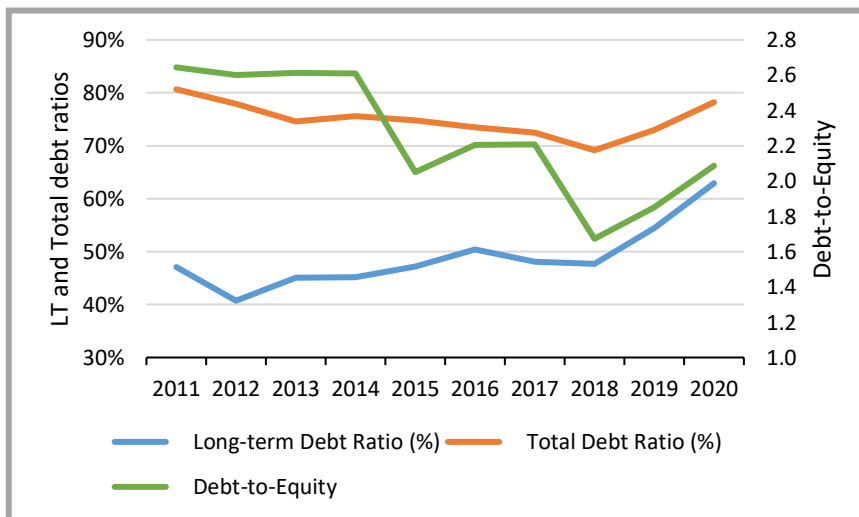


Figure 15: Average debt ratios for selected construction companies in Portugal

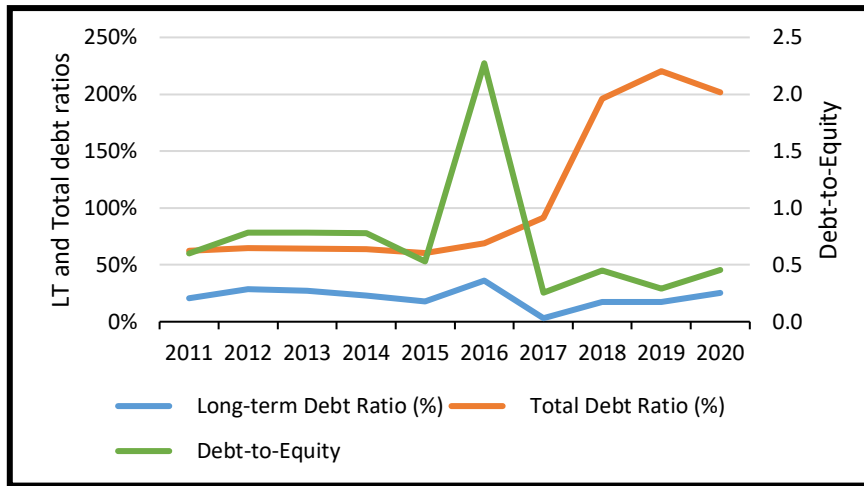


Figure 16: Average debt ratios for selected construction companies in Brazil

Being the acute increase in Debt-to-Equity ratio of Brazilian companies (Figure 15) again related to the major drawdown of Azevedo & Travassos' Equity, the main difference between both countries relies on the Total Debt ratio. Although higher average indebtedness levels (Long-term Debt Ratio and Debt-to-Equity) of Portuguese companies (Figure 16) can be observed along the period, a decrease in total assets, caused mainly by the reduction of current assets, distances the Brazilian companies' Total Debt Ratio in 2018-2020, and depict a worse leverage situation sustained until the end of the years being analyzed. This context, again, depict a constant healthy situation for the Portuguese sample, while a clear segregation between the first and the second half of the period is traced for the Brazilian companies.

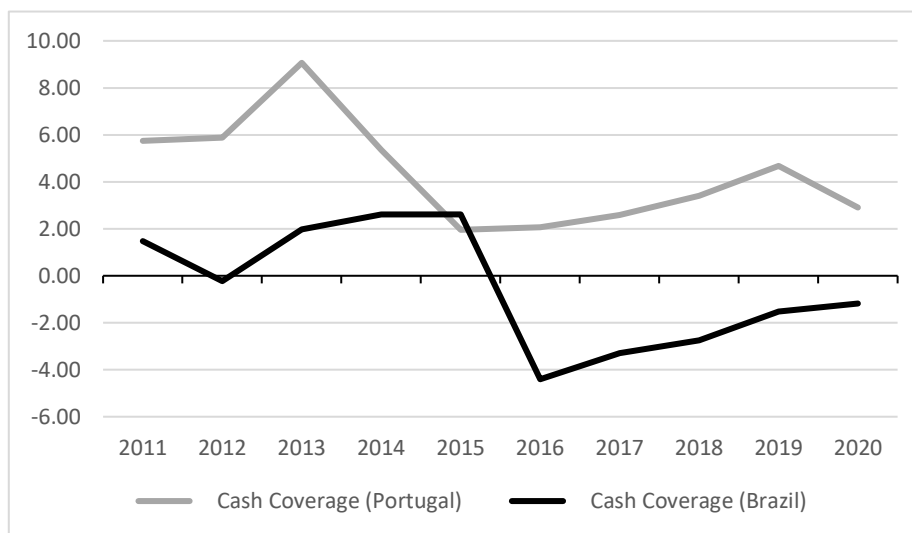


Figure 17: Average Cash Coverage ratio for selected construction companies in Portugal and Brazil

Although Portuguese construction companies suffered a significant reduction in their Cash Coverage ratio (Figure 17), when comparing the 2011-2014 period with the rest of the sample, they reached a bottom limit of around 2x EBIT over Interest Expenses, showing that healthy levels of leverage could still be maintained. As for the Brazilian companies, however, the scenario is very consonant with their profit margins, where the highly negative values of cash coverage are mainly only related to their

negative operational results, as interest expense levels did not suffer significant changes over the period. It is important to mention that, although the average ratio from the sample do not show a recovery to levels above zero after 2016, Direcional was able to reach positive values already in 2018, obtaining a cash coverage of more than 2x in 2020, and showing a strong resilience even with the covid-19 pandemic effects.

5.3.4 Liquidity Indicators

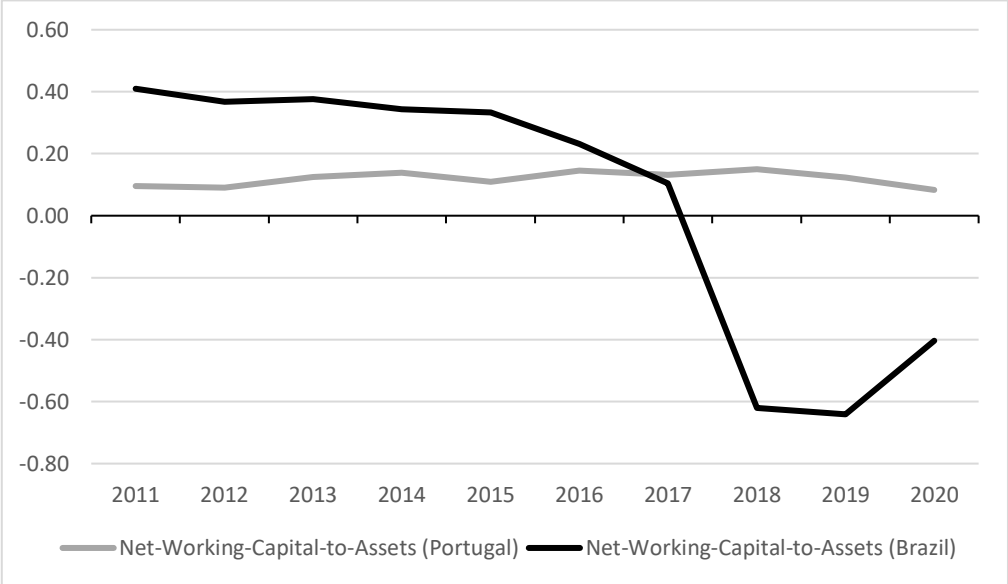


Figure 18: Average Net-Working-Capital-to-Assets ratio for selected construction companies in Portugal and Brazil

The relatively stable levels of Net-Working-Capital-to-Assets (Figure 18) seen in the Portuguese segment depict a healthy relation between the changes on current liabilities and current assets, keeping net-working-capital positive and constant, but also show a small amount of additional funds, in proportion to the size of the businesses, available to financing operations. As for the Brazilian companies, higher and healthier levels were maintained over the first half of the period, but with an equally mirrored drawdown shown in the following years. But more importantly, this loss, although with some delay, can be directly related to the major downside in earnings (depicted previously by the profit ratios) felt in the crisis of the sector in 2016: current liabilities increase, as short-term obligations are not fulfilled and long-term financing becomes more difficult, and current assets decrease, as they are the most liquid ones and the first used to cover the gap in net earnings. As a result, it corroborates for the overall unhealthy scenario shown by the Brazilian sample, in opposition to the constant healthy situation of Portuguese companies.

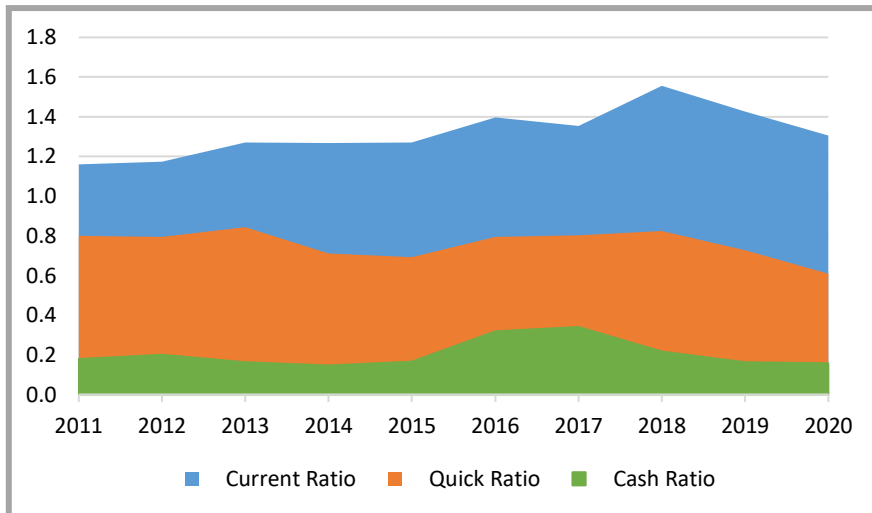


Figure 19: Average Current, Quick and Cash ratios for selected construction companies in Portugal

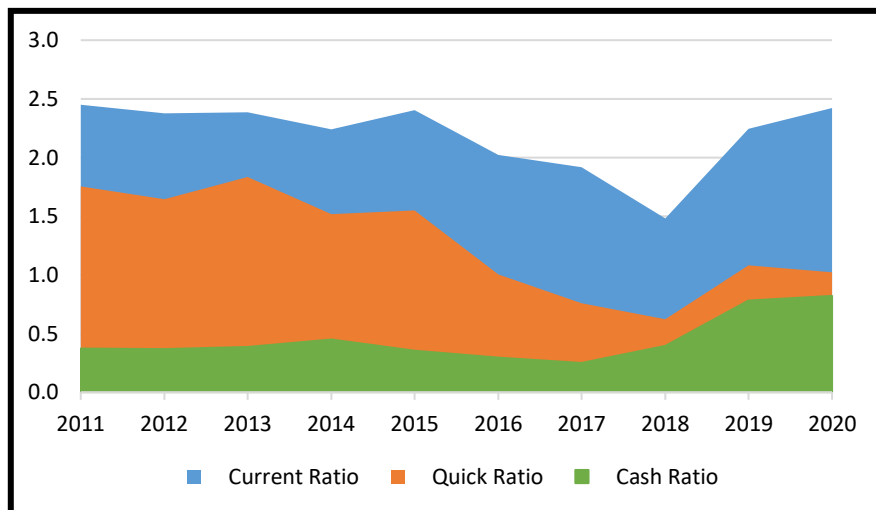


Figure 20: Average Current, Quick and Cash ratios for selected construction companies in Brazil

As expected for asset heavy companies, the relative proportion, for both countries' samples, between the most liquid assets (Cash Ratio) and the total assets (Current Ratio) is significantly high. This is mostly due to elevated inventory levels (depicted by the blue area of the figures), and the high accounts receivables amounts (depicted by the orange area of the charts). The Portuguese sample (Figure 19), although with lower overall levels, show a more stable – and therefore more sustainable - relationship between the companies' assets and liabilities, as also demonstrated by the net-working-capital-to-assets ratio just before.

The scenario observed in the first half of the period for the Brazilian companies (Figure 20), that show the gap between the Quick and the Cash Ratio as the most relevant one, show a very important relation with the high Inventory Turnover ratio levels observed before: being those companies involved in long maturity projects, very often with the option of extended and diffused methods of payments offered to clients, a high level of sales, in relation to the company's assets, causes also a conservation of large receivables amounts. Finally, the situation depicted in the second half of the period shows a worsening

of the quality of Brazilian companies' liquidity, as the inventory levels, included in the Current Ratio, become the predominant assets.

5.3.5 Bankruptcy prediction scores

Table 6: Mode of bankruptcy prediction models results, for Portuguese construction companies, obtained from the average financial statements. N = non-healthy; H = healthy. (source: own elaboration)

Construction companies in Portugal										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

Table 7: Mode of bankruptcy prediction models results, for Brazilian construction companies, obtained from the average financial statements. N = non-healthy; H = healthy. (source: own elaboration)

Construction companies in Brazil										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

In relation to the Portuguese Construction companies (Table 6), Teixeira Duarte is the one who got the worst average scores inside the three bankruptcy prediction models. Conduril, in its turn, obtained the best values, being classified in a healthy situation by Matias' model during all periods analyzed. All the sample, however, got an overall classification as non-healthy corporations, when considering the mode of all three models' results, and which can be explained by three main factors: low values net working capital, negligible amounts of cashflow and reduced amounts of retained earnings – all considering the relative proportion to total assets.

The Brazilian sample (Table 7), similarly, obtained a non-healthy overall classification, but with the evolution of scores confirming some of the circumstances observed with the isolated ratios. While Direcional was the one able to obtain the best scores of the sample, Azevedo & Travassos was depicted as in the most concerning situation. Additionally, all model's scores suffered a clear deterioration in 2016, with a clear distinction between the 2011-2015 and the 2016-2020 periods. Low levels of retained earnings, reduced average operating incomes, and reduce amounts of cashflow were the main factors related to the negative results. These results corroborate to the scenario depicted by the isolated ratios: the Portuguese sample depicted more stable indicators, with healthier levels and only with some deterioration in 2020, while the Brazilian companies selected entered in an unhealthy scenario after the bribery scandal in 2016, not being able to recover until the end of the period analyzed.

5.4 Pulp and Paper Sector

5.4.1 Performance Indicators

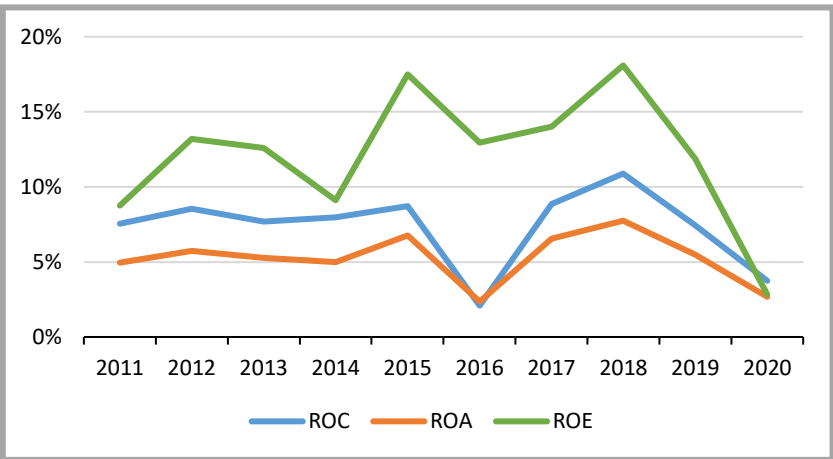


Figure 21: Average ROC, ROA, and ROE for selected pulp & paper companies in Portugal

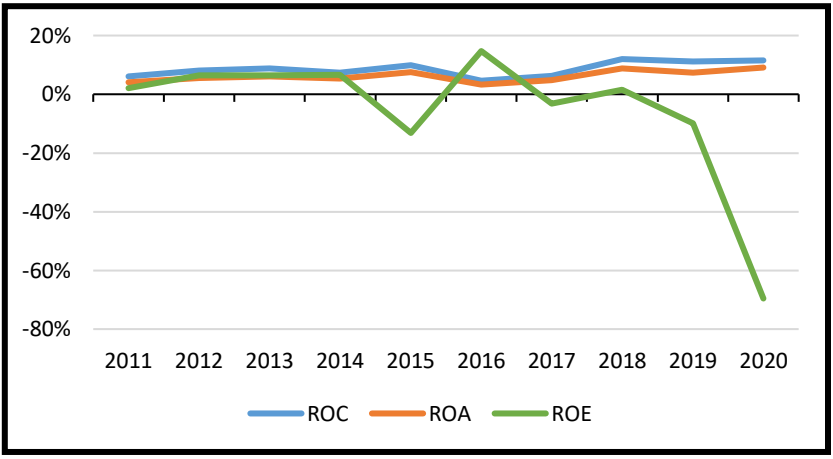


Figure 22: Average ROC, ROA, and ROE for selected pulp & paper companies in Brazil

The first important thing to notice in the Portuguese scenario (Figure 21), mainly opposed to the focused crisis observed in the Brazilian construction sector (Figure 22), is that the return ratios present themselves relatively stable for almost all the analyzed timeframe. The drawdown observed in 2016, in Portugal, is only related to a focused increase in the effective tax rate paid by INAPA, that therefore shrinks the NOPAT value, and explains the gap between ROC/ROA and ROE (based on net earnings).

As for the Brazilian scenario, the major drop in ROE, in 2020, is a result from both Suzano and Klabin's highly negative net earnings, due the impacts of the covid-19 pandemic. Irani, however, presents a marginal increase in their net earnings this year, bringing to light some of the heterogeneity of the impacts caused by the pandemic crisis. While paper consumption suffered a significant drop, connected to both the deceleration of the economic activity and the acceleration of technological/virtual transition processes, the demand for paper packages - which Irani has become more and more specialized in - increased significantly, as its use is deeply connected to the activity of delivery services and e-commerces (Figure 23).

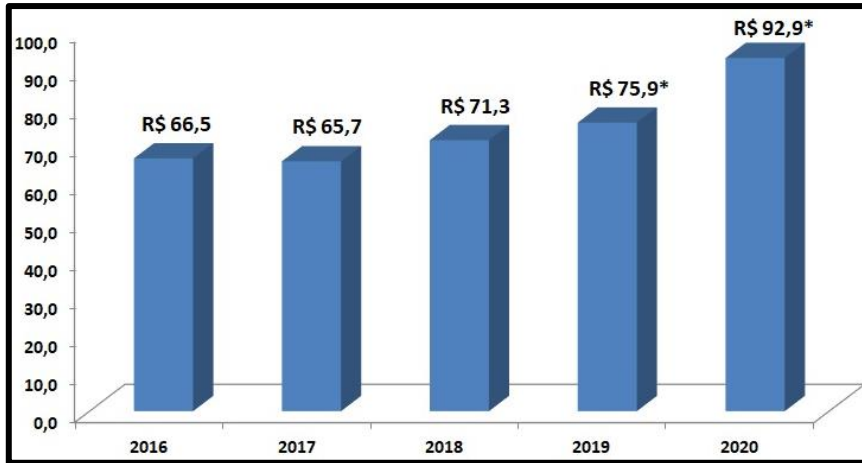


Figure 23: Gross value of national packaging production, in billions of reais. (Source: ABRE - Brazilian Packaging Association, 2021)

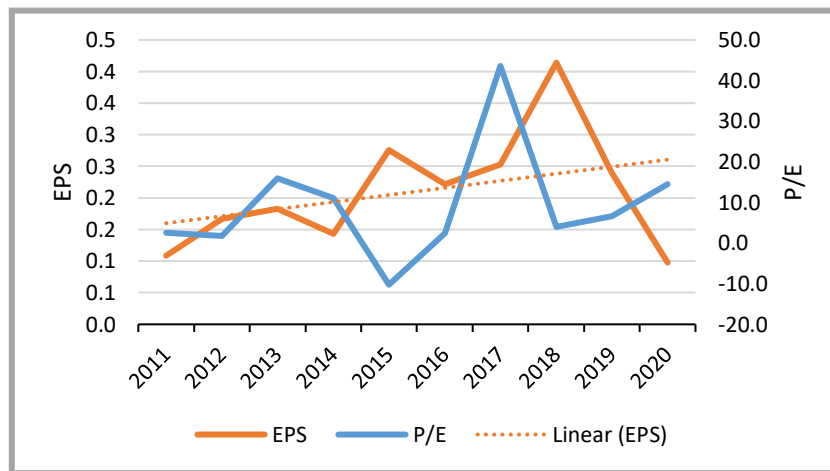


Figure 24: Average EPS & P/E ratios for selected pulp & paper companies in Portugal

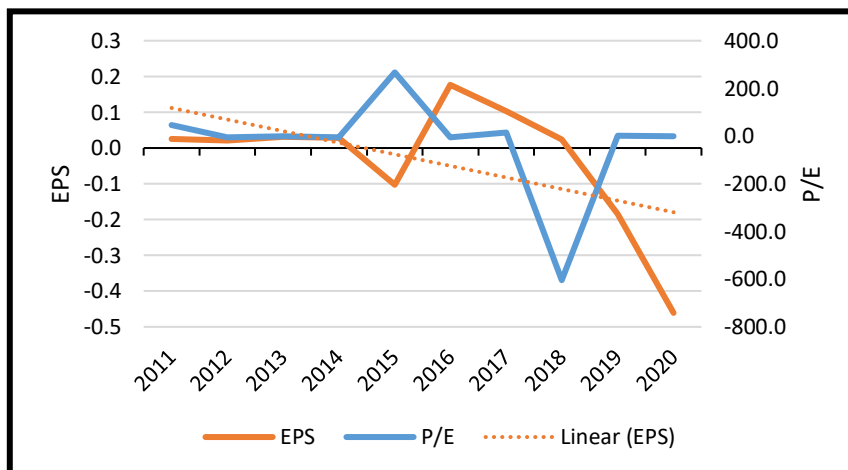


Figure 25: Average EPS & P/E ratios for selected pulp & paper companies in Brazil

Again, as the EPS' variations are mostly related to fluctuations in the companies' earnings, it presents a similar behavior to the return ratios in the scenario of both countries. Although the value of this ratio is difficult to be compared between companies, its evolution is an important factor, presenting a clear

distinction between both nations: an ascending trend for Portuguese corporations (Figure 24), and a sharp descending trend for Brazilian companies (Figure 25).

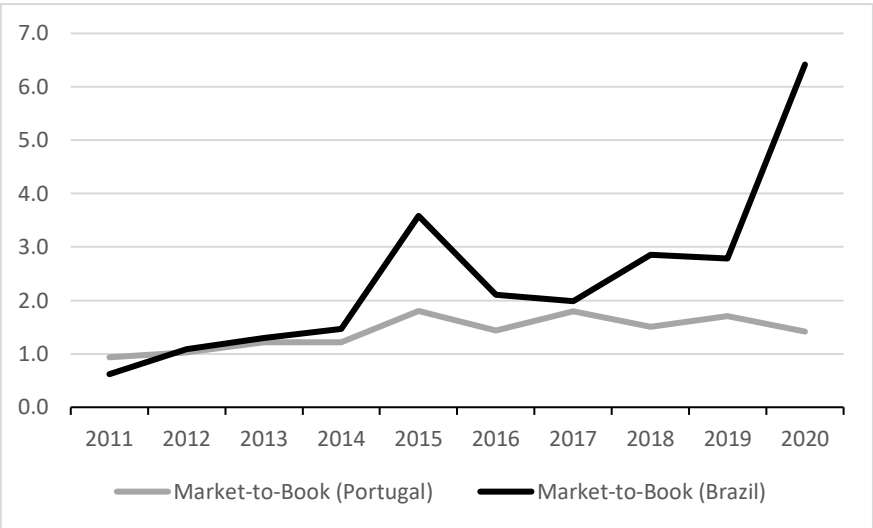


Figure 26: Average Market-to-Book ratio for selected pulp & paper companies in Portugal and Brazil

Market-to-book ratio of the Portuguese sample, shown in Figure 26, presents a stable and slightly positive trend, but in a not so high (around 1.5x) average level, and showing some stagnation in its market. The Brazilian scenario, however, is more optimistic, when considering a sharper crescent trend and, specially, the incredible upside seen in 2020, when considering that IBOV Index levels almost didn't suffer great changes between the end in 2019 and 2020. This isn't only related to an increase in market capitalization (except for Klabin), but with a significant decrease in these companies' equity. In terms of local markets, this depicts a better expectation, and therefore, better relative prices for the Brazilian Pulp & Paper companies in relation to the Portuguese sample, for most of the period analyzed.

5.4.2 Efficiency Indicators

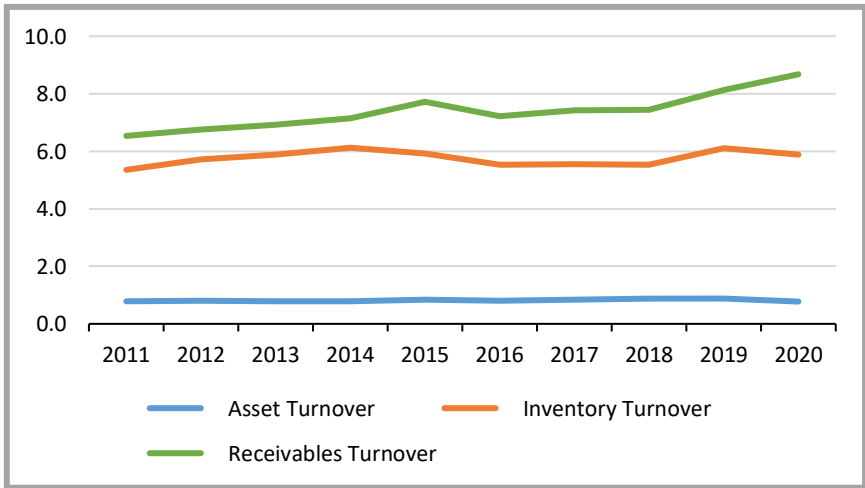


Figure 27: Average turnover ratios for selected pulp & paper companies in Portugal

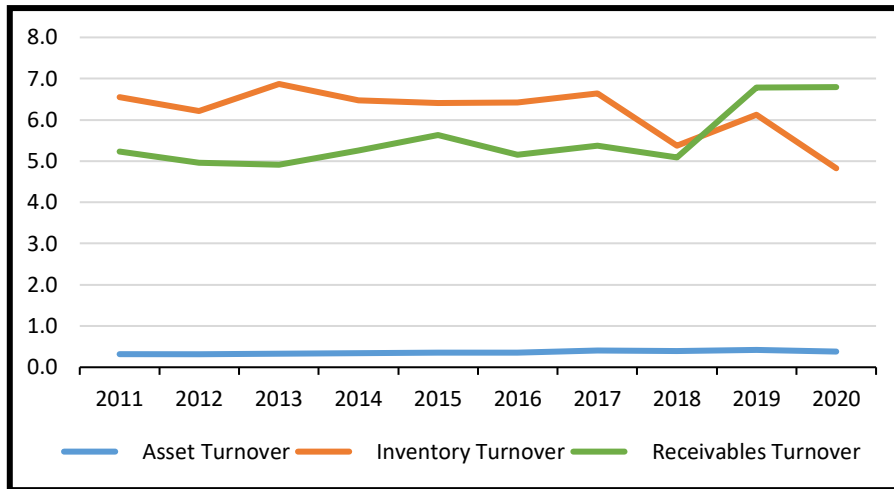


Figure 28: Average turnover ratios for selected pulp & paper companies in Brazil

Involving companies also classified as asset-heavy industries - which is directly related to the significant gap between the Asset Turnover and Receivables/Inventory Turnover (Figure 27 and Figure 28) - the Pulp & Paper sector presents a more dynamic sales cycle when compared to the Construction samples analyzed earlier. All turnover ratios show some similar behavior between the Brazilian and the Portuguese scenarios, with the only exception of a more loosen cycle of payment offered to clients in Brazil, depicted by its lower Receivables Turnover levels. Consequently, this set of indicators reinforces their connection to the structural context of each sectoral characteristic and depicts a similar situation for both samples in the period analyzed.

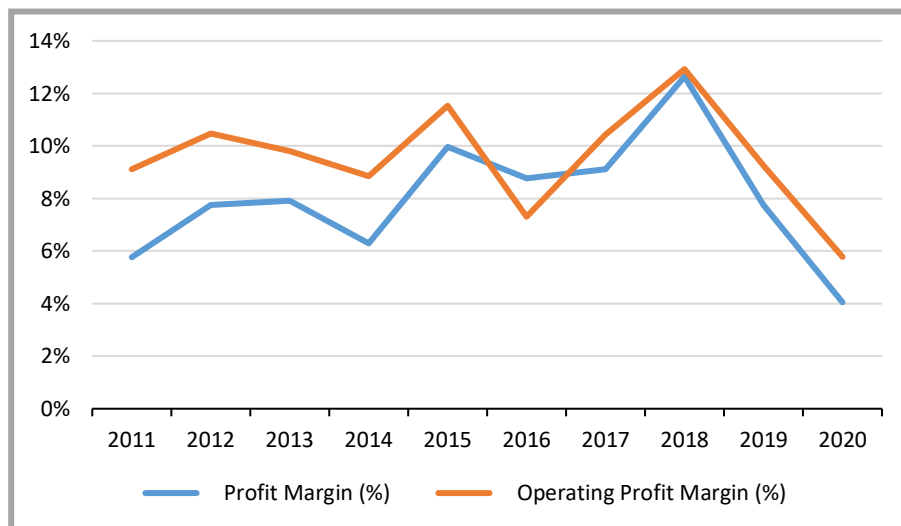


Figure 29: Average profit margins for selected pulp & paper companies in Portugal

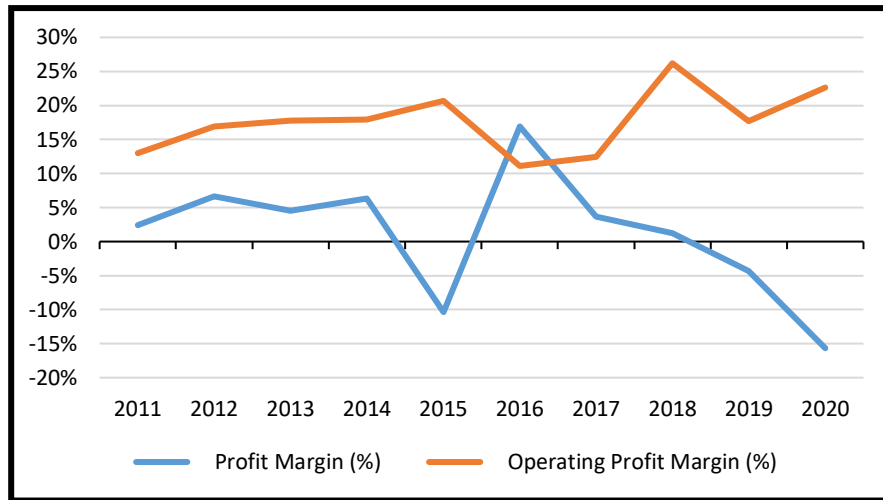


Figure 30: Average profit margins for selected pulp & paper companies in Brazil

The first important point to note, about the profit margins of Portuguese companies (Figure 29), is that while Altri and Navigator present similar and higher profit margins (around 12% for Profit and 14% for Operating Margin), Inapa is responsible for bringing this average down, with its levels around zero, and in some years, negative. The second relevant aspect to call attention to, is the significantly broader gap between both ratios for the Brazilian sample (Figure 30). This is explained by two main non-operational expenses: substantial amounts of interest expenses and relevant foreign exchange losses, that are both amplified in 2020. In conclusion, a worse situation is depicted for Brazilian companies in the recent years, more clearly depicted by the descending and, in the last couple of years, negative net earnings values.

5.4.3 Leverage Indicators

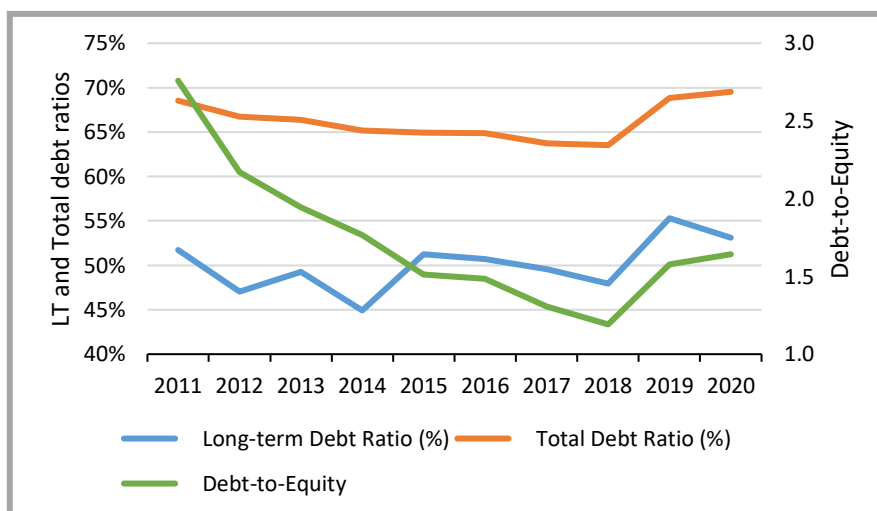


Figure 31: Average debt ratios for selected pulp & paper companies in Portugal

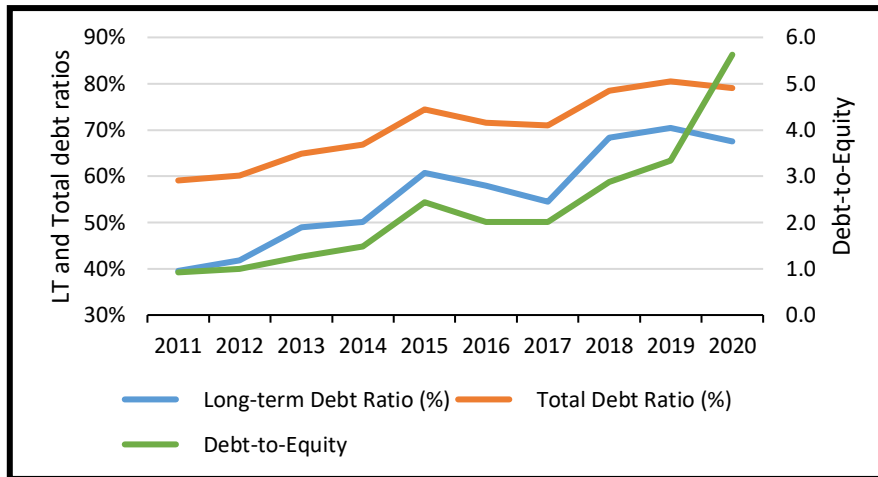


Figure 32: Average debt ratios for selected pulp & paper companies in Brazil

Considering the average levels for the period, both Long-term Debt and Total Debt Ratio present similar values for both countries' samples. The first important difference, however, is the evolution of these indicators: while Portuguese companies (Figure 31) depict more stable levels of leverage, Brazilian companies (Figure 32) suffer an increase of around 20% in both ratios just mentioned. The second (and sharper) difference relies on the Debt-to-Equity ratio. While it presents a decreasing trend, with an average level of 1.5 points, in the first sample, Brazil's scenario shows a trend of increasing indebtedness and with a pronounced deterioration in 2019 and 2020 - related also, in part, to a decrease in overall equity levels. In summary, the Pulp & Paper Brazilian sample depicts an overall worse leverage situation in relation to Portuguese companies, with a special deterioration suffered in the most recent years.

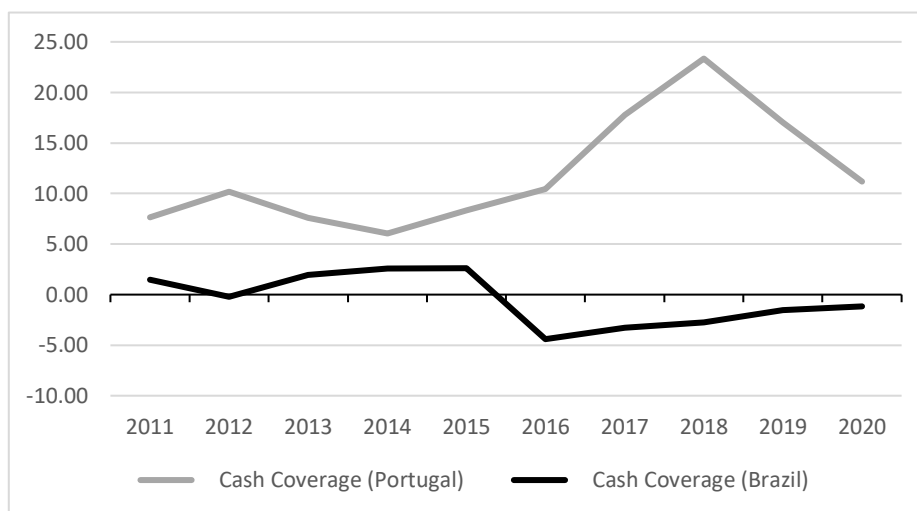


Figure 33: Average Cash Coverage ratio for selected pulp & paper companies in Portugal and Brazil

Even though Portuguese companies present an average Cash Coverage ratio almost four times higher than Brazilian ones (Figure 33), the second sample still depicts a maintenance of healthy leverage levels, of at least two times EBIT over Interest Expenses. For both countries' selections, however, it is important to highlight one common circumstance: while two companies are responsible for a high ratio of Cash Coverage, one finds itself in a more difficult situation. The Portuguese corporation Inapa presents an average of 1.6x for the period, and the Brazilian Irani shows an even lower average

indicator, of 1.1x interest expenses. Overall, the coverage circumstance is worse for the Brazilian sample, with a more significant deterioration from 2016 forward.

5.4.4 Liquidity Indicators

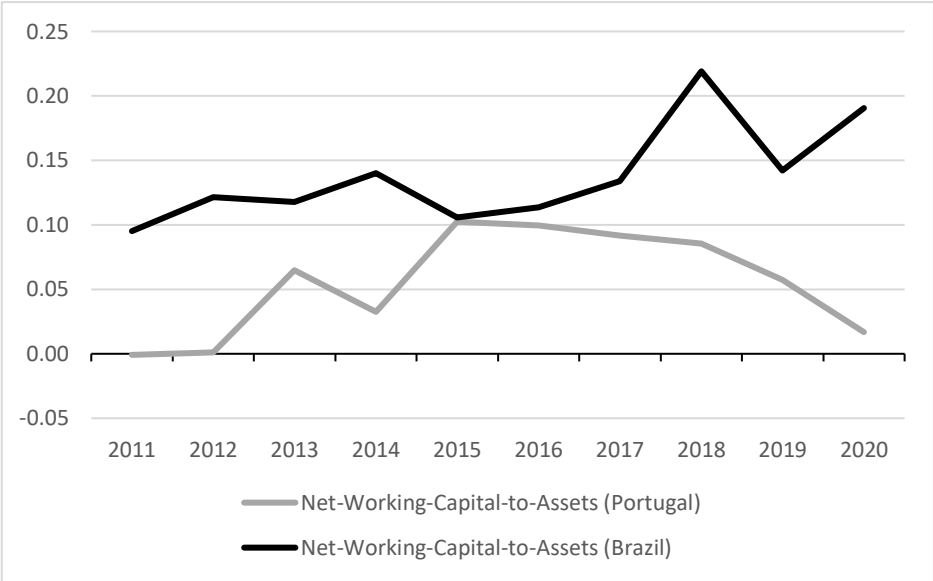


Figure 34: Average Net-Working-Capital-to-Assets ratio for selected pulp & paper companies in Portugal and Brazil

In terms additional proportional funds available to financing operations, Brazilian Pulp & Paper companies present a more comfortable situation (Figure 34). Additionally, they also show a healthier relation between current assets and current liabilities, with a less volatile and a crescent level of net-working-capital-to-assets. These figures are especially favorable when considering that the average net-working-capital (rising approximately 120% until 2019) can overcome a relevant increase in average total assets, that increase around 100% until 2019. Although the Portuguese companies can maintain average positive ratios, it is important to expose that both Altri and Inapa present negative net-working-capital figures in 2011 and 2012. In opposition to all other three sets of ratios presented before, the Brazilian sample depicts a better liquidity situation, with a marked deterioration of Portuguese companies in the most recent years.

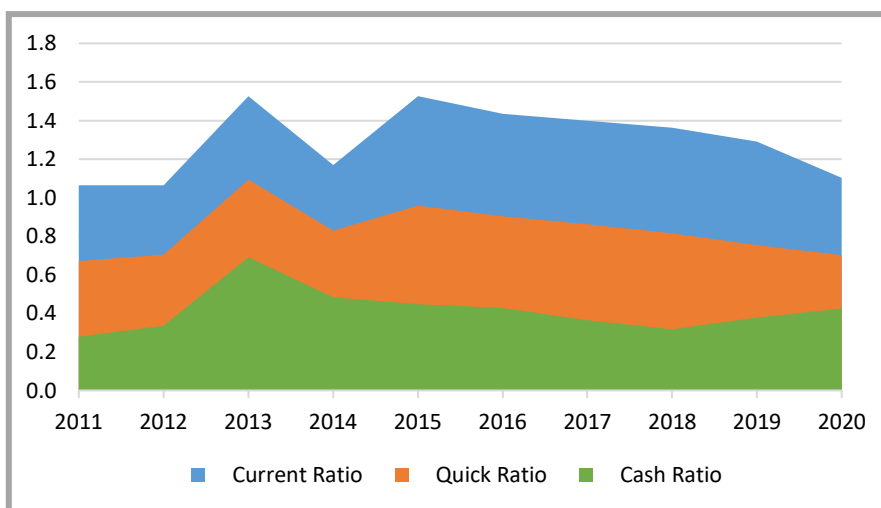


Figure 35: Average Current, Quick and Cash ratios for selected pulp & paper companies in Portugal

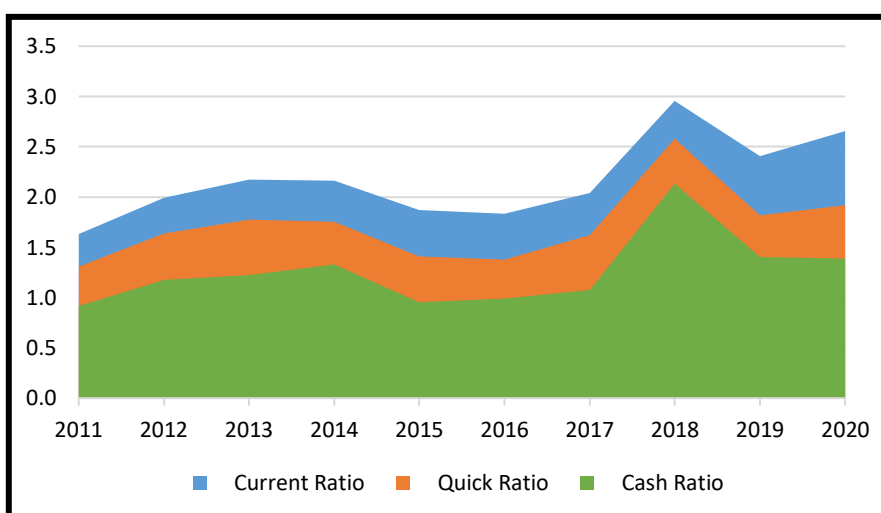


Figure 36: Average Current, Quick and Cash ratios for selected pulp & paper companies in Brazil

Confirming the more favorable situation for Brazilian companies, in terms of liquidity, brought by the Net-Working-Capital-to-Assets ratio (Figure 34), the three ratios above (Figure 35 and Figure 36) depict two important points. Not only Brazil's sample is able to maintain higher, and ascending, levels of Current, Quick and Cash ratios, but the proportion of the liquid assets (difference between Current ratio and Cash ratio) is especially remarkable when considering that this is still an asset-heavy industry. The evolution and the quality of the selected Brazilian companies is, therefore, better than the Portuguese sample.

5.4.5 Bankruptcy prediction scores

Table 8: Mode of bankruptcy prediction models results, for Portuguese pulp & paper companies, obtained from the average financial statements. N = non-healthy; H = healthy. (source: own elaboration)

Pulp & Paper companies in Portugal										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

Table 9: Mode of bankruptcy prediction models results, for Brazilian pulp & paper companies, obtained from the average financial statements. N = non-healthy; H = healthy. (Source: own elaboration)

Pulp & Paper companies in Brazil										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

Although both samples were classified as in non-healthy circumstances by the bankruptcy prediction models (Table 8 and Table 9), when comparing the overall level of scores brought by them, a reasonable distinction can be observed, depicting a more favorable situation of the Portuguese companies selected. While low levels of cashflow and operating income, in proportion to total assets, are main concerning factors for both samples, the lower amounts of net sales and the reduced levels of retained earnings constitute an additional source of deterioration for the Brazilian sample.

A deeper analysis of the results obtained through the Bankruptcy Prediction models' assessment contributes to confirm the framework depicted by all Performance, Efficiency, Leverage and Liquidity dimensions on the financial indicators.

5.5 Communications Sector

5.5.1 Performance Indicators

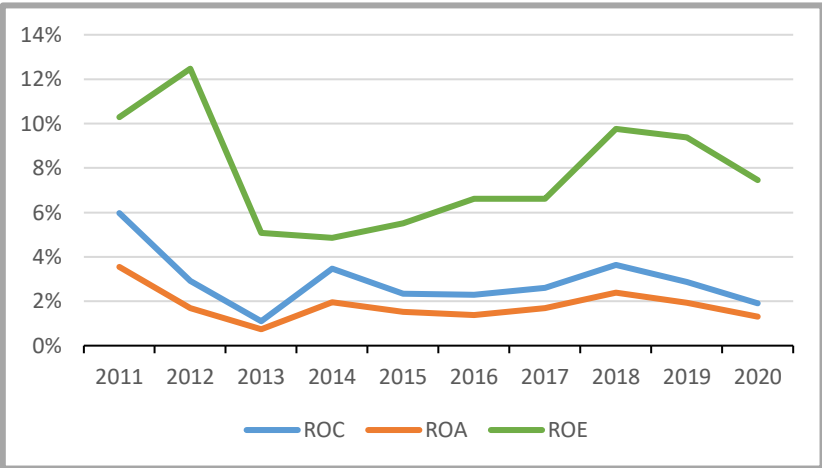


Figure 37: Average ROC, ROA, and ROE for selected communication companies in Portugal

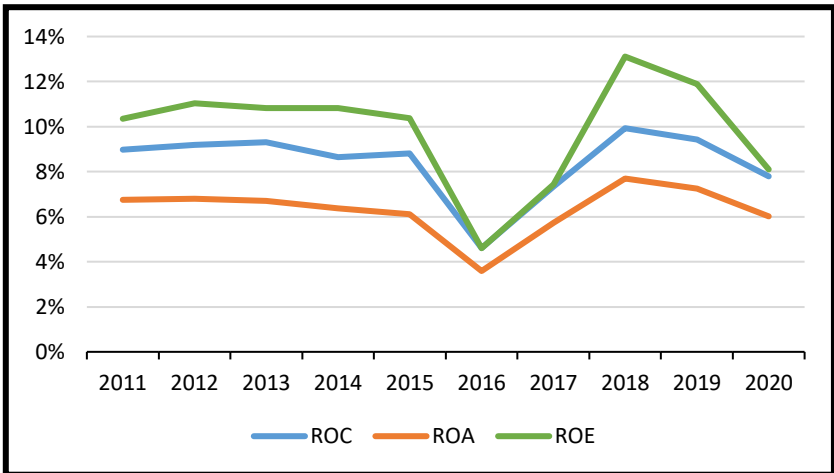


Figure 38: Average ROC, ROA, and ROE for selected communication companies in Brazil

Even though the Portuguese sample show lower average ROC and ROA (Figure 37), this is related to Sonaecom’s negative/near zero values, as NOS, in turn, shows similar figures to the Brazilian companies (Figure 38). The major difference between both samples relies on the standard deviation of both ROC and ROA, that present a more stable behavior in the Portuguese companies.

For both cases, however, it is also important to notice that ROE shows the most amplified variations. As its numerator is composed by the company’s net earnings, and opposed to NOPAT in ROC and ROA, it is affected by more variables, such as operational results, depreciation, tax expenses and interest expenses.

Finally, a major distinction can be outlined regarding the drawdown of ROE in both samples. While the decrease for the Portuguese companies, between 2011 and 2013, shows a trend modification, as lower levels are maintained until 2017, the “V-shaped” behavior depicted by Brazilian companies, between 2015 and 2018, is mostly related to a faster drawdown period. While the sovereign crisis suffered in

Europe was related to more structural factors, enduring for a longer period, the 2016 political crisis suffered in Brazil, due to the impeachment process of its former president Dilma Rousseff, presented more acute, but faster, consequences to the country's tertiary sector.

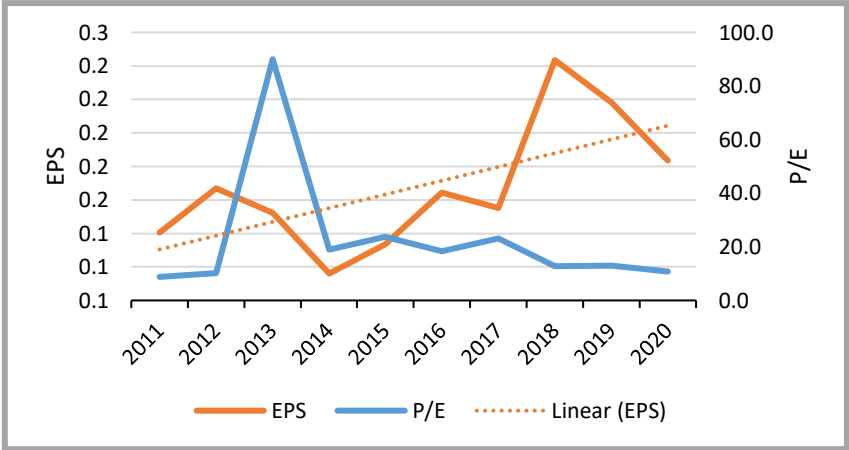


Figure 39: Average EPS & P/E ratios for selected communication companies in Portugal

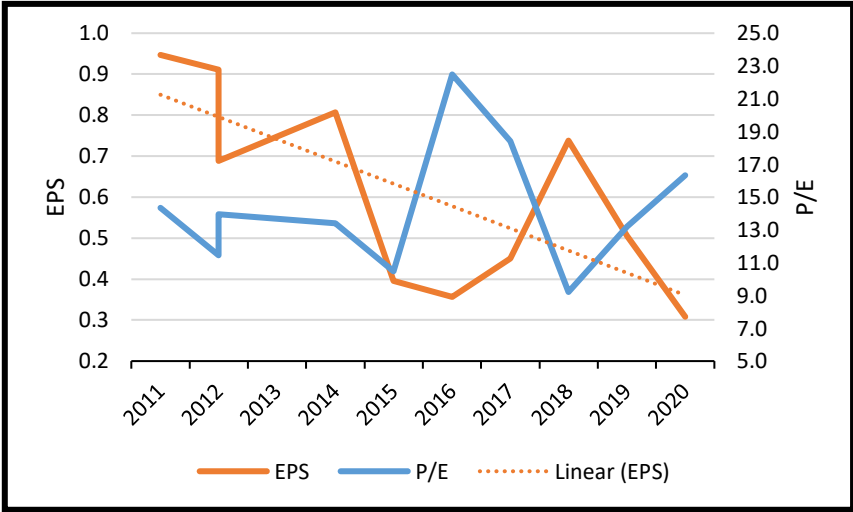


Figure 40: Average EPS & P/E ratios for selected communication companies in Brazil

Regarding the difference between samples, while the EPS ratio show an ascending trend for the Portuguese companies (Figure 39), a descending and sharper trend is shown by Brazilian corporations (Figure 40) – with both cases being highly connected to the changes in net income. The most interesting point, present in both samples, however, is the somewhat mirrored relation between EPS and P/E depicted. Naturally, as the two ratios include the companies' net earnings in opposite directions, this behavior is, in part, expected, but it shows some resilience of market prices in relation to the changes of companies' net income fluctuations. While both net earnings and stock prices are, in fact, correlated, the changes in the latter were not sufficient to compensate the modifications of the former. Overall, these ratios indicate a worse situation for Brazilian companies, in terms of proportional earnings to each share owned, and a more volatile scenario for Brazil's sample.

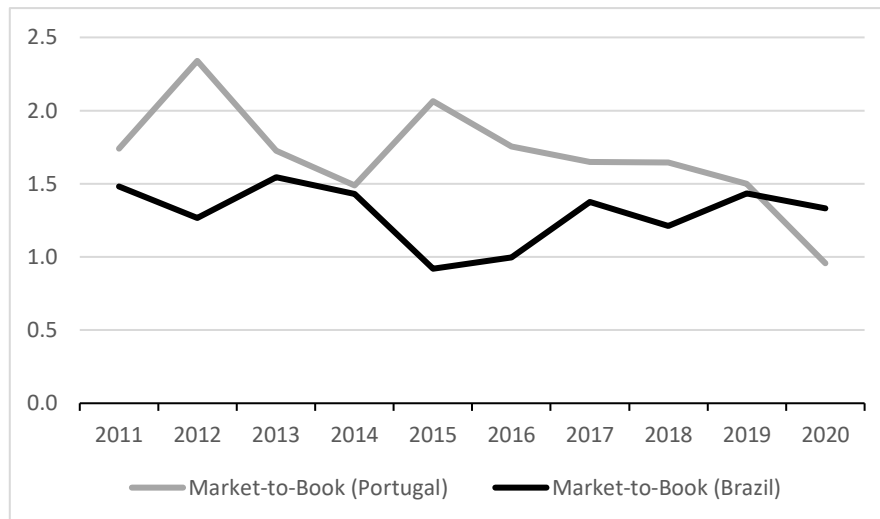


Figure 41: Average Market-to-Book ratio for selected communication companies in Portugal and Brazil

Similar to the situation of the return ratios mentioned before, regarding the Portuguese sample, a significant difference can be found between Sonaecom's and NOS's Market-to-Book ratios. While the first one presents a worse situation (Figure 41), with all values below 1.0 (and therefore a risk-aversion of the market in relation to this company), the second corporation presents itself as a highly regarded company, with an average Market-to-Book level of 2.7, depicting the market perception of a low-risk and high-growth investment.

Regarding the Brazilian sample, the situation of both companies is more similar, but it also shows an interesting behavior in comparison to the return ratios. While the drawdown of all ROC, ROA and ROE is contained between 2016 and 2017 (mostly connected to the changes of net income), the same rapid decrease can be observed in the Market-to-Book ratio, although between 2015 and 2016. This anticipation can be mostly attributed the faster response of the market participants' valuations to the socio-economic context of the country or region being analyzed.

Overall, a relatively healthy situation, in terms of proportional market value, is depicted by both countries' samples, with a less positive context for Brazilian companies for almost all years analyzed, and specially in 2015 and 2016 (market capitalization below book value of equity).

5.5.2 Efficiency Indicators

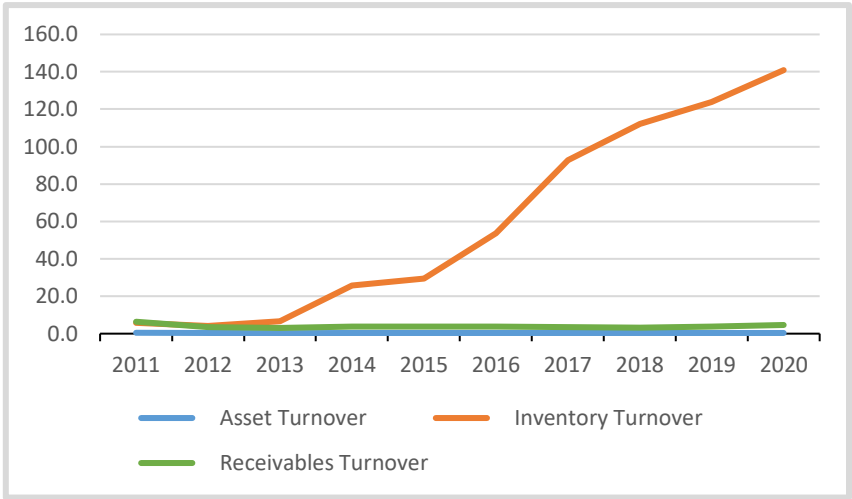


Figure 42: Average turnover ratios for selected communication companies in Portugal

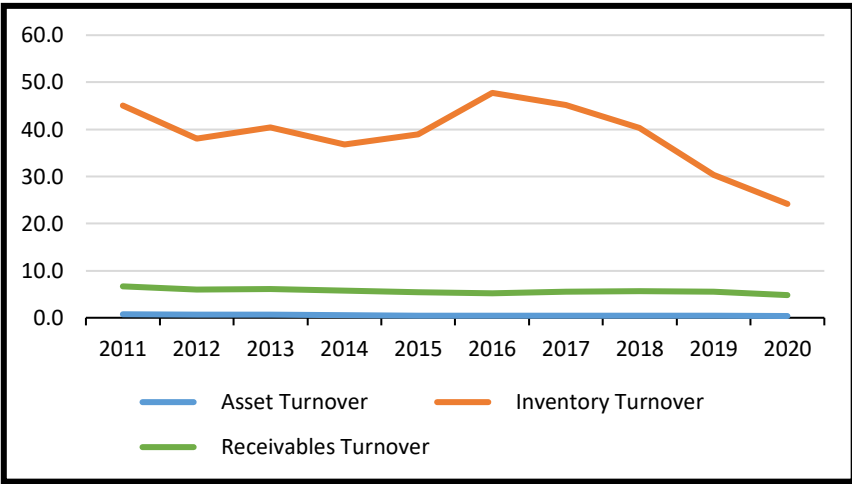


Figure 43: Average turnover ratios for selected communication companies in Brazil

While both other industrial sectors analyzed before (Construction and Pulp & Paper) presented average Inventory Turnover ratios of less than 10, a very different level can be noticed for the Communications sector. Although some distortion is produced at the Portuguese sample (Figure 42) by Sonaecom, that suffer a substantial decrease in Cost of Goods Sold/ Cost of Sales values, the average Inventory Turnover of NOS is still more than 11 (and with an ascending inventory level). Regarding the Brazilian sample (Figure 43), both companies show even higher ratios, with an average of 43 for Telefônica Brasil and 34 for TIM.

This behavior is all but random, being deeply connected to the activity of these companies. In opposition to the industrial sector, these are service-oriented companies, and rely on much lower inventory levels (as most of their revenue is not related to selling products). The average Asset Turnover figures, of 0.3 and 0.5, for the Portuguese and the Brazilian sample, respectively, show however a not so efficient management of these companies' assets, being significantly high in proportion to their sales.

Finally, even though the Receivables Turnover show a slight descending trend for the Brazilian sample, its average value (5.7) still depicts a more loosen payment situation in comparison to Portuguese companies (average ratio of 3.9), which can be related to the more widespread use of credit cards and installment payments in Brazil. Overall, healthier turnover levels are depicted by the Brazilian sample for most of the period analyzed.

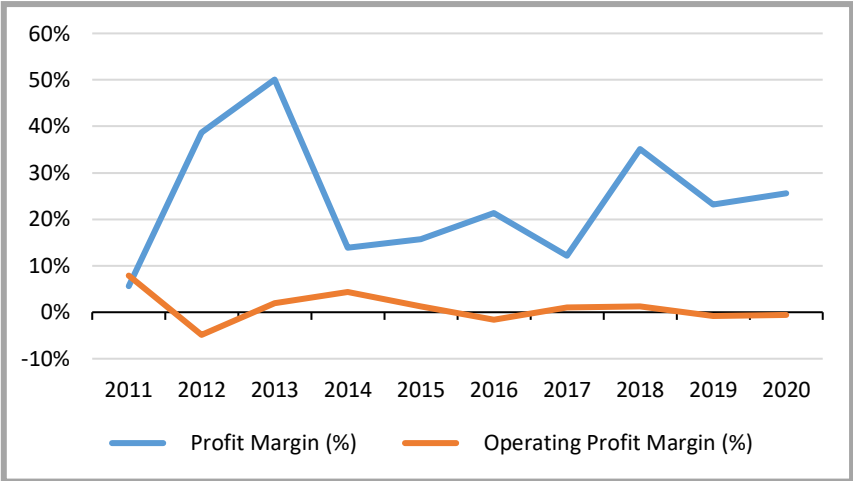


Figure 44: Average profit margins for selected communication companies in Portugal

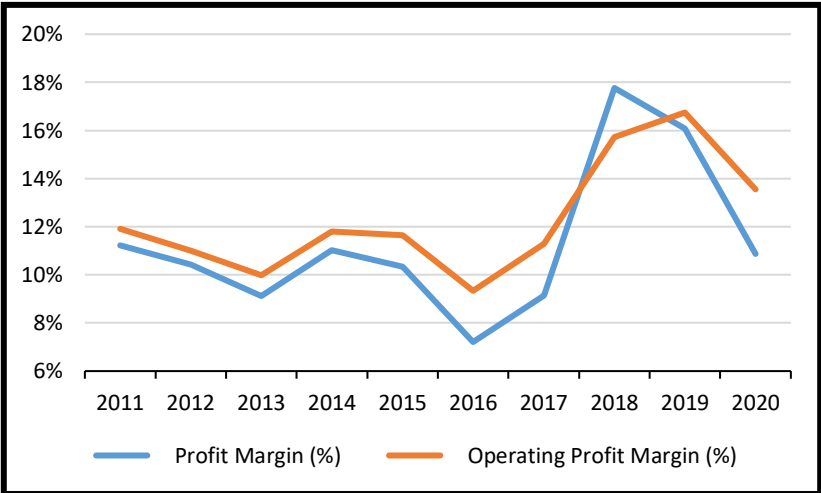


Figure 45: Average profit margins for selected communication companies in Brazil

While both Profit and Operating Margins are very similar and highly correlated in the Brazilian sample (Figure 45), depicting low levels of non-operating expenses, a very interesting situation is brought by the Portuguese companies (Figure 44). Although NOS presents closer values to the first mentioned group, with an average of 6% and 8.3%, for Profit Margin and Operating Profit Margin, respectively, Sonaecom's values require a more detailed analysis.

First, with the exception of 2011, the company presents negative Operating Profit Margin values in all fiscal years, due to its significantly elevated operating expenses. As this ratio is closely related to the control of selling and administrative expenses, before taking into account interest expenses and the tax

rate (which is outside management’s control), it depicts, apparently, a not healthy management of the firm.

Secondly, however, Sonaecom presents positive and high (average of 42%) Profit Margin values - which are usually lower than Operating Profit Margin figures. This is explained by two main sources of gains: extraordinary gains, from discontinued operations (2012 and 2013), and income from affiliates (from 2014 forward). Both are related to merger process between one of its major subsidiaries (Optimus) and another corporation, making it more difficult to confirm any conclusions brought by the Operating Profit Margin ratio, as they are able to cover all the increase in operating expenses (also related to this process).

5.5.3 Leverage Indicators

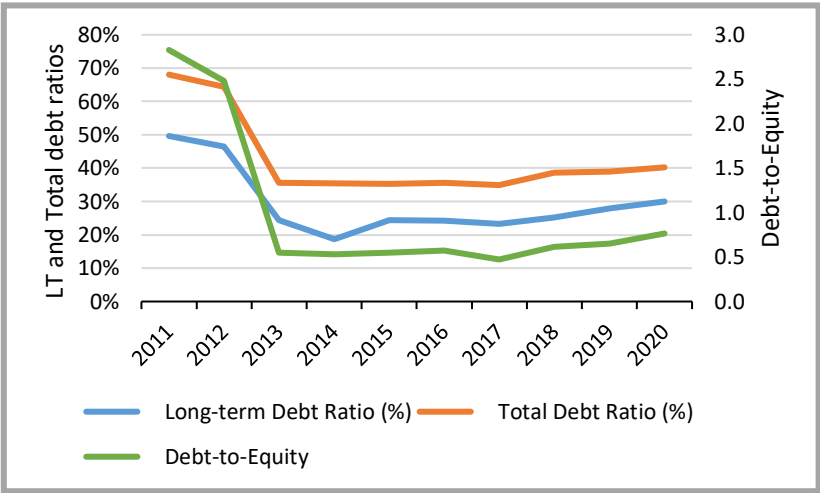


Figure 46: Average debt ratios for selected communication companies in Portugal

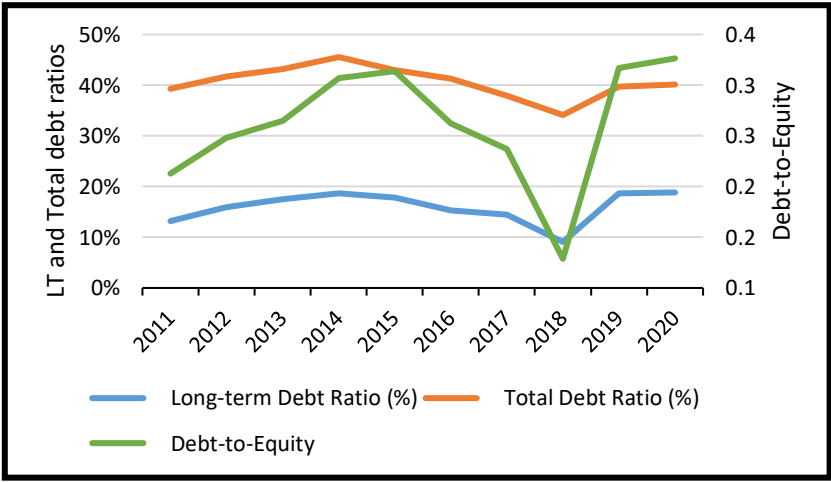


Figure 47: Average debt ratios for selected communication companies in Brazil

As one would expect, higher leverage levels can be observed close to the Sovereign Crisis in the Portuguese sample (Figure 46). After some accommodation, however, both companies are able to reduce their debt ratios, and maintain them at stable and healthier levels from 2013 forward. A very important point to highlight, however, is that NOS keeps an average Debt-to-Equity ratio above 1,

depicting that more funds have been borrowed (short and long-term debt) than have been supplied by the shareholders (equity). It puts the company at a higher risk situation and may be connected to the slow deterioration of NOS's Market-to-Book ratio, as the continuity of this circumstance confirms the company's difficulty in reversing the situation, in a market perspective.

The Brazilian sample (Figure 47) presents a relatively healthier indebtment situation for most of the timeframe, being the Debt-to-Equity ratio the one which presents the most relevant gap between samples, as the average of the second sample, between 2013 and 2020, is half the average of the Portuguese companies. One interesting point to highlight, with connection to the uptick shown before, in 2018, by the return ratios, is that the drop observed in all debt ratios of the Brazilian sample was caused by an extraordinary tax credit, related to a modification of tax payment laws specific for the telecommunications sector.

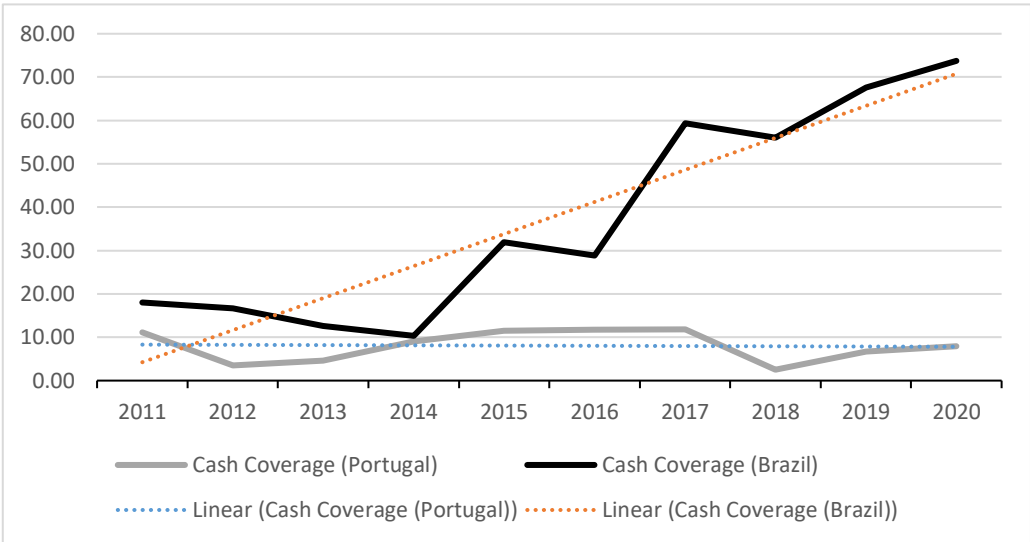


Figure 48: Average Cash Coverage ratio for selected communication companies in Portugal and Brazil

The difference between both samples' Cash Coverage level and trendline (Figure 48) can be explained by two main factors. Firstly, Sonaecom suffers a significant drawdown in its EBITDA figure due to the merger process of its major subsidiary (Optimus), described before, while NOS actually shows a more similar behavior (average ascending value of 16 points) to the Brazilian companies. Secondly, Telefonica Brasil is also responsible for most of the significant increase depicted from 2016 forward, in the second sample, due to a substantial decreasing trend of its interest expenses. TIM, in its turn, presents an average Cash Coverage value of 11.3 points, with some deterioration in 2019 and 2020.

Specially inside the Brazilian samples, a more explicit distinction can be observed between the Communications sector and the other two formerly analyzed (Construction and Pulp & Paper), as higher average values are depicted in the first. While industrial and asset-heavy companies rely on higher capital related expenses, when comparing it to service-oriented and asset-light companies, this difference should be attenuated by the EBITDA measure, used in the calculation of Cash Coverage, as it eliminates the effects of financing and capital expenditures. Therefore, this distinction of values

indicates a better performance of the Communications sector overall, being also possibly related to a worse condition of the industrial sector in Brazil, for the period analyzed.

5.5.4 Liquidity Indicators

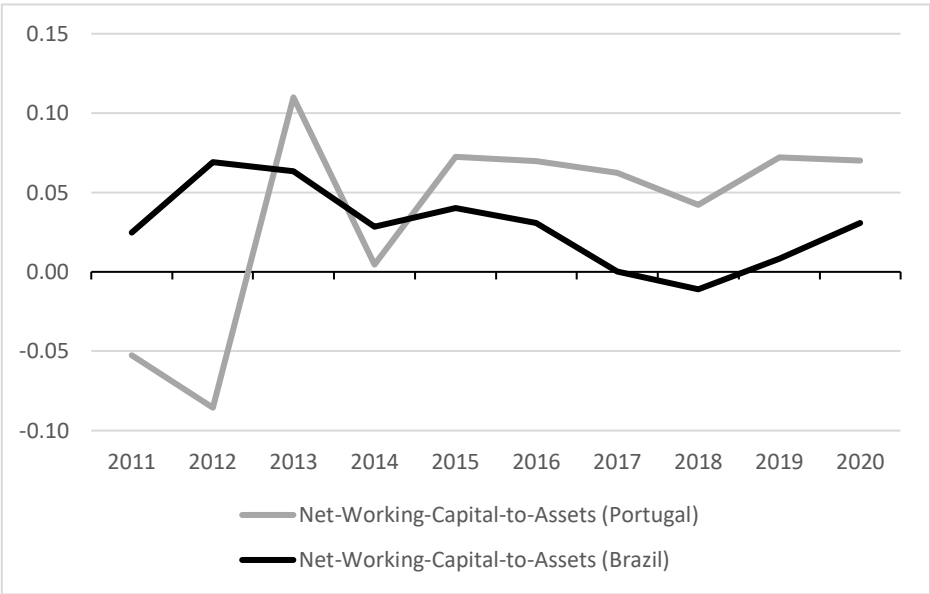


Figure 49: Average Net-Working-Capital-to-Assets ratio for selected communication companies in Portugal and Brazil

Inside the Portuguese sample, Sonaecom is the company responsible for maintaining the average Net-Working-Capital-to-Assets (Figure 49) with positive values from 2013 to 2020, as its current liabilities suffer a significant decrease, majorly correlated to a reduction of the company’s short-term debt and accounts payable to suppliers – a probable good situation made possible by the merger of its subsidiary. The years of 2011 and 2012, however, depict a more realistic situation, as NOS, isolated, maintains its Net-Working-Capital-to-Assets in an average of -0.1 over all the period.

Although the Brazilian sample contains a more homogeneous situation and is able to sustain average positive values over most of the timeframe, the figures show a small amount of additional funds, in proportion to the size of the businesses, available to financing operations – smaller levels, in fact, than those observed in the Construction and Pulp & Paper segments before. This difference, overall, can be explained by the tighter relation between these companies’ accounts receivables and inventory levels in relation to their accounts payable. This circumstance is depicted, exactly, by the negative values of Net Working Capital Requirements, and may also be related to the opposition of asset-heavy *versus* asset-light businesses.

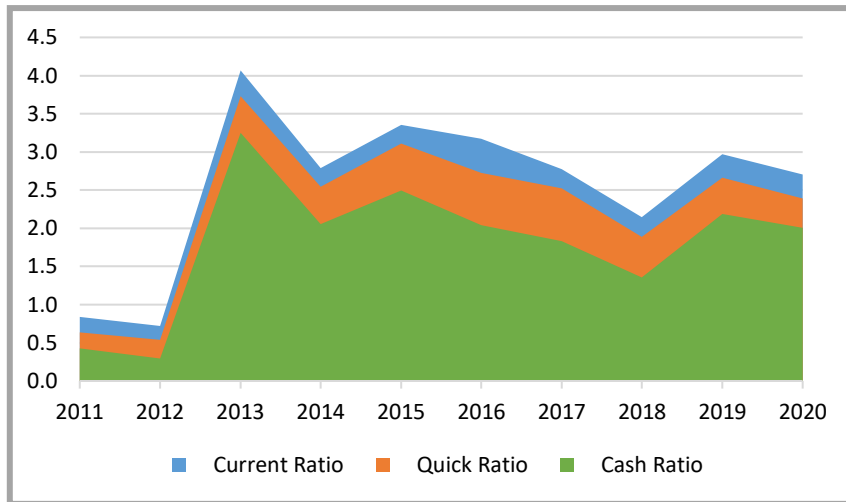


Figure 50: Average Current, Quick and Cash ratios for selected communication companies in Portugal

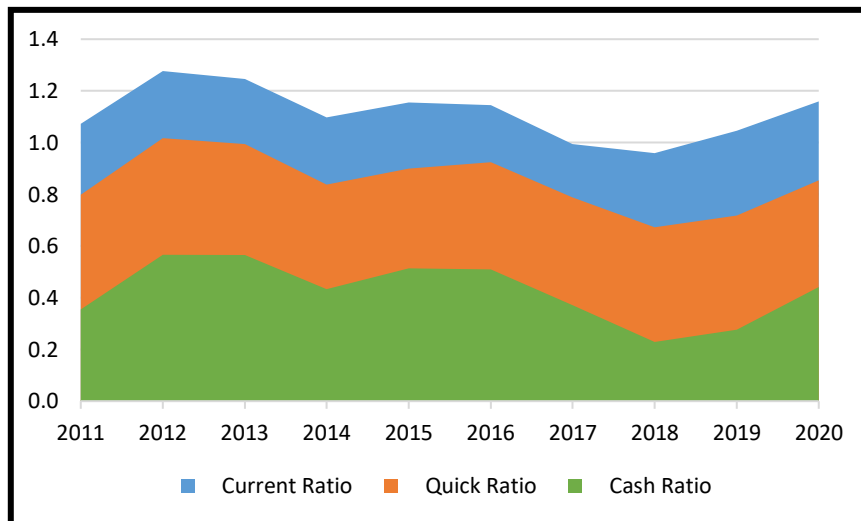


Figure 51: Average Current, Quick and Cash ratios for selected communication companies in Brazil

Again, the much higher average Current, Quick, and Cash Ratio values shown by the Portuguese sample (Figure 50), for the period of 2013-2020, is caused by Sonaecom's business modifications. Although NOS presents much closer values to the Brazilian companies, its Cash Ratio is much lower, both in level and proportion, and corroborates to an unhealthier liquidity situation of this company. Regarding the second sample (Figure 51), the proportion between all three ratios is maintained constant, and it confirms two important characteristics of these companies: the inventory levels (depicted by the difference between Current Ratio and Quick Ratio) are relatively low, and the accounts receivables amount (show by the distance between the Quick Ratio and the Cash Ratio) corresponds to a significant part of the business' liquidity. Considering Sonaecom's situation as an exception, both samples present similar liquidity situations, in terms of distribution of their current assets.

5.5.5 Bankruptcy prediction scores

Table 10: Mode of bankruptcy prediction models results, for Portuguese communication companies, obtained from the average financial statements. N = non-healthy; H = healthy. (Source: own elaboration)

Communication companies in Portugal										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

Table 11: Mode of bankruptcy prediction models results, for Brazilian communication companies, obtained from the average financial statements. N = non-healthy; H = healthy. (Source: own elaboration)

Communication companies in Brazil										
Bankruptcy prediction models	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Mode of results	N	N	N	N	N	N	N	N	N	N

In relation to the bankruptcy prediction models of Communications companies (Table 10 and Table 11), Carvalho das Neves' template situated both samples in a very similar situation, while both Altman's and Matias' placed the Brazilian companies selected in a better level. Although the overall result, from the average of financial statements, classify both samples as non-healthy corporations, it is relevant to mention the two main factors of impact deteriorate the Portuguese sample situation: low market value of equity, in relation to the amount of total liabilities, and higher amounts of debts (financing and bank loans) proportionally to these corporations' current assets. Reduced levels of retained earnings, cashflow, and net working capital – in relation to total assets – are responsible for the overall negative classification in both samples. Overall, a more worrying situation, in terms of continuity problems, is attributed to the Portuguese Communications companies selected.

6 Key Questions Disclosure

This chapter aims at discriminating the answers obtained to the four key questions previously raised at the beginning of this dissertation.

I. What does performance and sustainability mean inside a business context, and what main concepts are related to these subjects?

First, it was found that performance can be divided into four dimensions, including financial, economic, technical and market. Overall, it corresponds to the magnitude of profits a company is able to generate, how efficiently it is able to use its resources, how good it is able to manage the financial resources generated by its activities and how well it is inserted inside its marked segment and in relation to its main competitors. Secondly, it was observed that the concept of sustainability may include various definitions, being the scenario in which corporate value is maximized and does not decline over time, also referred as financial sustainability, the perspective used in this project. The concepts of going concern and bankruptcy prediction models were the main related subjects selected within this definition.

II. Which are the most relevant indicators and methods to evaluate the performance and the sustainability of the public listed companies in question?

In relation to the performance evaluation, approximately 20 main and most commonly used indicators were studied and selected, divided into four main dimensions: Performance, Efficiency, Leverage and Liquidity. It was found that the method of results assessment must be conducted through the analysis of aggregate results, as the information provided by the individual analysis of each ratio and each company, alone, have major limitations. Additionally, in relation to the sustainability evaluation, the bankruptcy prediction models were identified as the main method of analysis, where three different models were selected: Altman's, composed inside United States' context; Matias', based on Brazilian companies; and Carvalho das Neves', created focusing on the Portuguese market.

III. What is the current situation of the companies analyzed compared to their own past and to their competitors?

This dissertation was able to identify many differences between companies inside same sectoral and geographical dimensions, but also recognizing a major complexity for this analysis. Although each case is presented with broader details inside the results discussion segment (5) presented previously, for each sector and country, it is relevant to observe that the assessment of a company's situation requires the consideration of many different perspectives, that included, in summary, five dimensions: Performance, Efficiency, Leverage, Liquidity and Sustainability.

IV. Are there any significant differences between similar companies or business sectors in Portugal and Brazil?

Yes. This dissertation was able to identify various relevant differences between both countries' similar segments, as significantly distinct economic, cultural and political contexts exerted relevant impacts on each company and sector, being responsible for many of the geographical differences found in the timeframe analyzed. Although global macroeconomic factors were also able to exert visible similar impacts in both countries, as Covid-19's implications in 2020, episodes such as the Sovereign Crisis in Europe and the Brazilian Financial Crisis are examples of major factors that differentiated both countries' samples observed scenarios. Overall, a better situation was observed for Construction and Pulp & Paper companies in Portugal selected, while the sample of Communications corporations presented healthier circumstances in Brazil.

7 Conclusions

Financial analysis plays a crucial role at verifying the financial health and economic situation of a company, which requires an in-depth study of an extensive amount of data from its sources of financial information, being the Income Statement, the Balance Sheet, and the Cash Flow Statement the most relevant ones. In this domain, financial ratios, either in a univariate or multivariate approach, are an indispensable tool in financial analysis, since they allow to build the synthesis and identify the relationship of the data being analyzed. More importantly, as it enables a better comparison between different companies, they allow to control the effect of the magnitude of the variables, evaluating companies with greater independence from their size.

This dissertation aimed to study the content of financial information sources of companies representing three different sectors, from Portugal and Brazil, through the analysis of financial ratios and bankruptcy prediction models, in order to draw conclusions about their financial situation and respective sectors' and country's macroeconomic environment. For this purpose, detailed accounting information was obtained from each company's annual financial statements, for the period of 2010 until 2020, as well as stock market's data. The use of these economic-financial ratios allowed a geographical, temporal, and sectoral comparison, and understanding the essence of these three effects and how they affect companies, and their ratios is central to an economic and financial analysis of a given reality. The comparative study of economic and financial indicators was established in five different dimensions: four groups of ratios – Performance, Efficiency, Leverage and Liquidity - and a group referring to the multivariate approach of bankruptcy prediction models (as a Sustainability assessment tool).

It was found that, although very different situations could be observed between companies inside same countries (and therefore same economic, political, cultural, and social contexts) and sectors of activity, related to their internal situation, the macroeconomic environment exerts very relevant influences on the economic and financial performance of companies, as well as the nature of their activities (sector), have significant impacts on their capital and financial structures.

In relation to the Construction sector sample, the major difference between Brazil and Portugal's situation was brought by a sector-specific crisis in the first country, caused by a bribery scandal inside on major corporation of this sector, in 2016. In all four groups of ratios (Performance, Efficiency, Leverage and Liquidity), the general relative circumstance was the same: the Portuguese sample depicted more stable indicators, with healthier levels and only with some deterioration in 2020. It is important to highlight, however, that similarities, brought by the nature of activity of these companies, could still be observed between both countries: as asset-heavy industries, the proportion of most liquid assets (cash and cash equivalents) over total assets are low, as elevated inventory levels and high amounts of accounts receivables are characteristic to this sector.

Inside the Pulp & Paper sector, a significant deterioration of the Brazilian sample could also be observed between 2017 and 2020, related to the political and economic turmoil of the country during this period, with higher impacts felt by the industrial sector. In relation to the Performance, Efficiency and Leverage dimensions, similarly to the Construction sector, healthier and more stable values were observed in the

Portuguese sample. The Liquidity indicators, however, were able to show a relatively more comfortable situation for the Brazilian companies.

Additionally, in relation to the Communications selected companies, which depicts the situation of a service-oriented segment, a common decline in both countries' metrics was witnessed in 2019 and 2020. However, a more favorable circumstance for the Brazilian sample was observed in almost all dimensions, through the 10 fiscal years analyzed. Although Sonaecom was responsible for significant distortions inside the Portuguese selection, Brazilian companies have still shown healthier figures in the three Performance, Efficiency and Leverage dimensions. Inside the 2013-2020 period however, with the dissipation of the Sovereign crisis effects, Portuguese companies depicted a slightly more attractive Liquidity situation.

Finally, although the overall results of bankruptcy prediction models (Sustainability dimension) depicted a non-healthy situation for all the samples analyzed, with its final binary results not being able to contribute to the analysis, a more careful observation of their results was able to show the existent differences between companies and countries, that helped to sustain the conclusions obtained from the univariate (isolated ratios) analysis.

8 Limitations and further analysis

As most information was obtained from each company's financial statements, involving not only distinct sizes of corporations and different types of activities, but also different countries, the heterogeneity of financial statements, even though already based on IFRS standards for the period analyzed, is one relevant limitation of this study, as it may cause distortions for the comparison studies carried out. Also, the construction of harmonized financial statements was subject to the interpretation of each document, and although carried out aiming on the mitigation of any possible distortions, this process also constitutes a limitation of the study.

Additionally, the currency conversion used for the standardization of financial information, based on a specific day (last day of each year), may produce distortions in the size and evolution of values. It is important to note, however, that most of this problem is mitigated by the use of ratios, as most are indifferent to the base currency used.

The size of each sample, mostly limited by the number of the existent Portuguese public listed companies in same sectors, is also an important limitation of this study. Although average sector values are provided by the Bank of Portugal, this data is not available for Brazilian companies, and each sector's evolution and circumstance analysis were limited by the size of each sample analyzed (three companies for the Construction and the Pulp & Paper sector, and two corporations for the Communications segment).

Finally, the limited number of bankruptcy prediction models selected for the analysis constitutes a relevant limitation for the overall classification of each company and segment in relation to the sustainability dimension.

In this context, considering all the conclusions and limitations of this project, three main further scenarios, relevant to be explored, were depicted:

1. The use of wider samples for each segment of activity, including as many different sizes of companies as possible, and within an extended timeframe.
2. Carrying out a sustainability analysis based on a broader number of bankruptcy prediction models, as well as with different sizes of companies (public listed and limited ones).
3. Explore the sectoral differences with the use of more distinct segments (Industries, Services, Extraction, Energy and others) to better outline the structural specificities of each sector.

9 Bibliographic references

- ABRE (Brazilian Association of Packaging Itens) (2021) – “Estudo ABRE macroeconômico da embalagem e cadeia de consumo. Apresentação março de 2021: retrospecto de 2020 e perspectivas para o ano de 2021”. Retrieved from: <https://www.abre.org.br/dados-do-setor/2020-2/>
- Altman, E. (1968) - Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *The Journal of Finance*. 23:4 pp. 589-609.
- Aziz, M. A., Dar, H. A. (2004) ‘Predicting corporate bankruptcy: Whither we stand?’ *Economic Research Papers*, 4:1.
- Barros, G. C. O. (2008) ‘Modelos de Previsão da Falência de Empresas: Aplicação Empírica ao Caso das Pequenas e Médias Empresas Portuguesas.’ *Lisboa: Instituto Superior de Ciências do Trabalho e da Empresa*. Dissertação de Mestrado.
- Bellovary, J., Giacomin, D., Akers, M. (2007) ‘A Review of Bankruptcy Prediction Studies: 1930 to Present’. *Journal of Financial Education*, 33.
- Braga, H. R. and Almeida, M. C. (2008) ‘Mudanças Contábeis na Lei Societária Lei N. 11. 638 de 28-12-2007’. São Paulo, SP: *Editora Atlas S.A.*
- Brealey, R. A., Myers, S. C. and Allen, F. (2020) ‘Principles of Corporate Finance. Thirteenth Edition.’ Edited by R. A. Brealey, S. C. Myers, and F. Allen. New York, NY: *McGraw-Hill Education*.
- Breia, A.F., Mata, M. N. N. S., Pereira, V. M. M. (2014) ‘Análise Econômica e Financeira: Aspectos Teóricos e Casos Práticos’. *Rei dos Livros*. ISBN-13: 978-9898305619.
- Brigham, E. F., Houston, J. F. (2009) ‘Fundamentals of Financial Management: Twelfth Edition’. *South-Western, Cengage Learning*. ISBN-13: 978-0-324-59770-7
- Bugarim, M. C. C. and Oliveira, O. V. de (2014) ‘A Evolução da Contabilidade no Brasil: Legislações, órgão de Fiscalização, Instituições de Ensino e Profissão’, *XI Simpósio de Excelência em Gestão e Tecnologia*, pp. 1–16. Available at: <https://www.aedb.br/seget/arquivos/artigos14/47120554.pdf>.
- Bull, R. (2008) ‘Financial Ratios: How to use financial ratios to maximize value and success for your business’. First edition. *CIMA Publishing*. ISBN-13: 978-0750684538
- Carvalho das Neves, J. (2011) ‘Avaliação e Gestão da Performance Estratégica da Empresa.’ 2ª ed. *Lisboa: Texto Editora*.
- Carvalho das Neves, J. (2012) ‘Análise e Relato Financeiro – Uma visão integrada de gestão.’ 5ª ed. *Lisboa: Texto Editora*. ISBN: 978-972-47-4326-4
- Carvalho das Neves, J., Silva, J. A. (1998) ‘Análise do Risco de Incumprimento: na Perspectiva da Segurança Social’.

- Carvalho, P. M. T. (2013) 'Continuidade - Estudo de um Caso', *Revisores e Auditores: Revista da Ordem dos Revisores Oficiais de Contas*, pp. 20–34.
- Correia, C. S. V. (2012) 'Previsão da Insolvência: Evidência do Sector da Construção'. Aveiro: *Universidade de Aveiro: Departamento de Economia, Gestão e Engenharia Industrial*. Dissertação de Mestrado
- Creswell, John W., Creswell, J. David (2018) 'Research design : qualitative, quantitative, and mixed methods approaches'. Fifth edition. Los Angeles : SAGE. ISBN 978-1-5063-8670-6
- Dewi, V. I., Soei, C. T. L., Surjoko, F. O. (2019) 'The Impact of Macroeconomic Factors on Firms' Profitability (Evidence from Fast Moving Consumer Good Firms Listed on Indonesian Stock Exchange)'. *Academy of Accounting and Financial Studies Journal - Volume 23, Issue 1*.
- FIEC – European Construction Industry Federation (2020). "Statistical Report Nº 63 – Edition 2020". Brussels.
- Fraser, L. M., Ormiston, A. (2016) 'Understanding Financial Statements: Eleventh Edition". *Pearson Education Limited*. ISBN-13: 978-1-292-10155-2
- Fridson, M., Alvarez, F. (2011) 'Financial Statement Analysis: A Practitioner's Guide'. Fourth edition. NY: *John Wiley & Sons, Inc*. ISBN-13: 978-0470635605
- Guimarães, J. F. da C. (2011) Estudos sobre a Normalização Contabilística em Portugal. 1st edn. *Edited by V. Económica*. Porto: Vida Económica.
- Hayes, A. (2021) 'Market Share' (Reviewed by Somer Anderson). New York, NY: *Investopedia (Dotdash)*. Retrieved from '<https://www.investopedia.com/terms/m/marketshare.asp>'.
- Hediger, W. (2010) 'Welfare and capital-theoretic foundations of corporate social responsibility and corporate sustainability'. *Elsevier BV*, 39(4), pp. 518–526. doi: 10.1016/j.socec.2010.02.001.
- Hermes, G. (1986) 'O Bacharel em Ciências Contábeis'. *Brasília: Senado Federal: Centro Gráfico*.
- Hughes, S. (1993) 'Bankruptcy prediction models.' *Credit Control Journal*, 14:11. Pp.16-23.
- Kräussl, R., Lehnert, T. and Stefanova, D. (2016) 'The European sovereign debt crisis: What have we learned?', *Journal of Empirical Finance*. Elsevier BV, 38, pp. 363–373. doi: 10.1016/j.jempfin.2016.04.005.
- Lankoski, L. (2016) 'Alternative conceptions of sustainability in a business context', *Journal of Cleaner Production*. Elsevier BV, 139, pp. 847–857. doi: 10.1016/j.jclepro.2016.08.087.
- Legault, J., Veronneau, P. (1986) 'CA-Score, Un Modele De Prevision De Faillite'. *Research Report for the Ordre Des Comptables Agrées Du Quebec*.
- Macedo, V. D. A. C. (2017) 'A continuidade e as técnicas de previsão de falência - O caso das sociedades portuguesas.' Instituto Politécnico de Lisboa.

- Mares, A. (2001). 'Análisis de las dificultades financieras de las empresas en una economía emergente: Las bases de datos y las variables independientes en el sector hotelero de la bolsa Mexicana de valores.' Tesis Doctoral. Universitat Autònoma de Barcelona.
- Matarazzo, Dante C. (2003) 'Análise financeira de balanços: abordagem básica e gerencial.' 6th. ed. *São Paulo: Editora Atlas.*
- Matias, Alberto Borges (1978). 'Contribuição às técnicas de análise financeira: um modelo de concessão de crédito.' Dissertação de Mestrado, Departamento de Administração da Faculdade de Economia, Administração e Contabilidade da Universidade de São Paulo. São Paulo.
- Naser, K. (1993) 'Creative Financial Accounting: Its Nature and Use'. *Hemel Hempstead: Prentice Hall.*
- Parkinson, D. and Noble, J. (2006) 'Oxford Business English Dictionary, For learners of English.' *Oxford, UK: Oxford University Press.* Available at: <http://www.gbv.de/dms/hbz/toc/ht015030371.pdf>.
- Pereira, J. M., Basto, M., Gómez, F. D., Albuquerque, E. B. (2010) 'Los modelos de predicción del fracaso empresarial. Propuesta de un ranking'. XIV encontro da Asociación Española de Contabilidad y Administración de Empresas.
- Peres, C. J. (2014) 'A Eficácia dos Modelos de Previsão de Falência. Aplicação ao Caso das Sociedades Portuguesas.' *ISCAL - Instituto Superior de Contabilidade e Administração de Lisboa.* doi: 10400.21/3503.
- Queiroz, S. C. F. de et al. (2007) 'A Aplicação dos Modelos de Previsão de Falência em Postos de Combustíveis: Um Estudo Exploratório', *I Seminário de Ciências Contábeis.* Universidade Federal de Pernambuco.
- Rakićević, A. et al. (2016) 'DuPont Financial Ratio Analysis Using Logical Aggregation, Advances in Intelligent Systems and Computing'. Edited by V. E. Balas, L. C. Jain, and B. Kovačević. *Cham: Springer International Publishing (Advances in Intelligent Systems and Computing).* doi: 10.1007/978-3-319-18416-6.
- Rist, M., Pizzica A. J. (2015) 'Financial Ratios for Executives: How to assess company strength, fix problems, and make better decisions'. *NY: Apress L.P.* ISBN-13 (electronic): 978-1-4842-0731-4
- Rodrigues, J. (2010) 'Avaliação do Desempenho das Organizações'. Lisboa: Escolar Editora.
- Santos, P. J. M. (2000) 'Falência Empresarial: Modelo Discriminante e Logístico de Previsão Aplicado às PME do Sector Têxtil e do Vestuário.' Coimbra: Universidade Aberta, Instituto Superior de Contabilidade e Administração de Coimbra. Dissertação de Mestrado.
- Saraiva, H., Alves, M. and Gabriel, V. (2015) 'Normalização contabilística em Portugal: a sua evolução e situação atual', in V Congresso dos TOC, pp. 1–20. Available at: <http://hdl.handle.net/10314/2303>.
- Schmidt, P. (1998) 'A Classificação da Contabilidade dentre os Ramos do Conhecimento Humano', *Caderno de Estudos, FIECAFI*, 10.17, pp. 9–22.

Silva, A. C. R. da and Martins, W. T. S. (2006) *História do Pensamento Contábil – com Ênfase na História da Contabilidade Brasileira*. Curitiba: Juruá Editora.

Silva, A. R. S. C. (2011) 'Modelos de Previsão de Falência de Empresas.' Lisboa: Instituto Politécnico de Lisboa, Instituto Superior de Contabilidade e Administração de Lisboa. Dissertação de Mestrado.

Sousa, J.; Oliveira, I. (2014) 'As variáveis de previsão da falência nas empresas portuguesas de vestuário, couro e produtos de couro.' *Rev. Portuguesa e Brasileira de Gestão*, 13:1. Pp. 62-73. ISSN 1645-4464.

Tugas, F. C. (2012) 'A Comparative Analysis of the Financial Ratios of Listed Firms Belonging to the Education Subsector in the Philippines for the Years 2009-2011'. *International Journal of Business and Social Science - Vol. 3 No. 21; November 2012*.

Walsh, C. (2006) 'Key Management Ratios: The clearest guide to the critical numbers that drive your business'. Fourth Edition. ISBN-13: 978-0-273-70731-8

Young, S. D., O'Byrne, S. F. (2003) 'EVA e Gestão Baseada no Valor – Guia prático para implementação'. Porto Alegre: Bookman. *Pearson Education Limited*. ISBN: 85-363-0229-1.

10 Appendix

Exchange Rates - EUR/BRL									
31-Dec-2011	31-Dec-2012	31-Dec-2013	31-Dec-2014	31-Dec-2015	31-Dec-2016	31-Dec-2017	31-Dec-2018	31-Dec-2019	31-Dec-2020
2.41	2.70	3.26	3.20	4.30	3.43	3.98	4.45	4.51	6.35

Conduril Engenharia SA (CDU PL)										
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	15.28%	15.56%	19.56%	15.76%	5.32%	4.37%	4.70%	1.85%	1.30%	0.97%
Return on Assets (ROA)	5.70%	6.90%	10.20%	7.13%	3.06%	2.75%	3.02%	1.32%	0.88%	0.61%
Return on Equity (ROE)	14.03%	14.32%	19.47%	13.89%	2.90%	1.99%	3.22%	1.43%	1.18%	0.64%
Market-to-book ratio	0.11	0.27	0.54	0.57	0.53	0.27	0.37	0.39	0.30	0.31
Earnings per Share (EPS)	9.90	11.68	18.24	14.75	3.08	2.12	3.51	1.52	1.23	0.57
Price-to-Earnings (P/E)	0.81	1.59	2.46	3.78	17.15	13.05	11.02	27.09	26.00	48.24
Efficiency										
Asset turnover	0.61	0.58	0.54	0.47	0.39	0.31	0.34	0.32	0.43	0.33
Inventory turnover	4.50	5.15	2.68	3.90	3.69	3.24	2.49	2.10	3.00	2.66
Inventory period (days)	81	71	136	94	99	113	147	174	122	137
Receivables turnover	0.90	0.94	0.95	0.92	0.93	0.99	1.30	1.13	1.49	1.26
Accounts receivable period (days)	405	387	384	395	391	370	280	322	245	290
Profit margin (%)	8.31%	10.14%	17.50%	14.13%	3.14%	2.90%	4.78%	2.44%	1.59%	0.92%
Operating profit margin (%)	9.89%	11.52%	18.98%	17.14%	7.69%	8.28%	8.68%	3.67%	2.11%	1.85%
Leverage										
Long-term debt ratio (%)	8.43%	4.40%	7.36%	6.40%	25.03%	22.97%	19.58%	14.01%	16.56%	24.51%
Total debt ratio (%)	65.84%	57.60%	51.68%	57.68%	56.93%	51.59%	48.30%	38.68%	43.58%	52.71%
Times-interest-earned	11.18	11.29	20.81	9.59	1.69	1.54	2.23	3.00	4.07	1.99
Cash coverage	13.62	13.08	22.88	11.30	2.50	2.26	3.06	4.00	5.15	3.42
Debt to Equity	0.36	0.30	0.17	0.61	0.74	0.62	0.54	0.22	0.32	0.45
Liquidity										
Net working capital (M€)	116.84	141.21	153.02	167.67	190.40	182.68	121.84	100.94	97.36	75.18
Net working capital requirements (M€)	205.22	188.31	183.12	183.47	142.54	37.19	48.62	34.46	29.01	-2.56
Net Cash (M€)	-88.39	-47.10	-30.10	-15.80	47.86	145.50	73.22	66.49	68.35	77.74
Net-working-capital-to-assets	0.28	0.37	0.39	0.33	0.39	0.41	0.29	0.29	0.26	0.20
Current ratio	1.46	1.69	1.85	1.63	1.92	2.14	1.83	2.06	1.84	1.57
Quick ratio	1.23	1.38	1.42	1.01	1.06	1.27	1.42	1.21	1.00	0.75
Cash ratio	0.17	0.31	0.20	0.13	0.15	0.60	0.62	0.13	0.09	0.05
*Net Income (M€)	19.79	23.36	36.48	29.51	6.16	4.24	7.02	3.05	2.46	1.14
*Retained Earnings (M€)	37.16	41.24	2.50	35.52	10.52	9.37	12.13	8.05	8.21	7.82
*Market Capitalization (M€)	16.00	44.00	102.00	122.00	112.00	58.00	81.00	83.60	63.00	54.80
*Shares Outstanding (M)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
*Stock Price (Last in €)	8.02	18.52	44.79	55.84	52.79	27.69	38.66	41.25	32.00	27.40
*Effective Tax Rate	46.28%	51.61%	38.60%	35.19%	37.24%	38.87%	49.24%	76.16%	79.34%	65.32%

Conduril Engenharia SA (CDU PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.28	0.37	0.39	0.33	0.39	0.41	0.29	0.29	0.26	0.20
X ₂ (Retained earnings/Total assets)	1.4000	0.09	0.11	0.01	0.07	0.02	0.02	0.03	0.02	0.02	0.02
X ₃ (Operating income/Total assets)	3.3000	0.11	0.14	0.17	0.11	0.05	0.04	0.06	0.06	0.04	0.02
X ₄ (Market value of equity/Total liabilities)	0.6000	0.06	0.20	0.51	0.42	0.40	0.26	0.40	0.62	0.39	0.28
X ₅ (Net total sales/Total assets)	0.9900	0.58	0.60	0.54	0.42	0.40	0.33	0.35	0.36	0.42	0.33
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.34	0.42	0.48	0.42	0.43	0.48	0.52	0.61	0.56	0.47
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.14	0.14	0.10	0.30	0.40	0.38	0.43	0.24	0.31	0.39
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.18	0.11	0.13	0.12	0.12	0.11	0.10	0.10	0.11	0.11
M ₄ (Current assets/Current liabilities)	-0.7640	1.46	1.69	1.85	1.63	1.92	2.14	1.83	2.06	1.84	1.57
M ₅ (Operating income/Pretax income)	0.5350	1.19	1.14	1.08	1.21	2.45	2.85	1.82	1.50	1.33	2.01
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.11	0.17	0.10	0.07	0.06	0.03	0.02	0.04	0.03	0.02
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.09	0.11	0.01	0.07	0.02	0.02	0.03	0.02	0.02	0.02
C ₂ (Current assets/Total assets)	1.0760	0.90	0.90	0.86	0.86	0.80	0.78	0.64	0.57	0.57	0.55
C ₃ (Cashflow/Total assets)	5.5660	0.06	0.05	-0.07	0.00	-0.01	-0.04	-0.01	0.01	-0.01	-0.01
C ₄ (State & other public entities/Sales*365)	-0.0025	113.95	87.88	60.89	37.54	21.42	23.85	7.60	5.75	5.89	21.94
C ₅ (Financing and bank loans/Current assets)	0.1560	0.14	0.14	0.10	0.30	0.40	0.38	0.43	0.24	0.31	0.39

Teixeira Duarte SA (TDSA PL)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	4.46%	6.38%	9.33%	8.86%	7.20%	7.92%	-1.23%	2.40%	4.65%	1.22%	
Return on Assets (ROA)	1.87%	2.13%	4.11%	4.25%	3.37%	3.94%	-0.60%	1.47%	2.67%	0.73%	
Return on Equity (ROE)	-60.25%	7.37%	17.73%	14.50%	6.49%	4.53%	-1.14%	2.76%	4.28%	1.49%	
Market-to-book ratio	0.27	0.41	1.04	0.62	0.25	0.18	0.23	0.14	0.19	0.16	
Earnings per Share (EPS)	-0.48	0.06	0.15	0.17	0.08	0.05	-0.01	0.03	0.03	0.01	
Price-to-Earnings (P/E)	-0.40	5.08	5.45	4.02	3.80	3.86	-20.14	5.10	4.49	10.67	
Efficiency											
Asset turnover	0.44	0.50	0.57	0.59	0.49	0.41	0.43	0.42	0.47	0.35	
Inventory turnover	1.48	1.67	1.93	2.01	1.61	1.29	1.23	1.14	1.07	0.98	
Inventory period (days)	247	219	189	181	226	283	296	320	342	374	
Receivables turnover	2.69	2.97	3.26	3.57	3.20	2.62	3.06	3.91	4.16	3.14	
Accounts receivable period (days)	136	123	112	102	114	139	119	93	88	116	
Profit margin (%)	-16.70%	1.74%	4.05%	4.18%	2.38%	1.81%	-0.45%	1.27%	1.64%	0.58%	
Operating profit margin (%)	4.28%	4.27%	7.23%	7.48%	6.83%	8.97%	-1.33%	3.12%	5.64%	1.93%	
Leverage											
Long-term debt ratio (%)	71.12%	64.83%	70.57%	65.81%	61.32%	64.79%	63.57%	64.54%	68.35%	75.30%	
Total debt ratio (%)	87.92%	88.23%	87.02%	83.59%	81.89%	82.49%	82.18%	78.29%	81.81%	85.11%	
Times-interest-earned	0.69	1.83	1.28	1.60	1.32	2.29	2.03	3.07	5.26	2.26	
Cash coverage	1.51	2.61	1.98	2.21	2.13	3.12	2.88	4.67	7.58	4.26	
Debt to Equity	4.37	4.47	4.35	3.46	3.04	3.35	2.49	1.89	2.54	3.40	
Liquidity											
Net working capital (M€)	96.79	-159.06	-50.34	89.20	-24.50	28.62	250.30	311.58	279.84	214.72	
Net working capital requirements (M€)	440.00	467.10	420.57	464.37	381.30	420.42	210.32	153.72	263.25	200.89	
Net Cash (M€)	-343.21	-626.17	-470.91	-375.17	-405.81	-391.80	39.99	157.86	16.58	13.83	
Net-working-capital-to-assets	0.04	-0.06	-0.02	0.03	-0.01	0.01	0.11	0.17	0.15	0.13	
Current ratio	1.08	0.90	0.96	1.07	0.98	1.03	1.23	1.62	1.51	1.48	
Quick ratio	0.61	0.47	0.51	0.49	0.51	0.55	0.39	0.72	0.68	0.60	
Cash ratio	0.24	0.17	0.14	0.15	0.19	0.17	0.14	0.34	0.25	0.26	
*Net Income (M€)	-200.44	24.00	63.97	70.28	33.65	20.15	-4.65	11.13	14.41	3.56	
*Retained Earnings (M€)	-208.69	-11.62	49.68	69.85	37.01	37.27	38.08	46.08	46.69	68.91	
*Market Capitalization (M€)	88.20	134.40	373.80	298.62	131.88	78.12	93.66	56.70	64.68	37.97	
*Shares Outstanding (M)	420.00	420.00	420.00	420.00	420.00	420.00	420.00	420.00	420.00	420.00	
*Stock Price (Last in €)	0.19	0.29	0.83	0.67	0.30	0.19	0.22	0.14	0.15	0.09	
*Effective Tax Rate		58.76%		36.32%	22.74%	47.57%	110.33%	67.45%	62.08%	77.62%	

Teixeira Duarte SA (TDSA PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.04	-0.06	-0.02	0.03	-0.01	0.01	0.11	0.17	0.15	0.13
X ₂ (Retained earnings/Total assets)	1.4000	-0.08	0.00	0.02	0.02	0.01	0.01	0.02	0.02	0.03	0.04
X ₃ (Operating income/Total assets)	3.3000	0.01	0.01	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
X ₄ (Market value of equity/Total liabilities)	0.6000	0.04	0.06	0.15	0.12	0.06	0.04	0.05	0.04	0.04	0.03
X ₅ (Net total sales/Total assets)	0.9900	0.44	0.50	0.57	0.57	0.49	0.44	0.45	0.47	0.47	0.38
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.12	0.12	0.13	0.16	0.18	0.18	0.18	0.22	0.18	0.15
M ₂ (Financing and bank loans/Current assets)	-8.2600	1.09	1.05	1.22	1.20	1.20	1.33	0.77	0.94	1.03	1.22
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.07	0.07	0.06	0.06	0.07	0.05	0.07	0.08	0.08	0.07
M ₄ (Current assets/Current liabilities)	-0.7640	1.08	0.90	0.96	1.07	0.98	1.03	1.23	1.62	1.51	1.48
M ₅ (Operating income/Pretax income)	0.5350	-0.27	2.27	8.93	1.90	2.39	2.99	4.27	2.87	2.97	3.98
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.11	0.09	0.07	0.06	0.09	0.07	0.07	0.09	0.07	0.07
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	-0.08	0.00	0.02	0.02	0.01	0.01	0.02	0.02	0.03	0.04
C ₂ (Current assets/Total assets)	1.0760	0.48	0.50	0.46	0.47	0.46	0.44	0.58	0.44	0.45	0.41
C ₃ (Cashflow/Total assets)	5.5660	0.06	-0.02	-0.02	0.00	0.02	-0.03	-0.01	0.01	-0.02	-0.01
C ₄ (State & other public entities/Sales*365)	-0.0025	32.72	31.00	21.55	18.42	23.61	32.95	22.75	57.28	46.45	50.50
C ₅ (Financing and bank loans/Current assets)	0.1560	1.09	1.05	1.22	1.20	1.20	1.33	0.77	0.94	1.03	1.22

Mota-Engil SGPS SA (EGL PL)										
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	12.27%	12.31%	12.16%	11.72%	5.42%	4.54%	8.33%	11.06%	7.82%	3.35%
Return on Assets (ROA)	3.78%	3.17%	4.21%	4.66%	1.75%	1.68%	2.76%	2.95%	2.33%	0.92%
Return on Equity (ROE)	8.06%	9.35%	9.03%	8.75%	2.49%	8.79%	0.27%	5.23%	8.15%	-13.66%
Market-to-book ratio	0.51	0.74	1.58	0.94	0.63	0.67	1.46	0.86	1.35	2.22
Earnings per Share (EPS)	0.16	0.20	0.25	0.25	0.08	0.21	0.01	0.10	0.11	-0.08
Price-to-Earnings (P/E)	4.52	6.17	14.46	9.12	22.41	6.98	527.39	15.78	16.62	-16.24
Efficiency										
Asset turnover	0.62	0.63	0.63	0.61	0.54	0.48	0.59	0.60	0.60	0.49
Inventory turnover	5.27	4.49	3.67	3.44	3.51	2.82	3.36	3.83	1.98	1.92
Inventory period (days)	69	81	99	106	104	129	109	95	184	190
Receivables turnover	2.26	2.43	2.43	2.42	2.54	2.58	3.16	3.00	2.82	2.43
Accounts receivable period (days)	162	150	150	151	144	142	115	122	129	150
Profit margin (%)	1.54%	1.82%	2.18%	2.13%	0.74%	2.27%	0.06%	0.83%	0.92%	-0.82%
Operating profit margin (%)	6.13%	5.09%	6.87%	7.79%	3.63%	3.21%	4.90%	4.94%	4.05%	1.82%
Leverage										
Long-term debt ratio (%)	61.83%	52.94%	57.20%	63.30%	55.31%	63.51%	61.01%	64.39%	78.26%	88.95%
Total debt ratio (%)	88.23%	87.89%	85.18%	85.41%	85.55%	86.48%	87.09%	90.50%	93.51%	96.97%
Times-interest-earned	2.80	2.67	3.04	3.16	1.58	0.94	2.75	1.95	1.85	1.45
Cash coverage	2.08	1.98	2.33	2.55	1.23	0.79	1.83	1.52	1.29	1.02
Debt to Equity	3.20	3.03	3.32	3.77	2.38	2.65	3.60	2.91	2.70	2.41
Liquidity										
Net working capital (M€)	-116.96	-145.30	-4.03	198.18	-251.91	50.26	-5.87	-41.74	-212.08	-405.68
Net working capital requirements (M€)	184.60	153.72	277.74	262.05	147.31	133.97	243.56	517.63	475.83	371.84
Net Cash (M€)	-301.56	-299.02	-281.77	-63.87	-399.22	-83.72	-249.42	-559.37	-687.91	-777.52
Net-working-capital-to-assets	-0.03	-0.04	0.00	0.05	-0.05	0.01	0.00	-0.01	-0.04	-0.08
Current ratio	0.94	0.94	1.00	1.10	0.91	1.02	1.00	0.98	0.93	0.86
Quick ratio	0.56	0.53	0.60	0.63	0.50	0.56	0.60	0.55	0.50	0.48
Cash ratio	0.11	0.12	0.14	0.16	0.16	0.19	0.26	0.18	0.15	0.16
*Net Income (M€)	33.43	40.75	50.51	50.55	18.13	50.16	1.59	23.31	26.73	-19.94
*Retained Earnings (M€)	33.43	40.75	50.51	50.55	18.13	50.16	1.59	78.47	84.46	37.79
*Market Capitalization (M€)	211.80	320.66	884.64	544.54	457.20	382.38	869.98	382.38	444.13	323.96
*Shares Outstanding (M)	204.64	204.64	204.64	204.64	237.51	237.51	237.51	237.51	237.51	237.51
*Stock Price (Last in €)	0.74	1.23	3.57	2.25	1.71	1.47	3.52	1.55	1.87	1.36
*Effective Tax Rate	21.29%	33.35%	34.56%	32.30%	46.69%	12.20%	31.60%	30.87%	37.15%	69.42%

Mota-Engil SGPS SA (EGL PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	-0.03	-0.04	0.00	0.05	-0.05	0.01	0.00	-0.01	-0.04	-0.08
X ₂ (Retained earnings/Total assets)	1.4000	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.02	0.01
X ₃ (Operating income/Total assets)	3.3000	0.05	0.05	0.06	0.07	0.03	0.02	0.04	0.04	0.04	0.03
X ₄ (Market value of equity/Total liabilities)	0.6000	0.07	0.10	0.28	0.16	0.11	0.10	0.22	0.09	0.09	0.07
X ₅ (Net total sales/Total assets)	0.9900	0.62	0.62	0.61	0.60	0.48	0.52	0.56	0.60	0.58	0.50
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.12	0.12	0.15	0.15	0.14	0.14	0.13	0.10	0.06	0.03
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.64	0.53	0.62	0.69	0.77	0.77	0.67	0.59	0.77	0.86
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.14	0.15	0.13	0.11	0.09	0.10	0.11	0.12	0.11	0.11
M ₄ (Current assets/Current liabilities)	-0.7640	0.94	0.94	1.00	1.10	0.91	1.02	1.00	0.98	0.93	0.86
M ₅ (Operating income/Pretax income)	0.5350	1.88	1.54	1.80	2.22	1.70	1.05	2.07	1.48	1.68	5.66
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.07	0.08	0.08	0.08	0.09	0.09	0.14	0.10	0.09	0.09
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.02	0.01
C ₂ (Current assets/Total assets)	1.0760	0.55	0.58	0.57	0.57	0.50	0.50	0.54	0.57	0.55	0.53
C ₃ (Cashflow/Total assets)	5.5660	0.01	0.01	0.02	0.01	0.01	-0.01	0.04	-0.05	0.00	0.01
C ₄ (State & other public entities/Sales*365)	-0.0025	8.76	14.06	17.23	14.98	23.03	23.21	25.63	21.53	24.11	30.42
C ₅ (Financing and bank loans/Current assets)	0.1560	0.64	0.53	0.62	0.69	0.77	0.77	0.67	0.59	0.77	0.86

Azevedo e Travassos SA (AZEVBZ)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	22.87%	29.89%	25.46%	21.86%	12.43%	-236.34%	152.28%	45.63%	8.83%	9.09%	
Return on Assets (ROA)	5.65%	8.55%	7.39%	6.79%	3.64%	-26.45%	-62.18%	-146.87%	-39.36%	-34.23%	
Return on Equity (ROE)	28.26%	29.49%	21.90%	16.08%	3.26%	-606.00%	118.94%	65.25%	14.86%	16.78%	
Market-to-book ratio	1.90	1.66	1.68	1.10	0.90	11.48	-0.37	-1.15	-0.74	-0.48	
Earnings per Share (EPS)	0.22	0.22	0.17	0.14	0.02	-0.66	-1.50	-1.99	-0.10	-0.24	
Price-to-Earnings (P/E)	6.73	5.63	7.68	6.83	27.49	-1.90	-0.31	-1.76	-4.92	-2.85	
Efficiency											
Asset turnover	1.28	1.58	2.01	2.23	1.81	0.75	0.44	0.49	0.03	0.39	
Inventory turnover	13.35	17.90	30.40	33.90	27.01	11.76	7.40	6.80	0.59	1.12	
Inventory period (days)	27	20	12	11	14	31	49	54	614	326	
Receivables turnover	2.62	4.01	5.20	5.90	4.66	2.17	2.09	3.65	1.84	18.40	
Accounts receivable period (days)	139	91	70	62	78	168	175	100	198	20	
Profit margin (%)	4.30%	4.03%	2.67%	2.13%	0.43%	-32.51%	-132.08%	-272.11%	-2041.33%	-144.38%	
Operating profit margin (%)	3.97%	5.25%	3.44%	3.11%	1.79%	-38.46%	-117.55%	-170.70%	-1213.31%	-78.19%	
Leverage											
Long-term debt ratio (%)	12.30%	22.16%	9.73%	6.94%	7.73%	67.03%	-43.85%	-11.49%	0.00%	0.00%	
Total debt ratio (%)	78.35%	77.73%	73.79%	71.08%	72.96%	96.31%	158.74%	458.83%	545.47%	476.66%	
Times-interest-earned	1.41	1.86	1.83	2.46	1.13	-3.18	-4.35	-6.53	-1.52	-1.19	
Cash coverage	1.41	2.56	2.55	3.17	1.64	-2.88	-4.11	-6.26	-1.32	-1.10	
Debt to Equity	0.51	0.60	0.36	0.40	0.34	5.56	-0.45	-0.14	-0.14	-0.09	
Liquidity											
Net working capital (M€)	17.68	16.00	12.97	14.25	12.33	2.48	-9.66	-30.23	-31.06	-18.58	
Net working capital requirements (M€)	25.79	14.32	15.53	11.55	14.04	4.42	-4.09	-17.60	-17.14	-10.18	
Net Cash (M€)	-8.11	1.68	-2.56	2.69	-1.71	-1.94	-5.57	-12.63	-13.92	-8.40	
Net-working-capital-to-assets	0.31	0.30	0.28	0.29	0.32	0.05	-0.29	-2.28	-2.53	-1.85	
Current ratio	1.97	2.00	1.83	1.85	1.90	1.10	0.61	0.14	0.13	0.25	
Quick ratio	1.58	1.52	1.53	1.36	1.51	0.49	0.24	0.01	0.00	0.04	
Cash ratio	0.19	0.39	0.21	0.44	0.17	0.04	0.00	0.00	0.00	0.03	
*Net Income (M€)	3.47	3.51	2.69	2.27	0.34	-10.38	-23.41	-31.08	-8.11	-6.34	
*Retained Earnings (M€)	-17.71	-12.42	-7.94	0.11	0.10	-9.20	-29.06	-56.04	-62.35	-50.12	
*Market Capitalization (M€)	23.37	19.78	20.64	15.51	9.41	19.67	7.19	54.66	40.20	18.09	
*Shares Outstanding (M)	15.65	15.65	15.65	15.65	15.65	15.65	15.65	15.65	78.26	26.85	
*Stock Price (Last in €)	1.49	1.26	1.32	0.99	0.60	1.26	0.46	3.49	0.51	0.67	
*Effective Tax Rate				32.48%	47.14%						

Azevedo e Travassos SA (AZEVBZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	1.85	2.22	2.83	3.12	2.83	-0.14	-3.01	-12.10	-11.07	-9.68
X ₂ (Retained earnings/Total assets)	1.4000	-0.31	-0.23	-0.17	0.00	0.00	-0.20	-0.87	-4.22	-5.09	-4.99
X ₃ (Operating income/Total assets)	3.3000	0.06	0.09	0.07	0.10	0.07	-0.26	-0.62	-1.47	-0.39	-0.34
X ₄ (Market value of equity/Total liabilities)	0.6000	0.53	0.48	0.60	0.45	0.33	0.44	0.14	0.90	0.60	0.38
X ₅ (Net total sales/Total assets)	0.9900	1.42	1.63	2.15	2.19	2.04	0.69	0.53	0.86	0.03	0.44
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.22	0.22	0.26	0.29	0.27	0.04	-0.59	-3.59	-4.45	-3.77
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.18	0.22	0.15	0.18	0.14	0.36	0.58	1.27	1.60	0.57
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.07	0.08	0.10	0.09	0.11	0.11	0.23	0.50	0.54	0.30
M ₄ (Current assets/Current liabilities)	-0.7640	1.97	2.00	1.83	1.85	1.90	1.10	0.61	0.14	0.13	0.25
M ₅ (Operating income/Pretax income)	0.5350	0.97	1.84	1.97	1.46	4.14	0.77	0.81	0.87	0.60	0.54
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.00	0.12	0.07	0.15	0.06	0.02	0.00	0.00	0.00	0.07
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	-0.31	-0.23	-0.17	0.00	0.00	-0.20	-0.87	-4.22	-5.09	-4.99
C ₂ (Current assets/Total assets)	1.0760	0.63	0.60	0.61	0.64	0.67	0.58	0.46	0.39	0.38	0.62
C ₃ (Cashflow/Total assets)	5.5660	-0.02	0.06	-0.04	0.08	-0.10	-0.04	-0.02	0.00	0.00	0.08
C ₄ (State & other public entities/Sales*365)	-0.0025	3.14	12.56	9.84	8.96	10.93	73.71	65.78	434.80	13763.94	876.48
C ₅ (Financing and bank loans/Current assets)	0.1560	0.18	0.22	0.15	0.18	0.14	0.36	0.58	1.27	1.60	0.57

Tecnisa SA (TCSA BZ)										
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	3.99%	-6.52%	9.14%	4.84%	12.52%	-20.18%	-33.75%	-18.26%	-22.11%	-16.31%
Return on Assets (ROA)	2.56%	-4.07%	5.60%	2.84%	7.65%	-11.87%	-22.08%	-11.48%	-15.23%	-11.78%
Return on Equity (ROE)	9.19%	-12.82%	15.98%	9.38%	16.39%	-27.78%	-54.07%	-36.66%	-27.88%	-22.76%
Market-to-book ratio	1.13	1.02	1.03	0.41	0.28	0.40	0.64	0.61	1.42	0.93
Earnings per Share (EPS)	2.97	-3.27	3.71	2.46	3.22	-4.26	-4.37	-1.95	-0.79	-0.39
Price-to-Earnings (P/E)	12.46	-8.12	6.60	4.34	1.73	-1.47	-1.18	-1.67	-5.10	-4.08
Efficiency										
Asset turnover	0.45	0.29	0.44	0.35	0.30	0.10	0.11	0.08	0.20	0.09
Inventory turnover	1.81	1.29	1.52	1.12	0.85	0.38	0.45	0.30	0.83	0.56
Inventory period (days)	202	284	240	325	427	965	820	1207	442	656
Receivables turnover	1.37	0.87	1.26	0.94	1.02	0.61	1.01	1.31	4.54	2.46
Accounts receivable period (days)	266	421	289	389	357	595	363	278	80	149
Profit margin (%)	9.05%	-15.35%	12.07%	9.73%	18.68%	-131.64%	-169.05%	-157.48%	-70.48%	-91.26%
Operating profit margin (%)	6.09%	-13.42%	12.56%	8.31%	18.91%	-121.47%	-150.23%	-122.01%	-69.89%	-104.06%
Leverage										
Long-term debt ratio (%)	35.58%	41.87%	45.05%	39.53%	24.56%	21.28%	29.77%	35.72%	20.05%	37.14%
Total debt ratio (%)	58.61%	63.68%	66.33%	64.56%	53.89%	53.71%	54.05%	59.59%	44.92%	54.62%
Times-interest-earned	3.17	-3.04	3.41	4.26	6.01	-10.35	-5.68	-2.66	-4.40	-4.82
Cash coverage	3.63	-2.62	3.76	4.93	6.42	-10.10	-5.56	-2.56	-4.26	-4.63
Debt to Equity	0.91	1.22	1.44	1.39	0.79	0.74	0.66	0.78	0.37	0.66
Liquidity										
Net working capital (M€)	668.42	348.32	512.31	402.87	197.18	189.09	117.91	41.21	84.14	63.71
Net working capital requirements (M€)	865.47	704.76	855.53	848.14	411.92	441.83	225.90	126.28	72.47	61.98
Net Cash (M€)	-197.05	-356.44	-343.23	-445.27	-214.74	-252.75	-107.99	-85.08	11.67	1.74
Net-working-capital-to-assets	0.41	0.24	0.36	0.27	0.23	0.21	0.20	0.09	0.22	0.23
Current ratio	2.51	1.75	2.03	1.70	1.67	1.62	1.78	1.35	2.08	2.35
Quick ratio	1.72	1.08	1.36	1.05	0.71	0.50	0.35	0.21	1.15	0.97
Cash ratio	0.40	0.12	0.21	0.14	0.15	0.09	0.05	0.06	0.92	0.81
*Net Income (M€)	62.11	-68.27	77.48	49.82	65.18	-117.21	-144.70	-64.52	-58.49	-28.36
*Retained Earnings (M€)	11.85	10.59	12.18	14.82	13.78	17.28	-90.98	-143.81	-196.77	-165.82
*Market Capitalization (M€)	760.78	544.27	498.97	215.73	110.08	168.01	171.34	108.02	298.51	115.83
*Shares Outstanding (M)	20.90	20.90	20.90	20.23	20.23	27.53	33.12	33.12	73.62	73.62
*Stock Price (Last in €)	37.03	26.53	24.47	10.70	5.58	6.25	5.17	3.26	4.05	1.57
*Effective Tax Rate	25.07%		11.75%	13.31%	9.08%					

Bankruptcy prediction scores											
12 Months Ending	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.41	0.24	0.36	0.27	0.23	0.21	0.20	0.09	0.22	0.23
X ₂ (Retained earnings/Total assets)	1.4000	0.01	0.01	0.01	0.01	0.02	0.02	-0.16	-0.33	-0.52	-0.60
X ₃ (Operating income/Total assets)	3.3000	0.03	-0.04	0.06	0.03	0.08	-0.12	-0.22	-0.11	-0.15	-0.12
X ₄ (Market value of equity/Total liabilities)	0.6000	0.79	0.58	0.52	0.22	0.24	0.34	0.54	0.42	1.75	0.77
X ₅ (Net total sales/Total assets)	0.9900	0.42	0.30	0.45	0.34	0.40	0.10	0.15	0.09	0.22	0.11
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.41	0.36	0.34	0.35	0.46	0.46	0.46	0.40	0.55	0.45
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.55	0.80	0.69	0.76	0.64	0.63	0.65	0.85	0.48	0.74
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.00
M ₄ (Current assets/Current liabilities)	-0.7640	2.51	1.75	2.03	1.70	1.67	1.62	1.78	1.35	2.08	2.35
M ₅ (Operating income/Pretax income)	0.5350	0.67	1.02	0.81	0.63	0.82	0.92	0.88	0.77	1.00	1.17
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.11	0.02	0.07	0.05	0.03	0.00	0.00	0.01	0.15	0.06
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.01	0.01	0.01	0.01	0.02	0.02	-0.16	-0.33	-0.52	-0.60
C ₂ (Current assets/Total assets)	1.0760	0.68	0.55	0.70	0.65	0.57	0.54	0.46	0.37	0.43	0.40
C ₃ (Cashflow/Total assets)	5.5660	0.04	-0.08	0.06	-0.02	-0.05	-0.02	0.00	0.00	0.14	-0.09
C ₄ (State & other public entities/Sales*365)	-0.0025	8.27	8.20	2.45	4.44	0.00	0.00	22.57	17.28	8.45	23.72
C ₅ (Financing and bank loans/Current assets)	0.1560	0.55	0.80	0.69	0.76	0.64	0.63	0.65	0.85	0.48	0.74

Direcional Engenharia SA (DIRR BZ)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	11.39%	13.04%	11.73%	9.97%	7.56%	-0.01%	-6.90%	-1.52%	7.58%	9.04%	
Return on Assets (ROA)	6.62%	7.98%	7.46%	5.61%	4.36%	-0.01%	-3.49%	-0.63%	3.29%	3.86%	
Return on Equity (ROE)	14.77%	16.03%	16.26%	12.18%	8.21%	-0.61%	-9.92%	-5.76%	7.51%	9.22%	
Market-to-book ratio	1.17	1.43	1.15	0.71	0.29	0.36	0.49	0.79	1.56	1.43	
Earnings per Share (EPS)	0.50	0.59	0.52	0.44	0.23	-0.02	-0.29	-0.12	0.16	0.13	
Price-to-Earnings (P/E)	7.91	8.89	7.04	5.80	3.52	-59.73	-4.95	-13.74	20.78	15.55	
Efficiency											
Asset turnover	0.52	0.53	0.55	0.51	0.40	0.34	0.19	0.26	0.32	0.28	
Inventory turnover	1.69	1.82	2.52	2.57	1.78	1.62	0.83	0.92	1.03	0.77	
Inventory period (days)	216	200	145	142	205	225	440	396	353	476	
Receivables turnover	1.32	1.30	1.33	1.48	1.37	1.32	0.92	2.05	3.99	4.46	
Accounts receivable period (days)	276	281	274	246	266	277	396	178	92	82	
Profit margin (%)	16.35%	15.53%	13.09%	11.22%	7.88%	-0.87%	-19.12%	-6.65%	6.89%	7.53%	
Operating profit margin (%)	14.57%	16.23%	12.87%	11.78%	9.15%	-0.02%	-17.36%	-2.44%	10.27%	12.03%	
Leverage											
Long-term debt ratio (%)	13.49%	22.13%	26.66%	22.04%	20.73%	20.10%	23.35%	28.26%	32.26%	38.58%	
Total debt ratio (%)	49.73%	52.38%	53.36%	56.12%	54.28%	57.27%	61.26%	70.05%	70.58%	73.73%	
Times-interest-earned	11.20	16.79	7.94	5.18	3.39	0.09	-3.03	-0.48	2.61	4.04	
Cash coverage	-0.65	-0.62	-0.41	-0.30	-0.22	-0.23	-0.18	0.60	1.04	2.16	
Debt to Equity	0.38	0.52	0.56	0.55	0.47	0.52	0.56	0.72	0.64	0.80	
Liquidity											
Net working capital (M€)	516.06	667.67	522.23	581.32	410.45	514.18	414.28	334.47	402.57	329.81	
Net working capital requirements (M€)	551.83	730.47	526.46	555.14	388.23	482.63	388.72	245.80	293.14	215.97	
Net Cash (M€)	-35.78	-62.81	-4.23	26.18	22.21	31.55	25.56	88.68	109.43	113.84	
Net-working-capital-to-assets	0.51	0.57	0.50	0.47	0.45	0.43	0.40	0.32	0.39	0.41	
Current ratio	2.87	3.37	3.30	3.17	3.64	3.34	3.35	2.95	4.52	4.66	
Quick ratio	1.97	2.33	2.61	2.14	2.43	2.01	1.69	1.64	2.08	2.05	
Cash ratio	0.53	0.59	0.73	0.77	0.75	0.75	0.69	1.12	1.41	1.62	
*Net Income (M€)	75.40	89.84	79.95	66.02	33.93	-3.10	-39.96	-18.05	22.78	19.45	
*Retained Earnings (M€)	0.00	9.38	7.78	7.91	99.73	125.04	107.79	83.35	75.56	52.28	
*Market Capitalization (M€)	596.33	798.97	562.97	382.97	119.29	184.96	197.90	247.98	473.45	302.44	
*Shares Outstanding (M)	151.58	152.65	152.82	151.23	146.27	139.23	139.48	146.99	142.45	146.71	
*Stock Price (Last in €)	3.93	5.23	3.68	2.53	0.82	1.33	1.42	1.69	3.32	2.06	
*Effective Tax Rate	12.14%	7.29%	9.12%	9.12%	12.97%	106.92%			21.45%	17.16%	

Direcional Engenharia SA (DIRR BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.51	0.57	0.50	0.47	0.45	0.43	0.40	0.32	0.39	0.41
X ₂ (Retained earnings/Total assets)	1.4000	0.00	0.48	0.47	0.44	0.46	0.43	0.39	0.30	0.29	0.26
X ₃ (Operating income/Total assets)	3.3000	0.08	0.09	0.08	0.06	0.05	0.00	-0.03	-0.01	0.04	0.05
X ₄ (Market value of equity/Total liabilities)	0.6000	1.18	1.30	1.00	0.55	0.24	0.27	0.31	0.34	0.65	0.51
X ₅ (Net total sales/Total assets)	0.9900	0.45	0.49	0.58	0.48	0.48	0.30	0.20	0.26	0.32	0.32
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.50	0.48	0.47	0.44	0.46	0.43	0.39	0.30	0.29	0.26
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.25	0.31	0.36	0.35	0.34	0.36	0.38	0.44	0.37	0.40
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.05	0.01	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.02
M ₄ (Current assets/Current liabilities)	-0.7640	2.87	3.37	3.30	3.17	3.64	3.34	3.35	2.95	4.52	4.66
M ₅ (Operating income/Pretax income)	0.5350	0.86	0.91	0.95	0.93	0.92	0.22	1.08	0.55	1.24	1.20
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.14	0.12	0.14	0.16	0.11	0.11	0.10	0.15	0.11	0.14
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.00	0.48	0.47	0.44	0.46	0.43	0.39	0.30	0.29	0.26
C ₂ (Current assets/Total assets)	1.0760	0.78	0.81	0.71	0.69	0.63	0.62	0.57	0.48	0.50	0.52
C ₃ (Cashflow/Total assets)	5.5660	0.07	0.00	0.04	0.04	-0.06	0.00	-0.01	0.07	-0.04	0.04
C ₄ (State & other public entities/Sales*365)	-0.0025	4.80	1.38	1.41	1.89	0.00	0.00	17.34	8.18	6.58	6.42
C ₅ (Financing and bank loans/Current assets)	0.1560	7.78	9.39	6.36	5.64	4.48	4.69	4.66	4.80	3.13	3.46

INAPA - Investimentos Participacoes e Gestao SA (INA PL)										
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	4.45%	3.64%	3.37%	3.72%	-1.23%	-15.51%	2.56%	2.53%	2.46%	-0.71%
Return on Assets (ROA)	2.52%	1.80%	1.75%	2.20%	-0.75%	-9.41%	1.65%	1.67%	1.36%	-0.37%
Return on Equity (ROE)	-3.03%	-3.02%	0.66%	1.09%	-0.21%	-1.19%	0.11%	-1.99%	-2.39%	-10.00%
Market-to-book ratio	0.10	0.12	0.23	0.16	0.10	0.11	0.12	0.06	0.12	0.13
Earnings per Share (EPS)	-0.04	-0.03	0.01	0.01	0.00	-0.01	0.00	-0.02	-0.01	-0.03
Price-to-Earnings (P/E)	-3.41	-4.12	35.29	14.74	-47.05	-8.98	109.80	-3.22	-5.21	-1.34
Efficiency										
Asset turnover	1.40	1.37	1.33	1.37	1.33	1.27	1.32	1.36	1.48	1.37
Inventory turnover	10.96	11.25	10.97	11.49	11.57	10.85	11.10	11.51	13.20	12.48
Inventory period (days)	33	32	33	32	32	34	33	32	28	29
Receivables turnover	5.49	5.98	6.24	6.65	6.77	6.43	6.73	7.27	8.35	8.27
Accounts receivable period (days)	67	61	59	55	54	57	54	50	44	44
Profit margin (%)	-0.62%	-0.64%	0.14%	0.23%	-0.05%	-0.26%	0.02%	-0.40%	-0.39%	-1.48%
Operating profit margin (%)	1.74%	1.30%	1.32%	1.59%	-0.56%	-7.46%	1.23%	1.20%	1.02%	-0.26%
Leverage										
Long-term debt ratio (%)	47.85%	40.99%	44.97%	51.27%	53.22%	54.65%	56.98%	57.22%	60.43%	58.90%
Total debt ratio (%)	70.50%	70.89%	71.34%	71.19%	71.65%	72.49%	72.33%	71.80%	78.15%	78.75%
Times-interest-earned	1.10	0.92	1.45	1.31	1.45	1.29	1.28	0.92	0.80	-0.20
Cash coverage	1.48	1.34	1.94	1.72	1.88	1.78	1.81	1.42	1.99	1.18
Debt to Equity	1.78	1.82	1.89	1.82	1.76	1.67	1.70	1.61	2.16	2.10
Liquidity										
Net working capital (M€)	33.61	-28.66	-15.12	34.88	52.51	58.77	76.16	68.26	17.44	-39.84
Net working capital requirements (M€)	-451.28	-465.06	-466.59	-466.93	-481.30	-474.59	-478.73	-461.29	-586.34	-549.51
Net Cash (M€)	484.89	436.41	451.47	501.81	533.80	533.36	554.89	529.55	603.77	509.67
Net-working-capital-to-assets	0.05	-0.04	-0.02	0.05	0.08	0.09	0.11	0.11	0.02	-0.05
Current ratio	1.13	0.91	0.95	1.15	1.26	1.28	1.42	1.42	1.06	0.85
Quick ratio	0.68	0.54	0.58	0.72	0.76	0.78	0.80	0.82	0.63	0.46
Cash ratio	0.06	0.07	0.09	0.14	0.13	0.11	0.11	0.11	0.14	0.03
*Net Income (M€)	-6.16	-5.95	1.27	2.08	-0.40	-2.23	0.21	-3.58	-4.14	-15.45
*Retained Earnings (M€)	-49.83	-55.86	-55.81	-34.02	-36.50	-21.53	-21.32	-25.18	-30.79	-46.24
*Market Capitalization (M€)	21.00	24.50	44.92	30.63	18.91	20.00	23.06	11.53	21.58	20.73
*Shares Outstanding (M)	150.00	204.18	204.18	204.18	180.14	180.14	180.14	180.14	526.23	526.23
*Stock Price (Last in €)	0.14	0.12	0.22	0.15	0.11	0.11	0.13	0.06	0.04	0.04
*Effective Tax Rate			29.38%	19.71%	129.56%	533.71%	17.97%			

INAPA - Investimentos Participacoes e Gestao SA (INA PL)

Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	1.50	1.29	1.31	1.49	1.43	1.40	1.51	1.52	1.36	1.27
X ₂ (Retained earnings/Total assets)	1.4000	0.05	-0.04	-0.02	0.05	0.08	0.09	0.11	0.11	0.02	-0.05
X ₃ (Operating income/Total assets)	3.3000	-0.07	-0.08	-0.08	-0.05	-0.05	-0.03	-0.03	-0.04	-0.04	-0.06
X ₄ (Market value of equity/Total liabilities)	0.6000	0.03	0.02	0.02	0.03	0.03	0.02	0.02	0.02	0.01	0.00
X ₅ (Net total sales/Total assets)	0.9900	0.04	0.05	0.09	0.06	0.04	0.04	0.05	0.03	0.03	0.04
		1.45	1.38	1.33	1.38	1.32	1.26	1.33	1.39	1.34	1.43
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	-7.35	-6.18	-0.62	-1.09	-0.22	9.87	22.74	-7.16	-8.40	-8.35
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.30	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.22	0.21
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	1.21	1.28	1.33	1.30	1.32	1.18	1.22	1.25	1.28	1.40
M ₄ (Current assets/Current liabilities)	-0.7640	0.07	0.07	0.07	0.08	0.08	0.12	0.11	0.12	0.15	0.14
M ₅ (Operating income/Pretax income)	0.5350	1.13	0.91	0.95	1.15	1.26	1.28	1.42	1.42	1.06	0.85
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.5350	-5.65	-2.66	8.77	7.42	9.87	27.80	52.58	-2.87	-2.18
		0.02	0.03	0.04	0.05	0.04	0.03	0.03	0.03	0.03	0.01
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	-0.22	-0.47	-0.91	-0.04	-0.41	-0.32	-0.33	-0.48	-0.36	-0.80
C ₂ (Current assets/Total assets)	1.0760	0.30	-0.07	-0.08	-0.05	-0.05	-0.03	-0.03	-0.04	-0.04	-0.06
C ₃ (Cashflow/Total assets)	5.5660	0.43	0.41	0.41	0.40	0.38	0.39	0.38	0.36	0.37	0.32
C ₄ (State & other public entities/Sales*365)	-0.0025	0.05	0.01	-0.07	0.08	0.02	0.03	0.03	0.01	0.02	-0.04
C ₅ (Financing and bank loans/Current assets)	0.1560	8.49	9.79	10.53	10.25	20.30	21.33	20.18	18.88	16.07	16.71
		1.21	1.28	1.33	1.30	1.32	1.18	1.22	1.25	1.28	1.40

Navigator Co SA/The (NVG PL)

Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	10.21%	11.43%	9.93%	11.19%	12.59%	12.31%	11.56%	13.23%	9.47%	6.91%
Return on Assets (ROA)	7.40%	8.20%	7.93%	7.94%	9.85%	9.56%	8.78%	9.48%	7.18%	4.78%
Return on Equity (ROE)	13.28%	14.26%	14.19%	12.48%	16.17%	17.64%	17.54%	18.97%	16.38%	10.64%
Market-to-book ratio	0.95	1.18	1.51	1.63	2.27	1.90	2.57	2.18	2.51	1.75
Earnings per Share (EPS)	0.26	0.28	0.27	0.24	0.26	0.30	0.29	0.31	0.23	0.15
Price-to-Earnings (P/E)	4.11	5.29	7.21	9.40	10.75	8.69	12.57	10.24	14.63	15.69
Efficiency										
Asset turnover	0.54	0.54	0.55	0.56	0.63	0.65	0.68	0.68	0.66	0.54
Inventory turnover	3.21	3.04	3.18	3.45	3.43	3.14	3.29	3.41	3.25	2.89
Inventory period (days)	114	120	115	106	106	116	111	107	112	126
Receivables turnover	8.08	7.75	8.15	8.36	9.08	8.67	9.16	8.42	8.82	9.53
Accounts receivable period (days)	45	47	45	44	40	42	40	43	41	38
Profit margin (%)	13.20%	14.06%	13.72%	11.77%	12.06%	13.79%	12.69%	13.31%	9.97%	7.88%
Operating profit margin (%)	14.03%	14.88%	14.61%	13.95%	14.70%	14.60%	13.09%	14.38%	10.85%	8.80%
Leverage										
Long-term debt ratio (%)	27.72%	24.22%	34.27%	24.37%	36.12%	34.11%	36.05%	35.46%	46.87%	41.84%
Total debt ratio (%)	47.61%	45.65%	47.52%	46.33%	50.03%	48.81%	51.42%	53.72%	59.73%	59.81%
Times-interest-earned	11.69	17.01	9.42	6.90	6.39	11.50	24.58	31.70	18.88	10.49
Cash coverage	17.16	23.79	13.56	10.43	9.14	17.53	37.95	46.18	30.08	21.16
Debt to Equity	0.49	0.47	0.56	0.53	0.60	0.57	0.69	0.64	0.90	1.01
Liquidity										
Net working capital (M€)	224.41	240.31	607.73	329.57	215.22	155.30	172.62	164.36	172.30	77.69
Net working capital requirements (M€)	87.46	111.74	88.73	69.62	99.14	67.97	74.87	81.87	67.22	105.44
Net Cash (M€)	136.95	128.57	519.00	259.95	116.07	87.32	97.75	82.49	105.08	-27.75
Net-working-capital-to-assets	0.08	0.09	0.22	0.12	0.09	0.06	0.07	0.06	0.07	0.03
Current ratio	1.42	1.43	2.63	1.54	1.63	1.38	1.38	1.31	1.36	1.12
Quick ratio	0.89	0.93	1.92	1.11	0.74	0.61	0.66	0.58	0.66	0.69
Cash ratio	0.51	0.59	1.40	0.82	0.21	0.17	0.28	0.15	0.34	0.47
*Net Income (M€)	196.33	211.17	210.04	181.47	196.40	217.50	207.77	225.14	168.29	109.21
*Retained Earnings (M€)	696.05	734.80	732.21	700.86	469.49	423.14	375.16	417.65	374.29	207.20
*Market Capitalization (M€)	1411.43	1749.90	2233.43	2367.74	2759.93	2342.64	3050.81	2583.00	2574.39	1792.32
*Shares Outstanding (M)	767.50	767.50	767.50	767.50	767.50	717.50	717.50	717.50	717.50	717.50
*Stock Price (Last in €)	1.84	2.28	2.91	3.09	3.60	3.27	4.25	3.60	3.59	2.50
*Effective Tax Rate	21.59%	21.93%	4.34%	1.44%	15.40%		16.00%	19.79%	21.61%	13.14%

Navigator Co SA/The (NVG PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.08	0.09	0.22	0.12	0.09	0.06	0.07	0.06	0.07	0.03
X ₂ (Retained earnings/Total assets)	1.4000	0.25	0.27	0.26	0.26	0.19	0.18	0.15	0.16	0.15	0.08
X ₃ (Operating income/Total assets)	3.3000	0.09	0.11	0.08	0.08	0.12	0.10	0.10	0.12	0.09	0.05
X ₄ (Market value of equity/Total liabilities)	0.6000	1.05	1.41	1.67	1.89	2.27	1.99	2.43	1.88	1.69	1.17
X ₅ (Net total sales/Total assets)	0.9900	0.53	0.55	0.54	0.57	0.67	0.65	0.67	0.66	0.66	0.54
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.52	0.54	0.52	0.54	0.50	0.51	0.49	0.46	0.40	0.40
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.97	0.87	0.85	0.82	1.30	1.26	1.31	1.11	1.42	1.45
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.09	0.05
M ₄ (Current assets/Current liabilities)	-0.7640	1.42	1.43	2.63	1.54	1.63	1.38	1.38	1.31	1.36	1.12
M ₅ (Operating income/Pretax income)	0.5350	1.06	1.06	1.06	1.19	1.22	1.10	1.03	1.08	1.09	1.12
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.09	0.12	0.19	0.18	0.03	0.03	0.05	0.03	0.06	0.12
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	-0.9500	0.20	0.12	0.47	0.04	-1.09	-0.15	-0.02	-0.26	0.03	0.01
C ₂ (Current assets/Total assets)	2.5180	0.25	0.27	0.26	0.26	0.19	0.18	0.15	0.16	0.15	0.08
C ₃ (Cashflow/Total assets)	1.0760	0.27	0.29	0.35	0.35	0.23	0.23	0.26	0.27	0.26	0.28
C ₄ (State & other public entities/Sales*365)	5.5660	0.05	0.02	0.07	-0.01	-0.18	0.00	0.02	-0.02	0.03	0.06
C ₅ (Financing and bank loans/Current assets)	-0.0025	66.95	71.21	50.53	44.92	37.14	32.62	28.23	33.85	25.22	32.11
	0.1560	0.97	0.87	0.85	0.82	1.30	1.26	1.31	1.11	1.42	1.45

Altri SGPS SA (ALTR PL)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	8.03%	10.56%	9.82%	8.99%	14.79%	9.47%	12.49%	16.90%	10.37%	4.98%	
Return on Assets (ROA)	4.92%	7.16%	6.16%	4.83%	11.23%	6.92%	9.20%	12.09%	7.88%	3.60%	
Return on Equity (ROE)	16.03%	28.37%	22.89%	13.73%	36.50%	22.40%	24.35%	37.29%	21.63%	7.85%	
Market-to-book ratio	1.75	1.77	1.90	1.87	3.04	2.31	2.69	2.28	2.50	2.38	
Earnings per Share (EPS)	0.11	0.25	0.27	0.18	0.57	0.38	0.47	0.95	0.49	0.17	
Price-to-Earnings (P/E)	6.78	3.96	5.33	8.92	5.56	7.42	8.44	4.86	10.39	29.13	
Efficiency											
Asset turnover	0.41	0.47	0.48	0.44	0.54	0.49	0.53	0.58	0.49	0.41	
Inventory turnover	1.89	2.89	3.52	3.43	2.77	2.58	2.28	1.67	1.87	2.31	
Inventory period (days)	193	126	104	106	132	142	160	218	195	158	
Receivables turnover	6.04	6.56	6.38	6.42	7.28	6.56	6.38	6.64	7.19	8.23	
Accounts receivable period (days)	60	56	57	57	50	56	57	55	51	44	
Profit margin (%)	4.71%	9.84%	9.90%	6.89%	17.91%	12.77%	14.64%	25.01%	13.71%	5.75%	
Operating profit margin (%)	11.58%	15.24%	13.46%	11.03%	20.43%	14.74%	16.97%	23.20%	15.87%	8.79%	
Leverage											
Long-term debt ratio (%)	79.64%	75.97%	68.46%	59.13%	64.46%	63.40%	55.72%	51.15%	58.60%	58.52%	
Total debt ratio (%)	87.52%	83.70%	80.20%	78.03%	73.03%	73.26%	67.39%	65.04%	68.56%	70.03%	
Times-interest-earned	2.29	3.56	4.66	3.43	10.62	8.36	9.77	17.83	12.91	4.58	
Cash coverage	4.25	5.41	7.25	5.99	13.96	12.04	13.59	22.44	19.07	11.18	
Debt to Equity	6.00	4.23	3.38	2.94	2.18	2.21	1.52	1.32	1.68	1.82	
Liquidity											
Net working capital (M€)	-147.59	-47.46	1.07	-94.46	168.10	189.87	109.58	127.16	123.13	110.61	
Net working capital requirements (M€)	51.82	74.19	66.78	63.38	56.31	52.87	37.47	12.59	42.70	17.40	
Net Cash (M€)	-199.41	-121.65	-65.71	-157.85	111.79	137.00	72.11	114.57	80.44	93.21	
Net-working-capital-to-assets	-0.13	-0.04	0.00	-0.08	0.14	0.15	0.09	0.09	0.08	0.07	
Current ratio	0.64	0.85	1.00	0.82	1.69	1.64	1.40	1.36	1.45	1.33	
Quick ratio	0.43	0.64	0.78	0.67	1.38	1.32	1.12	1.04	0.97	0.96	
Cash ratio	0.27	0.35	0.58	0.50	1.00	1.01	0.71	0.69	0.66	0.77	
*Net Income (M€)	22.57	52.18	55.35	37.38	117.66	76.98	96.07	194.50	100.83	34.98	
*Retained Earnings (M€)	25.43	55.04	58.21	40.79	121.99	82.11	101.20	199.63	105.95	40.11	
*Market Capitalization (M€)	246.16	325.75	459.49	509.34	978.48	792.63	1060.74	1189.76	1165.15	1058.48	
*Shares Outstanding (M)	205.13	205.13	205.13	205.13	205.13	205.13	205.13	205.13	205.13	205.13	
*Stock Price (Last in €)	0.75	1.01	1.44	1.62	3.19	2.78	3.95	4.61	5.11	4.97	
*Effective Tax Rate	8.83%	14.23%	15.19%	7.94%	20.25%	23.56%	18.99%	22.40%	26.01%		

Altri SGPS SA (ALTR PL)

Bankruptcy prediction scores											
12 Months Ending	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	-0.13	-0.04	0.00	-0.08	0.14	0.15	0.09	0.09	0.08	0.07
X ₂ (Retained earnings/Total assets)	1.4000	0.02	0.05	0.05	0.03	0.10	0.06	0.08	0.13	0.07	0.03
X ₃ (Operating income/Total assets)	3.3000	0.05	0.08	0.07	0.05	0.14	0.09	0.11	0.16	0.11	0.04
X ₄ (Market value of equity/Total liabilities)	0.6000	0.25	0.34	0.47	0.53	1.12	0.84	1.30	1.23	1.15	1.02
X ₅ (Net total sales/Total assets)	0.9900	0.43	0.47	0.46	0.44	0.55	0.47	0.54	0.52	0.50	0.41
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.12	0.16	0.20	0.22	0.27	0.27	0.33	0.35	0.31	0.30
M ₂ (Financing and bank loans/Current assets)	-8.2600	1.10	0.72	0.73	0.95	0.28	0.33	0.27	0.30	0.30	0.42
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.06	0.05	0.05	0.05	0.05	0.05	0.08	0.08	0.07	0.07
M ₄ (Current assets/Current liabilities)	-0.7640	0.64	0.85	1.00	0.82	1.69	1.64	1.40	1.36	1.45	1.33
M ₅ (Operating income/Pretax income)	0.5350	2.20	1.55	1.36	1.60	1.14	1.15	1.16	0.93	1.16	1.79
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.10	0.10	0.19	0.21	0.20	0.23	0.16	0.16	0.12	0.17
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.02	0.05	0.05	0.03	0.10	0.06	0.08	0.13	0.07	0.03
C ₂ (Current assets/Total assets)	1.0760	0.24	0.24	0.33	0.35	0.34	0.38	0.32	0.32	0.27	0.30
C ₃ (Cashflow/Total assets)	5.5660	-0.02	0.00	0.10	0.02	-0.01	0.04	-0.09	0.03	-0.04	0.05
C ₄ (State & other public entities/Sales*365)	-0.0025	1.66	15.16	12.93	13.21	23.51	20.01	18.53	31.29	24.33	31.65
C ₅ (Financing and bank loans/Current assets)	0.1560	3.18	2.83	2.04	1.86	1.71	1.56	1.57	1.44	1.96	1.84

Suzano SA (SUZB BZ)

Indicators										
12 Months Ending	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Performance										
Return on Capital (ROC)	4.35%	2.92%	4.94%	5.67%	16.42%	3.68%	13.39%	11.67%	3.37%	11.74%
Return on Assets (ROA)	3.23%	2.32%	4.10%	4.49%	12.83%	2.82%	10.19%	9.60%	2.71%	9.02%
Return on Equity (ROE)	0.32%	-1.79%	-2.35%	-2.60%	-11.89%	14.95%	17.21%	2.74%	-15.94%	-159.67%
Market-to-book ratio	0.28	0.71	0.96	1.21	2.24	1.55	1.76	3.46	2.96	10.76
Earnings per Share (EPS)	0.03	-0.07	-0.07	-0.08	-0.23	0.41	0.46	0.07	-0.47	-1.37
Price-to-Earnings (P/E)	88.61	-39.56	-40.68	-46.40	-18.81	10.37	10.20	126.37	-18.57	-6.74
Efficiency										
Asset turnover	0.24	0.23	0.23	0.27	0.37	0.34	0.37	0.32	0.35	0.28
Inventory turnover	5.79	6.24	5.53	5.59	5.29	4.98	5.27	4.51	5.13	2.72
Inventory period (days)	63	58	66	65	69	73	69	81	71	134
Receivables turnover	5.29	4.94	4.63	5.48	6.71	5.67	5.56	5.45	9.49	9.26
Accounts receivable period (days)	69	74	79	67	54	64	66	67	38	39
Profit margin (%)	0.62%	-3.51%	-3.88%	-3.60%	-9.05%	17.12%	17.18%	2.37%	-10.83%	-35.21%
Operating profit margin (%)	13.95%	10.48%	17.15%	16.93%	30.03%	9.38%	24.95%	37.20%	9.98%	27.60%
Leverage										
Long-term debt ratio (%)	40.15%	45.26%	52.62%	53.70%	58.38%	55.04%	46.44%	72.88%	77.07%	90.62%
Total debt ratio (%)	55.45%	56.61%	60.64%	63.32%	67.47%	65.50%	59.26%	77.70%	81.53%	92.79%
Times-interest-earned	1.37	0.95	1.43	1.17	2.55	1.21	2.84	4.18	0.77	2.49
Cash coverage	2.64	2.22	2.74	2.33	3.73	2.50	4.07	5.48	3.17	4.48
Debt to Equity	0.90	0.97	1.20	1.33	1.62	1.38	1.05	2.97	3.74	9.94
Liquidity										
Net working capital (M€)	911.58	1417.14	1286.36	1105.90	715.28	1223.45	775.63	5565.02	1640.77	1541.05
Net working capital requirements (M€)	427.75	271.84	405.98	437.58	557.48	506.37	596.20	736.48	1,026.15	613.26
Net Cash (M€)	483.82	1145.30	880.38	668.32	157.80	717.07	179.43	4828.54	614.62	927.79
Net-working-capital-to-assets	0.10	0.15	0.15	0.13	0.11	0.14	0.11	0.46	0.08	0.10
Current ratio	1.70	2.34	2.84	2.15	1.88	2.10	1.83	5.08	1.65	2.20
Quick ratio	1.37	1.90	2.26	1.62	1.23	1.39	1.35	4.63	1.08	1.46
Cash ratio	1.04	1.52	1.62	1.20	0.70	0.96	0.73	4.21	0.82	1.11
*Net Income (M€)	12.88	-72.71	-77.24	-83.86	-253.91	441.72	502.32	74.14	-638.89	-1845.05
*Retained Earnings (M€)	203.64	123.11	108.65	119.25	123.59	126.19	161.84	283.86	70.27	-618.30
*Market Capitalization (M€)	1141.25	2876.33	3141.95	3891.20	4775.25	4582.46	5125.45	9368.97	11862.45	12438.99
*Shares Outstanding (M)	397.95	1090.03	1084.80	1086.60	1088.40	1090.19	1091.98	1093.78	1349.22	1349.22
*Stock Price (Last in €)	2.87	2.64	2.90	3.58	4.39	4.20	4.69	8.57	8.79	9.22
*Effective Tax Rate						30.03%	19.28%			

Suzano SA (SUZB BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.10	0.15	0.15	0.13	0.11	0.14	0.11	0.46	0.08	0.10
X ₂ (Retained earnings/Total assets)	1.4000	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.00	-0.04
X ₃ (Operating income/Total assets)	3.3000	0.03	0.02	0.04	0.04	0.13	0.04	0.13	0.10	0.03	0.09
X ₄ (Market value of equity/Total liabilities)	0.6000	0.23	0.54	0.62	0.70	1.08	0.82	1.21	0.99	0.67	0.84
X ₅ (Net total sales/Total assets)	0.9900	0.23	0.22	0.24	0.27	0.43	0.30	0.41	0.26	0.27	0.33
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.45	0.43	0.39	0.37	0.33	0.35	0.41	0.22	0.18	0.07
M ₂ (Financing and bank loans/Current assets)	-8.2600	1.64	1.60	1.99	2.08	2.26	1.75	1.79	1.16	3.58	4.06
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.02	0.03	0.03	0.03	0.02	0.02	0.02	0.01	0.02	0.02
M ₄ (Current assets/Current liabilities)	-0.7640	1.70	2.34	2.84	2.15	1.88	2.10	1.83	5.08	1.65	2.20
M ₅ (Operating income/Pretax income)	0.5350	-6.88	-1.75	-3.48	-3.38	-2.26	0.55	1.45	30.62	-0.63	-0.48
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.06	0.05	0.05	0.05	0.05	0.05	0.04	0.08	0.03	0.07
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	-0.9500	-0.84	-0.42	-0.74	-0.53	-0.90	-0.49	-0.63	0.17	-0.27	-0.01
C ₂ (Current assets/Total assets)	2.5180	0.02	0.01	0.01	0.01	0.02	0.01	0.02	0.02	0.00	-0.04
C ₃ (Cashflow/Total assets)	1.0760	0.25	0.26	0.24	0.24	0.23	0.27	0.24	0.57	0.19	0.18
C ₄ (State & other public entities/Sales*365)	5.5660	-0.02	0.05	-0.03	0.00	-0.09	0.00	-0.02	0.06	-0.01	0.04
C ₅ (Financing and bank loans/Current assets)	-0.0025	136.39	112.70	94.91	75.03	33.08	67.48	60.06	33.63	12.15	1.88
C ₅ (Financing and bank loans/Current assets)	0.1560	1.64	1.60	1.99	2.08	2.26	1.75	1.79	1.16	3.58	4.06

Irani Papel e Embalagem SA (RANI BZ)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	8.56%	9.58%	13.11%	9.27%	5.16%	6.06%	0.66%	11.41%	23.09%	11.56%	
Return on Assets (ROA)	5.11%	5.90%	7.63%	6.10%	3.43%	3.84%	0.42%	6.33%	13.29%	8.41%	
Return on Equity (ROE)	2.09%	6.27%	15.76%	11.68%	0.15%	-2.17%	-35.13%	-0.07%	-24.21%	12.89%	
Market-to-book ratio	0.33	0.56	1.11	1.08	1.25	0.88	0.96	1.57	1.95	1.74	
Earnings per Share (EPS)	0.03	0.07	0.14	0.11	0.00	-0.02	-0.18	0.00	-0.11	0.06	
Price-to-Earnings (P/E)	15.70	8.88	7.05	9.22	846.38	-40.48	-2.73	-2101.22	-8.07	13.53	
Efficiency											
Asset turnover	0.40	0.41	0.45	0.46	0.46	0.46	0.55	0.52	0.59	0.56	
Inventory turnover	8.58	8.40	8.94	8.65	8.37	8.41	9.35	7.23	8.61	7.65	
Inventory period (days)	43	43	41	42	44	43	39	50	42	48	
Receivables turnover	5.50	5.22	5.59	5.89	5.77	5.30	5.48	4.64	5.52	5.22	
Accounts receivable period (days)	66	70	65	62	63	69	67	79	66	70	
Profit margin (%)	1.98%	5.46%	11.16%	7.66%	0.07%	-1.39%	-12.59%	-0.03%	-8.86%	9.01%	
Operating profit margin (%)	12.32%	13.66%	18.05%	13.50%	6.35%	9.26%	0.67%	11.67%	22.82%	13.57%	
Leverage											
Long-term debt ratio (%)	31.52%	32.63%	42.26%	39.85%	48.96%	50.01%	46.97%	59.39%	56.13%	26.08%	
Total debt ratio (%)	60.72%	62.42%	70.07%	70.36%	76.09%	73.50%	77.31%	79.75%	78.70%	56.66%	
Times-interest-earned	1.14	1.48	1.76	1.21	1.07	0.72	0.06	1.40	1.57	2.57	
Cash coverage	1.03	0.99	0.86	0.87	1.06	1.07	1.03	0.99	1.79	0.86	
Debt to Equity	0.79	0.90	1.30	1.56	2.33	2.06	2.27	2.67	2.49	0.75	
Liquidity											
Net working capital (M€)	7.45	11.02	-2.90	20.85	-0.75	-0.32	10.98	-14.74	16.25	77.84	
Net working capital requirements (M€)	38.46	33.71	30.77	39.76	30.89	41.20	27.54	19.85	21.19	15.22	
Net Cash (M€)	-31.01	-22.70	-33.67	-18.91	-31.64	-41.52	-16.56	-34.59	-4.94	62.62	
Net-working-capital-to-assets	0.02	0.02	-0.01	0.04	0.00	0.00	0.03	-0.04	0.05	0.27	
Current ratio	1.08	1.14	0.97	1.20	0.99	1.00	1.14	0.86	1.17	2.78	
Quick ratio	0.81	0.89	0.75	0.90	0.74	0.79	0.84	0.67	0.63	1.98	
Cash ratio	0.37	0.45	0.39	0.51	0.38	0.44	0.28	0.29	0.26	1.25	
*Net Income (M€)	4.02	10.53	23.62	18.14	0.14	-2.81	-30.06	-0.05	-18.05	15.96	
*Retained Earnings (M€)	1.38	0.66	0.00	0.00	0.00	0.00	0.00	0.00	-0.44	0.00	
*Market Capitalization (M€)	63.19	93.59	166.49	167.29	114.94	113.95	82.13	109.05	145.66	215.90	
*Shares Outstanding (M)	160.46	158.13	164.34	164.34	164.34	164.34	164.34	164.34	164.34	254.34	
*Stock Price (Last in €)	0.39	0.59	1.01	1.02	0.70	0.69	0.50	0.66	0.89	0.85	
*Effective Tax Rate		12.25%			48.52%			28.48%		15.61%	

Irani Papel e Embalagem SA (RANI BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.73	0.88	0.95	0.97	0.99	0.73	0.84	1.02	1.39	2.07
X ₂ (Retained earnings/Total assets)	1.4000	0.02	0.02	-0.01	0.04	0.00	0.00	0.03	-0.04	0.05	0.27
X ₃ (Operating income/Total assets)	3.3000	0.05	0.07	0.08	0.06	0.07	0.04	0.00	0.09	0.13	0.10
X ₄ (Market value of equity/Total liabilities)	0.6000	0.21	0.34	0.47	0.45	0.39	0.32	0.28	0.40	0.53	1.33
X ₅ (Net total sales/Total assets)	0.9900	0.41	0.43	0.42	0.45	0.54	0.41	0.63	0.54	0.58	0.62
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	1.15	-3.38	-7.35	-7.57	37.08	-12.46	-14.01	-11.38	-13.34	2.39
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.39	0.38	0.30	0.30	0.24	0.27	0.23	0.20	0.21	0.43
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	1.59	1.64	1.82	1.96	2.45	2.06	2.23	2.13	1.66	0.76
M ₄ (Current assets/Current liabilities)	-0.7640	0.03	0.04	0.06	0.04	0.04	0.05	0.06	0.06	0.06	0.06
M ₅ (Operating income/Pretax income)	0.5350	1.08	1.14	0.97	1.20	0.99	1.00	1.14	0.86	1.17	2.78
M ₆ (Cash and cash equivalents/Total assets)	9.9120	10.23	3.02	1.94	3.51	97.22	-2.05	-0.06	3.43	-6.95	1.51
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	-0.9500	-0.70	-0.69	-0.59	-0.28	-0.48	-0.41	-0.65	-0.35	-0.73
C ₂ (Current assets/Total assets)	1.0760	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C ₃ (Cashflow/Total assets)	5.5660	0.20	0.21	0.21	0.24	0.23	0.26	0.23	0.25	0.32	0.43
C ₄ (State & other public entities/Sales*365)	-0.0025	0.03	0.02	0.03	0.02	-0.03	-0.01	-0.02	0.04	-0.03	-0.02
C ₅ (Financing and bank loans/Current assets)	0.1560	148.68	128.57	117.85	0.00	0.00	0.00	74.05	85.33	76.35	63.90
		0.1560	1.59	1.64	1.82	1.96	2.45	2.06	2.23	2.13	1.66
											0.76

Klabin SA (KLBN BZ)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	5.47%	11.59%	8.51%	7.22%	8.10%	4.11%	4.44%	12.84%	7.17%	11.33%	
Return on Assets (ROA)	4.01%	8.50%	6.40%	5.55%	6.57%	3.18%	3.54%	10.40%	6.14%	9.85%	
Return on Equity (ROE)	3.83%	14.97%	6.14%	10.63%	-27.65%	31.32%	8.14%	2.18%	10.64%	-61.98%	
Market-to-book ratio	1.24	2.01	1.81	2.13	7.27	3.90	3.23	3.54	3.45	6.74	
Earnings per Share (EPS)	0.02	0.06	0.02	0.05	-0.08	0.14	0.03	0.01	0.03	-0.08	
Price-to-Earnings (P/E)	32.51	13.44	29.47	20.02	-26.29	12.46	39.72	162.35	32.46	-10.88	
Efficiency											
Asset turnover	0.31	0.32	0.33	0.28	0.25	0.25	0.29	0.33	0.32	0.31	
Inventory turnover	5.27	4.02	6.14	5.18	5.58	5.86	5.30	4.36	4.62	4.11	
Inventory period (days)	69	91	59	71	65	62	69	84	79	89	
Receivables turnover	4.92	4.73	4.51	4.42	4.41	4.50	5.09	5.19	5.35	5.90	
Accounts receivable period (days)	74	77	81	83	83	81	72	70	68	62	
Profit margin (%)	4.70%	18.06%	6.31%	14.92%	-22.03%	35.00%	6.36%	1.37%	6.58%	-20.82%	
Operating profit margin (%)	12.65%	26.66%	18.20%	23.39%	25.71%	14.69%	11.66%	29.73%	20.27%	26.63%	
Leverage											
Long-term debt ratio (%)	46.94%	47.55%	51.99%	56.67%	74.90%	68.76%	70.25%	72.78%	78.12%	85.71%	
Total debt ratio (%)	61.09%	61.55%	63.85%	66.66%	79.62%	75.78%	76.32%	77.95%	81.27%	87.57%	
Times-interest-earned	2.21	4.56	3.13	2.77	1.44	1.18	1.34	2.51	1.69	1.96	
Cash coverage	2.86	5.20	3.81	3.24	1.75	1.83	2.21	3.37	2.45	2.68	
Debt to Equity	1.07	1.11	1.29	1.56	3.37	2.60	2.70	2.98	3.78	6.19	
Liquidity											
Net working capital (M€)	890.69	985.68	935.26	1680.12	1281.06	1694.44	2023.21	1609.12	2341.91	1129.57	
Net working capital requirements (M€)	327.94	333.02	339.76	336.76	292.60	400.88	410.98	391.91	354.33	100.77	
Net Cash (M€)	562.75	652.67	595.51	1343.36	988.47	1293.55	1612.23	1217.21	1987.59	1028.80	
Net-working-capital-to-assets	0.17	0.19	0.20	0.25	0.21	0.20	0.26	0.24	0.30	0.20	
Current ratio	2.11	2.51	2.71	3.14	2.74	2.40	3.15	2.93	4.40	2.98	
Quick ratio	1.75	2.12	2.32	2.74	2.25	1.95	2.68	2.45	3.73	2.31	
Cash ratio	1.33	1.56	1.67	2.28	1.77	1.56	2.21	1.90	3.13	1.81	
*Net Income (M€)	78.58	300.21	101.64	234.21	-343.87	647.95	147.90	32.01	153.25	-428.00	
*Retained Earnings (M€)	195.85	28.11	183.09	218.19	27.88	465.37	459.38	167.16	178.98	-156.52	
*Market Capitalization (M€)	2554.39	4035.60	2995.45	4689.92	9040.96	8074.01	5874.96	5197.31	4974.55	4656.23	
*Shares Outstanding (M)	4708.73	4704.55	4455.58	4579.29	4577.71	4573.44	4632.41	5263.21	5270.18	5485.25	
*Stock Price (Last in €)	0.54	0.86	0.67	1.02	1.97	1.77	1.27	0.99	0.94	0.85	
*Effective Tax Rate	38.30%	31.42%	23.70%	30.68%		22.80%	36.55%		17.34%		

Klabin SA (KLBN BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	1.26	1.71	1.54	1.49	1.84	1.41	1.49	1.61	1.42	1.47
X ₂ (Retained earnings/Total assets)	1.4000	0.17	0.19	0.20	0.25	0.21	0.20	0.26	0.24	0.30	0.20
X ₃ (Operating income/Total assets)	3.3000	0.04	0.01	0.04	0.03	0.00	0.05	0.06	0.03	0.02	-0.03
X ₄ (Market value of equity/Total liabilities)	0.6000	0.06	0.12	0.08	0.08	0.07	0.04	0.06	0.10	0.07	0.10
X ₅ (Net total sales/Total assets)	0.9900	0.79	1.26	1.02	1.06	1.86	1.25	1.00	1.00	0.80	0.96
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.32	0.32	0.35	0.24	0.26	0.22	0.30	0.35	0.30	0.37
M ₂ (Financing and bank loans/Current assets)	-8.2600	1.56	0.18	-0.55	-1.17	-11.40	-7.25	-5.89	-32.12	-9.46	-19.29
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.39	0.38	0.36	0.33	0.20	0.24	0.24	0.22	0.19	0.12
M ₄ (Current assets/Current liabilities)	-0.7640	1.10	1.14	1.24	1.19	1.86	1.60	1.47	1.64	1.72	2.47
M ₅ (Operating income/Pretax income)	0.5350	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.03	0.03	0.06
M ₆ (Cash and cash equivalents/Total assets)	9.9120	2.11	2.51	2.71	3.14	2.74	2.40	3.15	2.93	4.40	2.98
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	2.69	1.48	2.89	1.57	-0.75	0.42	1.83	-43.42	2.91	-0.83
C ₂ (Current assets/Total assets)	1.0760	0.18	0.18	0.18	0.25	0.19	0.20	0.23	0.19	0.24	0.15
C ₃ (Cashflow/Total assets)	5.5660	-0.9500	-0.67	-0.62	-0.41	-0.11	-0.45	-0.24	-0.05	-0.56	0.13
C ₄ (State & other public entities/Sales*365)	-0.0025	2.5180	0.04	0.01	0.04	0.03	0.00	0.05	0.06	0.03	0.02
C ₅ (Financing and bank loans/Current assets)	0.1560	1.0760	0.32	0.31	0.32	0.37	0.33	0.34	0.39	0.37	0.39
		5.5660	-0.02	0.01	0.02	0.12	-0.01	0.03	0.04	-0.05	0.08
		-0.0025	108.30	122.14	89.12	127.44	54.32	87.91	63.03	35.57	42.09
		0.1560	1.30	1.36	1.44	1.39	2.08	1.85	1.66	1.79	1.80
											2.52

NOS SGPS SA (NOS PL)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	6.78%	7.32%	2.26%	6.90%	5.34%	5.98%	5.97%	8.13%	7.33%	4.97%	
Return on Assets (ROA)	3.66%	4.40%	1.53%	3.89%	3.66%	4.06%	4.10%	5.50%	5.29%	3.63%	
Return on Equity (ROE)	14.55%	17.98%	1.02%	7.05%	7.78%	8.58%	11.03%	13.08%	14.17%	9.62%	
Market-to-book ratio	3.05	4.18	2.62	2.53	3.50	2.74	2.54	2.58	2.43	1.53	
Earnings per Share (EPS)	0.11	0.13	0.02	0.15	0.16	0.18	0.24	0.27	0.28	0.18	
Price-to-Earnings (P/E)	12.66	15.10	172.95	24.89	31.76	23.20	17.33	15.79	14.62	14.62	
Efficiency											
Asset turnover	0.50	0.47	0.44	0.47	0.48	0.50	0.52	0.52	0.47	0.44	
Inventory turnover	4.77	5.90	9.54	14.05	15.42	12.62	13.53	16.14	12.31	10.89	
Inventory period (days)	77	62	38	26	24	29	27	23	30	34	
Receivables turnover	6.77	6.42	4.96	4.50	4.21	4.30	4.16	4.03	3.92	4.19	
Accounts receivable period (days)	54	57	74	81	87	85	88	91	93	87	
Profit margin (%)	4.02%	5.04%	1.10%	5.46%	5.79%	6.04%	7.83%	8.74%	9.84%	6.73%	
Operating profit margin (%)	7.68%	8.71%	4.56%	8.41%	7.62%	8.10%	7.90%	10.67%	11.20%	8.42%	
Leverage											
Long-term debt ratio (%)	75.63%	76.44%	46.60%	36.44%	47.94%	48.00%	46.30%	49.05%	54.59%	58.78%	
Total debt ratio (%)	86.84%	85.85%	63.81%	64.14%	64.27%	64.69%	63.17%	65.55%	67.22%	69.86%	
Times-interest-earned	2.08	2.47	2.71	3.20	4.76	5.93	5.48	6.71	8.33	5.43	
Cash coverage	6.95	7.47	8.71	10.89	16.26	21.31	21.94	20.71	25.83	21.62	
Debt to Equity	5.23	4.59	1.07	1.05	1.09	1.14	0.94	1.20	1.29	1.52	
Liquidity											
Net working capital (M€)	-81.00	-98.89	-308.07	-635.59	-295.87	-231.21	-197.82	-310.84	-188.68	-113.41	
Net working capital requirements (M€)	-109.17	-121.97	-211.15	-204.86	-176.98	-73.94	-67.37	-92.93	-164.60	-190.94	
Net Cash (M€)	28.17	23.08	-96.92	-430.73	-118.89	-157.27	-130.45	-217.91	-24.07	77.53	
Net-working-capital-to-assets	-0.05	-0.06	-0.11	-0.22	-0.10	-0.08	-0.07	-0.10	-0.06	-0.04	
Current ratio	0.90	0.83	0.60	0.42	0.61	0.70	0.74	0.63	0.75	0.84	
Quick ratio	0.67	0.68	0.46	0.32	0.47	0.46	0.54	0.46	0.50	0.61	
Cash ratio	0.52	0.48	0.10	0.02	0.01	0.00	0.00	0.00	0.02	0.21	
*Net Income (M€)	34.20	39.45	10.81	74.71	82.72	90.38	122.08	137.77	143.49	92.00	
*Retained Earnings (M€)	56.02	39.90	10.81	74.71	82.72	90.38	122.08	137.77	143.49	92.00	
*Market Capitalization (M€)	717.11	916.83	2779.69	2684.31	3720.78	2887.47	2812.42	2716.82	2460.32	1462.54	
*Shares Outstanding (M)	309.10	309.10	515.16	515.16	515.16	515.16	515.16	515.16	515.16	515.16	
*Stock Price (Last in €)	1.40	1.93	3.63	3.61	5.10	4.07	4.11	4.22	4.07	2.61	
*Effective Tax Rate	29.79%	32.37%	59.34%	18.62%	28.04%	19.81%	11.89%	16.68%	18.61%	16.09%	

NOS SGPS SA (NOS PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	-0.05	-0.06	-0.11	-0.22	-0.10	-0.08	-0.07	-0.10	-0.06	-0.04
X ₂ (Retained earnings/Total assets)	1.4000	0.06	0.06	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.07
X ₃ (Operating income/Total assets)	3.3000	0.05	0.07	0.04	0.05	0.05	0.05	0.05	0.07	0.07	0.04
X ₄ (Market value of equity/Total liabilities)	0.6000	0.46	0.69	1.49	1.42	1.95	1.50	1.48	1.35	1.19	0.66
X ₅ (Net total sales/Total assets)	0.9900	0.48	0.50	0.33	0.46	0.48	0.50	0.52	0.52	0.47	0.43
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.13	0.14	0.36	0.36	0.36	0.35	0.37	0.34	0.33	0.30
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.71	0.62	0.47	1.08	0.38	0.42	0.16	0.48	0.16	0.15
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.10	0.12	0.12	0.13	0.12	0.09	0.09	0.09	0.09	0.09
M ₄ (Current assets/Current liabilities)	-0.7640	0.90	0.83	0.60	0.42	0.61	0.70	0.74	0.63	0.75	0.84
M ₅ (Operating income/Pretax income)	0.5350	1.88	1.69	3.98	1.53	1.32	1.35	1.01	1.23	1.15	1.35
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.23	0.18	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.05
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.06	0.06	0.02	0.03	0.05	0.06	0.07	0.08	0.09	0.07
C ₂ (Current assets/Total assets)	1.0760	0.40	0.31	0.16	0.16	0.16	0.18	0.18	0.17	0.18	0.19
C ₃ (Cashflow/Total assets)	5.5660	0.08	-0.09	-0.07	-0.02	-0.02	0.01	-0.01	0.01	0.01	0.06
C ₄ (State & other public entities/Sales*365)	-0.0025	9.17	9.34	14.30	8.48	9.45	8.33	10.48	9.01	19.98	15.21
C ₅ (Financing and bank loans/Current assets)	0.1560	1.74	2.12	2.51	2.38	2.48	2.26	1.88	2.39	2.36	2.36

Sonaecom SGPS SA (SNC PL)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	5.16%	-1.48%	-0.06%	0.03%	-0.65%	-1.41%	-0.78%	-0.84%	-1.58%	-1.13%	
Return on Assets (ROA)	3.43%	-1.01%	-0.05%	0.03%	-0.61%	-1.33%	-0.73%	-0.75%	-1.43%	-1.02%	
Return on Equity (ROE)	6.02%	6.96%	9.13%	2.66%	3.23%	4.62%	2.22%	6.42%	4.58%	5.27%	
Market-to-book ratio	0.43	0.50	0.83	0.44	0.63	0.77	0.76	0.71	0.57	0.38	
Earnings per Share (EPS)	0.17	0.21	0.28	0.09	0.11	0.15	0.07	0.22	0.16	0.19	
Price-to-Earnings (P/E)	4.89	5.25	7.10	13.05	15.55	13.63	28.92	9.65	11.29	7.01	
Efficiency											
Asset turnover	0.44	0.05	0.07	0.11	0.12	0.12	0.13	0.10	0.11	0.11	
Inventory turnover	6.88	2.35	3.45	37.21	43.60	94.80	171.79	207.98	235.30	270.90	
Inventory period (days)	53	155	106	10	8	4	2	2	2	1	
Receivables turnover	5.97	0.72	1.16	3.19	3.23	2.99	2.96	2.26	3.45	5.31	
Accounts receivable period (days)	61	509	316	115	113	122	123	161	106	69	
Profit margin (%)	7.21%	72.29%	99.05%	22.26%	25.60%	36.60%	16.41%	61.53%	36.45%	44.40%	
Operating profit margin (%)	8.09%	-18.45%	-0.62%	0.27%	-5.17%	-11.23%	-5.82%	-8.14%	-12.77%	-9.65%	
Leverage											
Long-term debt ratio (%)	23.64%	16.47%	2.14%	0.93%	0.91%	0.41%	0.25%	1.23%	1.33%	1.17%	
Total debt ratio (%)	49.23%	42.95%	7.36%	6.60%	6.17%	6.46%	6.67%	11.83%	10.85%	10.66%	
Times-interest-earned	5.35	-1.40	-0.07	0.32	-13.46	-39.42	-48.41	-36.14	-25.10	-19.30	
Cash coverage	15.32	-0.37	0.50	7.11	6.85	2.16	1.68	-15.69	-12.38	-5.86	
Debt to Equity	0.43	0.37	0.02	0.01	0.01	0.01	0.00	0.02	0.02	0.02	
Liquidity											
Net working capital (M€)	-121.67	-203.91	398.78	244.17	266.67	240.06	210.44	224.49	246.83	219.24	
Net working capital requirements (M€)	-62.75	-42.70	4.76	12.87	16.93	27.11	25.98	17.64	-3.60	-3.66	
Net Cash (M€)	-58.92	-161.21	394.02	231.31	249.74	212.95	184.47	206.85	250.42	222.89	
Net-working-capital-to-assets	-0.06	-0.11	0.32	0.22	0.24	0.22	0.19	0.19	0.21	0.18	
Current ratio	0.78	0.61	7.54	5.15	6.09	5.65	4.81	3.65	5.20	4.57	
Quick ratio	0.60	0.40	7.00	4.77	5.75	4.99	4.51	3.31	4.82	4.17	
Cash ratio	0.34	0.12	6.40	4.09	4.98	4.07	3.66	2.71	4.35	3.80	
*Net Income (M€)	62.29	75.43	103.77	27.10	33.15	47.78	22.90	68.34	49.16	58.72	
*Retained Earnings (M€)	70.28	296.04	29.31	13.19	15.09	19.73	18.50	58.10	71.72	71.55	
*Market Capitalization (M€)	444.99	542.41	940.89	451.44	644.47	794.23	784.58	755.25	606.95	428.08	
*Shares Outstanding (M)	366.25	366.25	366.25	311.34	311.34	311.34	311.34	311.34	311.34	311.34	
*Stock Price (Last in €)	0.83	1.08	2.01	1.14	1.66	2.09	2.13	2.12	1.78	1.32	
*Effective Tax Rate	14.95%		9.21%	4.70%	6.46%		10.69%	14.45%	14.31%		

Sonaecom SGPS SA (SNC PL)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	-0.06	-0.11	0.32	0.22	0.24	0.22	0.19	0.19	0.21	0.18
X ₂ (Retained earnings/Total assets)	1.4000	0.03	0.04	0.10	0.03	0.03	0.06	0.04	0.07	0.06	0.06
X ₃ (Operating income/Total assets)	3.3000	0.04	-0.01	0.00	0.00	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01
X ₄ (Market value of equity/Total liabilities)	0.6000	0.44	0.67	10.42	6.27	9.55	11.13	10.64	5.29	4.65	3.22
X ₅ (Net total sales/Total assets)	0.9900	0.42	0.05	0.09	0.11	0.12	0.12	0.13	0.09	0.11	0.11
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.51	0.57	0.93	0.93	0.94	0.94	0.93	0.88	0.89	0.89
M ₂ (Financing and bank loans/Current assets)	-8.2600	1.00	1.28	0.06	0.04	0.04	0.02	0.02	0.07	0.06	0.06
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.08	0.09	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01
M ₄ (Current assets/Current liabilities)	-0.7640	0.78	0.61	7.54	5.15	6.09	5.65	4.81	3.65	5.20	4.57
M ₅ (Operating income/Pretax income)	0.5350	1.12	0.58	-0.02	0.02	-0.20	-0.43	-0.35	-0.13	-0.47	-0.24
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.09	0.03	0.15	0.17	0.17	0.19	0.18	0.19	0.21	0.19
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.03	0.04	0.10	0.03	0.03	0.06	0.04	0.07	0.06	0.06
C ₂ (Current assets/Total assets)	1.0760	0.22	0.17	0.37	0.28	0.29	0.26	0.24	0.26	0.25	0.22
C ₃ (Cashflow/Total assets)	5.5660	0.06	0.02	0.10	-0.01	0.00	0.03	-0.01	0.02	0.02	-0.02
C ₄ (State & other public entities/Sales*365)	-0.0025	2.19	3.81	0.31	0.00	0.00	23.58	27.09	49.13	60.55	77.42
C ₅ (Financing and bank loans/Current assets)	0.1560	1.00	1.28	0.06	0.04	0.04	0.02	0.02	0.07	0.06	0.06

TIM SA/Brazil (TIMS BZ)											
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	
12 Months Ending											
Performance											
Return on Capital (ROC)	9.67%	9.77%	10.68%	8.66%	12.03%	4.15%	7.93%	11.13%	12.30%	9.06%	
Return on Assets (ROA)	6.40%	6.46%	6.97%	5.57%	7.50%	2.73%	5.64%	7.83%	9.14%	6.78%	
Return on Equity (ROE)	10.24%	11.30%	11.77%	10.37%	14.86%	3.91%	7.53%	13.31%	16.53%	8.69%	
Market-to-book ratio	1.72	1.43	2.04	1.86	1.00	1.10	1.75	1.45	1.69	1.53	
Earnings per Share (EPS)	0.23	0.24	0.22	0.20	0.24	0.08	0.14	0.24	0.34	0.13	
Price-to-Earnings (P/E)	16.83	12.67	17.34	17.95	6.74	28.18	23.20	10.88	10.23	17.61	
Efficiency											
Asset turnover	0.80	0.77	0.76	0.67	0.51	0.44	0.49	0.51	0.49	0.38	
Inventory turnover	33.99	37.10	39.77	37.26	39.51	53.66	35.94	29.53	17.37	14.06	
Inventory period (days)	11	10	9	10	9	7	10	12	21	26	
Receivables turnover	5.65	5.53	5.75	5.73	5.32	5.38	6.06	6.20	5.86	5.01	
Accounts receivable period (days)	65	66	64	64	69	68	60	59	62	73	
Profit margin (%)	7.48%	7.72%	7.56%	7.93%	12.17%	4.81%	7.60%	14.99%	20.84%	10.68%	
Operating profit margin (%)	8.46%	8.33%	8.63%	8.99%	13.18%	6.75%	10.24%	14.24%	20.75%	14.97%	
Leverage											
Long-term debt ratio (%)	16.55%	19.91%	20.57%	26.32%	25.25%	24.49%	21.76%	12.00%	25.19%	25.61%	
Total debt ratio (%)	44.72%	47.02%	48.13%	52.63%	53.38%	50.40%	44.32%	38.06%	44.41%	44.35%	
Times-interest-earned	6.45	6.91	5.79	3.52	4.08	1.96	4.07	6.21	4.67	3.20	
Cash coverage	14.57	14.91	12.36	7.85	8.30	7.17	12.52	16.37	9.98	9.48	
Debt to Equity	0.28	0.32	0.33	0.44	0.48	0.39	0.35	0.17	0.44	0.46	
Liquidity											
Net working capital (M€)	617.64	958.97	826.61	640.46	667.64	823.23	96.17	-242.32	74.59	332.24	
Net working capital requirements (M€)	-738.06	-636.09	-831.51	-948.78	-505.26	-475.79	-576.11	-599.86	-463.34	-295.07	
Net Cash (M€)	1355.70	1595.06	1658.12	1589.24	1172.90	1299.02	672.28	357.55	537.94	627.31	
Net-working-capital-to-assets	0.06	0.10	0.10	0.06	0.08	0.08	0.01	-0.03	0.01	0.05	
Current ratio	1.22	1.35	1.33	1.22	1.31	1.39	1.05	0.85	1.04	1.25	
Quick ratio	0.96	1.10	1.09	0.96	1.04	1.17	0.87	0.66	0.75	0.93	
Cash ratio	0.48	0.60	0.66	0.57	0.73	0.77	0.52	0.26	0.36	0.56	
*Net Income (M€)	549.55	578.45	527.51	495.92	572.23	195.91	343.09	592.74	821.35	317.18	
*Retained Earnings (M€)	120.47	134.41	134.65	161.10	143.95	191.41	180.51	188.65	223.81	163.19	
*Market Capitalization (M€)	9247.65	7330.78	9147.96	8902.19	3857.71	5520.69	7959.60	6451.21	8405.26	5584.38	
*Shares Outstanding (M)	2416.84	2416.84	2416.84	2420.24	2420.24	2420.24	2419.43	2420.25	2420.82	2420.41	
*Stock Price (Last in €)	3.83	3.03	3.79	3.68	1.59	2.28	3.29	2.67	3.47	2.31	
*Effective Tax Rate	29.92%	32.72%	29.52%	29.48%	30.51%	25.94%	14.00%		20.15%	8.17%	

TIM SA/Brazil (TIMS BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)											
X ₁ (Net working capital/Total assets)	1.2000	0.06	0.10	0.10	0.06	0.08	0.08	0.01	-0.03	0.01	0.05
X ₂ (Retained earnings/Total assets)	1.4000	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02
X ₃ (Operating income/Total assets)	3.3000	0.09	0.10	0.10	0.08	0.11	0.04	0.07	0.08	0.11	0.07
X ₄ (Market value of equity/Total liabilities)	0.6000	2.13	1.61	2.20	1.68	0.87	1.08	2.19	2.36	2.12	1.92
X ₅ (Net total sales/Total assets)	0.9900	0.76	0.78	0.81	0.62	0.57	0.40	0.55	0.55	0.44	0.45
Z₂ (Matia's)											
M ₁ (Total equity/Total assets)	23.7920	0.55	0.53	0.52	0.47	0.47	0.50	0.56	0.62	0.56	0.56
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.44	0.44	0.44	0.60	0.66	0.66	0.84	0.57	1.16	1.03
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.16	0.16	0.19	0.17	0.11	0.10	0.12	0.14	0.10	0.08
M ₄ (Current assets/Current liabilities)	-0.7640	1.22	1.35	1.33	1.22	1.31	1.39	1.05	0.85	1.04	1.25
M ₅ (Operating income/Pretax income)	0.5350	1.13	1.08	1.14	1.13	1.08	1.41	1.35	1.29	1.00	1.40
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.14	0.17	0.19	0.16	0.17	0.15	0.09	0.03	0.06	0.06
Z₃ (Carvalho das Neves')											
C ₁ (Retained earnings/Total assets)	2.5180	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.02
C ₂ (Current assets/Total assets)	1.0760	0.35	0.38	0.38	0.35	0.34	0.29	0.23	0.19	0.21	0.25
C ₃ (Cashflow/Total assets)	5.5660	0.04	0.05	0.03	0.00	0.03	-0.03	-0.07	-0.06	0.03	0.01
C ₄ (State & other public entities/Sales*365)	-0.0025	25.44	18.69	16.59	17.09	15.08	24.13	13.51	16.27	16.58	23.84
C ₅ (Financing and bank loans/Current assets)	0.1560	0.44	0.44	0.44	0.60	0.66	0.66	0.84	0.57	1.16	1.03

Telefonica Brasil SA (VIVT BZ)										
Indicators	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending										
Performance										
Return on Capital (ROC)	8.28%	8.60%	7.92%	8.61%	5.57%	5.06%	6.76%	8.73%	6.55%	6.53%
Return on Assets (ROA)	7.09%	7.13%	6.45%	7.18%	4.74%	4.45%	5.82%	7.56%	5.33%	5.25%
Return on Equity (ROE)	10.44%	10.76%	9.89%	11.28%	5.89%	5.29%	7.34%	12.91%	7.26%	7.49%
Market-to-book ratio	1.24	1.10	1.05	1.00	0.84	0.89	1.00	0.97	1.18	1.13
Earnings per Share (EPS)	1.67	1.58	1.16	1.41	0.56	0.63	0.76	1.23	0.67	0.49
Price-to-Earnings (P/E)	11.87	10.20	10.59	8.84	14.21	16.79	13.64	7.54	16.18	15.09
Efficiency										
Asset turnover	0.69	0.51	0.51	0.51	0.48	0.42	0.44	0.42	0.43	0.36
Inventory turnover	56.18	39.02	41.16	36.21	38.49	41.85	54.40	51.14	43.32	34.28
Inventory period (days)	6	9	9	10	9	9	7	7	8	11
Receivables turnover	7.68	6.52	6.37	5.78	5.49	4.98	5.12	5.03	5.28	4.61
Accounts receivable period (days)	48	56	57	63	66	73	71	73	69	79
Profit margin (%)	14.95%	13.13%	10.70%	14.10%	8.49%	9.61%	10.67%	20.54%	11.30%	11.06%
Operating profit margin (%)	15.35%	13.68%	11.32%	14.60%	10.12%	11.92%	12.34%	17.22%	12.74%	12.12%
Leverage										
Long-term debt ratio (%)	9.87%	11.86%	14.42%	10.96%	10.31%	6.18%	7.25%	6.13%	12.10%	12.08%
Total debt ratio (%)	33.84%	36.40%	38.32%	38.48%	32.57%	32.16%	31.49%	30.18%	34.94%	36.03%
Times-interest-earned	11.96	10.44	5.97	6.28	24.18	22.89	48.61	50.77	49.83	51.00
Cash coverage	21.42	18.38	12.81	12.79	55.62	50.41	106.18	95.71	125.25	138.02
Debt to Equity	0.14	0.18	0.20	0.17	0.15	0.13	0.12	0.09	0.20	0.19
Liquidity										
Net working capital (M€)	-385.18	1011.49	665.66	-154.14	-16.82	-594.17	-284.00	270.41	202.21	186.75
Net working capital requirements (M€)	-1,659.12	-1,135.79	-1,086.61	-1,359.94	-1,137.18	-1,225.61	-894.63	-1,298.79	-708.74	-673.69
Net Cash (M€)	1273.95	2147.28	1752.27	1205.80	1120.36	631.43	610.63	1569.21	910.95	860.44
Net-working-capital-to-assets	-0.01	0.04	0.03	-0.01	0.00	-0.02	-0.01	0.01	0.01	0.01
Current ratio	0.93	1.20	1.16	0.97	1.00	0.90	0.94	1.07	1.05	1.07
Quick ratio	0.63	0.94	0.90	0.71	0.76	0.68	0.71	0.68	0.68	0.78
Cash ratio	0.23	0.53	0.48	0.29	0.30	0.25	0.23	0.20	0.19	0.32
*Net Income (M€)	1873.04	1778.04	1301.93	1583.14	938.48	1066.51	1280.87	2079.33	1134.02	820.70
*Retained Earnings (M€)	808.76	1,571.64	755.59	1,343.03	694.94	1,113.40	1,087.47	1,136.71	1,114.60	734.03
*Market Capitalization (M€)	22241.86	18136.66	13792.96	13990.76	13336.73	17907.12	17472.49	15684.09	18349.35	12383.46
*Shares Outstanding (M)	1123.89	1123.27	1123.27	1123.27	1688.69	1688.69	1688.69	1688.69	1688.69	1690.99
*Stock Price (Last in €)	19.79	16.15	12.28	12.46	7.90	10.60	10.35	9.29	10.87	7.32
*Effective Tax Rate	22.90%	35.66%	20.30%		22.15%	20.44%	19.58%	20.83%	21.79%	20.60%

Telefonica Brasil SA (VIVT BZ)											
Bankruptcy prediction scores	Coeff.	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
12 Months Ending											
Z₁ (Altman's)		2.24	2.16	1.93	1.75	1.74	1.71	2.06	2.18	2.03	1.92
X ₁ (Net working capital/Total assets)	1.2000	-0.01	0.04	0.03	-0.01	0.00	-0.02	-0.01	0.01	0.01	0.01
X ₂ (Retained earnings/Total assets)	1.4000	0.03	0.06	0.04	0.06	0.03	0.04	0.04	0.05	0.05	0.04
X ₃ (Operating income/Total assets)	3.3000	0.09	0.11	0.08	0.07	0.06	0.06	0.07	0.10	0.07	0.07
X ₄ (Market value of equity/Total liabilities)	0.6000	2.42	1.92	1.69	1.59	1.73	1.87	2.18	2.25	2.19	2.01
X ₅ (Net total sales/Total assets)	0.9900	0.46	0.52	0.57	0.49	0.47	0.37	0.47	0.44	0.42	0.43
Z₂ (Matia's)		10.34	9.91	8.85	9.30	10.42	11.26	11.31	12.77	8.55	8.67
M ₁ (Total equity/Total assets)	23.7920	0.66	0.64	0.62	0.62	0.67	0.68	0.69	0.70	0.65	0.64
M ₂ (Financing and bank loans/Current assets)	-8.2600	0.53	0.49	0.55	0.50	0.57	0.50	0.51	0.33	0.74	0.69
M ₃ (Accounts payable to suppliers/Total assets)	-9.8680	0.09	0.08	0.10	0.10	0.08	0.07	0.07	0.07	0.06	0.06
M ₄ (Current assets/Current liabilities)	-0.7640	0.93	1.20	1.16	0.97	1.00	0.90	0.94	1.07	1.05	1.07
M ₅ (Operating income/Pretax income)	0.5350	1.02	1.04	1.06	1.07	1.19	1.24	1.16	0.84	1.13	1.10
M ₆ (Cash and cash equivalents/Total assets)	9.9120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Z₃ (Carvalho das Neves')		-0.9500	-0.56	-0.20	-0.63	-0.69	-0.60	-0.66	-0.70	-0.62	-0.54
C ₁ (Retained earnings/Total assets)	2.5180	0.03	0.06	0.04	0.06	0.03	0.04	0.04	0.05	0.05	0.04
C ₂ (Current assets/Total assets)	1.0760	0.18	0.23	0.23	0.21	0.18	0.18	0.17	0.18	0.17	0.18
C ₃ (Cashflow/Total assets)	5.5660	0.02	0.07	-0.01	-0.03	0.01	0.00	-0.01	-0.01	0.00	0.02
C ₄ (State & other public entities/Sales*365)	-0.0025	34.06	34.05	18.77	18.60	19.19	26.37	20.17	31.84	35.70	48.54
C ₅ (Financing and bank loans/Current assets)	0.1560	0.53	0.49	0.55	0.50	0.57	0.50	0.51	0.33	0.74	0.69

MOTA-ENGIL SGPS S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	2176.1	2243.2	2313.7	2368.2	2433.6	2210.1	2597.3	2801.8	2912.4	2429.1
COGS	—	1174.3	1146.3	1063.7	1053.2	1029.5	831.8	1092.9	1301.6	661.0	560.6
EBITDA	—	260.6	262.5	345.6	402.0	319.6	271.5	366.7	383.1	394.3	341.2
EBIT	—	169.4	171.2	242.9	272.6	165.9	80.9	186.1	200.3	187.7	144.5
Interest Expense	—	81.4	86.6	104.3	106.8	134.3	102.3	101.8	131.8	146.0	141.6
Tax Expense (Benefit)	—	19.2	37.0	46.7	39.6	45.7	9.4	28.4	41.7	41.5	17.7
Net Income (Loss)	—	33.4	40.7	50.5	50.6	18.1	50.2	1.6	23.3	26.7	-19.9
Cash & Cash Equivalents	200.6	234.2	271.8	306.2	322.5	443.9	396.1	644.3	471.7	443.4	470.9
Accounts & Notes Receivable	1008.2	921.2	924.5	978.5	975.7	939.4	775.1	866.7	1002.9	1059.5	941.7
Inventories	203.0	242.4	268.5	311.2	301.4	284.4	305.0	345.0	334.2	332.6	252.2
Total Current Assets	1844.2	1938.4	2104.9	2143.7	2257.5	2503.8	2129.4	2494.5	2652.4	2768.2	2560.8
Total Assets	3456.2	3524.3	3598.7	3773.4	3961.8	5042.6	4220.7	4614.1	4693.0	5054.6	4815.5
Payables & Accruals	923.2	979.0	1039.3	1011.9	1015.1	1076.5	946.1	968.2	819.4	916.2	822.1
Accounts Payable	482.2	478.1	525.9	488.1	431.8	436.8	419.4	489.8	572.8	554.6	549.6
ST Debt	518.4	567.0	631.7	583.8	552.3	1025.4	648.0	745.7	765.5	961.7	1017.6
Total Current Liabilities	1925.9	2055.3	2250.2	2147.7	2059.3	2755.7	2079.1	2500.3	2694.1	2980.3	2966.4
LT Debt	697.0	672.0	490.5	747.5	996.9	901.7	993.3	932.0	806.3	1181.1	1174.9
Total Liabilities	2975.4	3109.5	3162.8	3214.2	3383.8	4314.0	3650.1	4018.4	4247.1	4726.5	4669.5
Retained Earnings	37.0	33.4	40.7	50.5	50.6	18.1	50.2	1.6	78.5	84.5	37.8
Total Equity	480.7	414.8	436.0	559.2	578.0	728.6	570.6	595.7	445.9	328.0	146.0
Cash Flow	—	33.6	49.3	88.0	30.9	53.3	-61.0	185.2	-256.8	-18.3	35.7

CONDURIL ENGENHARIA S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	238.1	230.4	208.5	208.8	196.2	146.2	146.8	124.6	154.8	124.0
COGS	—	37.5	51.4	30.4	50.7	48.8	42.2	32.2	27.4	39.3	35.1
EBITDA	—	53.4	63.5	70.9	65.1	35.6	29.1	34.5	25.6	20.0	11.3
EBIT	—	43.8	54.8	64.5	55.2	24.0	19.8	25.1	19.2	15.8	6.6
Interest Expense	—	3.9	4.9	3.1	5.8	14.2	12.9	11.3	6.4	3.9	3.3
Tax Expense (Benefit)	—	17.1	24.9	22.9	16.0	3.7	2.7	6.8	9.7	9.5	2.1
Net Income (Loss)	—	19.8	23.4	36.5	29.5	6.2	4.2	7.0	3.0	2.5	1.1
Cash & Cash Equivalents	14.1	44.4	64.2	36.9	34.8	30.4	95.9	90.6	12.2	10.2	7.0
Accounts & Notes Receivable	259.1	269.5	218.7	219.7	231.8	188.6	107.9	117.2	102.6	105.4	91.3
Inventories	7.1	9.5	10.4	12.3	13.8	12.7	13.4	12.5	13.5	12.7	13.6
Total Current Assets	320.2	372.8	346.7	333.3	431.8	396.4	342.7	268.4	196.1	212.8	206.3
Total Assets	361.9	413.0	384.6	387.9	502.1	493.5	440.8	421.6	346.5	370.9	377.0
Payables & Accruals	71.6	73.8	40.8	48.8	62.1	58.7	84.0	81.1	81.7	89.1	107.5
Accounts Payable	71.6	73.8	40.8	48.8	62.1	58.7	47.8	40.2	34.0	40.8	42.3
ST Debt	5.8	37.8	41.3	17.3	114.4	85.8	67.7	63.7	12.9	25.2	22.0
Total Current Liabilities	216.9	256.0	205.4	180.3	264.2	206.0	160.0	146.6	95.2	115.4	131.1
LT Debt	12.9	13.0	7.5	14.9	14.5	71.0	63.7	53.0	34.6	41.5	57.9
Total Liabilities	239.4	271.9	221.5	200.4	289.6	281.0	227.4	203.6	134.0	161.6	198.7
Retained Earnings	45.6	37.2	41.2	2.5	35.5	10.5	9.4	12.1	8.0	8.2	7.8
Total Equity	122.5	141.1	163.1	187.4	212.5	212.5	213.4	218.0	212.5	209.3	178.3
Cash Flow	—	26.7	19.7	-27.2	-2.1	-4.4	-17.6	-5.3	4.7	-2.1	-3.2

TEIXEIRA DUARTE S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	1200.3	1383.3	1581.1	1679.7	1411.9	1115.4	1035.6	873.7	877.5	608.4
COGS	—	449.4	519.5	583.4	649.4	508.4	338.8	303.6	247.2	210.9	182.5
EBITDA	—	113.0	204.0	177.2	272.8	201.2	260.3	190.0	127.4	188.2	98.7
EBIT	—	51.4	143.2	114.4	197.2	124.9	190.8	133.7	83.9	130.5	52.4
Interest Expense	—	74.8	78.3	89.5	123.2	94.3	83.5	65.9	27.3	24.8	23.2
Tax Expense (Benefit)	—	24.2	37.1	-51.9	37.6	11.9	30.4	34.5	19.7	27.3	10.2
Net Income (Loss)	—	-200.4	24.0	64.0	70.3	33.7	20.1	-4.7	11.1	14.4	3.6
Cash & Cash Equivalents	144.9	301.4	257.0	186.5	195.4	252.7	180.9	154.3	172.0	135.4	116.2
Accounts & Notes Receivable	437.6	455.6	476.9	492.1	450.1	433.6	416.5	260.4	186.1	236.2	151.6
Inventories	298.5	308.6	313.6	289.9	355.9	274.0	251.4	241.1	192.6	202.1	171.4
Total Current Assets	1097.3	1330.9	1392.8	1283.8	1396.9	1315.3	1121.9	1319.3	811.8	829.6	661.9
Total Assets	2721.3	2753.2	2767.5	2779.2	2954.0	2861.8	2540.0	2294.4	1857.7	1850.0	1599.6
Payables & Accruals	360.1	324.1	323.3	361.5	341.6	326.3	247.5	291.1	225.0	175.0	122.2
Accounts Payable	227.7	188.3	187.8	167.0	187.4	193.9	121.4	155.6	139.6	148.1	106.2
ST Debt	530.8	635.1	856.9	703.3	743.5	753.5	670.7	303.4	27.5	126.8	83.4
Total Current Liabilities	1059.5	1234.1	1551.9	1334.1	1307.7	1339.8	1093.3	1069.0	500.2	549.8	447.1
LT Debt	926.4	819.3	600.6	865.0	932.9	821.4	818.4	713.5	734.0	726.6	726.3
Total Liabilities	2159.2	2420.5	2441.6	2418.5	2469.3	2343.6	2095.2	1885.5	1454.3	1513.5	1361.4
Retained Earnings	23.3	-208.7	-11.6	49.7	69.9	37.0	37.3	38.1	46.1	46.7	68.9
Total Equity	562.0	332.7	325.9	360.7	484.7	518.2	444.8	408.8	403.4	336.5	238.3
Cash Flow	—	153.9	-45.6	-55.5	5.0	61.2	-71.3	-14.1	17.7	-36.6	-19.2

AZEVEDO E TRAVASSOS S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	80.7	87.1	100.8	106.7	79.1	31.9	17.7	11.4	0.4	4.4
COGS	—	69.3	77.5	89.5	94.9	71.1	41.6	33.0	21.2	2.0	4.1
EBITDA	—	3.2	6.3	4.8	6.3	3.9	-11.1	-19.7	-18.7	-4.2	-3.2
EBIT	—	3.2	4.6	3.5	4.9	2.7	-12.3	-20.8	-19.5	-4.8	-3.4
Interest Expense	—	2.3	2.5	1.9	2.0	2.4	3.9	4.8	3.0	3.2	2.9
Tax Expense (Benefit)	—	-0.2	-1.0	-0.9	1.1	0.3	-5.5	-2.2	8.6	0.1	0.0
Net Income (Loss)	—	3.5	3.5	2.7	2.3	0.3	-10.4	-23.4	-31.1	-8.1	-6.3
Cash & Cash Equivalents	4.8	3.5	6.2	3.4	7.3	2.3	0.9	0.1	0.0	0.0	0.7
Accounts & Notes Receivable	36.2	25.3	18.1	20.6	15.5	18.4	11.0	5.9	0.3	0.1	0.4
Inventories	5.2	5.2	3.5	2.4	3.2	2.1	5.0	3.9	2.3	4.3	3.0
Total Current Assets	48.1	35.9	31.9	28.7	31.0	26.0	26.7	15.3	5.1	4.7	6.3
Total Assets	69.2	56.8	53.5	46.9	48.8	38.8	46.4	33.5	13.3	12.3	10.0
Payables & Accruals	16.8	4.7	7.3	7.5	7.2	6.4	11.6	13.9	20.3	21.6	13.6
Accounts Payable	9.2	4.0	4.3	4.8	4.5	4.1	5.2	7.6	6.7	6.6	3.0
ST Debt	6.9	4.6	3.8	3.0	4.6	2.7	6.0	2.8	1.6	7.5	3.6
Total Current Liabilities	27.5	18.2	15.9	15.7	16.8	13.7	24.2	24.9	35.3	35.8	24.8
LT Debt	1.3	1.7	3.4	1.3	1.1	0.9	3.5	6.0	4.9	0.0	0.0
Total Liabilities	59.5	44.5	41.5	34.6	34.7	28.3	44.7	53.2	60.9	66.8	47.8
Retained Earnings	—	-17.7	-12.4	-7.9	0.1	0.1	-9.2	-29.1	-56.0	-62.4	-50.1
Total Equity	9.7	12.3	11.9	12.3	14.1	10.5	1.7	-19.7	-47.6	-54.6	-37.8
Cash Flow	—	-1.0	3.3	-2.0	4.0	-3.7	-1.7	-0.8	-0.1	0.0	0.8

DIRECIONAL ENGENHARIA S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	461.2	578.4	611.0	588.7	430.7	354.5	209.0	271.6	330.7	258.2
COGS	—	331.9	419.2	469.6	451.7	340.0	313.7	198.5	197.8	219.3	168.3
EBITDA	—	81.0	108.5	92.0	82.6	56.9	7.8	-29.9	-1.9	51.4	44.6
EBIT	—	76.5	101.3	86.5	76.3	45.3	1.2	-36.3	-6.6	43.2	37.5
Interest Expense	—	6.8	6.0	10.9	14.7	13.4	13.1	11.9	13.7	16.6	9.3
Tax Expense (Benefit)	—	10.8	8.1	8.3	7.5	6.4	5.6	4.6	5.3	7.5	5.4
Net Income (Loss)	—	75.4	89.8	80.0	66.0	33.9	-3.1	-40.0	-18.0	22.8	19.5
Cash & Cash Equivalents	86.0	145.4	166.4	166.6	207.7	116.0	165.3	121.5	193.3	161.6	146.0
Accounts & Notes Receivable	298.6	399.3	490.3	427.3	366.1	260.8	276.7	176.5	88.8	77.0	38.9
Inventories	184.1	208.1	251.6	121.6	229.5	152.5	234.8	243.9	185.2	239.4	199.7
Total Current Assets	589.6	792.4	949.3	749.6	849.5	565.7	733.6	590.5	506.4	517.0	419.9
Total Assets	757.0	1015.4	1177.0	1054.1	1235.1	903.3	1191.4	1040.1	1046.3	1031.4	803.4
Payables & Accruals	10.6	55.5	11.4	22.4	40.5	25.0	28.9	31.7	28.2	23.3	22.6
Accounts Payable	10.6	55.5	11.4	22.4	40.5	25.0	28.9	17.9	17.0	11.4	14.2
ST Debt	54.8	116.3	134.1	94.6	142.9	86.3	136.1	101.8	100.9	49.0	36.1
Total Current Liabilities	185.4	276.4	281.6	227.4	268.2	155.3	219.4	176.2	171.9	114.5	90.1
LT Debt	81.5	79.6	159.3	178.7	153.2	108.0	128.1	122.7	123.5	144.5	132.6
Total Liabilities	383.9	505.0	616.5	562.5	693.2	490.3	682.4	637.2	732.9	728.0	592.4
Retained Earnings	—	—	9.4	7.8	7.9	99.7	125.0	107.8	83.3	75.6	52.3
Total Equity	373.1	510.4	560.5	491.6	541.9	413.0	509.1	402.9	313.4	303.4	211.0
Cash Flow	—	68.9	4.9	40.4	46.9	-54.7	-1.0	-5.5	70.4	-41.2	34.0

TECNISA S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	686.4	444.8	642.0	512.0	349.0	89.0	85.6	41.0	83.0	31.1
COGS	—	519.7	383.7	450.6	368.6	259.2	109.3	116.5	48.8	75.8	33.9
EBITDA	—	63.9	-51.5	101.0	56.8	77.6	-105.6	-126.1	-48.2	-56.2	-31.1
EBIT	—	55.8	-59.7	91.4	49.1	72.6	-108.2	-128.6	-50.0	-58.0	-32.3
Interest Expense	—	17.6	19.6	26.8	11.5	12.1	10.4	22.7	18.8	13.2	6.7
Tax Expense (Benefit)	—	20.8	7.9	13.3	10.4	8.0	1.6	1.5	1.2	1.3	1.0
Net Income (Loss)	—	62.1	-68.3	77.5	49.8	65.2	-117.2	-144.7	-64.5	-58.5	-28.4
Cash & Cash Equivalents	130.5	176.3	57.2	105.4	80.3	44.8	26.7	8.3	6.9	72.0	38.4
Accounts & Notes Receivable	418.3	581.9	443.1	572.4	519.0	163.6	126.5	43.8	18.7	17.9	7.4
Inventories	264.8	309.0	287.6	305.5	350.7	256.1	321.8	201.3	121.3	62.4	59.3
Total Current Assets	856.8	1110.3	813.2	1009.7	975.4	489.6	495.6	268.5	160.2	162.1	110.9
Total Assets	1413.0	1633.1	1465.6	1439.8	1498.3	862.7	911.3	582.4	435.6	380.8	274.6
Payables & Accruals	23.0	25.5	26.0	22.4	21.6	7.9	6.5	19.2	13.7	7.8	4.7
Accounts Payable	23.0	25.5	26.0	22.4	21.6	7.9	6.5	4.5	2.8	2.6	1.3
ST Debt	224.2	241.4	267.2	300.5	392.6	182.9	196.8	62.3	39.1	24.6	8.1
Total Current Liabilities	385.9	441.8	464.9	497.3	572.5	292.5	306.5	150.6	119.0	77.9	47.2
LT Debt	361.3	373.3	383.4	397.3	347.1	129.5	114.1	113.4	97.8	52.6	73.6
Total Liabilities	874.2	957.2	933.2	955.0	967.3	464.9	489.5	314.8	259.6	171.0	150.0
Retained Earnings	0.0	11.9	10.6	12.2	14.8	13.8	17.3	-91.0	-143.8	-196.8	-165.8
Total Equity	538.8	676.0	532.4	484.7	530.9	397.8	421.9	267.6	176.0	209.8	124.6
Cash Flow	—	58.6	-112.5	84.0	-26.7	-41.9	-22.7	-0.5	1.0	53.8	-25.8

ALTRI SGPS S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	479.3	530.1	559.1	542.7	657.0	603.0	656.1	777.6	735.5	608.6
COGS	—	201.5	208.8	240.3	254.8	237.9	244.8	257.0	255.5	285.6	287.3
EBITDA	—	113.1	143.0	138.0	113.5	221.1	167.5	191.1	292.7	233.1	130.4
EBIT	—	60.9	94.2	88.7	65.0	168.3	116.3	137.4	232.5	157.8	53.5
Interest Expense	—	26.6	26.5	19.0	18.9	15.8	13.9	14.1	13.0	12.2	11.7
Tax Expense (Benefit)	—	2.4	8.7	9.9	3.2	29.9	23.7	22.5	56.1	35.4	-7.0
Net Income (Loss)	—	22.6	52.2	55.3	37.4	117.7	77.0	96.1	194.5	100.8	35.0
Cash & Cash Equivalents	129.9	112.7	112.4	232.5	260.9	243.2	300.1	193.6	240.8	181.3	254.6
Accounts & Notes Receivable	92.1	66.7	94.9	80.3	88.9	91.5	92.3	113.3	120.8	83.7	64.1
Inventories	49.5	61.7	47.4	54.8	54.7	56.4	58.9	51.4	70.1	86.0	75.5
Total Current Assets	290.1	265.7	274.6	400.0	430.4	410.7	487.5	383.1	475.6	397.6	441.5
Total Assets	1190.5	1127.7	1128.4	1221.4	1239.3	1195.2	1285.1	1210.1	1492.2	1482.5	1486.0
Payables & Accruals	136.2	76.6	68.1	68.3	80.2	91.6	98.3	127.2	178.3	127.0	122.2
Accounts Payable	91.6	69.6	57.5	62.5	67.9	62.5	69.0	95.4	123.7	102.4	104.1
ST Debt	181.6	293.6	196.6	292.5	407.8	116.8	162.9	104.2	140.9	121.2	183.4
Total Current Liabilities	360.9	413.3	322.0	398.9	524.8	242.6	297.7	273.5	348.5	274.5	330.9
LT Debt	687.6	550.6	581.3	524.8	393.8	584.8	595.3	496.5	546.1	659.6	628.3
Total Liabilities	1075.3	987.0	944.4	979.6	967.0	872.9	941.4	815.5	970.6	1016.4	1040.7
Retained Earnings	64.9	25.4	55.0	58.2	40.8	122.0	82.1	101.2	199.6	106.0	40.1
Total Equity	115.2	140.8	183.9	241.8	272.3	322.3	343.6	394.6	521.6	466.0	445.3
Cash Flow	—	-18.2	-0.8	121.7	28.4	-17.6	56.9	-106.5	46.9	-59.1	71.2

INAPA S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	998.1	936.4	898.8	919.3	889.5	858.7	894.7	887.8	1060.0	1041.3
COGS	—	823.5	769.9	733.3	751.9	730.2	705.2	731.9	713.0	856.8	832.2
EBITDA	—	23.3	17.7	22.5	23.8	22.1	20.4	19.0	16.4	26.7	15.8
EBIT	—	17.3	12.2	16.8	18.2	17.0	14.8	13.5	10.6	10.8	-2.7
Interest Expense	—	15.7	13.2	11.6	13.9	11.7	11.4	10.5	11.5	13.4	13.4
Tax Expense (Benefit)	—	2.9	1.2	0.6	0.5	2.2	2.8	0.0	-0.1	-0.8	-2.8
Net Income (Loss)	—	-6.2	-5.9	1.3	2.1	-0.4	-2.2	0.2	-3.6	-4.1	-15.5
Cash & Cash Equivalents	16.6	15.0	20.6	24.8	31.8	25.5	22.3	19.3	17.9	37.7	9.4
Accounts & Notes Receivable	197.3	166.6	146.3	141.9	134.7	127.9	139.2	126.8	117.5	136.3	115.6
Inventories	79.3	71.0	65.9	67.9	63.0	63.2	66.8	65.1	58.7	71.1	62.2
Total Current Assets	338.0	299.0	279.6	274.2	267.6	255.3	265.3	258.0	232.6	292.3	232.3
Total Assets	733.0	688.9	677.2	676.4	664.6	672.4	680.5	670.7	637.5	793.8	727.3
Payables & Accruals	92.1	77.5	76.7	71.0	73.6	74.0	104.6	97.6	106.6	148.9	146.8
Accounts Payable	58.7	47.4	49.3	50.6	50.4	53.3	79.4	72.4	79.2	119.8	104.9
ST Debt	248.6	176.3	221.1	207.6	147.1	119.5	87.4	70.0	49.7	110.1	102.9
Total Current Liabilities	354.0	265.4	308.3	289.3	232.8	202.8	206.5	181.9	164.3	274.8	272.2
LT Debt	190.0	186.5	137.0	158.4	201.4	216.9	225.6	245.8	240.4	264.9	221.5
Total Liabilities	579.4	485.7	480.1	482.5	473.1	481.8	493.3	485.1	457.7	620.3	572.8
Retained Earnings	-45.0	-49.8	-55.9	-55.8	-34.0	-36.5	-21.5	-21.3	-25.2	-30.8	-46.2
Total Equity	153.5	203.3	197.2	193.9	191.5	190.7	187.2	185.6	179.8	173.5	154.5
Cash Flow	—	34.5	8.8	-45.1	51.4	14.3	20.1	17.4	3.7	18.7	-27.8

THE NAVIGATOR CO. S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	1487.9	1501.6	1530.6	1542.3	1628.0	1577.4	1636.8	1691.6	1687.9	1385.4
COGS	—	580.3	608.9	659.8	675.1	688.7	661.7	652.2	700.2	716.1	569.7
EBITDA	—	390.7	400.4	336.5	329.9	404.6	351.3	393.7	441.7	372.1	283.2
EBIT	—	266.2	286.2	233.7	218.3	282.9	230.4	255.0	303.2	233.6	140.4
Interest Expense	—	22.8	16.8	24.8	31.6	44.2	20.0	10.4	9.6	12.4	13.4
Tax Expense (Benefit)	—	54.1	59.3	9.5	2.7	35.8	-7.3	39.6	55.5	46.4	16.5
Net Income (Loss)	—	196.3	211.2	210.0	181.5	196.4	217.5	207.8	225.1	168.3	109.2
Cash & Cash Equivalents	134.0	267.4	329.4	524.3	499.6	72.7	67.5	125.3	80.9	161.9	302.4
Accounts & Notes Receivable	164.1	204.3	183.5	192.3	176.6	182.1	181.9	175.7	226.0	156.6	134.0
Inventories	172.9	188.7	212.4	202.9	188.9	212.6	208.9	187.8	222.4	217.9	176.7
Total Current Assets	551.9	753.1	794.5	981.1	940.2	558.2	561.9	625.9	690.7	652.3	714.4
Total Assets	2667.0	2821.3	2724.5	2819.7	2708.3	2429.9	2409.1	2439.1	2563.9	2551.6	2553.4
Payables & Accruals	251.6	305.5	284.1	306.5	295.8	295.5	322.8	288.6	366.5	307.2	205.3
Accounts Payable	159.5	182.5	152.7	161.5	150.5	147.3	162.7	161.8	185.4	220.8	123.6
ST Debt	91.3	164.1	219.7	59.7	304.7	40.6	69.7	150.2	111.8	17.6	297.1
Total Current Liabilities	405.4	528.7	554.2	373.4	610.6	343.0	406.6	453.3	526.4	480.0	636.7
LT Debt	729.7	566.8	473.3	771.6	468.5	686.6	638.6	667.9	652.0	906.4	738.4
Total Liabilities	1363.5	1343.1	1243.6	1339.8	1254.6	1215.6	1175.9	1254.3	1377.2	1524.2	1527.2
Retained Earnings	514.6	696.1	734.8	732.2	700.9	469.5	423.1	375.2	417.6	374.3	207.2
Total Equity	1303.5	1478.2	1480.8	1479.8	1453.7	1214.3	1233.3	1184.9	1186.6	1027.4	1026.2
Cash Flow	—	133.5	61.9	194.9	-24.7	-426.9	-5.1	57.8	-44.5	81.0	140.5

IRANI PAPEL E EMBALAGEM S.A											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	202.8	193.0	211.7	236.8	208.2	202.8	238.8	186.1	203.8	177.1
COGS	—	143.5	126.0	146.4	165.4	147.3	147.8	176.0	124.0	142.9	121.2
EBITDA	—	48.9	54.0	57.4	55.1	47.5	51.4	28.2	57.8	74.2	41.8
EBIT	—	25.0	30.0	38.2	32.0	25.7	18.8	1.6	30.4	46.5	28.5
Interest Expense	—	21.9	20.4	21.7	26.3	24.1	26.1	28.8	21.6	29.7	11.1
Tax Expense (Benefit)	—	-1.6	1.2	-4.0	-9.0	0.1	-6.4	2.1	2.5	-12.7	3.0
Net Income (Loss)	—	4.0	10.5	23.6	18.1	0.1	-2.8	-30.1	-0.1	-18.0	16.0
Cash & Cash Equivalents	18.2	33.1	36.2	42.3	52.5	33.8	57.7	21.5	29.7	24.4	54.5
Accounts & Notes Receivable	35.6	38.2	35.8	39.9	40.6	31.6	44.9	42.2	37.9	36.0	31.9
Inventories	17.6	15.9	14.1	18.7	19.6	15.6	19.5	18.1	16.2	17.0	14.6
Total Current Assets	85.1	95.9	92.4	106.8	123.8	87.6	129.4	86.8	87.0	111.6	121.5
Total Assets	515.9	489.4	446.9	500.8	524.2	385.4	489.4	377.2	343.4	350.0	285.7
Payables & Accruals	17.9	15.6	16.2	27.8	20.4	16.3	23.3	32.8	34.3	31.8	31.3
Accounts Payable	17.9	15.6	16.2	27.8	20.4	16.3	23.3	20.8	21.4	19.9	17.2
ST Debt	51.6	53.1	43.7	53.0	53.0	50.4	86.8	38.9	64.6	58.8	8.7
Total Current Liabilities	94.5	88.5	81.3	109.7	103.0	88.4	129.7	75.8	101.7	95.4	43.7
LT Debt	81.8	99.6	107.3	141.4	189.6	163.9	180.4	155.0	120.9	126.9	84.1
Total Liabilities	305.4	297.1	278.9	351.0	368.8	293.2	359.7	291.6	273.9	275.4	161.9
Retained Earnings	1.3	1.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0	-0.4	0.0
Total Equity	210.5	192.2	167.9	149.9	155.4	92.2	129.7	85.6	69.5	74.6	123.8
Cash Flow	—	13.8	8.9	13.3	9.9	-11.0	-5.7	-7.5	12.9	-11.7	-4.6

KLABIN S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	1672.6	1662.3	1611.4	1569.4	1560.6	1851.2	2327.1	2332.8	2329.2	2055.6
COGS	—	1099.6	773.4	1005.8	849.7	945.4	1225.5	1566.9	1330.8	1553.6	1243.3
EBITDA	—	444.3	737.4	467.5	618.6	487.2	547.5	703.7	930.2	827.0	747.7
EBIT	—	342.8	646.1	384.4	529.5	401.2	352.1	427.6	693.5	571.2	547.4
Interest Expense	—	155.2	141.8	122.7	191.0	278.6	298.7	318.9	275.9	337.1	279.1
Tax Expense (Benefit)	—	48.8	137.5	31.6	103.7	-190.6	191.4	85.2	-59.5	34.0	-245.1
Net Income (Loss)	—	78.6	300.2	101.6	234.2	-343.9	647.9	147.9	32.0	153.2	-428.0
Cash & Cash Equivalents	1230.1	1061.1	1020.0	914.6	1793.4	1303.7	1883.1	2077.3	1585.2	2156.1	1032.6
Accounts & Notes Receivable	339.8	340.0	363.2	351.5	358.7	348.8	473.5	440.5	459.1	412.0	284.6
Inventories	207.4	209.6	175.2	152.2	176.0	162.9	255.5	234.3	271.4	295.2	217.2
Total Current Assets	1860.1	1691.0	1639.4	1481.5	2466.6	2015.8	2901.6	2964.3	2443.3	3029.8	1698.7
Total Assets	5526.2	5276.4	5214.9	4580.0	6611.4	6103.5	8539.7	7672.0	6665.8	7689.3	5554.7
Payables & Accruals	198.8	221.7	205.4	164.0	197.9	219.1	328.1	263.9	338.5	352.9	401.0
Accounts Payable	121.6	138.7	117.7	106.0	137.0	163.2	184.9	179.2	203.3	226.9	315.5
ST Debt	379.5	377.0	414.6	345.3	548.0	475.4	826.8	620.3	444.4	304.7	136.2
Total Current Liabilities	762.1	800.3	653.8	546.3	786.5	734.8	1207.1	941.1	834.1	687.9	569.1
LT Debt	1809.6	1816.6	1817.8	1792.4	2882.2	3712.0	4553.5	4289.3	3929.7	5142.2	4141.6
Total Liabilities	3203.0	3223.1	3209.6	2924.6	4407.5	4859.8	6471.3	5855.3	5196.2	6248.8	4864.1
Retained Earnings	—	195.9	28.1	183.1	218.2	27.9	465.4	459.4	167.2	179.0	-156.5
Total Equity	2323.1	2053.3	2005.2	1655.5	2203.9	1243.6	2068.5	1816.7	1469.6	1440.5	690.6
Cash Flow	—	-81.7	70.4	74.5	806.8	-52.7	213.8	321.2	-301.5	591.1	-538.7

SUZANO S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	2084.9	2073.0	1993.1	2329.7	2805.5	2579.9	2923.9	3129.5	5898.6	5240.2
COGS	—	1622.2	1611.4	1468.1	1717.5	1696.9	1715.6	1792.4	1611.2	4703.8	3262.9
EBITDA	—	559.8	507.7	653.4	784.3	1231.9	712.1	1293.7	1528.1	2414.9	2601.8
EBIT	—	290.9	217.3	341.8	394.3	842.4	345.7	903.8	1164.0	588.8	1446.3
Interest Expense	—	212.1	228.2	238.8	336.6	330.1	284.9	318.0	278.7	761.6	581.0
Tax Expense (Benefit)	—	-55.1	-51.4	-20.9	-32.9	-118.9	189.6	120.0	-36.1	-290.8	-1191.7
Net Income (Loss)	—	12.9	-72.7	-77.2	-83.9	-253.9	441.7	502.3	74.1	-638.9	-1845.0
Cash & Cash Equivalents	1683.6	1355.8	1604.5	1132.7	1151.0	568.8	1076.5	680.2	5732.8	2082.7	1424.8
Accounts & Notes Receivable	357.0	431.3	407.9	452.5	397.7	438.2	472.6	578.6	570.7	672.7	459.1
Inventories	296.9	263.4	252.9	277.9	336.3	305.8	382.5	297.2	416.8	1038.2	631.4
Total Current Assets	2444.5	2213.1	2473.5	1986.7	2063.8	1531.0	2339.2	1706.9	6927.8	4184.3	2828.2
Total Assets	8524.4	8992.5	9378.3	8334.4	8780.1	6566.3	8564.7	7163.1	12131.5	21693.9	16032.5
Payables & Accruals	235.0	266.9	389.0	324.5	296.4	186.5	348.7	279.6	251.0	684.7	477.3
Accounts Payable	124.9	171.7	323.9	269.1	235.2	135.1	169.8	153.3	142.3	526.6	371.8
ST Debt	623.2	933.0	600.0	309.6	560.6	470.5	464.6	531.2	770.8	1525.5	321.8
Total Current Liabilities	935.3	1301.5	1056.4	700.3	957.9	815.7	1115.7	931.3	1362.8	2543.5	1287.1
LT Debt	2602.2	2687.8	3365.1	3643.4	3736.1	2995.6	3617.7	2530.6	7267.9	13468.1	11159.1
Total Liabilities	4630.0	4986.6	5308.6	5053.6	5559.3	4430.5	5609.6	4244.5	9426.4	17686.1	14876.9
Retained Earnings	109.8	203.6	123.1	108.6	119.3	123.6	126.2	161.8	283.9	70.3	-618.3
Total Equity	3894.4	4005.9	4069.7	3280.8	3220.8	2135.8	2955.0	2918.6	2705.1	4007.8	1155.6
Cash Flow	—	-198.5	424.7	-227.0	-1.1	-606.1	35.9	-149.5	771.0	-258.1	616.9

NOS SGPS S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	850.6	782.4	981.1	1368.7	1429.9	1496.8	1558.6	1576.2	1458.4	1367.9
COGS	—	251.3	231.0	306.1	460.7	490.1	514.7	562.2	572.4	449.1	423.1
EBITDA	—	311.4	304.9	353.2	480.7	517.9	542.7	559.7	623.3	622.1	547.2
EBIT	—	93.1	100.8	110.1	141.4	151.5	151.1	139.8	201.9	200.7	137.3
Interest Expense	—	44.8	40.8	40.6	44.1	31.8	25.5	25.5	30.1	24.1	25.3
Tax Expense (Benefit)	—	14.8	19.3	16.4	17.2	32.1	22.2	16.5	27.5	32.6	16.3
Net Income (Loss)	—	34.2	39.5	10.8	74.7	82.7	90.4	122.1	137.8	143.5	92.0
Cash & Cash Equivalents	264.6	407.4	273.2	74.4	21.1	9.9	2.3	3.0	2.2	12.8	153.3
Accounts & Notes Receivable	126.7	124.8	119.1	276.6	331.5	347.8	348.9	400.9	382.1	361.7	290.7
Inventories	58.6	46.7	31.6	32.6	33.0	30.5	51.0	32.0	38.9	34.1	43.6
Total Current Assets	530.7	708.1	475.4	454.2	466.4	466.4	529.6	555.2	530.1	553.8	615.2
Total Assets	1650.7	1785.6	1550.6	2929.9	2955.9	2976.5	2982.6	3006.2	3058.8	3088.2	3172.6
Payables & Accruals	289.6	280.7	272.7	520.4	569.4	555.4	473.9	500.3	513.9	560.4	525.2
Accounts Payable	184.2	176.6	189.5	344.8	389.2	355.1	273.6	265.6	282.0	287.2	295.2
ST Debt	92.6	500.0	295.3	213.4	503.5	178.0	224.7	87.2	253.6	88.3	89.6
Total Current Liabilities	398.7	789.1	574.3	762.2	1102.0	762.2	760.8	753.0	841.0	742.5	728.6
LT Debt	973.0	729.4	712.0	925.0	607.8	979.4	972.0	954.7	1014.4	1216.8	1363.5
Total Liabilities	1400.5	1550.6	1331.2	1869.7	1895.8	1913.0	1929.5	1899.1	2005.2	2075.9	2216.4
Retained Earnings	78.5	112.7	95.5	50.7	85.5	157.4	173.1	212.5	259.9	281.3	235.5
Total Equity	250.2	235.0	219.4	1060.2	1060.1	1063.5	1053.1	1107.1	1053.6	1012.3	956.2
Cash Flow	—	142.7	-133.1	-203.1	-50.5	-48.9	15.5	-24.9	21.0	21.1	192.8

SONAECOM SGPS S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	863.6	104.3	104.8	121.7	129.5	130.5	139.6	111.1	134.8	132.3
COGS	—	85.4	24.9	24.8	30.3	32.2	32.4	44.5	62.7	71.8	66.7
EBITDA	—	235.5	-5.1	5.2	7.5	3.6	0.8	0.3	-4.6	-9.9	-3.9
EBIT	—	82.2	-19.2	-0.7	0.3	-7.2	-14.7	-9.1	-10.6	-20.1	-12.8
Interest Expense	—	15.4	13.7	10.5	1.1	0.5	0.4	0.2	0.3	0.8	0.7
Tax Expense (Benefit)	—	11.0	0.0	3.8	0.7	2.3	-13.9	2.7	11.4	6.1	-4.5
Net Income (Loss)	—	62.3	75.4	103.8	28.0	34.6	48.1	22.8	68.4	51.6	60.1
Cash & Cash Equivalents	68.6	189.4	61.7	390.5	240.6	260.9	210.3	202.0	229.0	255.9	233.7
Accounts & Notes Receivable	143.3	146.1	144.9	36.4	40.0	40.1	47.1	47.2	51.0	27.2	22.6
Inventories	17.5	7.4	13.8	0.6	1.1	0.4	0.3	0.2	0.4	0.2	0.3
Total Current Assets	360.5	439.5	315.7	459.8	302.9	319.0	291.7	265.7	309.1	305.6	280.7
Total Assets	1861.9	2037.5	1898.9	1227.1	1090.4	1092.7	1104.5	1105.6	1206.3	1203.0	1247.5
Payables & Accruals	382.5	216.3	201.4	32.2	28.2	23.6	20.3	21.4	33.7	31.1	26.5
Accounts Payable	187.5	172.6	168.8	21.8	21.6	19.0	15.6	16.0	18.9	19.0	16.9
ST Debt	33.1	121.1	190.8	1.1	2.3	2.7	1.8	1.5	9.1	5.0	5.0
Total Current Liabilities	485.9	561.2	519.6	61.0	58.8	52.4	51.6	55.2	84.6	58.8	61.4
LT Debt	324.3	320.2	213.5	24.9	9.5	9.4	4.3	2.6	13.2	14.4	13.2
Total Liabilities	886.6	1003.1	815.6	90.3	72.0	67.5	71.3	73.7	142.7	130.5	133.0
Retained Earnings	42.4	70.3	83.4	117.0	28.0	34.6	63.3	39.7	86.1	70.1	80.8
Total Equity	975.3	1034.4	1083.2	1136.8	1018.5	1025.2	1033.1	1031.9	1063.6	1072.5	1114.5
Cash Flow	—	123.0	42.4	126.3	-6.2	-0.7	29.2	-8.2	26.5	27.3	-22.2

TELEFONICA BRASIL S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	12527.1	13542.1	12165.2	11224.2	11054.3	11097.5	12008.0	10122.2	10038.2	7419.3
COGS	—	6467.9	6610.4	6146.1	5523.2	5582.5	5436.2	5634.1	4896.8	5024.7	3904.0
EBITDA	—	4465.4	5071.4	3705.3	3336.7	3307.7	3660.8	4025.9	4151.3	4112.0	3063.7
EBIT	—	2493.2	2878.9	1728.1	1638.4	1437.7	1662.5	1843.2	2202.3	1635.8	1132.2
Interest Expense	—	208.4	275.9	289.3	260.8	59.5	72.6	37.9	43.4	32.8	22.2
Tax Expense (Benefit)	—	557.1	985.3	331.6	-58.6	267.0	274.0	311.8	547.1	316.0	212.9
Net Income (Loss)	—	1873.0	1778.0	1301.9	1583.1	938.5	1066.5	1280.9	2079.3	1134.0	820.7
Cash & Cash Equivalents	701.6	1217.6	2661.9	2008.9	1465.3	1240.0	1487.2	1017.2	760.6	751.9	907.5
Accounts & Notes Receivable	1147.6	2114.4	2039.4	1781.4	2099.5	1925.1	2535.0	2156.9	1868.0	1932.0	1288.7
Inventories	34.9	195.3	143.5	155.2	149.8	140.3	119.6	87.6	103.9	128.1	99.7
Total Current Assets	2320.0	4890.6	6019.1	4892.3	4845.2	4161.3	5360.0	4201.9	4130.5	4131.2	3001.9
Total Assets	8998.9	27119.8	25987.5	21347.9	22814.2	23626.8	29734.2	25460.7	23070.0	23994.2	17125.1
Payables & Accruals	2033.1	3968.8	3318.7	3023.2	3609.3	3202.6	3880.2	3139.1	3270.7	2768.8	2062.1
Accounts Payable	1253.3	2518.4	2178.5	2122.5	2385.9	1945.5	2217.3	1870.2	1719.2	1522.6	1041.5
ST Debt	189.5	603.4	724.1	467.8	707.1	544.4	1358.6	761.8	329.3	914.3	579.9
Total Current Liabilities	2578.0	5275.8	5007.6	4226.6	4999.3	4178.1	5954.2	4485.9	3860.1	3929.0	2815.1
LT Debt	633.4	1965.7	2223.0	2219.4	1728.2	1830.5	1328.6	1363.3	1051.6	2148.9	1505.1
Total Liabilities	3740.5	9176.3	9459.8	8180.1	8778.8	7695.0	9561.7	8016.6	6962.8	8383.1	6170.7
Retained Earnings	1060.8	808.8	1571.6	755.6	1343.0	694.9	1113.4	1087.5	1136.7	1114.6	734.0
Total Equity	5258.4	17943.6	16527.7	13167.8	14035.4	15931.8	20172.4	17444.2	16107.2	15611.1	10954.4
Cash Flow	—	595.0	1694.3	-206.6	-593.7	176.8	-60.5	-293.1	-155.8	2.7	407.5

TIM S.A.											
M€	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020
Net Revenue	—	7348.0	7491.3	6979.7	6252.9	4703.7	4077.2	4511.7	3954.8	3940.4	2970.7
COGS	—	3673.8	3944.9	3791.7	3233.8	2279.3	2008.5	2151.1	1793.6	1685.7	1375.7
EBITDA	—	2003.3	2001.0	1824.2	1776.1	1814.7	1360.0	1652.8	1484.0	2186.8	1435.1
EBIT	—	886.9	927.6	854.5	797.1	892.2	371.8	537.3	563.0	1023.8	484.3
Interest Expense	—	137.5	134.2	147.6	226.3	218.5	189.6	132.0	90.7	219.2	151.4
Tax Expense (Benefit)	—	234.7	281.3	220.9	207.3	251.2	68.6	55.9	-154.9	207.2	28.2
Net Income (Loss)	—	549.5	578.5	527.5	495.9	572.2	195.9	343.1	592.7	821.3	317.2
Cash & Cash Equivalents	1079.2	1351.9	1638.9	1623.2	1634.0	1556.7	1633.8	935.8	418.5	651.3	731.6
Accounts & Notes Receivable	1238.7	1360.7	1350.5	1078.4	1104.5	664.1	850.4	638.1	638.6	705.7	480.6
Inventories	103.1	113.1	99.6	91.1	82.4	32.9	41.9	31.1	41.2	45.0	38.8
Total Current Assets	2896.2	3431.8	3687.1	3297.2	3489.1	2797.6	2944.5	1910.5	1349.2	1873.2	1639.7
Total Assets	8730.5	9705.9	9657.8	8637.9	10098.9	8261.6	10096.0	8187.1	7188.5	8940.3	6560.1
Payables & Accruals	2050.8	2211.8	2086.1	2001.1	2135.8	1202.3	1368.1	1245.3	1279.6	1214.1	814.5
Accounts Payable	1398.7	1536.0	1588.0	1613.3	1686.8	867.7	1008.3	1001.2	972.5	869.2	492.7
ST Debt	431.6	451.4	351.8	296.7	400.2	540.5	333.6	339.5	157.2	500.1	432.2
Total Current Liabilities	2565.0	2814.1	2728.1	2470.6	2848.7	2129.9	2121.3	1814.3	1591.5	1798.6	1307.5
LT Debt	1026.3	1064.4	1272.1	1160.4	1708.9	1301.2	1624.0	1268.1	607.2	1673.5	1256.7
Total Liabilities	4087.9	4340.5	4541.0	4157.6	5314.7	4409.8	5088.9	3628.7	2735.9	3970.0	2909.1
Retained Earnings	102.2	120.5	134.4	134.7	161.1	143.9	191.4	180.5	188.7	223.8	163.2
Total Equity	4642.6	5365.5	5116.8	4480.3	4784.2	3851.8	5007.1	4558.4	4452.6	4970.3	3651.0
Cash Flow	—	381.3	465.9	300.6	-17.5	238.0	-253.8	-602.4	-439.0	274.2	50.1