

Reasons for potential bankruptcy: evidence from the construction industry in Slovakia

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Abstract

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Small and medium-sized enterprises are seen as a source of growth, new ideas, and the competitiveness of the economy, as they can flexibly respond to changing conditions through their rapid launch and activities; on the other hand, these entities are associated with a relatively high failure rate. The purpose of the paper is to analyse the overall dynamics in the construction industry in Slovakia with the focus on the failure rate of companies due to bankruptcy, and to identify the reasons for and specifics of bankruptcy in the construction sector in Slovakia. A Slovak dataset of critical events, used for the identification of bankrupt companies, was paired with a dataset containing the financial statements of 162 companies which went bankrupt in the Slovak construction sector during the period of 2016-2020 and whose bankruptcy proceedings have been completed. Data from the Statistical Office of the Slovak Republic were presented to provide a deeper understanding of the size of the industry and its development over time. Selected reasons for bankruptcy (overindebtedness, insolvency, age of the company, and region) were analysed by means of descriptive statistics and correlations to the duration of bankruptcies. The research confirmed that simple signals indicating potential financial problems could be captured well in advance of bankruptcy. The majority of bankrupt entities reacted to such signals and prepared for bankruptcy, while the regional aspect was insignificant. The results of the research constitute a contribution to the identification of the specific reasons that lead to bankruptcy among companies in the construction industry in Slovakia.

Keywords

bankrupt, crisis indicators, construction industry, failure of business, Slovakia.

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Introduction

The business lifecycle is usually described by identifying several stages of the duration of the company on the market. Research on entrepreneurship differs between stages that can be described as the shiny side of economic activity (business creation, but mostly growth and market expansion) and stages (such as failure with a subsequent exit from the market) perceived as the dark side of entrepreneurial ventures when risks become reality and bring about failure (Levratto, 2013). Pawełek et al. (2017) opined that the establishment of new companies and the closure of some existing companies are natural phenomena occurring in a free-market economy. However, according to Levratto (2013), “the exit rate of new entrants barely decreases below 50% before their fifth birthday”. This means that this problem is an important issue in the economic sciences, and it is important to determine the characteristics of company failure and exit from the market.

Most companies in each economy are small and medium-sized enterprises (SMEs), which are usually described as the backbone of the economy (Eggers, 2020). SMEs have specific features and fulfil important tasks in the economic system (Belás et al., 2014). Their importance is not only due to the number thereof, but also to their essential contributions, e.g. to the level of employment and new job creation, as well as economic stability and growth (Hyder and Lussier, 2016). Unfortunately, this sector is also known for its especially high company mortality rates (Mayr et al., 2017).

Business failure is a term that is sometimes used in the literature together with other terms such as financial distress, bankruptcy, insolvency, or default (Yigit, 2018). Although they are all related to unsuccessful business enterprises, these terms also have some distinguishing features. In this study, the focus will be on company bankruptcy,

which is considered to be a disruptive process that can influence not only the company itself, but also other companies. According to Fedorova, Dovzhenko, and Fedorov (2016), more than 95% of enterprises experience significant losses due to bankruptcy. The theoretical framework focuses on bankruptcy and the costs thereof, together with the identification of the reasons for bankruptcy. The main analysis was conducted on bankrupt construction companies in the Slovak Republic with the aim of identifying their reasons for entering bankruptcy and the process itself. Slovak legislation considers bankruptcy an irrevocable process leading to the termination of business activity and distinguishes the two stages (and reasons) thereof: 1. a warning signal via the imbalance between equity and liabilities (Act No. 513/1991, 2020); and 2. the bankruptcy process itself initiated via overindebtedness or insolvency (Act No. 7/2005 Coll., 2016).

The aim of the paper is to analyse the overall dynamics in the construction industry in Slovakia with a focus on the failure rate of companies due to bankruptcy and to identify the reasons and specifics of the bankruptcy in the construction sector in Slovakia. The paper offers added value in the form of the analysis of the bankruptcy process in the Slovak construction industry with an emphasis on three areas: the age of bankrupt companies, the behaviour of managers during the two-year period before the bankruptcy, and the verification of whether the indicator of the crisis (recommended in the Commercial Code) is functional. There are various existing investigations on bankruptcy prediction models among enterprises in different countries and sectors of the economy. The paper fills the gap in the classification of the reasons behind bankruptcies in the Slovak construction industry into shared and specific ones, as well as the evaluation of the crisis/failure. e research has led to the following conclusions: economic results in the Slovak construction industry

are influenced by several factors such as economic cycles, seasonal fluctuations, and sectoral foundations. A strong connection and dependence among enterprises in this sector is proven – in the case of problems in some enterprises, they would also most likely be identified in other cooperating enterprises. The research has also shown that descriptive statistics can be used as a tool to discover early signals of potential bankruptcy; on the other hand, the decision about how to solve this situation is entirely in the hands of company representatives.

The following section of the paper introduces the theoretical background for the bankruptcy of enterprises with an emphasis on the identified external and internal causes of this process. The paper continues with the research methodology section. The next section and subsections introduce the microeconomic situation in the construction industry in Slovakia, the development of bankruptcies in this sector and selected economic and financial indicators of the analysed companies. It analyses and discusses the findings as they relate to specific (industry) and general causes of bankruptcy and to regional stratification of bankrupted companies in Slovakia. The conclusion indicates the current and future challenges faced by the Slovak construction industry and presents the limitations of the investigation.

1. Literature review

Yigit (2018) defines failure as a situation in which the capital costs are higher than the approximate return on investment. According to the aforementioned author, a company may experience economic failure over a long period of time, but never fail to satisfy its financial obligations due to the lack of any debt that is enforceable by law. Financial distress differs from operational distress, and several causes of operational distress are identified (such as the departure of key employees or management, changes in

the availability or quality of raw materials, or a change in the demand for company products / services) (Yigit, 2018). They usually result in a decline in market share or revenues, increased operating expenses, and liquidity constraints. If the company cannot react to these negative situations, it soon inevitably experiences financial stress and possibly insolvency. On the other hand, financial distress is related to a situation where there is excessive leverage in the company and in companies that use short-term lines of credit to finance their long-term assets. These two types of distress are not mutually exclusive; that is, a company with strong operating activity may be struggling financially, and a company in a strong financial position may be struggling operationally. However, troubled companies can use certain techniques and tools to solve these situations and avoid having to immediately file for bankruptcy. Among the most powerful such activities are (Ratner et al., 2009):

- the sale of part of the company,
- strategic acquisitions by the company,
- new equity investments in the company,
- a tender offer for debt,
- the recapitalisation of the business,
- interim forbearance by lenders, and
- exchange offers, either debt for debt, debt for equity, or debt for debt and equity.

The terms 'bankruptcy' and 'insolvency' are often confused, but there is a subtle difference between them. According to Boratyńska (2016), bankruptcy refers to an economic process, while insolvency is basically a legal category with the purpose of satisfying all the creditors of a given debtor. A bankrupt company is not able to settle its debts and the value of its assets is not sufficient to cover all liabilities; bankruptcy represents one possible solution to insolvency. Bankruptcy can be identified as either formal or material (Moravec, 2013). The former relates to the court that declares bankruptcy; the latter means fulfilling the legal assumption of bankruptcy and the obligation

to file a bankruptcy petition. Insolvency can arise when the total liabilities of a company surpass its total assets; this is considered a greater danger of possible bankruptcy (Altman and Hotchkiss, 2006). The relationship between the debtor company and its creditors is also represented by default, usually differentiated in a legal and/or technical manner. A debtor missing a scheduled payment can cause legal default, whilst technical default occurs when a debtor violates the agreement with a creditor (Yigit, 2018).

“Bankruptcy represents a legal process that allows creditors to have control over the assets of the debtor” (Yigit, 2018). According to Bryan et al. (2013), bankruptcy occurs when the company is unable to meet its obligations. Financial distress is generally considered a reason that may lead to bankruptcy and is generally evident before the event. Early indicators of bankruptcy include losses in multiple consecutive years, dry cash flows, and declining sales (Bryan et al., 2013). Bankruptcy also represents a financial and legal consequence of a personal or organisational failure to pay outstanding debts. It has become a highly prevalent phenomenon throughout the world due to rapid economic growth and the serious problems caused by this new economic condition. Bankruptcy is considered disruptive and costly, not only for owners, but also for various stakeholders such as employees, creditors, suppliers, and customers (Baixauli and Mónica-Milo, 2010). Also, in the case of the bankruptcy of small and medium-sized enterprises, consideration of the position of their stakeholders, who would be affected directly by the failure of such SMEs, is essential (Crutzen and Van Caillie, 2008).

As mentioned above, bankruptcy brings costs for the economy as a whole, as many procedures in this process are expensive and last for an extended period of time (Levratto, 2013). Weiss (1990) found that the average cost of bankruptcy is around 3% of total book assets and 20% of the market value of equity

in the year prior to bankruptcy. Authors tend to differentiate between the direct and indirect costs of bankruptcy. Direct costs are represented by fees paid to lawyers, accountants, consultants, and other professionals involved in the bankruptcy process; a substantial part of these costs is fixed (Yigit, 2018). LoPucki and Doherty (2003) characterise direct costs as high because procedures are complex and involve many creditors, and due to the information asymmetry between the company and lenders. These costs usually represent 15% of the company’s assets according to the Doing Business Index (García-Posada and Mora-Sanguinetti, 2014). Indirect costs can be characterised as economic losses incurred during the bankruptcy process and relate to a wide range of unobservable opportunity costs (including loss of profits, loss of sales, and the inability of companies to issue securities or obtain credit). The loss of important suppliers, customers, and key employees are other examples of indirect costs; companies in bankruptcy usually have a weaker position when trading with suppliers. The measurement of indirect costs is nearly impossible to perform; therefore, it is very difficult to calculate the total costs of bankruptcy (Yigit, 2018).

A complete picture of the possible causes of bankruptcy is provided by Bradley and Rubach (2002), who offer a reminder of the different types of factors identified as the causes of insolvency in a survey commissioned by the Small Business Administration. Management, marketing or financial reasons are the main ones, but additional elements should also be stated, such as the following:

- external business conditions: include increased competition, insurance, and general costs of doing business,
- financing: includes loss of capital, inability to secure new capital, and high debt,
- internal business conditions: include management errors, location, loss of clients, and trade credit problems,

- tax: includes problems with the tax administration,
- disputes with a particular creditor: include foreclosures, lawsuits, and contract disputes,
- personal: includes illness and divorce,
- calamities: include fraud, theft, natural disasters, and accidents, and
- other: includes delaying and involuntary bankruptcy filings.

Other authors (Ooghe and Prijcker, 2008) have identified five different groups of factors that can cause the failure of a company; moreover, they also stress that these groups are linked. First, the general environment (composed of factors such as politics, technology, economics, social factors, foreign countries, etc.) affects the motivation of managers, the usefulness of their skills, and therefore corporate policy, in addition to the relationship with stakeholders in their immediate environment (e.g. customers, suppliers, competitors, banks and credit institutions, and stockholders). The immediate environment is seen as the second group of factors because the interactions between a company and its stakeholders determine corporate development. Ruinous competition, but also mutual projects with stakeholders, are well-known examples of these interactions. Third, the characteristics of management (or the entrepreneur) – motivation, skills, qualities, and personal characteristics – also have an important effect on company performance. Together with these factors, corporate policy (such as company strategy and investments, personnel, finance and administration, and corporate governance) can negatively influence the wellbeing of the company in the case of certain errors. Finally, company characteristics (e.g. maturity, size, industry, and flexibility) must also be considered – for example, young companies are very vulnerable because they must build up stable relationships with stakeholders. Moreover, even companies with similar financial profiles but in

different industries have a different probability of failure.

Some authors (Collett et al., 2014; Lukason and Hofman, 2015) differentiate between the internal (or intra-organisational) and external (or extra-organisational) causes of bankruptcy; sometimes there is a combination of causes from both groups (Qeidari et al., 2020).

The most important extra-organisational reasons for bankruptcy are competition, business fluctuations, rapid technological advancement, and the characteristics of many other companies attempting to obtain a competitive advantage and gain customers, all of which can significantly increase the risk of bankruptcy. On the other hand, enterprises should ensure to dispose of the ineffective management of the company, and thus to reduce this risk. The irrationality of some investors can cause business fluctuations that can result in the bankruptcy of some enterprises; factors such as a reduction in price of goods or a sudden increase in prices and a reduction in sales, along with other similar factors, also increase the risk of bankruptcy. Rapid technological progress is also a significant factor in causing bankruptcy because it may render certain production processes and products obsolete. If entrepreneurs do not use modern methods and quickly identify consumer demands, they will experience failure. Some economic systems are unstable and still developing, and enterprises in these economies are at greater risk of bankruptcy compared to more stable economic systems. However, in unstable economies there is also an opportunity for entrepreneurs to be successful, albeit this is mostly dependent on effective management that must predict changes in the economic structure and reduce risk accordingly (Bikas and Saponaitė, 2018).

On the other hand, intra-organisational reasons for businesses going bankrupt are those that could be prevented by taking the proper measures. Most of these factors are

the result of poor decision making, and responsibility for this lies directly with management (Qeidari et al., 2020), including general managerial inefficiency, insufficient sales, or improper pricing. The inefficiency of CEOs is one of the most important reasons for bankruptcy, and success or failure is directly affected by executive measures and decisions. A lack of education and experience affects managerial ability and innovation in the field of competition and technology. Insufficient sales result from an unsuitable location, an inefficient marketing department, insignificant measures to improve sales, and the offer of low-quality services and products. In other words, an entrepreneur does not earn enough income to continue his activities. Considering manufacturing costs, a product priced improperly, sold for extremely low prices, will lead to minimal profits or even a loss on said product (Newton, 2009).

The current literature deals mainly with bankruptcy in general and models that predict future problems in companies and assess their financial health (Shetty et al., 2022; Voda et al., 2021; Bateni et al., 2020; Kováčová et al., 2020). Many studies (Ďurica et al., 2021; Klieštík et al., 2020; Khan et al., 2020; Kováčová et al., 2019) emphasise that these models need to be constructed for a specific country or industry because of their specificities and differences, but it is also possible to construct a bankruptcy model for a group of countries with similar features or for neighbouring countries (Sponerová, 2021). According to Khan et al. (2020), the perception of bankruptcy in Slovak enterprises and those in the Czech Republic is different – Slovak entrepreneurs perceive bankruptcy as a natural part of business. Another study (Bič, 2022) confirms that in both countries certain interventions in the business environment are needed to help entrepreneurs in this unfortunate situation. Rybářová et al. (2016), who performed research on a sample of

companies from the construction sector, analysing the efficiency of the Altman Z-score bankruptcy model, confirmed that this model is also suitable for Slovak construction businesses. Our study also focuses on the construction sector, but with the emphasis on the identification of the potential reasons for bankruptcy in these companies.

2. Methodological approach

In order to investigate the reasons behind bankruptcies of business entities in Slovakia, the construction sector was chosen (SK NACE Section F) as it represents a traditional – in terms of economic development – and important industry in Slovakia (measured by the value produced on domestic and foreign markets, the number of employees, the number of business entities, etc.), with long-term growth potential, but also one that is highly sensitive to economic cycles and public spending. From a geographical point of view, bankruptcies in the construction sector were scaled according to NUTS III regions and the period of filing for bankruptcy. In line with the objective, three research questions were formulated:

- The status of crisis is the first step towards bankruptcy, but its warning function may fail – the status of crisis introduced by legislation (Slovak Act No. 513/1991 Coll., as amended, Commercial Code) helps to identify companies which are dangerously close to overindebtedness. It expects a crisis to have begun if the debt to equity ratio falls below 8% (Commercial Code). The potential of such an indicator to identify failure is based on the fact that small and medium-sized enterprises with limited resources can quickly become overindebted after an unsuccessful business venture if their losses suddenly exceed this value. As small companies are prevalent in the Slovak construction industry, this warning is less relevant. Before

the conditions of the Commercial Code were tightened, the limit of 8% was less strict before 2018, but with the effort to ensure mutual comparability between periods, the same and most rigorous 8% limit is used for all companies.

- Subsidies from owners can save liquidity and offer additional financial sources – as the median values of loans-to-assets indicators suggest, construction companies in Slovakia are seldom financed by bank loans, and only large companies rely on this financial instrument (Finstat, 2019). It does not mean that smaller companies never utilise debt financing, but it includes sources gained from common supplier-customer relations. Therefore, companies (mostly in the early stages of their activity) are somewhat dependent on the private resources of owners. It is common practice, then, that apart from direct equity contributions, companies also utilise indirect subsidies from their owners, because said process is faster, simpler, and bears lower risk. In line with this, the article answers the question of how owners behave before bankruptcy.
- The length of the bankruptcy process depends on the age of companies – the causes of failure of younger companies clearly differ from those of mature ones, mostly due to a lack of quality or capital (Kücher et al., 2020). Moreover, Ooghe and Prijcker (2008) consider new companies to be candidates for bankruptcy primarily because of limited managerial and industry-related experience and a weak financial and administrative structure. As all these factors have an impact on potential profit and thus even on the structure of capital, it raises the question of whether the age of a company influences the duration of the bankruptcy process as a whole, or whether there are other factors which have a significant effect.

The research sample consisted of all bankrupt business units identified via the Dataset of Critical Events administrated by the Finstat commercial data register (Finstat, 2020). The availability of their financial statements in the Slovak register of accounting statements was a necessary precondition, owing to which three companies were eliminated from the 165 previously identified bankrupt organisations. So as to measure the proper characteristics of the bankruptcy process, only those companies whose process was closed and their legal existence terminated were chosen. The secondary reason for the construction of such a sample was the legislative exemption by which a company in bankruptcy does not submit the regular closure of accounts within the process of bankruptcy; thus, there is no information about the financial background of bankrupt companies except for the information published by the administrator of the bankruptcy assets. In total, 138 business entities from the construction sector which went bankrupt during the observation period of 2016-2020 and whose bankruptcy was fully completed were analysed. The decision was made to conduct the research based on data covering a five-year period including the newest available data for 2020. Sole proprietors were excluded, as their financial data is not publicly available, is confidential in character, and is partially subject to different legal regulations. Furthermore, companies with an unknown bankruptcy start date were omitted, as the bankruptcy process might have been initiated in conditions which differed from those in the evaluation period. Thus, we consider the research to be applied on the above-defined parent population of bankrupt companies. The robustness of the sample (in terms of representativeness) allows one to apply the conclusions to all bankrupt companies in the construction sector.

Specific attention was devoted to the development of warning signals in time. This “time effect” was considered twice, once

to see whether the value of the selected indicators differed according to the year in which the companies entered bankruptcy, and secondly to understand the degree to which the indicators worsened one or two years before bankruptcy, the latter also in connection with the region and the intensity of construction activity therein. The crucial indicators were split into two categories: legal indicators given by the legislation and relevant in the case of internal or external start of bankruptcy (crisis leading to overindebtedness or insolvency) and financial indicators relevant in the case of obvious (liquidity, debt) or hidden (sales, assets change, asset sellout, internal borrowings) problems. Therefore, the choice of measures was partially inspired by the Bankruptcy and Restructuring Act (legal rules) and other

studies (Djankov et al., 2008; Boratyńska, 2016; Ooghe and Prijcker, 2008), although those indicated more or less complex insight into the topic (Djankov et al., 2008) or were more general in focus without exact data (Boratyńska, 2016); thus, the measures were selectively chosen with respect to the aim of the investigation. Macroeconomic or broader qualitative characteristics of the industry were not considered. The number of measures was limited, since the intention was not to prepare financial predictions or distress models, as the number of failed companies is not sufficiently robust in the mid-term period, their activities are heterogeneous and seasonal, and they declare variable financial results according to size, which requires a separate approach (Pervan, Pervan and Kuvek, 2018).

Table 1. Absolute and relative measures

Legal indicators	Financial indicators	Hidden proofs
Equity-to-liabilities (crisis)	Acid test (liquidity)	Change in sales and assets
Equity-to-assets (debt)	Loans-to-assets (debt)	Sellout of assets
Mature liabilities (insolvency)	Daily sales in payables (debt)	Internal borrowings
	Return on assets (profit)	

Source: own elaboration

In addition to the descriptive statistics (absolute and relative indicators) used for the profile of each individual legal entity in the sample, all bankrupt companies were evaluated through the median values for the entire sample (we preferred the median instead of the mean due to its greater accuracy and lower sensitivity to the expected outlying values in the sample). The Pearson correlation coefficient was used to measure the potential dependability of the entire bankruptcy process. The duration of bankruptcy was correlated with debt (the greater the debt, the shorter the process), asset size (the more it owns, the longer it takes to process), and company age (older companies with complex relationships may have a large number of creditors).

Apart from the literature review and other research results, two financial databases were used as primary information sources, both administrated by the Finstat register. The dataset with critical situations was used to identify bankrupt companies (specifically, the start and completion date of bankruptcy). These companies were paired with the dataset containing financial statements used for data processing and evaluation. Data from the Statistical Office of the Slovak Republic were presented to understand the size of the industry and its development over time. The Cribis register offered median values of selected relative indicators that described the entire construction industry in Slovakia.

To infer specific reasons for bankruptcy in the Slovak construction sector, we used a narrative literature review with purposive sampling, as we were interested in respondents who had the most knowledge regarding the reasons for bankruptcy.

3. Research results and discussion

The following text is divided into three sections. The first section is focused on the characteristics of the construction industry in the Slovak Republic through selected indicators (e.g. number of entities, territorial location of business entities, number of employees, average nominal wage, value of production, number of bankruptcies entered). The second part is focused on the analysis of the economic situation in construction companies with a more detailed orientation towards bankrupt construction companies. The last section is dedicated to the analysis of the bankruptcy process and its consequences for construction companies.

The construction industry and the development of bankruptcies in the construction sector in Slovakia

Construction is one of the most important sectors of the Slovak economy. Its annual share in gross domestic product (GDP) is approximately 7%, and it constitutes a significant share of private sector output (Statistical Office of the Slovak Republic, 2020a). Construction contributes significantly to the growth of the Slovak economy and in many ways is comparable to the level of construction in other EU countries (especially in terms of technical, technological, and architectural standards of buildings, quality of construction work and speed of construction, range of materials and products used, etc.). Table 2 presents the development of the number of legal entities in the construction sector during the period of 2016-2020 and the share of legal entities in the construction sector in the total population of legal entities in Slovakia.

Table 2. Number of legal entities in the construction sector and their share in the economy

Year	Legal entities in the construction sector	Share of total entities in construction	Share of legal entities in construction in the total population of Slovakia
2016	16,439	18.05%	6.52%
2017	18,688	19.97%	6.84%
2018	19,831	21.17%	6.79%
2019	21,468	20.72%	6.98%
2020	22,954	21.21%	7.09%
relative change 2016-2020	1.39		
absolute change 2016-2020	6515		

Source: own elaboration according to the Statistical Office of the Slovak Republic, 2020a

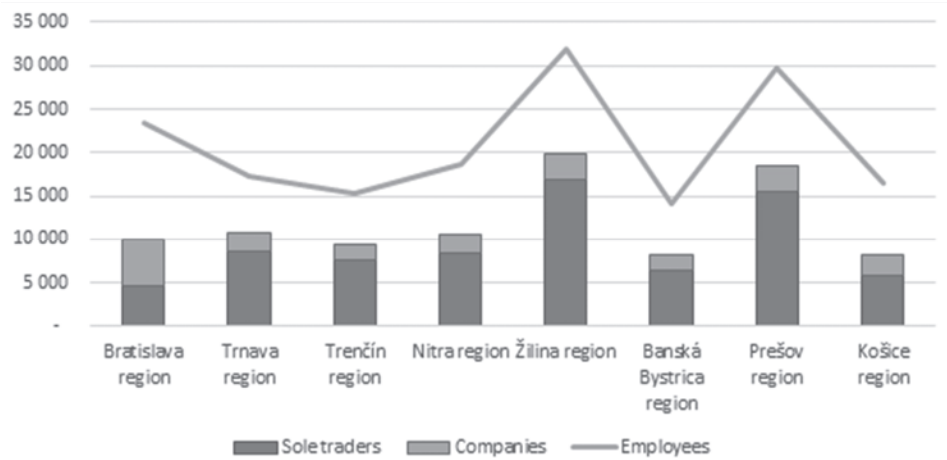
During the observed period, an increase in the number of legal entities was recorded in the construction sector in Slovakia (by

39% in total). Legal entities also increased their share of the total number of entities in the construction sector (by 3.16 percentage

points). A similar change was recorded as a 0.57 percentage point increase in the share of legal entities in the total number of legal entities in Slovakia.

Figure 1 illustrates the geographical dispersion of business entities in the Slovak construction sector and the number of employees.

Figure 1. Number and structure of construction business entities in the regions of Slovakia (2020)



Source: own elaboration

The data in Figure 1 presents the number of companies and people actively working in the Slovak construction sector in 2020. The data can be interpreted from two points of view; the first indicates that the number of sole proprietors was much higher than the number of companies, being predominant in all regions except the Bratislava region. The second interpretation would be that the companies held a dominant position in terms

of number of people involved (employees). The number of employees was highest in the Žilina, Prešov and Bratislava regions.

The increasing economic importance of the construction sector in Slovakia was also confirmed by the growth in the value of production since 2016. The construction sector achieved an increase in the value produced of almost 9% in 2020 compared to 2016 (Table 3).

Table 3. Value of production in the construction sector in Slovakia

	2016	2017	2018	2019	2020
Value of production (mil. €)	4866	5174	5801	5807	5290
Domestic construction (mil. €)	4622.7	4863.56	5452.94	5458.58	4622.7
Foreign construction (mil. €)	243.3	310.44	348.06	348.42	317.4
Domestic construction (%)	0.95	0.94	0.94	0.94	0.94
Foreign construction (%)	0.05	0.06	0.06	0.06	0.06

Source: own elaboration according to the Statistical Office of the Slovak Republic, 2020

In the long run, the share of domestic production in the construction sector was around 94%, while the rest (6%) constituted Slovak companies in other countries. This also implies that if there was a loss of production in this sector, it would be reflected primarily in the domestic market (through the number of people employed, products and services purchased, as well as the value created for domestic customers).

The decisive factors for the development of the construction sector in Slovakia are mainly the qualifications, expertise, and experience of the workers. However, there has been a long-term lack of a qualified workforce in this sector, which could threaten the competitiveness of construction companies on the Slovak and European markets.

Although employment in the construction sector has been on an upward trend since 2016 (Table 4), there are too few skilled workers available (especially in the manual and craft professions), and it is estimated that this situation will further worsen. The reason for this is probably the low average wage within the sector, long-distance work, and the general unattractiveness of the technical fields of study, which lag significantly behind the humanities. Slovakia is solving this problem by supporting secondary vocational education through the introduction of a dual education system. At the same time, there is a need to promote technical education, intensify cooperation between schools and businesses, and adapt the content of education to the needs of practice.

Table 4. Number of employees and average nominal wage in the construction sector

	2016	2017	2018	2019	2020
Number of employees	157,236	162,631	166,864	176,914	166,336
Average nominal wage (€)	639	646	713	746	751
Standard deviation of nominal wage (€)	153	192	210	268	169

Source: own elaboration according to the Statistical Office of the Slovak Republic, 2020

In 2020, the largest number of employees were employed in companies based in the Bratislava, Žilina and Prešov regions (51% of all employees working in the Slovak construction sector), while the lowest level of employment was in the Banská Bystrica (8.5%) and Trenčín (9%) regions. There were also large regional differences in the nominal wages of the employees. While in 2020, the wages of employees in almost all regions were at the level of 90% or less of the average wage in the construction sector (and as little as 74% in the Prešov region), in the Bratislava region, the capital city paradox had a visible effect, and the nominal wage was up to 167% of the average wage in the sector. The standard deviation of

the average wage in the construction sector suggests a deeper regional inequality in this area as well.

Table 5 presents the number of bankruptcies entered in the construction industry in Slovakia in the period 2015-2020. The share of bankruptcies among sole proprietors (measured from the average number of sole proprietors during 2015-2020) was approximately three times higher than the share of bankruptcies among companies in the construction industry. Unfortunately, the data pertaining to sole proprietors was not available due to its confidential character, so the only objects of investigation were companies (legal entities) which closed the bankruptcy process within this period.

Table 5. Number of bankruptcies entered in the construction sector

	Total 2015–2020	Closed 2015–2020	Closed 2021–2022
Total	3999	2178	352
• Legal entities	239	141	29
• Sole proprietors	3760	2037	323

Source: own elaboration according to Finstat, 2022

The economic situation and the reasons behind bankruptcies

Generally, the economic conditions (or financial health) of construction companies in Slovakia were quite variable (compared to other industries in the period analysed) but developed rather positively in the last five years (Table 6). Liquidity was built on a lower share of inventories, thus contributing to better coverage of liabilities. The relationship between receivables and payables was standard and slightly in favour of a shorter payable turnover period, and both indicators were proportionally lower over time, each by almost 10 days. On the other hand, the pandemic worsened all indicators as a rule, especially in the case of profitability. The overall money cycle was faster, but companies paid trade debts sooner than they

collected trade claims. Lower trade debt partially influenced the size of total liabilities, with a debt-to-assets ratio of almost 58% in 2020, while contributing to the improvement of the debt-to-equity ratio (crisis ratio) that was increased to 0.88 in 2019 (in contrast to the significant crisis found in bankrupted companies). The development of profitability was not as positive, as the return on assets fell below 1% in 2020. The median value of loans-to-assets was equal to zero (the same in the upper-quartile companies) in each year. This indicates that construction companies are not regularly financed by financial institutions, although the value of debt is partly based on the size of the company; in the upper quartile the value of loans to assets increased (10% in medium companies, 17% in large companies identified through the size of assets).

Table 6. Median values of key indicators in the construction sector and their development over time

Indicator	2015	2016	2017	2018	2019	2020
Acid Test Liquidity (coef.)	1.24	1.29	1.60	1.58	1.67	1.56
Daily Sales in Receivables (days)	39.87	34.96	34.02	30.17	28.88	30.69
Daily Sales in Trade Payables (days)	30.37	24.35	21.83	20.78	16.95	20.05
Debt-to-Equity (crisis; coef.)	0.47	0.56	0.81	0.76	0.88	0.74
Debt-to-Assets (%)	68.51	34.32	55.34	56.85	53.30	57.67
Loans-to-Assets (%)	0	0	0	0	0	0
ROA (%)	2.18	3.10	1.76	1.18	1.14	0.43

Source: own elaboration and Cribis.sk

The economic situation in bankrupt companies was significantly different. The legal reasons why companies go bankrupt are usually focused on the capital structure (share and structure of debt) and cash situation (how the obligations are satisfied). Bankruptcy legislation in Slovakia follows similar principles that were also added to the research as a crucial criterion for the identification of causalities in bankruptcy. These are focused on the legislative reasons why companies went bankrupt (although with a degree of modification, as certain company data may not be disclosed in detail due to the privacy of statements) and other financial reasons that preceded the ultimate situation in which the bankruptcy was inevitable from the legislative point of view. It is obvious that none of the factors was the one and only cause of bankruptcy, as they usually collide or go hand-in-hand. Thus, bankruptcy is considered the result of an ultimate chain effect brought about by several economic and financial issues.

Many authors focus their research on the compilation of different country- or industry-specific distress models. Specific models for the construction industry are not very common (e.g. Chen, 2009; Ho and Lin, 2004), mostly due to the unique characteristics of this industry (highly diversified, very seasonal). Our research focused primarily on the causes; therefore, individual characteristics and ratios were crucial, not the eventual result itself (failed vs. not failed). Many of the ratios used were confirmed in the existing literature (e.g. Kováčová et al., 2019) as being predominant in Central Europe, while others came directly (negative

equity period, debt-to-equity) or indirectly (daily sales in trade payables) from the legislation, and thus are specific to Slovak conditions.

Sales development

53% of companies in the construction industry went without sales two years before entering bankruptcy (period X-2) and 80% one year before bankruptcy (period x-1). This opens the question of a potential speculative approach of their owners (zero sales as a delaying strategy or as a consequence of the crisis). The fact that only 8% of companies had no employees within a year of bankruptcy indicated that the purpose was not necessarily only speculative. All companies without sales two years before bankruptcy no longer had employees, so the bankruptcy in their case was quite expected and planned.

The median value of the decline in sales (in companies which continued to generate sales) was 57%, thus creating potential threats to later cash generation and payable compensation (after 90% winsorisation, the median value increased to 59%). Approximately 6% of companies generated increased sales before filing for bankruptcy. The best companies in the upper quartile increased their sales by more than 121%, but it should be stated that there were many extreme outlier values due to the lower initial sales before their sudden growth. The development of sales indicated that companies either prepared themselves for bankruptcy or remained inactive for a period of time and potentially utilised economic and tax allowances.

Table 7. Development of key causalities of bankruptcy in bankrupt construction companies

		Assets change	Negative equity period	Crisis _(x-1) (Debt-to-Equity)	Crisis _(x-2) (Debt-to-Equity)	Sales change	Equity-to-Assets _(x-1)	Equity-to-Assets _(x-2)	Sales-to-Assets _(x-1)	Sales-to-Assets _(x-2)
N	Valid	62	111	80	60	87	110	106	96	86
	Missing	100	51	82	102	75	52	56	66	76
Median		.86	2.00	-.69	-.61	.57	-.77	-.26	.55	.91
Std. Deviation		13.20	1.96	2.01	2.31	21.49	264.19	88.90	99.39	6.95
Percentile	25	.46	1.00	-.86	-.71	.15	-5.94	-1.68	.00	.00
	50	.86	2.00	-.69	-.61	.57	-.77	-.26	.55	.91
	75	1.009	4.00	-.046	-.032	1.21	.01	.11	2.59	1.91

Source: own elaboration

Sales generation problems were also documented by the share of sales in total assets (Table 7). While in period X-2 this share (or turnover) was 91% (median value), in period X-1 it was a mere 55%, so even in the case of lowered assets (covered in more detail in the next paragraph) the development of sales was disproportional. Only the best companies (upper quartile) succeeded, as their share of sales on total assets increased (from 191% to 259%). All indicators in Table 7 were calculated from unmodified financial statements from the extraordinary closure of accounts made due to the start of bankruptcy (Act No. 431/2002 Coll.). Missing observations are registered due to missing data in statements, either in period X-1 or X-2.

The fact that companies did not have sales one or two years before entering bankruptcy may be the result of strong competition, lost projects, lack of employees, or a pure consequence of poor management. These findings confirmed the results of Bryan et al. (2013), specifically the role of sales in prediction. The fact that some companies had no employees seems to be a result of planned activity, and there was also evidence that many companies

intentionally sold their property in advance, while they also simultaneously settled preferred claims, mostly those of owners instead of other business partners. The size of negative equity (overindebtedness) showed that many times companies went beyond extreme loss tolerance, and thus potentially brought their lenders to secondary insolvency with a very limited likelihood of even the partial recovery of their claims (albeit this is not only the case in the construction industry). Similarly, Altman and Hotchkiss (2006) pointed to the crucial role of liabilities prevailing over assets in the probability of bankruptcy, although the examples given above support the idea of distinguishing between the types of liability and also the important role of management (both competence and ethics).

Assets represent a necessary precondition of sales; moreover, in the case of the construction industry, they significantly affect production capacity, although some minor activities such as electrical, plumbing, and other installations or building completion and finishing (suitable rather for micro- and small enterprises) do not need a great deal of property. Increased assets can potentially

be considered proof of the growth of the company (reflecting the power of capital, although sales are also relevant), although they can be devalued in the case of abandoned claims. Additionally, extreme growth in property, plant, and equipment, which is not actively used in sales generation, may be ineffective in financial health (including potential debt financing and the ensuing consequences). But it needs to be said that newly built capacities require sufficient time to reflect their value in sales (it depends on the purchase value, expected return, annual sales potential, depreciation policy, etc.); on the other hand, some ratios may seem extremely efficient in the case of rented long-term assets generating a significant portion of sales (rather than assets owned).

The loss of assets may, on the other hand, offer warnings similar to those of sales development. A certain decrease is natural due to depreciation, although missing fixed investments in the long run may point to a lower level of liquidity, problems with external financing (theoretically, as the simple operations not based on technological infrastructure do not require as much investment, nor as often), or general managerial dysfunction. The gradual and intentional decrease in fixed assets also signals the potential sale of PPE, indicating that bankruptcy is expected or even planned. It may also demonstrate speculative reasons and the effort to eliminate the responsibility to settle liabilities as companies enter bankruptcy.

Approximately 5% of companies in the construction industry had no assets two years before bankruptcy and 21% a year later. Only the upper quartile companies increased the value of assets (median value +0.9%), while the decrease in assets in the lower quartile companies reached 46%. The value of sales of long-term assets was used as a dummy variable (although it was generally accepted that it is not automatically connected with the sale of assets and preparation for bankruptcy). Almost one quarter of all companies had certain income

from the sale of long-term assets in both years (26% two years before entering bankruptcy and 21% one year beforehand).

Status of crisis and capital structure

The status of crisis was introduced into the Slovakian Commercial Code in order to create warning signals before potential failure and, most of all, to protect companies and their creditors from privileged claims compensation and potentially unfair acts of statutory bodies. The crisis ratio directly points to a low level of equity, and when the company enters this crisis state, it is threatened by the start of potential bankruptcy, and should announce this fact in its financial statements. The company is considered to be in crisis when the relationship between equity and debt falls below 8%.

The analysed companies had already signalled significant problems two years before bankruptcy. The median value of the equity-to-debt relationship was -0.31 in period X-2 and -0.69 in period X-1. Thus, even in the case of active businesses, problems with capital structure deepened. The negative value of this indicator reflected still more negative equity (due to increased losses); more precisely, such extreme indebtedness (with higher levels of debt than assets) is one of the two conditions for potentially commencing the bankruptcy process (Act No. 7/2005 Coll.). Moreover, while the crisis detects potential future problems, the analysed companies directly became bankruptcy candidates as the values of equity fell significantly. The Act on bankruptcy and restructuring expects that company authorities should do their best to avoid the crisis and/or indebtedness and insolvency in the case of the detection of warning signals, but the results showed that companies were bankruptcy candidates more than two years before bankruptcy started in practice. Only 6.5% of the companies were in crisis two years before bankruptcy and only two of them became overindebted afterward. This goes to answer

the first research question about the partial failure of this indication of a crisis.

69% of all active companies had negative equity in period X-2 and 73% in period X-1, despite the fact that the law cited above expects immediate action in the case of detection (primarily due to losses generated). The average period for which companies were indebted was two years, but the worst quartile of companies remained in this situation for more than four years. In terms of certain solutions to this problem (taking immediate action), both additional equity (although no company did so) or provisions given by related parties (usually owners) may be considered. Only 15% of companies provided additional funds for company liquidity purposes, although in fact increasing the already extreme portion of debt financing at that time by doing so. It seems that a direct contribution to equity may be too risky, leading to the prevalence of owners' subsidies.

Fundamentally, contact with related parties is one of the limitations that the status of crisis rule has introduced. All provisions provided by the owner, shareholders, statutory bodies, or other related entities could not be refunded during the crisis, but only after they had perished. This protection "helps" to designate all necessary funds to cover claims against other creditors (state, employees, banks, suppliers, etc.). Despite this, 21% of companies repaid those funds back to related parties, although they were already in crisis. This does not mean that they broke the law (since part of the research sample comes from the 2015 period preceding the force of this legislation), but it emphasises the fact that they preferred their own interests rather than paying back the "real" debts they had previously collected. Therefore, the second research question about the behaviour of owners before the start of bankruptcy was thus answered.

The second rule in filing for bankruptcy is insolvency. A company is deemed illiquid if it is unable to pay its debts that are in arrears

for more than 30 days and if it has more than one creditor. 55% of the companies claimed to have no overdue debts, while the remaining companies in the sample recorded significant debts (as indicated also by the negative equity above). The median value of the debt-to-asset ratio was 115% in period X-2 and 162% in period X-1. Furthermore, the average share of debts due on assets was 51%.

Although insolvency is usually initiated by creditors, indebtedness is based primarily on the initiative of each company (its representatives and statutory bodies). The situation in the construction industry showed that both legislation tests prove the expectation of incoming bankruptcy, although insolvency generally seemed to be a more intensive threat (as it pertained to the start of bankruptcy), because creditors lose patience sooner (short-term effect) and indebtedness is a more complex topic also due to its spread over time (long-term effect; moreover, it can be quite successfully hidden).

Boratyńska (2016) considers bankruptcy to be an economic process and insolvency to be a legal category. According to the Slovak legal system, it may suggest that insolvency (as specified in legislation) is rather the opposite – an economic category with reversible status – while bankruptcy is a legal category, as Yigit (2018) also mentions, irreversibly heading towards the cancellation of the company's legal status; moreover, it is strictly under the control of the court and supposes at least an effort to partially settle the claims of creditors. Significant international differences in the framework of bankruptcy exist, in terms of its procedures, an understanding of the consequences, or in enforcements of insolvency (Merovach, 2021). Moreover, although bankruptcy solves economic and legal issues, it not only has an economic or financial background, but takes place because of many more or less visible causes.

The reasons that lead companies to experience financial problems and ultimately cause their default may be split into two categories

(Table 8) (Belás et al., 2020; CEEC Research, 2020; CEEC Research, 2021; EUROSTAV, 2018; Statistical Office of the Slovak Republic, 2019; Statistical Office of the Slovak Republic 2020b; Krokoš, 2019; CRIF Slovak Credit Bureau, 2015; European Construction Sector Observatory, 2021; European Construction Sector Observatory, 2020).

Table 8. Reasons for bankruptcy in the Slovak construction sector

Shared reasons	Specific reasons
Demand crisis / Public procurement	Construction legislation
Law enforceability (general)	Power of key players in the sector
Corruption	Cascade effect of problems in a chain
Lowered liquidity / Insolvency	Minimal wage pressures
Poor management	Material availability / Price pressures
	Low quality
	Availability of workforce
	Decrease of new constructions / Increased recovery and maintenance

Source: own elaboration

As Levrato (2013) states, the causes of bankruptcy can be as numerous and complex as the factors leading to growth, which can make each company a unique case suffering from specific and partial failures, albeit such a candidate for bankruptcy may suffer from general economic problems/collapse (shared reasons) or industry recession (specific) as well. Reasons in the first category may be shared with other industries; thus, we do not consider them unique to the construction sector. At the beginning of the analysis period, it was quite common to designate lower public investments as a cause of the crisis in the industry. The government / regional governments were blamed for lower investments in public infrastructure or public procurement. The latter was considered too static, bureaucratic and unclear as regards the criteria evaluated in public tenders. Specifically, in the case of housing and road infrastructure, or those generally financed by EU funds (such deals are considered by construction companies to be partially manipulated and extremely risky including price shocks). As the majority of

construction activities occurred in the western Slovak regions (both infrastructural and housing), it also intensified the quite significant differences between regions with the consequent economic deviations (Table 9).

It was not only the public procurement process that prolonged the entire process and frequently hindered the financial flows within the industry (compensation, complaints, etc.). Many companies and stakeholders, including the Slovak Chamber of Construction Engineers, blame the entire construction law for the extremely long preparation of new constructions and the long closing phase of finished ones. The excessive number of amendments made it unclear and created space for both bureaucratic and economic interventions and the occurrence of illegal constructions that are legalised afterwards.

The status and extent of certain construction activities (specifically highway or railway reconstruction) suit only a very few key players, while they simultaneously create long list of small suppliers dependable on their success. Several public projects showed how a failure (whether an economic one or

a physical accident) in the case of one company threatens the existence of its suppliers and pushes them to bankruptcy. Moreover, the opacity of such relations threatens safety in terms of the final construction and spreads the responsibility for potential failure over an excessive number of unidentified subjects/suppliers (who officially were not considered in case of construction approval). As the price is usually the most important factor in a tender, the low quality of the materials used or the work provided intensifies the overall effect in the case of safety.

The abovementioned facts are why many companies are reluctant to take part in certain construction projects (due to their duration, the way of financing, of the potential cooperation partners) or why they are vulnerable during participation. This is also proven by the fact that sales from maintenance and recovery deals grew faster than new constructions in recent years. On one hand, it may give small companies an opportunity to benefit; on the other hand, they are less

beneficial for larger companies due to lower added value (in the case of prevailing fixed costs) and beset with inherent economic risk.

**The bankruptcy process
and the consequences thereof –
the regional point of view**

Differences in values from a geographical point of view proved a certain heterogeneity of bankruptcy. Table 9 shows how the values of indicators were scaled in all Slovak regions. The worst values in each criterion are in black, while the better values (in terms of the data spread, not in terms of the optimum) are in white. Generally, the Košice (KE) and Bratislava (BA) regions were ranked among the better percentiles (lighter background), although they represented the highest shares in total bankruptcies. On the other hand, the Prešov (PO), Trenčín (TN), and Trnava (TT) regions represented the worst percentiles (due to the scaling of the values from better to worse), in their case displayed against a somewhat dark background.

Table 9. Regional stratification of indicators (medians)

Regions	BB	BA	KE	NR	PO	TN	TT	ZA
Regional share of total bankruptcies in the sector (%)	11	25	17	9	14	5	9	10
Debt-to-assets _{x-2}	2.340	1.126	0.970	1.226	1.355	1.652	3.123	0.999
Debt-to-assets _{x-1}	3.210	1.580	1.014	2.790	5.649	5.310	4.350	1.467
Mature liabilities (coef.)	0.410	0.183	0.356	0.419	0.360	0.999	0.056	0.502
Crisis status _{x-2}	-0.573	-0.268	-0.007	-0.164	-0.529	-0.552	-0.729	-0.066
Crisis status _{x-1}	-0.688	-0.695	-0.035	-0.427	-0.895	-0.902	-0.965	-0.582
Life cycle (years)	7.826	11.833	11.871	12.205	11.556	12.140	12.474	8.037
Bankruptcy duration (years)	0.392	0.518	0.786	1.403	0.945	0.575	0.684	0.759

Source: own elaboration

The majority of the indebted companies were in the Banská Bystrica (BB) and Trenčín (TN) regions in period X-2. A year later, the situation had worsened significantly in Prešov (PO) and Trenčín (TN), thus demonstrating a sudden increase in debts compared

to assets (partly due to significant losses). In the Bratislava (BA), Košice (KE) and Žilina (ZA) regions, the increase in debt was not as dramatic. Incoming threats of overindebtedness and insolvency were also identified through the crisis status. In Trnava (TT),

Trenčín (TN) and Prešov (PO) the crisis was the most intensive, and in Košice (KE) the least. In all regions, due to negative equity, companies were (generally) over-indebted. The highest share of overdue payables on total debt (mature liabilities) was in Trenčín (TN), while in Trnava (TT) and Bratislava (BA) the solvency of the construction companies was better. Of course, ex-post analysis deals with bankruptcies which have already been completed, after the terminal situation had already arisen. Within the life cycle, it is very difficult to identify the proper breaking point, especially in situations where companies accrue an increasing amount of debt and fall into secondary insolvency due to the active receivables (which are overdue).

Although young companies appear to be more vulnerable due to lower capital, lower economies of scale, or less developed relationships with key stakeholders, the results showed that only two companies went bankrupt before the second year of their existence. This finding is in line with research by Levrato (2013) suggesting lower failure rates among young businesses. On the other hand, in our research 18% of companies had been operating for longer than 20 years. The oldest bankrupt companies are in Trnava (TT) region and the youngest in Banská Bystrica (BB), but other factors making age more or less relevant that had not yet been researched in the Slovakian context (e.g. regional intensity of competition, local or national business focus, etc.) might also exist. Specifically, younger companies frequently fail due to inexperience (Headd, 2003), underestimation of equity, cost calculation, or ignorance of accounting, while older ones fail due to resistance to changes or preference of routine activities (Kücher et al., 2020).

The distribution of bankruptcies in all regions was shown to have a normal distribution (Elexa, Hvolková, Knapková, 2019), notwithstanding the fact that construction was one of the most bankruptcy-prone industries in Slovakia. On average, according to the

Doing Business survey (The World Bank, 2020), Slovakia was 46th in terms of insolvency proceedings (compared to the Czech Republic being much higher in 16th place), recovering just 46 cents of each 1 EUR of debt, lasting for years, and incurring a total cost of 18% of property. There were only two countries with higher bankruptcy costs and eight with lower satisfaction measures (among OECD countries). On the other hand, general data from the Slovak Insolvency Register (2021) without specification of the particular industry suggested an almost 27.06% median cost in 2018, thus proving a certain underestimation, as was also claimed by Staszkievicz and Morawska (2019) in the case of Poland.

The duration of the bankruptcy process in construction companies was considerably shorter than in the above-cited Doing Business report, lasting for approximately nine months. The reason may be found in the characteristics of bankrupt companies presented above, mainly in assets (or the absence thereof), and in the fact that those companies were economically in bankruptcy (in terms of overindebtedness) a long time prior, although legally the bankruptcy process had not yet been initiated. In 38% of bankruptcies, the process was halted due to insufficient property and even in the case of some assets recorded on the company's balance sheet, their value was recorded at historical prices, including receivables that cannot be fully sold (or collected), all of which limited the level of recovery.

The Pearson correlation coefficient proved the existence of a significant but not especially strong relationship between the length of bankruptcy and the size of the debt (0.11, $p = 0.046$). It was supposed that, in accordance with Slovakian legislation, increasing debt leading to overindebtedness and insufficient asset value stops bankruptcy. Other factors (e.g. insolvency, the administrative burden, and judicial factors) were found to have a potentially more significant influence. Unfortunately, for creditors, it confirmed

that in many cases the bankruptcy occurred in a situation for which the debtor had been preparing. It was also partially proved by continually lowering sales and the sudden compensation of the owner's borrowings, followed by an accelerated sell-off of assets that were analysed separately. In their case, the effect (correlation coefficient 0.14; $p = 0.62$) indicates that the evidence is not sufficiently strong to suggest an effect exists in the population of bankrupt companies. It could also be an outcome of the abovementioned bankruptcy preparation (sell-off of assets or lacking assets at the time of bankruptcy). Thus, it also made a very weak contribution to the prolongation of the bankruptcy process. An even higher, albeit still quite weak, correlation was found in the case of company age (0.28; $p = 0.001$), very prudently claiming that the more mature the company, the longer the bankruptcy process will last, perhaps due to more complex relations with many partners, a potentially more complicated process, and a longer time period required for the inspection and acknowledgment of all debts (although it is expected that after so many years of successful cooperation, business partners are well known and the cumulation of debts is not an intentionally fraudulent process). The bankruptcy process in the Nitra and Prešov regions lasted the longest, whereby the oldest companies were bankrupt with rather higher debt-to-asset ratios one year before bankruptcy. On the other hand, the shortest bankruptcies were in the Banská Bystrica and Bratislava regions, both with quite a significant share of total bankruptcies across regions, but very different economic situations (more indebted companies and mature liabilities in Banská Bystrica; almost equal in terms of crisis intensity; older companies in Bratislava). This meant that, in the case of the third research question, it is not possible to identify the primary factor that prolongs the bankruptcy process. Although in the case of age the correlation was stronger, it is still too weak to have significant implications.

This is also supported by one other finding, namely that owners (or administrators) still have sufficient time and measures before bankruptcy to either prolong the crisis or prepare for bankruptcy.

Conclusions

The construction sector in Slovakia suffered for both cyclical/seasonal and fundamental/sectoral reasons. There are between three and five large companies that are somewhat dependent on public expenditures and public projects. Currently, construction of the northern and southern highways have slowed down; thus, railroad reconstruction has become relatively more important instead. The concentration of activities among a relatively small number of companies emphasized the dependability of the sector on its performance (the 10 largest companies had a 12% share of total sales in the industry and 1% of the total population had a 41.5% share in sales in 2019). It is visible even in the supply chain in the case of many small and medium-sized enterprises, which suffer every time some of the key players have financial problems. This is also one of the problems that brought the highway projects to a halt. Private investments in construction were dependent on economic conditions, which worsened in the last two years (including the pandemic-induced slowdown). Since the beginning of 2019, there were 17 months in which the sales in the sector had decreased compared to the previous year (Statistical Office of the Slovak Republic, 2020a), although in some of them companies paid the price for seasonal activities.

Another problem that has occurred in recent years is the development of the labour market, specifically the lack of workers. The qualifications, expertise, and experience of workers are considered the decisive factors for this state of affairs. However, there has been a long-term lack of a qualified workforce in this sector. This situation could threaten the

competitiveness of construction companies on the Slovak and European markets. Although employment in the construction sector has been on an upward trend since 2015, the availability of skilled workers (especially in manual and craft professions) is insufficient, and it is estimated that this situation will worsen in the future. The most likely reasons for this are the low average wage within the sector, long-distance work, and the overall weak attractiveness of technical fields of study, which lag significantly behind other fields among young people. Slovakia is solving this problem by supporting secondary vocational education through the introduction of a dual education system. At the same time, there is an effort to promote technical education, intensify cooperation between schools and businesses, and parallel adaptation of the content of education to the needs of practice. Moreover, the share of foreign workers in construction is next to automotive sector the highest, although in this case it is more or less seasonal.

Descriptive statistics showed that early signals of potential bankruptcy could be very simple and warn the company of the threat of bankruptcy long before real problems occur. On the other hand, it also showed that the statutory bodies of threatened companies are aware of those problems and can do a great deal to avoid terminal closure (or meet company obligations). At the same time, they may undertake many unethical actions that can hinder even the partial satisfaction of claims, as happened in case of bankruptcy processes stopped because of the insufficient assets of bankrupt companies.

It should be mentioned that this research suffered from certain limitations given by the sample construction and publicly available data. The sample was built from bankrupt companies which had already completed the process and been removed from the business register. The fact that some companies entered bankruptcy before the research period, and that those bankruptcies are still ongoing,

generally prolongs the estimated duration of the process and supports the measures offered by the World Bank (2020). On the other hand, it also points out that, for some companies (or owners), it is advantageous to remain in the bankruptcy process for a period of time. Publicly available data is considered a limitation due to several facts. First, it is not able to detect seasonal changes, and any annual financial summary may come too late for lenders to check the potential threat. Second, from a regional point of view, the distribution of companies was given according to their place of registration. This does not always correspond to the place of their economic activity, and as such their potential failure cannot automatically be linked to a local economic boom or crisis. Finally, the companies are highly heterogeneous, having specific expertise, portfolio and customer structure. Therefore, the research relied less on macro-economic cyclical data and instead looked at internal financial measures as reflections of external influences. Measuring the probability of failure among Slovak companies as Lesáková, Gundová and Vinczeová (2020) did, or comparing flourishing and bankrupt companies as Malakauskas and Lakstutiene (2021) or Mihalovič (2016) did using different analytical methods or modelling techniques, was not part of the research framework. Instead, the research focused only on bankrupt companies and followed their path before entering bankruptcy.

As the state is not only an administrator of the entire reporting system, but simultaneously also a referee when it comes to the legal recovery of debts, it is odd that so many companies can continue to operate freely for so long under the threat of extreme debts, especially in a situation where the state itself is one of the most affected stakeholders/lenders with a very low recovery rate. Economic stagnation or crisis and weaker business activity during the pandemic has brought and will continue to bring new candidates for bankruptcy; therefore, it would

be necessary to look for potential changes in warning signs, but also to study in detail the potential cross-industrial transmission of problems from one industry to another.

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