

Article

Strategic Management of External Disruptions on Realization of Business Plans—Case of Serbian Manufacturing Companies

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Abstract: This research paper analyzes the key influences of external disruptions on the business sustainability of medium-sized manufacturing companies operating in Serbia. This paper explores the strategic management of massive external disruptions (such as the global pandemic in 2020) and unveils key correlations between internal and external influences. The quantitative part of this research includes two phases; the first was conducted in 2019, with predictions made in the pre-pandemic period, and the second phase was conducted in 2022 by comparing the predictions with actual business results. Existing theoretical research has already identified many weaknesses, including how strategic business outlooks (in relation to economic downturns and bottlenecks within supply chains) influence the success of medium-sized companies, as well as internal factors, such as strategic management and the flexible adjustment of business plans. Taking into account that the whole world is still recovering after the pandemic, the empirical research conducted on 580 Serbian companies sheds light on how the pandemic disruption has affected businesses. As business plans relate to forecasted revenue, profit margins and investment effects, the main results of this study confirm that predicted business results are significantly influenced by supply chain disruptions, negatively affecting companies relying on the import of raw material and companies that have widely internationalized their sales efforts.

Keywords: strategy; business plan; disruption



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1. Introduction

While the implications of the last major disruption influencing the whole world are still being measured [1–3], companies all over the world are making strategic efforts in order to adjust their previously made (pre-pandemic) business plans to a novel reality. Many company executives faced the assumption that everything would change after 2020, but it was their sole responsibility to find the best solution to the crisis.

On a more focused level, taking into consideration Serbia's general economy in 2020 and 2021, the social and economic disruption caused by the COVID-19 pandemic resulted in an estimated net loss of 12.7% of its GDP in 2020 [4]. Despite the emergency measures, available to Serbian companies in order to maintain their good standing during the original shock to the market, the second quarter of 2020 was the most disastrous, as lockdown measures had their highest influence on the economy [5]. Serbian Government interventions in the SME sector were significant in order to maintain business activity, so several measures were defined—credit loans totaling 200 million EUR, designed to “alleviate the immediate negative effects of the pandemic by offering working capital finance, strengthen competitiveness and build-up of future resilience through financing small-scale investments in several sectors”, as defined in [6], and a tax-free period was introduced for all

companies, followed by financial assistance during 2020 and 2021, based on the number of employees [7]. The implications of these government interventions were analyzed in [8], a full-scale study on 726 companies from Serbia, and the following discoveries were made:

1. COVID-19 pandemic effects have massively hit Serbian enterprises regarding their influence on international trade, so government interventions helped by replacing the missing cash inflow;
2. Supply chains were disrupted heavily, so the majority of placement focused on the domestic market, instead of the Balkans region (or European markets);
3. SMEs' coping strategies were adjusted due to low-interest loans from the government;
4. SMEs maintained their number of employees because their salaries were being paid (financed) externally by the government.

Globally, it was reported that 70 percent of jobs were at risk during and closely after the pandemic, and the statistics can be found in the accommodation and food sector, along with 56 percent of jobs in the wholesale and retail sector, 75 percent in the real estate and construction sector and 68 percent in the professional service sector [9].

According to research results on crisis-combating strategies in emerging Asian markets, supply chain disruptions, problems of foresighting business results and cash flow shortages were identified as the most important shocks (disruptions) to small and medium-sized companies [10].

At the moment of the COVID-19 disruption outbreak, there were 17,293 registered small and medium-sized manufacturing companies in Serbia with up to 249 employees [11], employing a total of 180,421 people. Over 60% of them reported that, during the pandemic, they significantly reduced their operation capacity or could not operate at all, and 75% of them reported having lower income during 2020 than planned in 2019.

In the strategic business analysis factsheet [12] from the West Balkans, including Serbia, the key features of medium-sized companies in the post-COVID-19 period are the enablement of a sustainable transition to the digital economy, better access to loans and the unification of the regional economy, while the main business indicators for Serbia report that it has the largest share of manufacturing value added to the economy (compared with other countries), but the export activities of the same companies still only amount to one-fifth of all exports from Serbia. Additionally, according to that study, access to financial resources during challenging times (such as the pandemic period) is essential for business survival, and also for the adequate planning of future business results.

Medium-sized companies have traditionally been exposed to most economic downturns. One study examining a limited sample from Portugal found that, during the last 40 years, while all manufacturers were negatively affected but able to work through difficult cycles, large companies were far more likely to recover quicker from economic downturns than smaller companies [13].

Due to the nature of medium-sized companies often being enterprises that may be family owned or run by top management, sudden economic disruption can be better handled by large businesses, since they are more often in a position to entirely cut their workforce, while it would lead to smaller companies closing down their businesses [14]. Additionally, in some economies, external disruptions can also speed up the natural selection process of shutting down businesses that are not large enough to survive in hard times, which was discovered in a research study conducted in Greece [15].

Despite the massive footprint of multinational companies directly or indirectly employing millions of people, it must be noted that medium-sized companies that employ above 50 and below 250 people still make up the largest share of economic output [16].

In 2019, 2020 and 2021, medium-sized companies comprised more than 4 trillion EUR of the EU-27 (plus the United Kingdom). However, medium-sized companies, due to the economic downturn caused by COVID-19 (which led to a massive decrease in market supply and demand), were especially at risk or outright harmed [17]. Specific industry sectors (such as hospitality management and transport) are predominantly sectors

whose return will require more external support or shall never return to previous heights at all [18].

Very few research studies focused on the assumption that the owners or CEOs of medium-sized manufacturing companies are in a better position to predict business outcomes if their business performance is not depending on international partners and if their business is part of a smaller (and thus more sustainable) supply chain. These two important research topics present a research gap, which may be further extrapolated in the empirical research presented within this article. Previously, there were no similar research attempts conducted in Serbia or anywhere else in the Balkans region, but these problems can certainly be observed equally in a global context. Therefore, the authors of this paper started from the following research questions in order to address deficiencies within the existing worldwide body of literature:

- RQ1. *Is it possible to correlate business plan predictions empirically between the pre-COVID-19 (year 2019) and post-COVID-19 (year 2021) periods following the fact that predictions are more accurate if a company does not depend on the import of raw materials?*
- RQ2. *Is it possible to correlate business plan predictions empirically between the pre-COVID-19 (year 2019) and post-COVID-19 (year 2021) periods following the fact that predictions are more accurate if a company has predominant placement of their products on a domestic level?*
- RQ3. *Are companies participating in smaller supply chains less prone to bottlenecks (lower level of placement of finished goods)?*
- RQ4. *Is the future business outcome of a company directly affected by the direction and amount of planned investments?*

Based on the context of a de-escalating crisis evidenced throughout the world, with clear consequences measured in Serbia, the authors decided to follow-up from a previously unpublished study conducted within a doctoral dissertation of one of the authors of this paper (originated during 2019) on a sample of 640 medium-sized manufacturing companies from Serbia.

The authors of this paper analyzed business sustainability in relation to their supply chain participation/management and internationalization efforts. According to [19], business sustainability can be perceived as a complex, core strategic value for adequately driving competitive advantage. This core value is achieved through fostering development projects and investments, improving supply chain risk management and the continuous improvement of financial performance in the long-term. Some other (less relevant to this paper) aspects of sustainability are customer and investor loyalty, as well as employee engagement.

The emergence of the COVID-19 crisis presented a proper testing ground for initial predictions made during 2019 (for the forthcoming period of 2020–2022), so the authors organized a second phase of their research during 2022 to allow new and revealing conclusions to be recorded by comparing initial predictions against the actual business performances of companies.

The identification of the key effects of COVID-19 disruption on company business performance and the predictability of business outcome may be determined when examining:

- Whether the manufacturing company has international supply chain participants or is in full control of the supply chain;
- If the majority of the sales share comes from international or domestic destinations;
- Whether the supply chain in which it participates includes possible “bottleneck” participants.

Therefore, it is possible to define the main research goal as follows:

- To identify key the effects of strategic management within a medium-sized manufacturing company through the influence of external disruptions on the realization of business plans (measured through planned income growth);

Bearing in mind that the official business performance results for Serbian companies are not available for 2022 and taking into account that the business results for the previous

year are always published with 3–4 months of delay, the authors were forced to wait in order to be able to approach company CEOs or owners during Q1 2022.

Based on a literature review and the defined research gap, the purpose of this research was to determine the key influence of external disruptions on company sustainability. This will be achieved through measuring the influence of the pandemic's disruption on key strategic elements, such as supply chain disruption, planned investments and business plan predictions.

This paper has its foundation in previously published research by [20] on analyzing the future growth of surviving companies. Growth capacity was described there by using the values of the output parameter set from forecasting models that are able to predict the next life-cycle phase of a company. Growth capacity was presented as the delta between the forecasted and current values of parameters observed, such as networking capital, liquidity and profitability. The capacity for growth is limited based on the input parameters, defined by the company CEO or owner, through the time horizon for decision-making (the forecasted results are most significant for a maximum of a couple of years in advance). Additionally, the direction of investing can also be seen through the investment plan designed to ensure company growth, all of which have been investigated in this research and shall be presented in the following chapters.

The research methodology applied in this paper consists of conducting quantitative empirical research on a sample of manufacturing companies operating in Serbia by testing several research hypotheses, with the goal of determining adequate correlations. The findings and remarks were discussed in detail and compared with previous research.

This research has been defined through five chapters. The literature review chapter covers three detailed theoretical review topics, covering the impact of internationalization efforts and influence on company business performance, effects of external disruptions on planned investments and finally supply chain bottlenecks (sustainability measured through supply chain size). Next, the methodology chapter displays the framework and formulation of the research hypotheses, developed in order to find answers to research questions. Within the results chapter, the authors present the main research results by analyzing and correlating key findings, with special attention paid to hypothesis testing (accompanied by appropriate tests). Lastly, the research results are followed by the conclusions and a detailed discussion, which provide context from the research results based on previous theoretical findings. Additionally, this chapter includes a presentation of limitations, along with practical implications and future plans for research efforts on this topic.

2. Literature Review

Since 2000, foreign investments in multiple industries have become an integral driver of economic growth in Serbia [21]. Such investments indirectly affect medium-sized companies, particularly manufacturing companies. Arsic [22] suggested that company business owners are heavily involved in managing allocated time and responsibility. Arsic [22] also noted that they were more oriented towards B2B (business to business) interactions, further claiming that a single decision maker is in a better position to predict business results as they directly control internal processes. In addition, a company that is not considered as large (by turnover or number of employees) can be more independent of other participants in the supply chain and particularly isolated from disruptions in foreign markets. It is necessary to further explore and analyze theoretical grounds from previously published papers, covering topics related to internationalization efforts, growth capacity achieved via investment effects, and the influence of supply chain bottlenecks on the business performance of a company.

2.1. Import/Export Activities and Influence on Company Performance

H1. *Medium-sized manufacturing companies are less influenced by external disruptions in terms of business outcome if they are less dependent on import and export activities.*

Based on the literature review, the generation of new courses of business may be linked to connectivity, cooperation and enhancement offers by taking advantage of location and trade to optimize export and import [23]. However, it is still uncertain how companies may do their best to include themselves in international supply chains and trade networks.

Within European manufacturing companies, competitiveness in the export and distribution of products has been found to be the most significant factor or common feature [24]. Furthermore, if a company decides to invest in innovation, it may positively contribute to the likelihood that it will be able to export its products with greater success. Moreover, when a company utilizes government networks (or supply lines), it is far more likely to export successfully, at least to the nearest region surrounding its main market. A company is also more likely to be an exporter when participating in industrial networks or chains of similar companies by manufacturing sector [25].

Conversely, local funding (either through informal finance or local banks) may be a sign that companies are only oriented toward their local economy, placing their products mostly within national borders. However, export participation has also been found to drive technological innovation. Small and medium-sized companies may also perform worse overall in terms of exports and finance when compared with large manufacturing corporations [26].

Export does not need to be considered as important, across vast global lines in order to be of curtail importance. With the COVID-19 pandemic, which has weakened global supply lines, Cai and Luo [27] suggested that it is likely that manufacturing supply chains are to become more regionalized and digitalized as the world tries to emerge from a crisis. Companies, especially those in manufacturing, need to view regional export as one source of potential innovation in sales and distribution processes in order to better control demand fluctuations.

This argument is strengthened by results surveying 229 Australian and New Zealand companies, which indicate that, if a company develops networks through trade, it can increase the companies' operational performance [28]. By doing so, companies are able to create a foundation from which they are able to innovate through supply networks.

Subject to economic cycles, specific treatments are required to best weather difficult times among companies, and it was found that managers who possess a long tenure at the company and who invest in employee skill-specific training achieve the best performance on a company level [29]. In order for companies to achieve resilience, it is necessary for them to be able to efficiently respond to the changing environment through ambidexterity (i.e., the ability to apply existing skills and talents to new areas/opportunities) and strategic consistency [30].

The effects of supply chain management (SCM) on imports and exports vary widely on a national basis, making it complex to observe unilaterally. Universal SCM practices may be able to improve and sustain the operations of companies, while inhibiting factors may appear on a national level [31].

A distinct issue facing companies in times of crisis is that their traditional supply lines may drastically alter [32]. Therefore, dependable imports and exports may substantially shift in light of a changing market. However, strengthening ties can help companies to bridge communications with financiers and suppliers, thereby allowing them better access to supply chains and to sources of liquidity that they may be able to use [33].

It can be concluded that the level of dependence on internationalization within the supply chain (where a company participates) should be investigated via empirical research to check for answers to all research questions and to validate the proposed research hypothesis.

Additionally, companies also face an extra burden via financial constraints and limited local markets [34]. However, where possible, research has shown that they may also turn to export as a manner to fight increased prices and associated overhead costs during economic downturns. Nevertheless, this is not within the reach of all companies, and this is not the focus of this research because of the sheer nature of the COVID-19 pandemic.

Additionally, companies engaging in import activities face challenges in accessing and maintaining existing supply chain relationships. Trust needs to be established within companies to allow them to be able to rely on partnerships formed in their respective supply chains and to ensure that a company may continue to deal with sudden changes, especially in regard to the disruption of imports [35].

2.2. Effect of Disruption on Direction and Implementation of Planned Investments

H2. *The predictability of a company's business outcome is directly impacted by planned investments.*

While companies are commonly cited as innovators and drivers within the economy that can best adapt to changes due to their limited structural size and business obligations [36], they have been adversely affected by the worldwide pandemic, which has led to a vast number of businesses potentially running out of cash [37]. One key factor is that companies, although theoretically able to recover from crisis easier than larger companies, are in fact slower to react due to their sheer momentum; they also lack the management systems and tools, as well as financial health, to do so [38]. It is necessary to empirically examine how planned investments impact the eventual size of a business outcome and what determines the volume of shrinking planned investments after the event of a massive external disruption.

One key factor holding significant influence over company performance is the availability of finance sources to support investments. According to Meslier [39], financial constraints on privately owned companies always play a crucial role in their ability to function and may be exacerbated in times of crises. Companies removed from these channels are, therefore, more prone to the effects of large-scale economic downturns, especially when there are black swan events affecting markets, as well as the application of idiosyncratic liquidity strategy [40]. The most significant factor in limiting a company's operations seems to be the "Chicken and Egg" problem—they need to provide clear strategies to receive the funding necessary to grow, but first, they must obtain some funding to be able to apply strategic management.

Funding seems to lead to improvements within the business that may open further opportunities in financing, but one business cannot achieve the first goal without the second. Apart from private financing channels, companies may not have the preconditions or ability to apply for government relief in economic downturns. A survey conducted by the Rand Organization found that companies in the United States were unable to participate in both public and private assistance due to their limited capacities to do so. Furthermore, in the case of some smaller medium-sized companies, they were unable to continue business operations due to interruptions in the supply chain and them not being well-established compared with larger organizations that could draw on their already established business relationships. This is particularly the case when a company outsources one or several business functions (transport, sales, packaging, etc.), which, in the case of external disruption, could lead to the collapse of the whole company. Research conducted by the Carbó-Valverde [41] in Spain indicated that small- and medium-sized companies depend on trade credit, while the impact of bank loans on company operations during crises is smaller. Liquidity distractions are distributed through trade credit channels and may influence other suppliers in the supply channel [42].

Frequently, companies need to resort to alternative channels to continue operating. Microfinancing, for example, extends the needed liquid capital to struggling industries during pandemics and economic slowdowns. Given their smaller footprint, companies may need to turn to these in order to finance their business operations or to conduct business in general [43].

A sample composed of 13,430 Eastern Europe and Central Asian companies was found to favor companies that operated through formal financial channels. There was a positive correlation between operating through formal finance and the innovation of processes and products that allow the company to operate. Innovation under formal finance was

found to be more crucial for early stage companies. Nonetheless, informal finance exerts a significant impact on the product marketing of companies with longer tenure [44].

By testing hypotheses in a sample of 200 manufacturing companies, Partanen's [45] results showed that supply chain ambidexterity decreases company performance; however, network capabilities and strategic information flow with their supply chain partners help to mitigate this negative relationship.

According to a previously mentioned study, medium-sized companies in Serbia are relying on internal financial reserves, rather than loans [46], which was recorded in the highest share (around 80% of manufacturers) when compared with micro, small and large enterprises. On the other hand, it was also reported that 60% of medium-sized manufacturers in Serbia suffer from problems caused by the collection of payments.

Dabić [25] found that it was not the total number of operating years, but rather the size of a business, that significantly affected its performance. Therefore, the larger the company, the more likely its business is to invest in something entirely new. Using a data set of 1248 companies from seven national contexts, a performance-based culture positively affects the results of those companies [46].

Brink [47] claimed that there are three distinct pathways by which companies may be successful—by achieving cooperation and collaboration with larger enterprises: (1) demand-driven cooperation, (2) supplier-driven cooperation and (3) partner-driven collaboration. Company contributions to innovation and competitiveness differ between these three, from providing specific knowledge, unity between suppliers and manufacturing companies and long-term investment collaboration on equal terms for competitiveness. While it may be difficult for a company to develop, it is achievable through the adequate directioning of investments and successful implementation.

2.3. Influence of Supply Chain Bottlenecks on Company Business Sustainability

H3. *Medium-sized manufacturing companies are less influenced by external disruptions in terms of business outcome if they control the supply chain integrally.*

Benigno [48] reported, in his study on global supply chains, that after the pandemic outbreak, the pressure index measured through the level of impact of bottlenecks has been at a historic all-time high. Kapoor [49] reported that supply chain (which also includes manufacturing companies) participants have experienced closed facilities, reduced capacities, increased costs and severe economic uncertainty.

Access and ability to adapt within a supply chain have recently been reported as being among the most decisive factors affecting a business when trying to positively navigate complications arising from COVID-19. A recent questionnaire among Serbian companies reported that supply chain disruptions occurred in 16% of all businesses surveyed, which far outweighed any other problems noted, such as the ability to pay wages, reduction in overall business and disruption of production [50].

It has also been found that already participating in an integrated supply chain that follows sustainability guidelines provides the benefits of long-term procurement and robust sales trends, thereby making companies more capable of weathering economic downturns [51].

The case of analyzing sustainability through the number of supply chain participants can of course only be used as a starting point in this research, while Coe [52], the Asian Development Bank [53] and Hamilton [54] defined the supply chain structure and interdependencies of participants, subcontracting for large international corporations and sensitivity of participant ecosystems. Bearing in mind that these factors span the last 15 years, they can be accepted as informative enough.

Liu [55] argued that partnership quality enhances organizational performance, which improves the overall supply chain, resource allocation and availability, as well as inter-company communication and collaboration activities. Sharing information within a supply chain and maintaining connectivity has a substantial influence on company performance.

External factors to the supply chain may determine how managers within it decide to allocate resources [56].

By not proactively striving to improve their relationships with supply chains through the coordination of the company with them, companies are further prevented from implementing innovative measures that help them to manage risks more effectively. The conclusion is that companies need to be better coordinated and more responsive to (global) supply chain disruptions [57]. It would be beneficial to investigate how the number of supply chain participants (and possible bottlenecks within the supply chain) influences the business sustainability of manufacturing companies.

Supply chain credit factors play an important role in the ability of a company to directly access the distribution pipeline, as well as inter-operative credit to purchase from within a supply chain. Moreover, interaction in the supply chain allows a company to better navigate due to it being familiar with the structure of its function [58].

The nature of trade between companies and their respective supply chain excludes the financial institutions that fund both. This knowledge asymmetry, if corrected, may lead to better sustainability within supply chain management as it allows financial institutions to better adjust rates and other factors by being included within the knowledge loop [59].

As measured through the solvency and profitability of companies, the conclusion is that possessing open logistic capacities among companies allows them to have a more positive impact on their overall sustainability [60].

3. Methodology

3.1. Framework

This research presents the results of the second stage of a two-phase study surveying medium-sized companies in Serbia that are the best representatives of the Serbian economy and a good testing ground for the investigation of external disruptions caused by the pandemic. The authors decided to perform a survey in order to include objective indicators (income growth) and the subjective opinions of the company owner or CEO (such as the plans for the company). All company owners or CEOs who decided to participate in the survey had to reply to several closed questions where they could choose only one option (possible values were 0 or 1):

- What supply chain section has been most at risk during the COVID-19 pandemic (import of raw materials, exports, placement in the country, internal reduction of manufacturing or raw materials from domestic suppliers)?
- To what extent did COVID-19 prevent planned investments in capacity growth (investments stopped entirely, investments carried out as planned, decreased when compared with plans or there was no intention to invest)?
- What is the level of internationalization of your business (fully international, only domestic, operates within an international supply chain or controls supply chain integrally)?

Additionally, calculations were made to determine the income growth recorded in 2021 versus the predictions made in 2020 by owners or CEOs. These calculations were later used to analyze key correlations. All survey replies were statistically tested for internal validity, and there were no missing replies or mistakes in the completion of the survey.

It is possible to define the following graphical interpretation of the research framework, presented in Figure 1, to help the reader better understand the conceptual framework, problem identified from real-world symptoms, identified specific knowledge gap connected to the purpose of the study and eventually the correlation of the research goal, questions and specific variables.

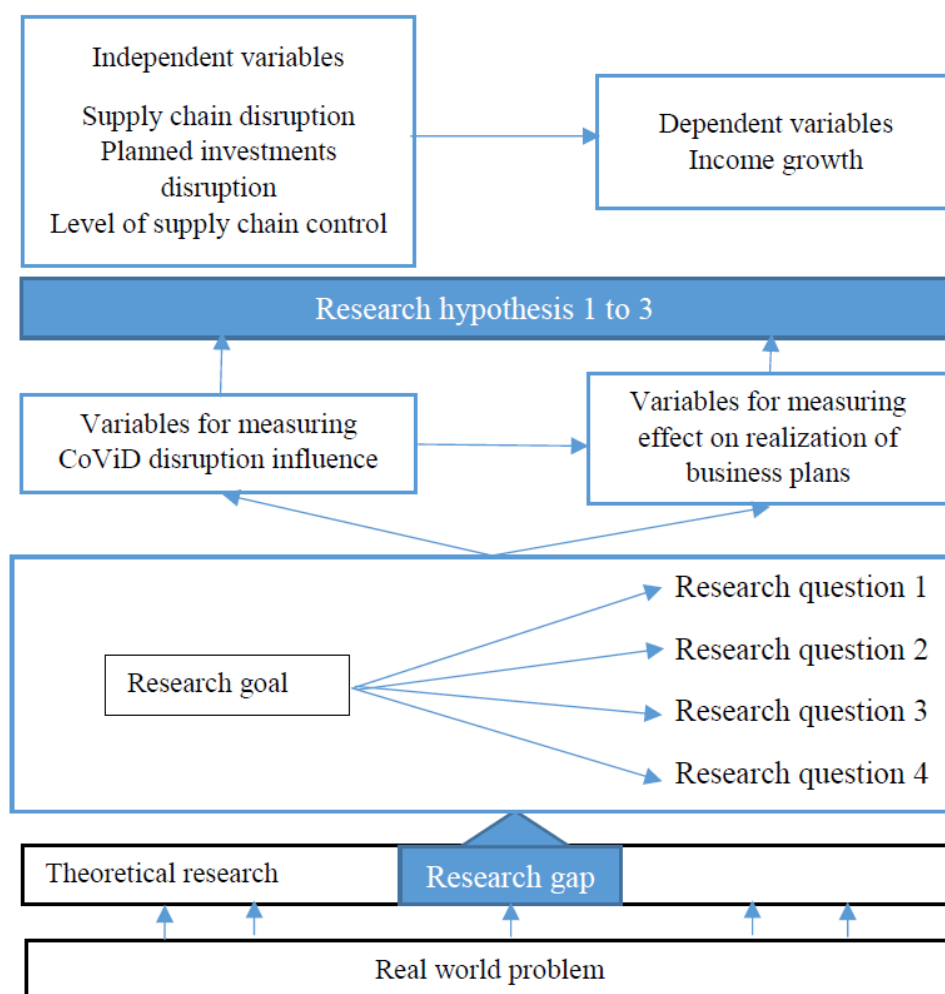


Figure 1. Research framework.

The quantitative research involved the same companies in the pre-pandemic period (first phase conducted in 2020 within a doctoral dissertation of one of the authors of this paper) and post-pandemic period (second phase conducted in Q2 2022 within a joint effort of all of the authors of this paper).

The total sample consisted of 640 companies from Serbia (who replied to the survey in 2020 out of a total of 6000 contacted companies), which employed more than 49 employees and up to 249 employees, across all manufacturing industries (service-oriented companies were left out of the research).

The authors decided to focus on findings from the second phase conducted in 2022 after testing the initial conclusions from the first phase (results from the first phase are displayed in Appendix A). The initial phase of research (conducted before the pandemic) included the examination of correlations between business performance predictions (income growth) for 2020 and the expectations of manufacturing company owners (general managers) in terms of supply chain enlargement as well as the planned direction of investments in the midterm. Therefore, the research included statistical learning analysis based on multiple regressions in order to be able to come to some conclusions and findings regarding company strategy. Key findings indicated that those companies relying on enlarging the number of supply chain participants involved in domestic market placement are essential to income growth, while the key factors of predicted stagnation or income decline were plans to not invest at all. Interestingly, plans to invest less in capacity growth were correlated highly with significant income growth rates, possibly indicating that companies orient more toward other sales channels, such as digital transformation.

This paper examines the predictability of business results in a highly unpredictable environment through the analysis of real-world business subjects. The main objective of this study was to identify correlations that can describe what factors of company sustainability are in relation to income growth as a key indicator of business performance. In order to do so, the paper uses measurables reported among companies as defined in previous studies, such as those conducted by the International Trade Centre [61], as well McKibbin [62], Paunovic [63] and Baldwin [64], that were used to predict business activity for 2020 in terms of strategic business management according to the following determined disruptions:

1. Related to RQ1 and RQ3—Supply chain impact, measured through the number of individual participants in a supply chain or the level of integrity over supply chain activities;
2. Related to RQ2—COVID-19 lockdown impact, measured through lowered import/export activities and demand depressions (forced redundancies and lower demand);
3. Related to RQ4—Recovery, measured through planned investments that were successfully completed and the estimation of income growth in 2022.

All of these three major disruptions on a strategic business level can and shall be measured through hypotheses 1 to 3. Since the first phase of the study, carried out at the beginning of 2020, consisted of questions used to determine the most important factors (as well as surveying business owners regarding their plans for future growth), all of these same determinants were included in the second phase of the survey.

As already mentioned, the second phase included the factor of integral control of the supply chain level, the completion of planned investments (independent variables) and their correlations with achieving income growth/decline (dependent variables).

In order to be able to fully explore and elaborate the findings after investigating the main research goal, it is necessary to analyze what factors influence business outcomes and thus enable the perseverance of such results during a crisis.

Taking into consideration measurability and scalability with quantitative methods and techniques, key correlations between business factors were analyzed through statistical learning methods and techniques via simple linear regression analysis, as it represents an integral process of discovering statistically significant inferences and correlations.

3.2. Hypothesis Formulation and Variables Definition

The authors formulated three research hypotheses that could provide a novel approach to business predictability to be used in times of crisis, such as COVID-19. Factors linked to these hypotheses were applied through the main survey questions defined. The questions focused on efforts to determine the key influences of external disruptions on achieving planned business outcomes (with a combination of subjective opinion and available objective, public historic data about company performance).

The research hypotheses were formulated as follows:

- **H1.** *Medium-sized manufacturing companies are less influenced by external disruptions in terms of business outcome if they are less dependent on import and export activities;*
- **H2.** *The predictability of company business outcomes is directly impacted by planned investments;*
- **H3.** *Medium-sized manufacturing companies are less influenced by external disruptions in terms of business outcomes if they control the supply chain integrally.*

In order to determine key correlations and analyze statistically significant regressions, the authors introduced five dependent variables and fourteen independent variables (Table 1), which were valued as 0 or 1, since values for these variables were obtained from the survey)

Table 1. Regression model variables for the research hypothesis.

Group of Variables	Value of Variable	Independent Variable	Standardized Value of Variable
Income: actual result in 2021 vs. that predicted in Q1 2020	Growth larger than 5%	Y1	(0,1)
	Decline larger than 10%	Y2	(0,1)
	Decline less than 10%	Y3	(0,1)
	Stagnation (decline btw 0 and –1%)	Y4	(0,1)
	Growth up to 5%	Y5	(0,1)
COVID-19 disruption to supply chain	Import of raw materials	X1	(0,1)
	Export of products/services	X2	(0,1)
	Domestic market placement	X3	(0,1)
	Internal reduction of manufacturing	X4	(0,1)
	Raw materials from domestic supplier	X5	(0,1)
COVID-19 disruption to planned investments	Stopped entirely	X6	(0,1)
	Decreased when compared to initially planned in 2020	X7	(0,1)
	Carried out as planned	X8	(0,1)
	No intention to invest for the duration of the pandemic	X9	(0,1)
	Stopped entirely	X10	(0,1)
Supply chain level of control	Internationalized	X11	(0,1)
	Only domestic market	X12	(0,1)
	Operates within a supply chain	X13	(0,1)
	Controls supply chain integrally	X14	(0,1)

All research hypotheses were tested using their respective multiple linear regression tests (by analyzing regression coefficients—slopes and adjusted R-squared values) and validated for significance (ANOVA, *t*-test and *p*-values). All data generated during the survey tests were processed by using EViews v.11 and are presented in Appendix B.

4. Results

4.1. Research Sample

Since phase one of the research is not the main subject of this paper, the main focus will be on describing the research sample for phase two of this research.

Phase two consisted of survey questions related to the effects of the COVID-19 crisis on company business performance. The survey dealt with estimating the influence of the COVID-19 crisis on business outcomes (annual income) with respect to the previous year, examining which part of the supply chain was destabilized the most, how the crisis influenced the direction and amount of planned investments from being realized and overall checks for supply chain bottlenecks in terms of sustainability.

All respondents were given the opportunity to respond to the survey by e-mail, by contacting the authors over the phone, or by using the online questionnaire response form. A questionnaire was sent twice to each company to ensure that managers were able to find the time to complete the survey questionnaire. The questionnaire was validated immediately upon arrival (the e-mail address of the company was checked against the one to which the inquiry was sent) and the identity of the owner was validated. All respondents filled in answers to all the questions asked.

The authors contacted 640 companies in total (the companies surveyed in 2019). A total of 580 companies replied, and 45 had already shut down or were in the process of

closing. Finally, several companies (15 of them) did not have the owner or CEO available at the time of the survey process due to over-occupation.

On average, the sampled companies employed approximately 124 employees in 2019, with a clear increase in employment (compared to the previous year) of 2%, on average. Taking the official division of companies by size into consideration (fewer than 249 employees and more than 49 employees—medium-sized companies), the distribution of the companies surveyed was assessed according to their overall number of employees (Table 2):

Table 2. Segmentation of companies surveyed according to their size.

Company Size	50–100		101–200		201–249	
Number of companies—phase 1 (share of total)	180 (28%)	20 (0.03%)	298 (51%)	35 (5.4%)	102 (18%)	5 (0.01%)
Number of companies—phase 2 (share of total)	202 (34.8%)	0 *	286 (49.3%)	0 *	92 (15.8%)	0 *

* closed or unavailable for survey in 2022.

The sample did not include companies employing more than 249 employees, or micro and small companies. Bearing in mind that, in order to validate the predictions, the authors were limited to using data from 2020 and 2021; therefore, it must be stated that some companies may have grown beyond this limit within the time of the study, but it was highly unlikely due to the overall shrinkage experienced in the economy and the size of the surveyed companies.

Among the companies surveyed in 2021, there were 74,332 employees, while in 2020 and 2019 there were 71,125 and 68,929, respectively. These numbers indicate that employment in medium-sized companies in Serbia has increased in conjunction with the strong economic growth in the national GDP of Serbia during the last 5 years. All surveyed companies were limited-liability companies and all of them were manufacturing-oriented.

The authors tried to ensure the representativeness of the sample in terms of regional distribution (all four regions were represented to be proportionally similar) and industry distribution (there were examples of companies across most of the major industries in Serbia). The overall population of companies in Serbia is not defined in the literature originating from Serbia, as there are little formalized data regarding privately owned companies. All of the sample data were cross-referenced and tested.

The authors based the internal validity of the data gathered from the sample on the authenticity of the questions. The questionnaire reflected real-life processes in company business surroundings to extract the maximum amount of information on the topic from the respondents. Regional representativeness ensured (see a further statistical breakdown in Appendix A), the authors collected data from 580 companies registered in the four main regions of Serbia noted herein:

- Belgrade—290 companies (10,000 in total, of which 4000 generate 80% of the total revenue of this region);
- Vojvodina—128 companies (4000 in total, of which 1000 generate 80% of the total revenue of this region);
- Sumadija and Western Serbia—102 companies (2000 in total, out of which 800 generate 80% of the total revenue of this region);
- South and East Serbia—60 companies (1000 in total, of which 400 generate 80% of the total revenue of this region).

Now follows a presentation of the research findings from the second research phase.

4.2. Research Findings

Companies with their main area of business being performed domestically and accounted for more than 80% of their turnover were severely affected by the COVID-19 pandemic. The fall in exports in the majority of companies was substantial (according to

publicly available data from 2019 to 2021), with a significant number of respondents (about one-third) reporting a fall of more than 10%, which is reflected in decreases in exports of up to 10% (24% of the sample).

The placement of goods on the market also significantly fell (as reported by 29% of the sample). However, there was a considerable decrease in the imports of raw materials, where participants (43% of them) reported a more than 10 percent decrease (which has not happened since the last major economic crisis in 2009 for any of the surveyed companies that exported their products).

The COVID-19 pandemic has had the largest effect on investment plans among privately owned companies in Serbia, affecting how they plan to manage their further expansion and current operations through new projects. A significant number reported that they have now ceased all investments within the company for the duration of the pandemic. Those companies that have not stopped any investments have drastically reduced the invested amounts. However, a smaller number of companies (13%) reported themselves to be carrying out investments as had already been planned in terms of the direction and projected amount.

Oddly, some companies appear to have not planned investment into their businesses at all, as a significant number reported not having any plans to invest in the midterm. The pandemic has also reflected negatively on expanding internal capacities, with a significant number of manufacturers reporting that they have halted doing so. However, some companies reported that they are carrying on with plans to expand their capacities as had been established prior to the pandemic (there was no statistically significant difference regarding their answer to the same question in 2019).

It may be concluded that the significant fall in export has had an overt negative effect on the abilities of companies to maintain the same business outcome (revenue from sales). Finally, the owners/managers were not very pessimistic when planning for the future, but this might still be a case of premature conclusions.

From Table 3 displaying the regression results between key correlations, the following may be concluded:

- Import of raw materials highly correlates with an income decrease larger than 10% (correlations coefficient equals 0.39);
- Export of products/services correlates with a decline of income larger than 10% (correlations coefficient equals 0.41);
- Domestic market placement correlates with a decline in income larger than 10% (correlations coefficient equals 0.21).

Table 3. Completed planned revenue under the direct influence of supply chain sustainability.

Correlations	Income Growth: 2021 vs. Predicted in Q1 2020				
	Decline < −10%	Decline > 10%	Stagnation −1% and 0%	Growth 0–5%	Growth +5%
What Supply Chain Section Has Been Most at Risk during the COVID-19 Pandemic?					
Import of raw materials	−0.22	0.09	−0.04	0.01	0.38
Export of products/services	0.31	−0.20	−0.33	0.04	−0.01
Domestic market placement	0.29	−0.11	−0.03	0.03	−0.19
Internal reduction of manufacturing	0.03	−0.03	−0.03	−0.11	0.11
Raw materials from domestic suppliers	−0.03	0.01	0.11	0.02	−0.03

The regression analysis involving research variables yielded results using the eViews 11 tool that indicate key regression with Y1 (predicted growth in 2021 larger than 5%) for companies where the greatest threat to sustainability was the endangered import of raw materials from abroad. Y2 (a decline larger than 10%) indicated severely endangered exports to foreign markets. For Y3, Y4 and Y5 (decline less than 10%, stagnation and growth

less than 5%, respectively), there were no statistically significant regressions (supply chain sustainability vs. predicted income growth in 2021).

From Table 4 laying out the regression results (p -value below 0.05) between key correlations, the following may be concluded:

- There was a slightly negative overall correlation for companies experiencing a decline in income larger than 10% in 2021;
- Predicted 2021 growth in income directly correlated with the completion of planned investments for 2021 (predictions made in 2019).

Table 4. Predictability of SME business outcomes under the direct influence of the completion of investments into capacity growth.

Correlations	Income Growth: Actual Result in 2021 vs. Predicted in Q1 2020				
	<−10%	Decline less than 10%	Stagnation −1% and 0%	0–5%	+5%
To What Extent Did COVID-19 Prevent Planned Investments in Capacity Growth?					
Stopped entirely	−0.39	−0.02	0.32	0.16	0.01
Decreased when compared with that initially planned in 2020	−0.31	−0.02	0.21	0.12	0.11
Carried out as planned	−0.02	−0.10	0.21	0.24	0.38
No intention to invest for the duration of the pandemic	−0.36	−0.24	0.31	0.03	0.01

The results from eViews (Appendix B) indicate a key regression with Y1 (predicted growth in 2021 larger than 5%) and Y5 when the largest regression was recorded when investments were carried out as planned under Y2 (a decline larger than 10%) and when investments stopped entirely or there were no planned investments at all. For Y3 and Y4 (a decline of less than 10% or stagnation), there were no statistically significant regressions found.

4.3. Hypothesis Testing—Statistical Significance

In order to confirm/reject both research hypotheses, it is necessary to analyze the impact of multi-various independent variables within two groups of companies, demarcated into the two categories of whether they (1) conduct business internationally or (2) depend on other companies in the supply chain. As the financial component of this analysis was found to be expressed through three key dependent variables within individual participants in the chain, it is legitimate to analyze the differences in the values of independent variables for companies within both groups, as well as to analyze any statistically significant differences between companies within different groups.

Further analysis of the variables by the groups defined has been carried out according to the framework that has already been defined here but used in conjunction with additional statistical indicators to determine any statistically significant differences within and between the defined groups, as well as their p -value.

An ANOVA test was conducted in eViews v.11 to compare the business outcomes measured through the levels of income of companies within and between the groups sampled based on the values for 2019 and 2021 (subjective opinion of surveyed owners) and on the real values of financial indicators for 2017–2021, which were used to forecast growth within business plans.

The test was performed to determine whether it was appropriate to divide companies according to whether they were internationalized or independent of a supply chain.

Table 5 clearly shows that the two company groups (within and between groups) were sufficiently representative to be tested for correlations. Following the analysis of the sample, considerable variability was described within independent variables (based on the values of the sum of squares and mean of squares, which were significantly larger than zero).

Table 5. Results of the ANOVA tests within and between groups.

Dependent Variables	Company Group	ANOVA (Variability Sources Inside and Between Groups)				F Test <i>p</i> -Value
		Sum of Squares		Mean of Squares		
		Between Groups	Within Groups	Between Groups	Within Groups	
Y1, Y2, Y3, Y4 and Y5—actual income for 2021 vs. predicted income (from 2020)	Internationalized	416,564	345,199	13,601	9952	F 21.12 <i>p</i> -value < 0.01
	Only domestic market	216,323	215,787	378,508	170,747	F 28.11 <i>p</i> -value < 0.01
	Operates within a supply chain	393,053	223,133	129,941	6563	F 26.52 <i>p</i> -value < 0.01
	Controls supply chain integrally	116,711	225,232	218,010	145,997	F 27.54 <i>p</i> -value < 0.01

The highest score for the ANOVA test (the most substantial difference in variability) was recorded in relation to whether a company was internationalized or not. In the case of supply chain sustainability, there was a lower difference in variability, but it may represent the result of other (undiscovered) interdependencies.

It is 95% certain that supply chain sustainability and the completion of planned investments are key preconditions for business outcome predictability. Undoubtedly, after analyzing all test results, it can be concluded that there was a significant relationship between variables (adjusted R² was highly approximate to “1”, the F statistics value was much larger than “1”, the root square error (RSE) was slightly above the standard deviation level and the *p*-value was smaller than 0.05).

It can be concluded that either both research hypotheses may be confirmed, or that there is a statistically significant correlation between the business factors and business performances analyzed, or between companies that operate in international or domestic markets, as well as between companies that control supply chains integrally or just act as a participant. All tests were conducted on predefined values within the experimental region (based on the values of the variables within the sample).

5. Discussion and Conclusions

5.1. Key Findings and Conclusions

This paper examined whether and how external disruptions can be managed strategically to allow companies to confront challenges to the realization of business plans. The focus of this paper was on analyzing Serbian manufacturing companies of medium size, which contribute significantly to the economy and export. Correlations were determined between predictions made before the pandemic period in 2019 and the post-pandemic period of 2021. Correlations between business plan predictions were calculated depending on whether the company integrally controls the supply chain or depends on import activities at any level. Considering everything analyzed throughout this paper, to comprehensively understand the problem, the existing rationale regarding influences on the business survival of medium-sized value-added manufacturing companies can now be understood in more detail.

The key results show that, if companies focus their supply chain within national borders, they will be able to maintain previous business (financial) results in case of a large-scale disruption. Alongside the fact of them conducting business abroad, companies will face lower income if their international supply chains are falling apart, regardless of whether there is unmatched demand on the far end. The most significant influence on decreased business performance was observed in cases where companies are relying heavily on the import of raw materials from abroad, while the largest influence of stagnation during the pandemic period was recorded for companies that could not export their products because of the pandemic.

Additionally, business outcome is more predictable if the company management defines the correct vision through planned investments. The findings show that, if a company

strategically planned their investments and carried out their investments as planned during the pandemic period, the negative influence on the realization of business plans (predicted income growth) was rather minimal. In cases where companies recorded large decreases in income (and large disruption to the business plan being fulfilled), investments were stopped entirely or decreased when compared with what was planned to occur in 2020. There were no statistical correlations determined for companies that recorded income growth but did not invest at all during the pandemic period.

5.2. Discussion of Research Findings

The findings of this research present a good extension to a previous study by Paunovic and Anicic [64], who analyzed the impact of COVID-19 disruption to the logistics, organization, demand, receivables and financing aspects of an SME (based on a sample of 689 companies from Serbia conducting business in the manufacturing and services industries).

A specific advantage of this research is that it focuses on medium-sized manufacturing companies (because of the gross size of the impact of disruption), while in the study by Paunovic and Anicic [64], they only accounted for a small portion (5%) of the sample.

The conclusions of both studies are complementary regarding planning investments, dependence on international participants in the supply chain (import and export activities) and the supply chain level of control (number of participants).

Taking into consideration the regional differentiation of sampled companies (displayed in subchapter 4.1), the authors formed the majority of conclusions and key findings based on the Belgrade and Vojvodina regions (only a third of the overall territory), but both regions contain the majority share of the population and economic activity in Serbia. This form of generalization has also been performed previously in a study on Spanish manufacturing companies [65].

As also previously performed by Fairlie [66], the authors defined the main idea of creating an insightful report on the effects of the COVID-19 pandemic on manufacturing companies and determine its influence on the predictability of business results, so the following conclusions may expand on the following:

- The predictability of business results is directly influenced by the ability to carry out planned investments, as companies that have managed to carry out investments according to their plans recorded annual growth of income (or only a small decline). This conclusion presents an expansion of the results reported by Arsic [22] on selecting a strategy to avert a decline or stagnation phase in the company life cycle;
- Business success (measured through annual growth of income) is highly interdependent on the degree of internationalization, supply chain sustainability and control within the supply chain. This is complementary to other fast-track research conducted by Kraus [67], who focused on the preservation of business liquidity and the re-emergence of a modified business model (i.e., speeding up digital transformation projects) as a method for dealing with the aftermath of COVID-19;
- Minimizing the number of participants within the supply chain can present a factor of resilience, which can be quite useful in the case of large disruptions and shocks, which is fully in line with Dutton [68], who analyzed the pandemic and its primary effects of massive disruption on European enterprises;
- Sustainability during and after a major crisis is achieved by adequate balancing between the effects of investments (such as digitalization) and efficiency of supply chain resilience; similar factors were explored during the pandemic in a paper by Obrenovic [69], outlining financial discipline as the key strategic approach.

The authors of this paper attempt to discuss their results in the context of other published papers on the strategic management approach to external disruptions, such as the COVID-19 outbreak, similar to that in a study by Wentzel [70], who defined four key responses to the consequences of the disruption: (1) entrenchment, (2) perseverance, (3) innovation and (4) exit (shutdown).

In this research (on Serbian manufacturing companies), a two-phase study was carried out on the perseverance (plan realization) and investments following foundations laid in 2019.

Supply chain sustainability was analyzed through examining endangered segments of the supply chain since the emergence of the crisis, as well as through internationalization (imports and exports). These findings expand on preliminary findings reported by Del Rio Chanona [71] regarding supply and demand shocks stemming from COVID-19.

5.3. Limitations of the Conducted Research

This research study (having in mind the complex circumstances) contains several limitations, apart from the fact that the pandemic era is still not fully resolved. An important limitation of this study is that it anticipates a V-shaped recovery.

Based on this assumption, the authors compensated for missing data regarding business results for 2022 through the input of survey participants' estimated growth of the annual incomes of their companies. Since they were prone to optimistic or pessimistic biases, this estimation also presents one of the main limitations of this research.

An overall conclusion may also be made that the sample needs to be broadened, as the majority of the surveyed manufacturing companies recorded growth during the period in which the survey was conducted (initiated in 2019, recording slightly negative effects in 2020, with recovery in 2021), which very likely does not provide a complete picture of the effects and pandemic as a whole.

5.4. Practical Implications

This study contributes to theoretical and practical findings already reported in the wider literature by analyzing business factors that have the power to destabilize a company that manufactures goods and is thus involved more or less in a supply chain. The rationale for using "internationalization" and "predictability of business outcome" as two important factors of sustainability in terms of business performance and ability to realize plans was that all potential influences on business results—measured through annual growth of income (2021 vs. predictions initially made in 2020)—required them to be identified and analyzed, which was conducted through hypothesis testing.

Therefore, regarding the initially defined research gap, the authors developed several implications that can be useful when approaching the problem of business survival in cases of massive external disruptions:

- From the business survival aspect, owners or CEOs of medium-sized manufacturing companies are strategically managing external shocks if their company is conducting business mainly on a domestic level and if they are in full control over their supply chain. This signifies that they are in a better position to avoid business decline or shutdown, and it also confirms that such companies should take more risks when planning investments in the midterm;
- From the business planning aspect, proper strategic management of external disruptions can maintain the sustainability of a business, but key elements of that strategy do not contribute to the further improvement of business performance if it does not take place to its full effect. Means for achieving better business performance while exploiting existing strategic leverage points mostly include creating good direction for investments for the future;
- From an organizational perspective, strategic business planning is still in its early developing stage in the Serbian business environment; this study can serve all decision makers who are conducting business in similar markets, as well as other researchers closely connected to the topic.

After analyzing annual income growth versus business factors related to supply chain sustainability and internationalization on a sample of manufacturing companies from Serbia, there is one dominant description applicable: the predictability of business results initially forecasted within the business plan. One factor falls heavily towards integral

control of the supply chain and relies primarily on the placement of goods on the domestic market. When this is calculated into financial effects, a clear direction appears for planning future investments.

Therefore, the results of this research imply that, in order to achieve the forecasted values defined in the business plan, external shocks should be strategically managed by taking into account a variety of the mentioned external factors. Fulfilling this, the number of “unknowns” is reduced when a massive, unpredictable disruption takes place.

5.5. Future Research Plans

Future research will further investigate the links between important parameters directly related to the business of the company, with external (i.e., macroeconomic trends) parameters that shape the overall performance of small markets, such as Serbia, which would enable a broader perspective and are mandatory when analyzing the predictability of business results and the sustainability of a company. The research will certainly be updated after the business results for 2022 become available, making it a multi-year study on the same topic.

Additionally, the authors plan to broaden the scope of research regarding the parameters of supply chain sustainability, since within this research, findings from analyzed data confirm the initial hypothesis that medium-sized manufacturing companies are more sustainable (in terms of business results) if they control their supply chain integrally or if there are no other participants in the supply chain. This would include regional and European perspectives of the supply chain partners of Serbian manufacturing companies, making it the next logical step in research.

Gathering and analyzing more knowledge about businesses from the Balkans region that contribute the most significant share of economic activity within their countries will certainly provide a better understanding of some future external disruptions in case they are impossible to avoid.

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Appendix A

Table A1. Key results of phase 1 (conducted in Q1 2020).

Correlations	Income Growth: Predicted in Q1 2020 (Based on data from 2019, 2018 and 2017)				
	Decline < −10%	Decline > 10%	Stagnation −1% and 0%	Growth 0–5%	Growth +5%
RQ: What Section of the Supply Chain do You Expect to Grow in the Midterm? *					
Import of raw materials	−0.02	0.01	−0.01	0.01	0.26
Export of products/services	0.01	−0.01	−0.03	0.08	0.11
Domestic market placement	0.01	−0.01	−0.01	0.04	0.36

Table A1. Cont.

Correlations	Income Growth: Predicted in Q1 2020 (Based on data from 2019, 2018 and 2017)				
	Decline < −10%	Decline > 10%	Stagnation −1% and 0%	Growth 0–5%	Growth +5%
RQ: What Section of the Supply Chain do You Expect to Grow in the Midterm? *					
Internal reduction of manufacturing	0.01	−0.01	−0.01	−0.2	0.11
Raw materials from domestic suppliers	−0.01	0.01	0.01	0.22	−0.03
RQ: What are your plans regarding investments in the midterm?	Decline < −10%	Decline > 10%	Stagnation −1% and 0%	Growth 0–5%	Growth +5%
We do not plan to invest at all	0.31	0.33	0.39	0.01	0.01
We will invest more in capacity growth	−0.01	−0.01	0.21	0.12	0.11
We will invest less in capacity growth	−0.01	−0.01	0.21	0.24	0.38

* years 2020, 2021 and 2022.

Table A2. Statistics regarding the surveyed manufacturing companies.

Industry	Company Size (Approx Employee Number)	Average Years of Existence on the Market	Region of Serbia
Food industry	230	14	Vojvodina
Machines and parts manufacturers	90	18	South Serbia and Vojvodina
Textile industry	160	22	South and East Serbia

Appendix B

Table A3. Results exported from eViews 11. Independent variable Y1: growth exceeding 5%. Performance vector: root-mean-squared error: 0.245 +/− 0.455 (micro average: 0.473 +/− 0.000). Squared error: 0.211 +/− 0.404 (micro average: 0.240 +/− 0.322).

Dependent Variable	Coefficient	Std Error	Std Coefficient	t-Stat	p-Value
Supply chain—threatened raw material imports	0.27	0.03	0.41	2.99	0.01
Impact of the pandemic on carrying out planned investment	0.88	0.09	0.43	2.11	0.03

Table A4. Independent variable Y2: decreases exceeding 10%. Performance vector: root-mean-squared error: 0.361 +/− 0.115 (micro average: 0.399 +/− 0.000). Squared error: 0.219 +/− 0.225 (micro average: 0.274 +/− 0.228).

Dependent Variable	Coefficient	Std Error	Std Coefficient	t-Stat	p-Value
Impact of the pandemic on carrying out planned investment	0.75	0.17	0.33	1.33	0.02
Supply chain—threatened export	0.39	0.13	0.35	1.81	0.03
All planned investments halted until the end of the pandemic	0.40	0.15	0.45	1.65	0.04

Table A5. Independent variable Y3: decreases lower than 10%. Performance vector: root-mean-squared error: 0.189 +/− 0.323 (micro average: 0.299 +/− 0.000). Squared error: 0.245 +/− 0.434 (micro average: 0.215 +/− 0.324).

Dependent Variable	Coefficient	Std Error	Std Coefficient	t-Stat	p-Value
Supply chain—threatened exports	0.11	0.11	0.023	0.44	0.09

Table A6. Independent variable Y4: stagnation (from −1% to 0%). Performance vector: root-mean-squared error: 0.212 +/− 0.346 (micro average: 0.233 +/− 0.000). Squared error: 0.291 +/− 0.193 (micro average: 0.099 +/− 0.383).

Dependent Variable	Coefficient	Std Error	Std Coefficient	t-Stat	p-Value
Supply chain—threatened exports	0.04	0.08	0.07	0.54	0.15

Table A7. Independent variable Y5: growth up to 5%. Performance vector: root-mean-squared error: 0.193 +/− 0.223 (micro average: 0.297 +/− 0.000). Squared error: 0.240 +/− 0.431 (micro average: 0.223 +/− 0.390).

Dependent Variable	Coefficient	Std Error	Std Coefficient	t-Stat	p-Value
Impact of the pandemic on carrying out planned investment	0.76	0.12	0.2	1.99	0.05

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