

Digitalization of BSR in the recession

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CHRONICLE

Article history:

Received: December 21, 2023

Received in revised format:

January 2 2024

Accepted: February 9, 2024

Available online:

February 9, 2024

Keywords:

BSR digitalization

Economic recession

BSR performance

ABSTRACT

Digitalization of BSR (buyer supplier relationship) is generally one of the effective tools to strengthen the supply chain. This study aims to establish the correlations between the perceived importance of BSR, investment in BSR digitalization and ER (economic result) change. Data collecting was realized in the form of a questionnaire survey. This survey was carried out in Czech enterprises of different focuses and sizes. Hypotheses are tested using Pearson's Chi-squared test. The study confirmed that correlation between the perceived importance of BSR and investment to BSR digitalization is stronger for producers than for service providers. The investment in BSR digitalization brings about ER development in the short term only for services providers. Enterprises do not associate the development of ER and the importance of BSR. BSR is considered an important area as part of the SCM whole, but ER development is not associated with this area, nor does investment in this area have a clear economic effect in a recession. Thus, the logical triad of "importance of the process- investment in process development – process effect" is unprovable in the case of BSR digitalization in a recession.

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1. Introduction

The Covid-19 pandemic increased supply chain complexity and subsequently caused increased supply chain vulnerability in all aspects (Duong et al., 2022), led to material flow constraints that caused a global economic recession (Gomez et al., 2021; Priya et al., 2021; Li et al., 2022). The Global Value Chain (GVC) needs to be flexible to turbulent external changes (Ersay and Akdag, 2022; Ha, 2022). According to Cherkas and Chekh (2018), change in the structure and architecture of GVCs is associated with technological progress. Supplier-customer relationships within the value chain belong to procurement, which traditionally falls under facility processes (Jensen, 2019; Jurasek et al., 2021). However, recent studies, e.g. Hofbauer and Sangl (2016), point to an intensification of the role of purchasing within the value chain. Modern purchasing and supply management implies cross-functional integration between purchasing and other functions of the firm (Jaaskelainen & Heikkilä, 2019; Dušek, 2020). Thus, the importance of BSR as a part of procurement is becoming increasingly important. The perceived importance of buyer-supplier relationship (BSR) may vary across firms. The digitalisation of business processes is one of the key directions in the development of value chain knowledge (Bastug et al., 2020), as it is an important factor in strengthening the firm's resilience to external influences (Munien and Telukdarie, 2021), guiding the development of supply chains in the COVID-19 period (Pollák et al., 2021; Rokicki et al., 2022). Investing in the digitalisation of internal processes is a pathway to achieving greater business performance (Yu et al., 2021; Kollmann & Dobrovič, 2022) and sustainable competitiveness (Zighan, 2022). Veile et al. (2021) mentions the potential significant benefits of investing in BSR digitalisation. Digitalisation and its positive impact on individual core and facility processes is a prominent topic in the literature and may include digitalisation of manufacturing (Pekarcikova et al., 2021; Martinez et al., 2022), digitalisation of marketing (Vadana et al., 2020; Khan et al., 2022), digitalisation of HR management (Fernandez and Gallardo-Gallardo, 2021), and others. The concept of the "digital supply chain" is still evolving (Haddud and Khare, 2020), and sets requirements for effective communication within BSR (Kovalevskava et al., 2022). The digitalisation and automation of processes and transactions between

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supplier and customer is a prerequisite for the success of a business (Veile et al., 2021). It can be summarized that digitizing processes is expected to achieve better business performance.

BSR (Buyer-Supplier Relationships) is discussed in the literature from several perspectives, e.g. in the context of aspects of trust between partners (Collier et al, 2022), partners' subjective perceptions of BSR success (Sombultawee and Pasunon, 2022), and sustainability of BSR (SBSR- Sustainable buyer-supplier relationship). Bai et al. (2021) focuses on sustainable buyer-supplier relationship (SBSR- Sustainable buyer-supplier relationship), the interconnectedness of partners in BSR (Sharma et al., 2022), in his study, the multidimensional sustainable performance (which includes economic goals of short-term profitability, and long-term growth and environmental performance) and their interconnectedness. The interconnectedness of the three aspects of BSR (i.e., perceived importance, investment in digitalisation, and increase in firm-wide performance) is the object of investigation in this paper. Enterprise performance in this case will be defined in the form of economic result (ER). The links that will be the object of research are schematically presented in Fig. 1.

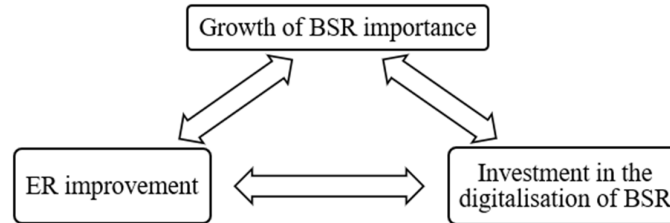


Fig 1. Research object: the interconnection between the importance of BSR, investment in BSR digitalisation and economic result improvement.

The main objective is to establish the existence of a direct link between the perceived relevance of BSR, investment in BSR digitalisation and economic performance. There are research questions defined for aim achieving:

- *RQ1: Is there a link between the perceived importance of BSR and investment in BSR digitalisation?*
- *RQ2: Is there a link between perceived investment in BSR digitalisation and economic result?*
- *RQ3: Is there a link between economic result and the perceived importance of BSR?*

2. Literature review

2.1 Bibliographic map

To determine the topical relevance of the article, a comparison of bibliographic maps created by VoS Viewer was chosen. The first step was to create search parameters based on the information found in the literature search. After entering the required parameters into the database, it is necessary to export all the results into a format that suits the VoS Viewer program. It is possible to modify the creation of the bibliographic map by means of refinement options (number of occurrences and others). The resulting map is made up of bubbles that are clustered by colour. The distance and size of the bubbles is an important factor that determines the relationships and number of occurrences of each bubble (Van Eck & Waltman, 2010). After the completion of the bibliographic maps, the top 5 keywords were selected and included in the keyword occurrence analysis. The analysis identifies the increase in articles with the selected keyword over the last 10 years. From this data, a graph is created to determine the transcription function. Determining the rewrite function is done in Excel using the least squares method. The correlation coefficient was used to determine the accuracy of this transcription (Yang et al., 2021; Zhang et al., 2022).

Linear regression function:

$$y_i = \beta_0 + \beta_1 \cdot x_i + \varepsilon_i$$

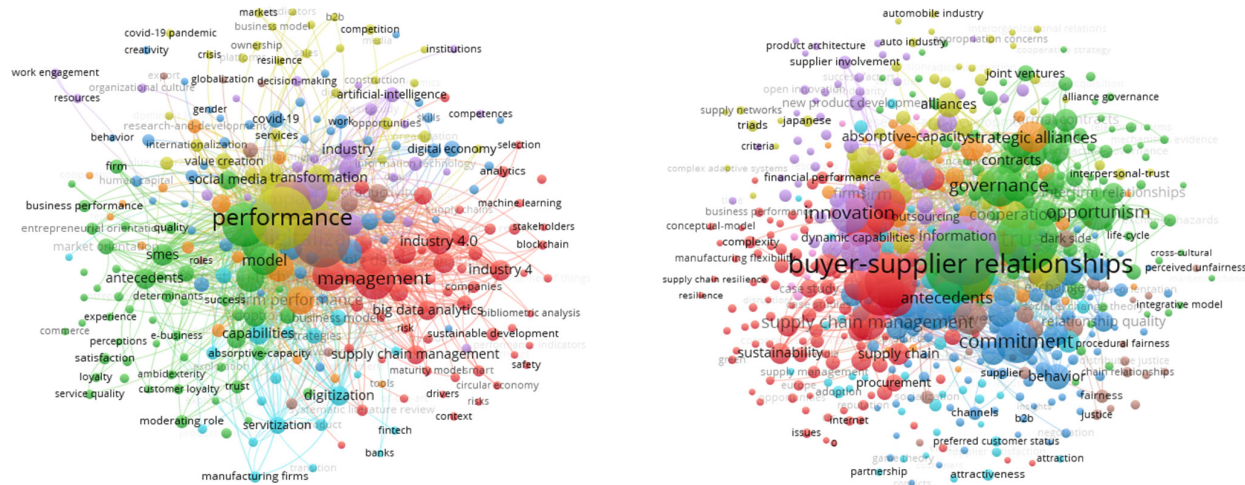
where: β_0 = absolute term, β_1 = regression line directive, ε_i = random component.

Formula for calculating the correlation coefficient:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$

where: x = mean value of the matrix; y = mean value of the matrix 2

The results indicate a high relevance of the themes of firm performance and BSR, see Fig. 2.



Source: Authors (2023)

Fig. 2. Results of the bibliographic map

Keyword analysis was chosen to complement the literature search, using a combination of VOS Viewer and information available in the Web of Science database. The analysis was performed on a total of two searches. The first search conducted was **Digitalisation (All Fields) and Performance (Search within all fields) and Management or Business or Economics (Web of Science Categories)**, which had 783 results. The next search had the parameters **Buyer-supplier relationship (All Fields) and Management or Business or Economics (Web of Science Categories)** with 1453 results. The second step was to export data on all articles from the mentioned results to create a bibliographic map. The Digitalisation and Performance analysis identified 266 keywords, which were classified into 8 clusters. In contrast, the BSR analysis identified 540 keywords with a classification into 9 clusters. For the purposes of this paper, the strength and type of clusters will be determined for the top 5 clusters. The bibliographic analysis showed that of the searches analysed, the BSR search is the more discussed search on Web of Science. The quantitative characteristics of the Digitalisation and Performance and BSR clusters are presented in Table 1 and Table 2.

Table 1
Clusters – Digitalisation and Performance

PICTURE 1	COLOUR	ITEMS	CLUSTER STRENGHT	FIELD
CLUSTER 1	Red	57	21,43 %	Management
CLUSTER 2	Green	54	20,3 %	Qualities
CLUSTER 3	Blue	46	17,29 %	Digitalisation
CLUSTER 4	Yellow	35	13,16 %	Performance
CLUSTER 5	Purple	25	9,4 %	Transformation

Table 2
Clusters – BSR (Buyer Supplier Relationship)

PICTURE 1	COLOUR	ITEMS	CLUSTER STRENGHT	FIELD
CLUSTER 1	Red	114	21,11 %	Company
CLUSTER 2	Green	102	18,89 %	BSR
CLUSTER 3	Blue	95	17,59 %	Characteristic
CLUSTER 4	Yellow	54	10 %	Sector
CLUSTER 5	Purple	50	9,26 %	Innovation

From the results of the bibliographic analysis, the 5 most relevant keywords were selected, namely **Performance** (common to both searches), **Digitalisation, Innovation, BSR** and **Trust**. These words were used to analyse the occurrence in the Web of Science database (categories Management, Business or Economics), where the annual growth and total number of each word were determined, together with the selected feature transcripts. Innovation came out best from the keyword occurrence analysis with a total of 40260 results. The least searched word is BSR, which was mentioned in only 432 articles.

3. Literature review

There are several studies in the literature focusing on both the nature of BSR and the impact of BSR digitalisation on business performance. The decision-making factors in BSR have been the object of research in several studies. For example, Kumar et al.(2022) focuses on the research on the impact of prior experience on BSR decision making in the MSME sector. In this

case, several factors influencing perceived buyer experience (e.g., customer orientation, employee orientation, digital readiness, financial stability) were tested using data signal analysis (text mining, polarity and subjectivity scores, Python tool), algorithmic data summarization using Latent Dirichlet Allocation (LDA) tool. Factors influencing BSR decision making are also the object of research by Mir et al. (2022). The basic methods of hypothesis testing in quantitative research in this case include ANCOVA (analysis of covariance) to obtain respondents and communicate with them, Qualtrics tool was used. The article by Carnovale et al. (2019) focuses on the factors influencing supplier behaviour (e.g. whether price concessions given by the supplier to the buyer in the previous year have a negative effect on the supplier). The hypotheses were tested using a dataset of empirical data from automakers. Sustainability is an important topic in BSR research. The issue of BSR sustainability is addressed, for example, by Bai et al.(2021) in their study of sustainable buyer-supplier relationship (SBSR), where they examine a manufacturing firm and its top five suppliers using radar map and DEMATEL. The paper by Hao et al.(2022) discusses key SOPs (Sustainable Operations Practices), their links to corporate sustainability strategy and business model innovation, high performance sustainability. The data processing methods in this case include content analysis, complexity theory, resource-based view (RBV) to pronounce hypotheses, fuzzy-set qualitative comparative analysis (fsQCA), analysis (ANOVA. The influence of suppliers on the application of lean management is addressed in the study of Kovalevskava et al. (2022), while the research was conducted in the form of semi-structured interviews to construct case studies. Sharma et al. (2022) investigates the nature of the relationship between BSR network density and buyer earnings, and between BSR network clustering and total GHG emissions. In doing so, data was drawn from public databases and annual company reports. Studies focusing on the analysis of the nature of BSR and the link between supplier and buyer can also be found in the literature. For example, Gallear et al.(2022) discusses the influence of selected factors (expectations, supplier characteristics, relationship performance evaluation, partnership risk assessment) on the form of BSR. The survey was conducted in the form of a pilot study, a questionnaire survey where respondents used a Likert scale to self-assess the BSR in the firm. Orders of instruments such as Cronbachs alpha, Composite reliability, Satorra-Bentler Scaled were used to test the hypotheses. The Butt (2020) study focuses on mitigating knowledge hiding between supplier and buyer. The empirical research was conducted in the form of a multiple case study (MCS) in four firms (two buying firms and two supplier firms). Data collection was in the form of interviews. A similar focus is the pilot study by Butt et al.(2020), which focuses on analysing the potential outcomes that knowledge seekers encounter when their top managers deliberately withhold knowledge from their firms. The study by Pulles and Loohuis (2020) summarizes the results of research on potential supplier-buyer conflicts. The research was conducted in the form of an illustrative PS and an experiment. The instruments used to assess the results were: confirmatory factor analysis using AMOS 24.0.; comparative fit index; Tucker-Lewis index; root mean square error of approximation (RMSEA). Sombultawee and Pasunon (2022) discusses the analysis of long-term BSR in the IT sphere. The research presents qualitative research in the form of semi-structured interviews with representatives of five Thai firms The quantitative research consisted of an online survey of firms in various high-tech industries. Confirmatory factor analysis (CFA) was used to measure the results. The study by Makkonem et al. (2021) focuses on the analysis of bargaining position (power) factors in BSR. The primary research was conducted in the form of an illustrative multicase case study. Data collection was conducted through interviews. Bals and Turkulainen' (2021) study focuses on understanding the integration of buyer-supplier interface for global sourcing. A case study was conducted, while empirical data collection was done through interviews and systematic observation. The study by Poblete and Bengtson (2021) answers, among others, the question of factors influencing the reactivation of a previously broken buyer-supplier relationship. The empirical research was conducted as a qualitative case study of an industrial manufacturing firm and one of its former suppliers. Gesell et al. (2022) examine, among others, the relationship between communication quality, BSR initiation success and communication satisfaction. The empirical research was conducted in the form of a paired questionnaire using a Likert scale. The data required for this research was collected using a paired questionnaire for buyers and suppliers. The study by Veile et al. (2021) addresses the research questions of how BSR is characterized in the context of Industry 4.0 compared to the present and what drivers and causes can be identified for the transformation. The study applies a qualitative exploratory empirical research design based on inductively analysed in-depth expert interviews. One of the attributes of Industry 4.0 is digitalisation. The digitalisation of BSR, the main thrust of this paper, has been the focus of a number of the academic papers. For example, Son et al. (2021) discusses the potential negative consequences of digitalisation for supplier-MSMEs in BSR. In this case, quantitative research was conducted through a questionnaire survey in MSMEs in South Korea. The following instruments were used: Cronbach's alpha and composite reliability for hypothesis testing, CFA (confirmatory factor analysis) for assessing the validity of the developed model. The paper by Hu (2022) focuses on the use of digital technologies during the COVID-19 pandemic by PPE (personal protective equipment) manufacturers. Primary research was conducted through semi-structured interviews. Primary results include a summary of digital technology use practices during the pandemic. The paper by Brinker and Haasis (2022) focuses on research on the relationship between supply chain digitalisation and the bargaining power of individual BSR partners. Descriptive analysis and meta-analysis (meta-analysis) were used to process the data. The data were drawn from scientific databases. Haddud and Khare (2020) focuses on the potential impacts of digitalisation on the implementation of lean management practices (lean operations). The empirical research was conducted through a questionnaire survey with academic experts in the field and industry experts who are directly involved in aspects and implementation of supply chain digitalisation. IBM Statistical Package for the Social Sciences (SPSS) version 24 was used to analyse the data collected for this study. The data processing methods include Cronbach's alpha, exploratory factor analysis (EFA), descriptive analysis, chi-square testing.

We can summarize that the impact of BSR digitalisation on firm performance is one of the current directions of scientific research in SCM. It can be concluded that there is a lack of association between BSR relevance, economic result and investment in BSR. The data collection in the field of BSR research is mainly quantitative with the help of questionnaire survey in enterprises. Available sources show that hypothesis testing is mostly done in the form of Pearson's Chi-squared test, Cronbach's alpha, confirmatory factor analysis (CFA) and others.

4. Methods

4.1 Data collection methods

To explore the potential relationship between economic result, the importance of BSR and investment in BSR, the following RQs were established:

- *RQ1: Is there a link between the perceived importance of BSR and investment in BSR digitalisation?*
- *RQ2: Is there a link between perceived investment in BSR digitalisation and economic result?*
- *RQ3: Is there a link between economic result and the perceived importance of BSR?*

To answer these research questions, quantitative research will be conducted in Czech companies in the form of a questionnaire survey. In the framework of quantitative research, the sample will be defined by non-probability sampling, based on voluntariness. A minimum threshold of 200 enterprises has been set for this research due to the likely return rate of the questionnaires. The sampling of enterprises for the questionnaire survey will be carried out by random sampling. Fig. 3 shows the structure of the empirical research.

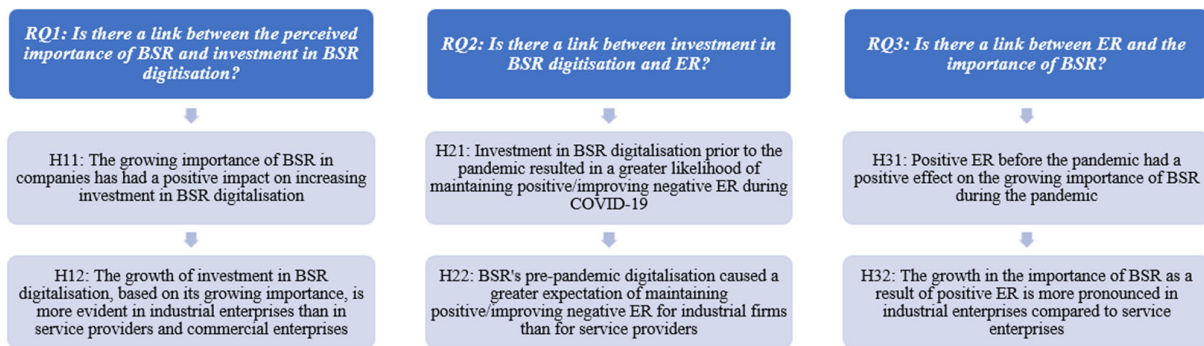


Fig. 3. Diagram of the structure of the empirical research

Given the above structure of the empirical research, the following hypotheses were established, building on the established *RQ1: Is there a link between the perceived importance of BSR and investment in BSR digitalisation?* H11: The increasing importance of BSR in companies had a positive effect on the increase in investment in BSR digitalisation. There are questionnaire questions that designed to test these and the following hypotheses:

1. Main activity (answer options: administrative and support processes, money and insurance, education, wholesale and retail trade, manufacturing; agriculture, forestry and fishing; construction; electricity generation and distribution, mining and other).
2. The company's financial performance in 2019 (pre-pandemic). Answer options: profit/ stagnation/ loss.
3. Economic result in 2020 (during the pandemic). Answer options: profit/ stagnation/ loss
4. Rate of investment of resources in BSR digital in 2019 (pre-pandemic) (as a percentage of enterprise-wide investment),
5. Rate of investment of resources in BSR digitalisation in 2020 (during the pandemic) (as a percentage of enterprise-wide investment),
6. Importance of BSR in 2019 (pre-pandemic), Response options: 0, more than 0.
7. Importance of BSR in 2020 (during the pandemic), answer options: 0, more than 0.
8. Minimum data requirement-total of 210 enterprises. Files will be compared in terms of investment in BSR digitalisation during the pandemic.

H12: The growth of investment in BSR digitalisation based on increasing importance is more evident for industrial enterprises than for service providers and commercial enterprises The description of the different sets in the H11 and H12 testing is presented in Table 3.

Table 3

Description of files for testing hypotheses H11 and H12

data	file description	Min - n
<i>H11 testing</i>		
A11	businesses that show an increase in the importance of BSR during a pandemic	200
B11	undertakings showing no change in the importance of BSR during a pandemic	
C11	undertakings showing a decrease in the importance of BSR during a pandemic	
<i>H12 testing</i>		
A121	industries that have seen a growth in the importance of BSR	100
A122	industrial enterprises that have not seen a change in the importance of BSR	
A123	industrial enterprises that have experienced a decrease in the importance of BSR	
B121	service businesses that have seen an increase in the importance of BSR	
B122	service businesses that have not seen a change in the importance of BSR	
B123	service businesses that have seen a decline in the importance of BSR	

The main *industrial* activities for the purposes of this study are manufacturing, construction, electricity generation and distribution, agriculture, water supply, mining, and quarrying. A *service provider* for the purposes of this article is defined as an enterprise with the following types of business activities: administrative activities, money and insurance, information and communication, real estate, cultural and entertainment activities, and other activities. *VO2: Is there a link between investment in BSR digitalisation and economic result?* H21: Investment in BSR digitalisation before the pandemic caused a greater prediction of maintaining positive/improving negative economic result during COVID-19. Minimum data requirement-total 300 enterprises. Files will be compared in terms of economic result evolution in the periods before and during the pandemic (2020 and 2021) H22: Investment in BSR digitalisation before the pandemic caused a greater prediction of maintaining positive/improving negative economic result for industrial enterprises than for service providers. A description of the sets for testing hypotheses H21 and H22 is presented in Table 4.

Table 4

Description of files for testing hypotheses H21 and H22

data	file description	Min - n
<i>H21 testing</i>		
A21	businesses without investment in digitalisation BSR facing a pandemic	300
B21	businesses investing in digitizing BSR ahead of the pandemic	
<i>H22 testing</i>		
A221	industrial enterprises, without investment in digitalisation BSR	150
A222	service providers, without investment in the digitalisation of BSR	
B221	industrial enterprises, investment in BSR digitalisation greater than 0	150
B222	service providers, investment in BSR digitalisation greater than 0	

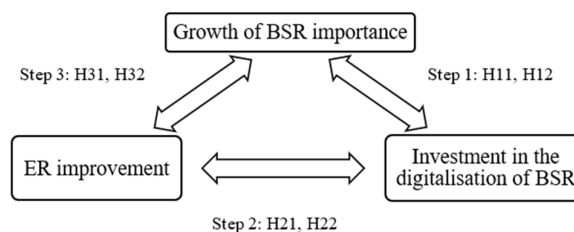
VO3: Is there a link between economic result and the importance of BSR? H31: Positive economic result before the pandemic had a positive effect on the growth of BSR importance during the pandemic. The files will be compared in terms of change in BSR importance between the pandemic and pre-pandemic periods. Change in this case will be defined by 3 levels (negative, no change, positive). H32: The growth in BSR importance due to positive economic result is more evident in industrial enterprises compared to service enterprises. The description of the files for testing H31 and H32 is presented in Table 5.

Table 5

Description of files for testing hypotheses H31 and H32

data	file description	Min - n
<i>H31 testing</i>		
A31	businesses that show an increase in the importance of BSR during a pandemic	300
B31	businesses that do not show a change in the importance of BSR during a pandemic	
C31	businesses that show a decline in the importance of BSR during a pandemic	
<i>H32 testing</i>		
A321	industrial companies showing a profit before the pandemic	150
A322	industrial enterprises showing stagnation before the pandemic	
A323	industrial enterprises showing a loss before the pandemic	
B321	service providers showing a profit before the pandemic	
B322	service providers showing stagnation before the pandemic	
B323	service providers showing a loss before the pandemic	

4.2 Data processing methods

**Fig. 4.** Schematic representation of hypothesis testing coherence

The data processing will take place in three stages, which are schematically presented in Fig. 4. In the first stage, hypotheses H11 and H12 will be tested, i.e. the existence of a link between the importance of BSR and investment in BSR will be established. The significance level will be set at 5 percent. Hypothesis testing will be carried out using Pearson's Chi-squared test in Recommennder. In the second stage, Pearson's Chi-squared test will be conducted to test H21 and H22. The existence of an association between investment in BSR digitalisation and economic result during the pandemic will be tested. The X-squared parameter has been applied to answer the RQ in the implementation of Pearson's chi-squared test for relevance. The significance level will again be set at 5 percent. The Pearson chi-squared test is a common test for determining significance that links two categorical variables. It can be used to test whether the two variables are independent or dependent (Xu et al., 2019). The result of the analysis is the determination of the p-value. If the resulting significance value for a given group is greater than 0.05 ($p\text{-value} > 0.05$), there is no significant difference, the association is not confirmed. If the significance is less than or equal to 0.05 ($p\text{-value} \leq 0.05$), this means that there is a significant difference between the groups, i.e. an association is established. The third stage of the research consists of testing H31 and H32. Hypothesis testing will also be done using one-factor Pearson's Chi-squared test.

5. Results

A total of 395 enterprises from different sectors participated in the survey. The services sector consisted of a total of 157 enterprises and included money and insurance; information and communication activities; professional, scientific and technical activities; real estate activities; accommodation, food and beverage service activities; transportation and storage; arts, entertainment and recreation; and other activities. The industrial sector was represented by 159 companies whose main activities included: manufacturing; construction; water supply; agriculture, forestry and fishing; mining and quarrying; electricity generation and distribution. Among the respondents, 48 enterprises with wholesale and retail trade as their main activity, 7 enterprises in the field of education, 7 in the public administration and defence sector, 1 providing accounting and auditing services and 16 enterprises providing health and social services were defined. All these enterprises were part of the test sets H11, H21 and H31. At the same time, these enterprises were not part of the test sets H12, H22 and H32. The composition of the sample by enterprise size is presented below (Table 5),

Table 5
Distribution of respondent enterprises by size

size of companies	number of enterprises in the category
micro-enterprise	95
small enterprise	100
medium-sized enterprise	82
large enterprise	117
national	1
total	395

Results of testing hypotheses H11 and H12:

The following tables (Table 6) shows the results of testing H11 and H12 using Pearson's Chi-squared test in Recommennder (R).

Table 6
Testing the link between the perceived importance of BSR and investment in BSR digitalization

Pearson's Chi-squared test results, H11, H12			
test file	X-squared	df	p-value
services	8.3929	4	0.0782
industrial enterprises	14.924	4	0.00486
total	14.916	4	0.004879

Testing hypothesis H11 showed that there is a direct relationship between the change in the perceived importance of BSR and investment in BSR digitalisation. Hypothesis H11 was therefore confirmed. The testing of hypothesis H12 showed that for industrial enterprises the link between the change in perceived importance and investment in BSR digitalisation is demonstrated, whereas for service providers the link was not demonstrated. Hypothesis H12 was confirmed. Overall, the answer to RQ1: *Is there a link between the perceived importance of BSR and investment in BSR digitalisation?* is as follows: *Yes, there is a direct link, especially for industrial enterprises.* The results of testing H21 and H22 are presented in Table 7.

Table 7
Testing the association between investment in BSR and change in economic result

Pearson's Chi-squared test results			
test file	X-squared	df	p-value
services	4.0331	1	0.0461
industrial enterprises	0.42225	1	0.5158
total	1.3536	1	0.2447

From Table 7, it can be concluded that there was no overall association between investment in BSR digitalisation before the pandemic and economic result during the pandemic. Hypothesis H21 is rejected. The results suggest that for industrial firms, the association between investment in BSR digitalisation and economic result is not demonstrable. Interestingly, the association between investment in BSR digitalisation and economic result is instead evident for service providers. In summary, hypothesis H12 is rejected. On RQ2: *Is there a link between investment in BSR digitalisation and economic result?* Partially, the link exists only for service providers. Table 8 presents the results of testing H31.

Table 8

Testing the association between pre-pandemic economic result and the increasing importance of BSR during the pandemic

Pearson's Chi-squared test results			
test file	X-squared	df	p-value
services	5.0979	6	0.5313
industrial enterprises	2.7699	4	0.597
total	7.1439	6	0.3077

Testing of H31 shows that there is not an across-the-board association between pre-pandemic economic result and the increase in the perceived importance of BSR over the course of a pandemic. Testing of hypothesis H32 showed that there is no apparent association between pre-pandemic economic result and the growth in perceived importance of BSR over the course of a pandemic, either for industrial firms or service providers. Hypothesis H32 is rejected. RQ3 was: *Is there an association between economic result and the importance of BSR?* According to the empirical data, the answer to this question is: *No, there is no association, neither across the board nor in the selected sectors (industry or service providers).*

6. Discussion

The conclusions of the study are grouped according to the individual VOs. *Relationship between the importance of BSR and investment in BSR digitalisation:* H11 was confirmed, i.e. the growth of the perceived importance of BSR in enterprises caused an increase in investment in BSR digitalisation. The confirmation of H12 implies that the increase in investment in BSR digitalisation based on increasing importance is more evident in industrial enterprises than in service providers and commercial enterprises. Our results confirm the findings of Park (2018), who finds that there is some association between supplier relationships and investment decisions to support these relationships. The results of our own empirical research are also loosely related to the conclusion of Liu et al. (2022), on the interface between R&D and supply chains in the context of emerging markets. The study by Liu et al. (2022) highlights the importance of BSR in ensuring successful R&D activities that create value in the manufacturing sector. *The link between pre-pandemic BSR digitalisation investments and improved economic result during a pandemic:*

The absence of an across-the-board primary association between BSR digitalisation investments and improved economic result/maintaining positive economic result is perhaps the main point of the study's conclusions. Given the confirmed association between relevance and investment in BSR digitalisation, one can only speak of a potential impact in the long run or a link to another (non-ER) indicator of firm performance. The confirmed link between investment in BSR digitalisation and economic result for service providers is the main conclusion of the H22 testing. In contrast, in industrial enterprises, the effectiveness of investments in BSR digitalisation from the perspective of the economic result of the enterprise is not evident. Thus, our own results are loosely related to the studies of Huang and Huang (2019); Yoon and Moon (2019), which demonstrated the positive impact of transaction specific investment (TSI) in BSR on firm performance. Although our results show that, in general, BSR digitalisation investments do not affect firm economic result, it can be assumed that not all investments in a firm must immediately translate into improved economic result. We cannot conclusively determine whether BSR digitalisation investments do not have a primary effect on firm performance. *The association between positive economic result and BSR importance:* testing H31 results in rejecting the association between economic result before the pandemic and the change in BSR importance during the pandemic. A direct link between these indicators was rejected for both industrial firms and service providers in H32 testing. We can conclude that in the short term, during the crisis period, enterprises do not perceive BSR as a key element for economic result growth. However, the research of Matopoulos et al.(2019) confirms the benefits of strong inter-organizational relationships for firm performance. Furthermore, the research of Matopoulos et al.(2019) points out that in times of crisis, suppliers who perceive that their customers treat them fairly devote additional resources to efforts to satisfy both partners in the business relationship. Thus, it can be summarized that although growth in economic result may not imply growth in the importance of BSR, the benefits of effective BSR for business efficiency are clear. In times of crisis, the requirement for the strength of BSR is particularly acute precisely because of the awareness of its potential role in the long run.

7. Conclusion

The main objective of this paper was to determine the current role of BSR in corporate practice in the context of digitalisation and business performance. The observed links between the rise in the importance of BSR during the pandemic, investment in BSR digitalisation, and improvements in economic result are presented in Fig. 5.

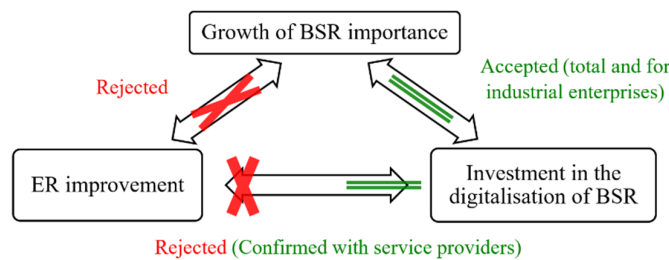


Fig. 5. Observed links between the importance of BSR, investment in BSR digitalisation and economic result

Among the *basic recommendations for the target segment* is the awareness of the importance of digitalisation as a tool for streamlining processes. The BSR area is an important element for ensuring efficiency both in the short and long term. The growing importance of BSR and the consequent increased investment in digitalisation in times of crisis describes a key requirement of companies in times of crisis, i.e. the drive for better, more flexible and resilient connections within the global value chain. The unproven link between investment and economic result improvement in the short term means that it is impossible for companies to use economic result as the sole and definitive measure of the effectiveness of corporate digitalisation investments. A long-term time perspective and a holistic view of enterprise performance is a prerequisite for assessing the effectiveness of BSR digitalisation investments. The unconfirmed relationship between economic result improvement and the growing importance of BSR means that enterprises do not primarily see the merit of BSR in improving economic result. The level of BSR as part of the enterprise value chain must first and foremost be linked to the current requirements of the enterprise vis-à-vis the outside world. The symmetry of the development and significance of the individual components of the value chain is a key requirement of enterprise development. Therefore, the perception of the importance of BSR should be in line with both the current situation in the corporate environment and the development of the importance of other related components of the value chain.

The research results have some *limitations*. Proven and unproven relationships apply to the environment of Czech enterprises. Therefore, it cannot be said with certainty whether they will be valid in other environments. The unproven relationships were for the recession period, it cannot be excluded that they will not be valid in the growth period. The confirmed relationships confirm the conclusions of other studies, but it is possible that they may not be valid in a specific environment. The relationship between the concepts of firm efficiency and economic result is quite close, but they cannot be considered identical. The realized conclusions are valid for the short-term perspective of economic result, not the performance of the enterprise in a broader context. Overall, the results are valid for a very specific period - unexpected crisis situations. This statement is followed by potential directions for *future work*. To generalize the findings of this research, it is necessary to repeat the research in multiple periods, preferably at different stages of the economic cycle. Another direction is to define the perceived impact of BSR on firm performance in the long run. The impact of BSR digitalisation on firm performance in different industries is also an interesting issue. Future research in this area could also be directed at identifying potential reasons for the differences in the confirmed relationships for the industrial and service sectors.

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