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# Balkans Journal of Emerging Trends in Social Sciences – Balkans JETSS

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# DETERMINING THE EFFECTS OF THE COVID-19 CRISIS ON HUMAN RESOURCE MANAGEMENT IN ORGANIZATIONS

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**Abstract:** *Human resource management (HRM), as a crucial constituent of crisis management, has paramount importance in managing the employees and ensuring business continuity, especially during the COVID-19 pandemic. In the constellation of such circumstances, this paper aims to identify the impact of COVID-19 on the HRM in organizations and provide recommendations for the development of long-term strategies, effective management practices and activities that are expected to result in increased employee satisfaction and retention as an organizational response to the crisis. Considering the dynamics and ever-changing environment dominantly, this paper attempts to contribute and expand the HRM literature by providing a comprehensive overview of the level of resilience of HR managers in North Macedonia to deal with a crisis such as the COVID-19 pandemic and valuable insight into the adequacy of the measures taken. As for the purpose of determining the impact of the crisis on the HRM practices, a structured questionnaire was developed and distributed to the top and middle management, HR professionals and employees in selected companies in the Republic of North Macedonia. The results revealed that adequate managerial responses to the crisis positively influence the organizational performance of the observed companies.*

**Keywords:** *COVID-19, Human resource management implications, Organizational response, Crisis management, Employee retention.*

**JEL Classification O15 · H12 · E24**

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## 1. INTRODUCTION

The COVID-19 pandemic has inevitably imposed organizations to profoundly transform their day-to-day activities and management practices and rapidly operationalize innovative workarounds of the business processes in order to withstand the unpleasant effects of the crisis which resulted in reduced salaries, labour shortage, unpleasant working conditions and employee dismissal. HR managers are viewed as a bridge between management and the staff to communicate with them, to keep positive interaction, and maintain organizational values (Gigauri, 2020). Introducing agile and flexible workforce strategies, as a response to the current market conditions, has become a major constituent in enhancing firm performance, ensuring competitive advantage and survival of the business in today's dynamic environment. In the constellation of such relations, adaptive HR practices and agile labour force planning promote trustworthy organizational culture, innovative problem-solving approaches, encourage organizational change, create synergy, and introduce smart and cost-effective use of space.

Nowadays, strategic human resource management (SHRM) highlights the growing change in the HRM function from being prescriptive, reactive and administrative to being descriptive, proactive and executive (Fahim, 2018). In this respect, HR professionals are expected to significantly contribute to the development of steadily coping mechanisms and recovery strategies in organizations. From an intraorganizational point of view, during the COVID-19 outbreak, a pivotal element is to empower employees and increase labour productivity. This is, most commonly, achieved by introducing remote working policies that include well-defined strategies concerning the positions eligible for operating remotely, availability expectations of employees, two-way communication mechanisms and cybersecurity measures especially for-profit and non-profit organizations operating with highly confidential customer data such as banks, insurance companies, educational or healthcare institutions.

Ultimately, this paper attempts to identify the relation and role of human resource management in crisis management, to provide a comprehensive analysis of the main indicators such as unemployment rates and remote working levels to determine the impact of the COVID-19 crisis on the HRM practices in selected countries, and finally to specify recommendations of HRM and organizational responses to the COVID-19 outbreak.

## 2. LITERATURE OVERVIEW AND HYPOTHESES DEVELOPMENT

The establishment of adequate working conditions accompanied by a set of formal and informal organizational configurations that prompt acknowledgment and recognition of efficient workplace actions and incentives can have a notable impact on stimulating the employee's behaviour. This is frequently achieved by the implementation of reward programs and stimulants that consist of a mix of internal rewards, such as challenging assignments, and external rewards, such as higher compensation and peer recognition (Chandrasekar, 2011).

The research conducted by Mcguire & Mclaren (2007) revealed that the working environment not only develops interaction between the employees, collaboration and innovation within the organization but also increases job satisfaction and has a significant impact on employees' well-being. Supporting these results, Noah and Steve (2012) revealed that a working environment in an organization increases the level of job satisfaction that ultimately leads to the achievement of organization goals. Oppositely, employees that are conducting their business tasks and activities in an insecure and unhealthy environment tend to be prone to occupational diseases as a result of

the negative influences of the environment on their performance, which affects the overall productivity of the organization (Chandrasekar, 2011). This is also supported by Sheikh Ali et al. (2013) who note that organizations that maintain the working conditions and working environment to a certain optimal threshold level tend to have increased employee performance followed by a decrease if this level is surpassed. Additionally, the compensation programs, rewards incentives, job security and working environment can increase the level of commitment and sense of belonging with the organization (Arokiasamy, 2013).

A balanced work-life is associated with increased job satisfaction and organizational commitment. Employees' work-life experiences deepen their role-related engagement which is related to organizational performance improvement (Nanzushi, 2015). In that context, numerous conducted researches have stressed the important role of work-life balance as it is related to employees' psychological well-being and overall sense of harmony in life (Clark, 2000). In the study conducted by Porathe (2009), it has been found that adequate knowledge and understanding of employees' behaviour is the crucial factor that embodies individual performance and it has a significant impact on the overall organizational performance. To do so, managers are encouraged to include employees to participate in the decision-making process which can result in the formation of the working environment.

Extensive employee participation in management style has a critical role for cross-functional addition and efficient working (Masood, 2010). As noted by Tan and Nasurdin (2012), innovative firms include HRM practices as part of the organization's strategy that encourages team working which results in enhanced customer relationships and retention through participation. In that manner, the employees, as a crucial and most valuable asset in organizations, should be nurtured generously and the retention and acquirement of new talent should be the main focus for the HR professionals (Mishra, 2010). Additionally, Lings (2004) suggest that the internal marketing orientation has implications not only for internal aspects of organizational performance, such as employee's retention, their motivation, satisfaction and organizational commitment, but also for external aspects of performance such as service quality, client satisfaction and, in the end, financial performance. Finally, the employees tend to seek those employment opportunities that are ready to invest in their personal growth (Schweitzer & Lyons, 2008). In the constellation of such circumstances, we propose the following hypotheses:

H1a: Firm environment has a statistically significant effect on employee performance.

H1b: Firm environment has a statistically significant effect on employee behaviour.

H1c: Firm environment has a statistically significant effect on the job-related factors.

H2a: The job-related factors have a statistically significant effect on employee performance.

H2b: Employee behaviour has a statistically significant effect on employee performance.

H3: Employee performance has a statistically significant effect on organizational performance.

Figure 1 presents the conceptual framework and demonstrates the proposed networked relations between the variables. In addition, it compiles and systematizes the basic concepts for the development of the proposed evaluation model.

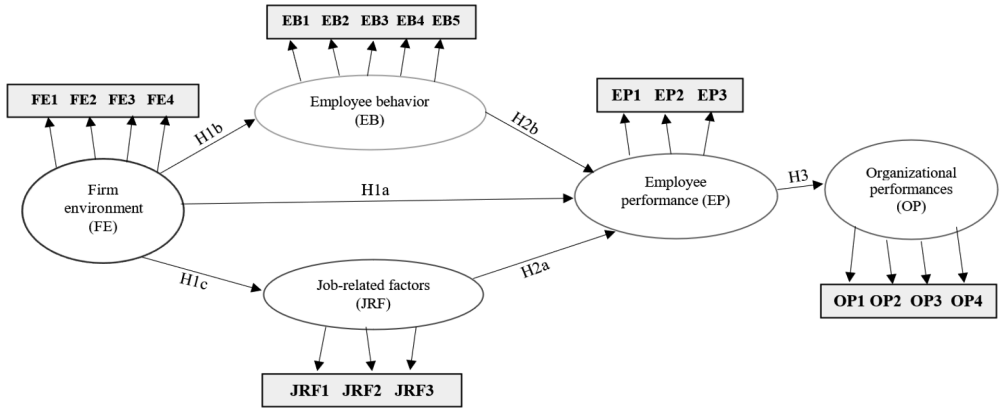


**Figure 1.** Conceptual framework and hypothesis development
**Source:** Author's elaboration

## 3. DATA AND METHODOLOGY

In order to empirically investigate what are the main effects of the COVID-19 on the HRM in organizations in the Republic of North Macedonia, primary data sources were used, which were obtained through a structured questionnaire, that was distributed over three weeks with the help of field assistants and associates to the top and middle management, HR professionals and employees in the companies with long experience in the sector who have a solid knowledge of current and previous organizational practices in various functional areas and HRM practices.

Efforts were made to explain the importance of the research to each respondent and thus to encourage the respondents to be truthful and faithful in their answers, all in order to preserve the objectivity and reliability of the research. The questionnaires sent to the respondents contained a brief explanation stating the purpose of the research, the importance of the respondents' participation, a statement guaranteeing the confidentiality of the answers and gratitude.

The questionnaire was self-administered as this type of questionnaire is easy to distribute, it is economical, and it included 25 questions. The questionnaire was developed in direction of the proposed employee evaluation model by Diamantidis & Chatzoglu (2018) and modified by the specific needs for determining the effects of the COVID-19 on the HRM. It is divided into five parts which include perceptual assessment of the respondents for each construction in the conceptual model.

After adopting a suitable technique for data collection and passing the screening and cleaning process, a sample of 74 respondents was collected. The research sample was randomly selected from large and medium enterprises that conduct their business activities in the Republic of North Macedonia. The questions were short, concise and clear, and respondents were asked to rate the HRM activities that were available and implemented in their companies in the last 6-12 months on a Likert scale from 1 to 5 (1 = „low success" 2 = „partially successful", 3 = „neutral", 4 = „successful", 5 = „very successful").

The questions were developed after a detailed review of the literature related to the HRM practices and organizational performance in the companies, and the measures for each item were designed and based on theoretical and operational definitions and aspects in the literature. The collected

data were coded and reviewed in order to eliminate any deviations or any other variations in the data set. The answers were analysed using the statistical software IBM SPSS 23, Stata and IBM SPSS AMOS 24. To conduct the empirical research, we apply a Structural Equation Model to validate the conceptual model based on KMO measure, Cronbach's alpha test, convergent validity analysis, EFA analysis, CFA analysis and SEM analysis.

## 4. RESULTS AND DISCUSSION

The validity of the constructs was measured using the Bartlett sphericity test and the Kaiser-Mayer-Olkin measure (KMO) for sampling adequacy of individual variables (Rajapathirana & Hui, 2018). The total score of KMO is considered valid with a value of 0.6 or more to conduct factor analysis (Özdamar, 2017). The results of the Bartlett and KMO sphericity test (0.700) found that the data set was suitable for factor analysis (Table 1). The explained cumulative variance is 77.359%, which exceeds the acceptable limit of 60% (Özdamar, 2017). Bartlett's sphericity test indicates a sufficient correlation between the variables with a value of 740.582 and it is significant for $p < 0.001$. The obtained values show that the scales used in the research are valid.

**Table 1.** KMO and Bartlett's test

| *KMO Bartlett's test* | |
|---|---|
| Kaiser-Mayer-Olkin (KMO) measures of sampling adequacy | 0.700 |
| | |
| *Bartlett's Test of Sphericity* | |
| Approx. chi-square | 740.582 |
| Df | 300 |
| Sig. | 0.000 |

**Source:** Author's calculation

The factor loading on each scale exceeds 0.5 (Ringle et al., 2015) and thus these values indicate that the measurements have an acceptable convergent validity. Furthermore, reliability measures were assessed by factor loadings of items having an acceptable value of 0.70 and a Cronbach α value of 0.7 or more (Ringle et al., 2015).

The reliability coefficient was tested using Cronbach α in order to measure the reliability of a set of two or more structures. According to the test results, the total reliability scales for the factors range from 0.568 to 0.895 (Table 2) and exceed the 0.7 thresholds introduced by Nunnally (1978). Construct reliability (composite reliability - CR) and average variance extracted (AVE) were used as convergent validity measures (Fornell & Larcker, 1981). Convergent validity was achieved because the values of AVE and CR are higher than the minimum thresholds of 0.50 and 0.70 (Fornell & Larcker, 1981; Ringle et al., 2015).

Some authors note that CR must reach a value of 0.6 or more (Fornell & Larcker, 1981). The results also showed that all latent variables reached the reference value of 0.7 (Nunnally & Bernstein, 1994) (Table 2). Regarding AVE, all constructions exceed the proposed value of 0.5 (Bagozzi & Yi, 1988), i.e. they range from 0.561 to 0.637, which indicates that the measure has adequate convergent validity. Finally, the measurement model showed adequate reliability, convergent and discriminatory validity.

To detect possible mediations, we could conduct more hierarchical regression analyses following the procedure developed by Baron & Kenny (1986), but due to the complexity and multiplicity

of mediating effects, in order to discover the best structure of complex relationships between the analysed variables, the implementation of the SEM approach is preferred. Hence, a one-step SEM analysis was performed, with simultaneous assessment of the measurement and structural models in IBM SPSS AMOS 24.

**Table 2.** Degree of internal consistency and convergent validity

| Factors | Items | Factor loads | Cronbach α | AVE | CR |
|---|---|---|---|---|---|
| FEF | Management support | 0,792 | 0,838 | 0,637 | 0,875 |
| | Training culture | 0,843 | | | |
| | Organizational culture | 0,715 | | | |
| | Environmental dynamism | 0,837 | | | |
| JRF | Job environment | 0,686 | 0,841 | 0,570 | 0,798 |
| | Job communication | 0,779 | | | |
| | Job autonomy | 0,797 | | | |
| EB | Proactivity | 0,632 | 0,817 | 0,604 | 0,882 |
| | Adaptability | 0,758 | | | |
| | Motivation | 0,893 | | | |
| | Commitment | 0,883 | | | |
| | Skill level | 0,685 | | | |
| EP | Achieved results | 0,761 | 0,715 | 0,632 | 0,836 |
| | Satisfaction of the performance | 0,895 | | | |
| | Task performance during crisis | 0,719 | | | |
| OP | Financial performance | 0,828 | 0,800 | 0,561 | 0,834 |
| | Internal business processes | 0,831 | | | |
| | Relation company-customer | 0,741 | | | |
| | Knowledge and growth | 0,568 | | | |

**Source**: Author's calculation

The results consistently support the factor structure for all factors. The structured model of SEM investigates the impacts of different types of HR-related measures on the organizational performances in the companies in the COVID-19 period and proposes a theoretical scheme for such a network of relationships as presented in Figure 1, which is also a conceptual framework of the research. As a result, the proposed relationship paths that correspond to the types of HR-related measures towards the employee performance of the firm and consequently the organizational performance are analysed.

The structured model is also supported by appropriateness indices (Table 3). Adequacy indices include the Comparative Fit Index (CFI; Bentler, 1990), the Normative Fit Index (NFI; Bentler-Bonett, 1980), the Relative Fit Index (RFI; Bollen, 1986), the Increase Fit Index (IFI; Bollen, 1989b) and the Tucker-Lewis index (TLI; Bentler & Bonett, 1980). All of these indices indicate a very good fit when close to 1. Brown & Kadek (1993) found that a value of about 0.08 or less for the Root Mean Square Error Approximation (RMSEA) would indicate a reasonable approximation error. On the other hand, Hu & Bentler (1999) suggest that, for continuous data, RMSEA <0.08, TLI <0.95, CFI <0.95 are necessary values for model fit. The comparative fit index (CFI) exceeded the recommended breakout level of 0.9 (Bagozzi & Yi, 1988). The root means square approximation error (RMSEA) is in line with the cross-sectional level of 0.08 recommended by Brown & Kadek (1993). The combination of these results suggested that the measurement model showed a good level of suitability. These indices are shown in Table 3 and they showed a moderate but acceptable level of overall model adequacy and therefore provided support for the overall validity of the structural model.

**Table 3.** Goodness-of-fit indices

| Goodness-of-fit indices | Construct | Reference value |
|---|---|---|
| Chi2/degree of freedom | 1,764 | $1<\chi 2/df<5$ |
| CFI (comparative fit index) | 0,967 | 0,95<CFI<1 |
| NFI (normed fit index) | 0,921 | 0,90<NFI<1 |
| RFI (relative fit index) | 0,947 | 0,90<RFI<1 |
| IFI (incremental fit index) | 0,963 | 0,95<IFI<1 |
| TLI (Tucker-Lewis fit index) | 0,964 | 0,95<TLI<1 |
| RMSEA (root mean square error) | 0,074 | RMSEA<0,08 |

**Source:** Author's calculations

From Table 4 it can be determined through standardized path estimates (SPE) that the environment in which the company operates has a positive impact on the employee behaviour (0,52), job-related factors (0,92), as well as a direct and positive effect on the employee performance (0,67). Furthermore, the employee behaviour is found to have a positive impact on the employee performance (0,84) while the job-related factors positively but insignificantly affected the employee performance (0,24). Consequently, hypotheses that suggest a significant relationship between the independent variables and the organizational performance are supported and are statistically significant at 1%, with exception of one hypothesis (H2a). In addition, the analysis provides interesting findings beyond the general confirmation of the hypothesized relationship. The findings reveal that the internal and external environmental firm factors directly and positively influence employee performance and result in increased organizational performance. Also, according to the regression estimates in the SEM model, it is noted that the factors related to employee behaviour are the strongest driver of organizational performance in companies in the Republic of North Macedonia. Finally, the independent sample t-test procedure is also used to investigate the likely effects of the firm environment during the COVID-19 pandemic on organizational performances. The results reveal that companies that are focused on providing a significant effort in encouraging and stimulating dedicated employee behaviour have greater employee and, consequently, organizational performances.

**Table 4.** Standardized path estimates and hypothesis test

| Hypothesis | | Path | SPE | P | Result |
|---|---|---|---|---|---|
| H1 | A | FE → EP | 0,67 | 0,000 | Accepted |
| | B | FE → EB | 0,92 | 0,002 | Accepted |
| | C | FE → JRF | 0,96 | 0,000 | Accepted |
| H2 | A | JRF → EP | 0,24 | 0,617 | Rejected |
| | B | EB → EP | 0,84 | 0,000 | Accepted |
| H3 | | EP → OP | 0,61 | 0,002 | Accepted |

**Source:** Author's calculations

The statistically significant and positive impact of the working environment on employee performance is in line with the results obtained from a number of studies (Ollukkaran & Gunaseelan, 2003; Leblebici, 2012; Arokiasamy, 2013). The development and implementation of long-term management support measures as a crucial constituent of the organizational strategies ought to increase job satisfaction and prompt an open organizational culture that encourages employees to share their knowledge and generate a corpus of ideas. Furthermore, the positive effect of the firm environment on the employee behaviour and the job-related factors indicates that the ability to adapt to the environmental dynamism and the establishment of a training culture within

the organization is likely to be beneficial for the employees and result in personal growth and acquired expertise while increasing the level of commitment and sense of belonging within the organization.

In addition to these results, it can be noticed that job related factors have a positive but statistically insignificant effect on the employees' performances. These findings do not correspond to the results of theoretical and empirical research (Morrison, 2006; Grant & Ashford, 2008; Diamantidis & Chatzoglou, 2018), in which a positive impact of the job-related factors was observed on the employees' performance. This can be a result - that the optimal level of job autonomy has already been reached in the pre-COVID-19 period in the observed companies. Additionally, this can be explained that in a stable job environment, employees tend to be proactive, feel "free" in their workplaces and express innovative ideas while taking the initiative to solve job-related problems. The observed positive and statistically significant impact of the employee behaviour on the employee performance indicates that employees' innovative behaviours are consistently useful to improve the business practices are and considered as a significant source for the organization's competitive advantage (Anderson et al., 2014; Shin et al., 2017). This finding also suggests that the high-level commitment incorporates psychological attachment that enhances the ability to work and this improves the understanding of behaviours which leads to an improved organizational learning environment (Hussain et al., 2018).

Furthermore, the results reveal a positive and statistically significant impact of the employee performance and organizational performance which is in line with multiple studies (Tarmidi & Arsjah, 2019) and it is suggested for the companies to pay dominant attention to developing and implementing training culture as a crucial element for reaching cohesive crisis response as the human resource capital has a prominent role in gaining a competitive advantage and ensures the continuous growth of the organization.

## 5. RECOMMENDATIONS FOR HRM AND ORGANIZATIONAL RESPONSES TO THE COVID-19 CRISIS

HRM strategies not only affect the ability of individuals to operate, to compete, and the effectiveness of the organization, but it has also been emphasized that the lack of effective communication between decision-makers and administrators is one of the most significant causes of organizations failing to control the crisis and reduce its negative impacts (Eshkavandi et al., 2015). HRM alongside the top management serves as principal protagonists in the identification of potential internal and external threats. They enable employees to adapt to complex crises such as the COVID-19, promote synergy and as a result, ensure sustainability and productivity in organizations. For that purpose, we have identified nine crucial SHRM incentives that ought to contribute to the recovery practices and organizational responses to the COVID-19 pandemic:

- **Establish adequate HR protection mechanisms.** Intellectual capital, if efficiently managed, can significantly contribute to the expansion of knowledge, experience, and know-how skills within the organizations, which in times of COVID-19 can be a remarkable driver in gaining competitive advantage in the market. In that manner, the HR professionals and the top management must implement proactive employee protection practices for the promotion and protection of human rights, but also increase employee crisis readiness that can result in improved organizational performance and overall, more sustainable economic growth.
- **Promote organizational agility.** By continuously providing effort in the development of the dynamic capabilities (speed, nimbleness, responsiveness) and agility, organizations significantly enhance the employee engagements and innovation capabilities which in times of

crisis are critical factors to achieve and maintain competitive leadership. Analogous to that, innovative businesses tend to be less vulnerable than non-innovative companies in terms of cyclical sectoral and environmental pressures, and the ability to innovate in an ever-changing environment allows companies to improve their current business processes, launch new products and implement new technologies.

- **Align HR capacities with organizational objectives during the pandemic.** The culture of change can help organizations to prioritize goals and the benefits of adequate talent management practices ought to ensure business survival, especially at the time of COVID-19. Consequently, HR professionals need to keep the employees well-informed of the measures taken in the shift of the business strategies during the crisis. In that way, setting objectives and minimizing biases in communicating the strategic decisions could improve the operational performance in the organizations.
- **Empower employees by nurturing positive relationships and taking safety initiatives.** One of the most important constituents in any SHRM practice is the implementation of safety measures during the time of the COVID-19 crisis. HR professionals should analyse the potential safety risks of employees' work activities and provide hazard controls mechanisms. This allows companies to enhance their brand image and reputation, and also by fostering an organizational climate that takes into consideration the employee's safety will increase the social responsibility and the collective conscience. In such unpredictive times, managers ought to focus on the nurturing of understanding, supportive and trustworthy relationships with the subordinates, listen intently and encourage employees to disclose their ideas, opinions, and perceptions.
- **Introduce the employees to the remote working strategies.** HR professionals need to consider work and family differences when addressing this issue, as the work-family linkage is different for various types of work and distinct family structures, and hence, work-life balance requirement is also different (Edwards & Rothbard, 2000; Mushkudiani & Dzotsenidze, 2019). Therefore, managers are advised to communicate with remote workers frequently and to be focused on employee well-being (Meister, 2020).
- **Promote workplace diversity and inclusion.** By introducing an inclusive workplace culture, organizations with diverse employee structures tend to increase the brainstorming of new ideas, different perspectives and experiences. This will allow the company to develop out-of-the-box thinking which most likely can be a significant factor in ensuring business sustainability in crisis situations.
- **Demonstrate personal instead of positional power.** During the COVID-19 outbreak, the top management and HR professionals faced the challenge of influencing employees to adapt to the imposed dynamic changes. The inherent positional power as a type of authority managers practice appears to have less impact when motivating the employees in remote-friendly environments than the executed power derived from the expertise, knowledge, interpersonal relationships, or personality of the superiors. In times of the COVID-19 pandemic, the importance of demonstrating empathy and taking into consideration the fundamental human needs are critical success factors in organizations.
- **Organize efficient training programs and increase crisis readiness.** In the process of searching and reaching optimal levels of crisis readiness, the organization should most importantly, designate crisis response team members and provide efficient crisis leadership. To do so, HR professionals are advised to maximize the use of the technological benefits when organizing training programs and workshops while attempting to enhance and achieve efficiencies in the optimization of crisis readiness.
- **Reward employee engagement.** The implementation of recognition-based incentives can result in the enhanced accomplishment of business tasks, increased creativity and inno-

vativeness of employees. In cases of crisis situations, the HR managers should dominantly focus on providing rewards in form of opportunities for professional development and growth, public acknowledgment and recognition or encouraging employees to pursue their ideas. This can further increase the employee commitment and overall operational performance of the organizations.

## 6. CONCLUSION

This paper contributed to the literature as pioneering research which enhanced the understanding of the effects that the COVID-19 pandemic has left on the HRM practices. The findings support the claim that some of the HRM practices that were implemented in companies during the COVID-19 crisis have a significant impact on organizational performances. These findings support our conceptual model and offer several managerial implications.

The top management, as well as the HR professionals, need to place additional emphasis on finding and implementing optimal work-life balance mechanisms, especially during the times of COVID-19 as they are important tools for achieving sustainable competitive power and market leadership.

Improved organizational performance depends on the degree of implementation of adequate HRM measures. Firms that have the resources and knowledge to improve their HRM capabilities could expect a significant improvement in the sales and market performance if they encourage and implement an appropriately balanced level of HRM activities. Furthermore, the research model should be further developed and analysed with samples from other countries since the cultural differences between organizations differ significantly and affect the perception of employees in terms of knowledge sharing, and in that context, further theoretical and empirical research will provide stronger verification of the results obtained from this study.

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# THE GLOBAL PANDEMIC (COVID-19) HAS CAUSED LONG MEMORIES IN EUROPE'S BANKING SECTOR

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**Abstract:** *This study aims to analyze the impact of the 2020 global pandemic on the banking sectors of the countries of France, Germany, Greece, Ireland, Italy, Portugal, and Spain for the period from January 1, 2018, to August 10, 2020, with the sample being split into two subperiods: first subperiod from January 2018 to August 2019 (Pre-Covid); and the second from September 2019 to August 2020 (Covid-19). Different approaches were undertaken to perform this analysis, in order to verify whether: (i) the global pandemic (Covid-19) accentuated the persistence, in the returns, of the European banking sectors? (ii) the presence of long memories increases the synchronizations between markets? The main findings show that the assumption of the market efficiency hypothesis may be challenged, due to the possible predictability of the banking sectors' actions, and that the analyzed sectors also show marked levels of integration, thus questioning the hypothesis of efficient portfolio diversification. The results seem to be of interest to investors looking for opportunities in these specific sectors and for policymakers to carry out institutional reforms to increase efficiency and promote sustainable growth of financial markets.*

**Keywords:** *Covid-19, Banking sectors, Arbitrage, Portfolio diversification.*

**JEL Classification C58 · G15**

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## 1. INTRODUCTION

The European banking sector has been in the spotlight for the last ten years. There are several reasons for this: the impact of the global financial crisis on the stability of banks; the vulnerability of banking institutions to the Euro crisis and, last but not least, the problems of the largest banks in Italy and Germany, which in recent decades were considered the most efficient. The financial crisis has negatively impacted not only small national banks but also more robust international institutions demonstrating that the problem of measuring the efficiency of the banking sector is still a current and important issue for both academia, and international regulators (Allegret, Raymond, and Rharrabti, 2017; Dietrich and Vollmer, 2012; Flögel and Gärtner, 2020).

A market is held to be efficient when all relevant stock price information is reflected in the market price. The lack of consensus among economists and financial analysts on market efficiency implies that the efficient market hypothesis should be further studied. Another significant reason to study market efficiency is the role of stock markets acting as financial intermediaries, between savers and borrowers, in the distribution of scarce resources via price mechanisms (Jain, 2020; Karasiński, 2020).

The market efficiency hypothesis relates to the asset's current price reflecting all available information at a given time and the price adjusting rapidly as new and unanticipated information arrives in the market. The mean-reversion hypothesis, also called negative serial correlation, has been interpreted as an efficient correction mechanism in developed markets and a sign of a speculative bubble in emerging financial markets (Summers, 1986; Fama and French, 1988).

In corroboration, the rhoDCCA validates the results of the Detrended Fluctuation Analysis (DFA) exponent, showing 19 strong (0.666 → ≅ 1.000) cross-correlation coefficients (λ_DCCA) (out of a possible 21 in total), with the exception made to the pairs France DS Banks / Germany DS Banks (0.12), Ireland DS Banks / Italy DS Banks (0.59). These findings show that the banking sectors analyzed evidenced marked levels of integration, which in return may question the hypothesis of efficient portfolio diversification.

This research contributes to the existing literature, namely the study of efficiency in its weak form in the banking sector within the global pandemic context (Covid-19). To our knowledge, other studies have analyzed banking sectors to examine whether they are efficient, in their weak form, by testing the possibility of investors obtaining abnormal returns without incurring additional risk. Some of these studies have been conducted by the authors Balcerzak, Kliestik, Streimikiene, and Smrčka (2017), Asaad (2017), AL-Hisnawi, Abd AL-Shara, and Al-Bidairi (2018), Aloui, Shahzad, and Jammazi (2018), Ferreira, Dionísio, Guedes, and Zebende (2018), Sharma (2018), Grmanová and Ivanová (2018), González, Razia, Búa, and Sestayo (2019), but with a different emphasis and focus of this study, namely regarding the analyzed markets, the sample period and the research questions.

In terms of structure, this paper is organized into five sections. The five sections pertain to an introduction, a literature review on market efficiency in its weak form, methods, results, and conclusions.

## 2. LITERATURE REVIEW

The issue of market efficiency has been addressed in different studies. These studies have analyzed the hypothesis of predictability of returns through the mean-reversion patterns of stock prices, inspired by the seminal work of Poterba and Summers (1988), Fama and French (1988), who have

documented the mean reversion in stock markets over a time span longer than a year. According to the authors Malafeyev, Awasthi, S.Kambekar, and Kupinskaya (2019), when the random walk and informational efficiency hypotheses are rejected, extreme moves on stock prices can be observed. The occurrence of these phenomena may eventually decrease the implementation of efficient portfolio diversification strategies. Ascarya, Yumanita, Achsani, and Rokhimah (2008), Bashir, Ilyas, and Furrukh (2011), Tai (2011), Řepková (2014) examined the efficiency of banking sectors in several countries.

Ascarya, Yumanita, Achsani, and Rokhimah (2008) analyzed banks' efficiency in Malaysia and Indonesia. The authors evidenced that Malaysian banks have improved their efficiency and become as efficient as Indonesian banks were in 2006. On the other hand, Bashir, Ilyas, and Furrukh (2011) examined informational efficiency, in its weak form, in Pakistan's banking sector (KSE). The authors advocate that the random walk hypothesis is rejected, showing that the market sector shows signs of inefficiency. Furthermore, prices show predictable patterns in the KSE banking sector. Tai (2011) examined the UAE banking sector's efficiency based on a sample of UAE national banks. The authors show that large banks tend to be more efficient. Řepková (2014) studied the efficiency of commercial banks in the Czech Republic, the author provides evidence that large banks are less efficient than the other banks in this sector.

Narayan, Narayan, Popp, and Ali Ahmed (2015), Kok and Munir (2015), Sufian, Kamarudin, and Nassir (2016), Niţoi and Pochea (2016), Ching, Munir, and Bahron (2016), Apergis and Polemis (2016) tested whether bank stocks show signs of (in) efficiency. Narayan, Narayan, Popp, and Ali Ahmed (2015) analyzed firms belonging to the NYSE market's banking sector. These authors found significant evidence that the efficient market hypothesis depends on the day of the week, and that only 62% of firms show efficiency, in its weak form.

Kok and Munir (2015) studied the efficient market hypothesis in its weak form in the Malaysian stock market's banking sector. The authors evidenced that the data series follow the random walk hypothesis, implying that the financial sector is efficient, in its weak form. Sufian, Kamarudin, and Nassir (2016) analyzed the Malaysian banking sector's efficiency, suggesting that bank stocks increased their efficiency over the sample period. Niţoi and Pochea (2016) analyzed financial convergence between equity markets, sovereign CDS, long-term government bonds, and the banking sector from Central and Eastern Europe (CEEC). The authors demonstrated that CEE financial markets do not form a homogeneous convergence. Furthermore, in the aftermath of the global financial crisis and the sovereign debt crisis, the disparities between these financial markets increased. CEEs should implement further structural reforms in order to achieve greater financial convergence. Ching, Munir, and Bahron (2016) examined the market efficiency of Malaysian commercial banks in their weak form. The authors show and based on their results, that all series can be characterized by a random walk process, suggesting that the banks' actions are efficient, in their weak form. Apergis and Polemis (2016) examined the efficiency in the banking sector of the Middle East and North Africa (MENA) countries in the period 1997-2011 and have evidenced that the efficient market hypothesis is rejected.

Balcerzak, Kliestik, Streimikiene, and Smrčka (2017), Asaad (2017), AL-Hisnawi, Abd AL-Shara, and Al-Bidairi (2018), Aloui, Shahzad, and Jammazi (2018), Ferreira, Dionísio, Guedes, and Zebende (2018), Sharma (2018), Grmanová and Ivanová (2018), González, Razia, Búa, and Sestayo (2019) examined whether banking sectors are efficient, in their weak form, by testing whether investors can earn abnormal returns without incurring additional risk. Balcerzak, Kliestik, Streimikiene, and Smrčka (2017) highlight that there are differences between the efficiency

of the banking sectors of the „old" fifteen and the „new" EU member countries. In corroboration, they show a clear difference between the efficiency of banking sectors that are members of the European Monetary Union and those that are not in the Eurozone. Asaad (2017) evidenced that bank stock prices on the Iraqi stock exchange do not reflect all historical information or, in other words, they are (in) efficient in their weak form and, thereby, create arbitrage opportunities.

Also, market efficiency levels vary over time, for both short and long-term periods, and change significantly in crisis and non-crisis scenarios. Ferreira, Dionísio, Guedes, and Zebende (2018) advocate that the financial crises of 2008 and 2010 affected European markets in general, and in particular the banking sector. Additionally, they also evidenced that the 63 European banks (inside and outside the Eurozone) analyzed decreased their market efficiency significantly. Sharma (2018) evidence a statistically significant association between operational efficiency and banking sector performance in India, i.e., operationally efficient banks create more value and profitability for investors and, therefore, are considered adequate.

Grmanová and Ivanová (2018) evidenced that the three largest Slovak banks are efficient in their weak form. González et al. (2019) analyzed 201 banks in the Middle East and North Africa (MENA) countries during 2005-2012. The authors mention that the efficiency hypothesis in the banking sector is rejected in MENA countries.

In summary, the contribution of this work is to provide information to investors and regulators in the European banking sectors, where individual and institutional investors seek diversification benefits, and to help promote the implementation of policies that contribute to the efficiency of these markets in this period of global pandemic (Covid-19).

## 3. METHODOLOGY

### 3.1. Data

The data used in this study comprised the price index (daily) of the banking sectors of France, Germany, Greece, Ireland, Italy, Portugal, and Spain, for the period from January 1, 2018, to August 10, 2020. The sample was split into two subperiods. The first subperiod is from January 2018 to August 2019 (Pre-Covid), and the second is from September 2019 to August 2020 (Covid-19). The information was obtained from the *Thomson Reuters* platform, with the quotes presented in local currency to mitigate exchange rate distortions.

**Table 1.** The countries and their indices used in the study.

| Index | Country |
|---|---|
| France DS Banks | France |
| Germany DS Banks | Germany |
| Greece DS Banks | Greece |
| Ireland DS Banks | Ireland |
| Italy DS Banks | Italy |
| Portugal DS Banks | Portugal |
| Spain DS Banks | Spain |

**Source:** Own elaboration

### 3.2. Methods

The research was conducted in several stages. The sample's characterization was done through descriptive statistics, using the test of adherence of Jarque and Bera (1980) to verify that the data followed a normal distribution. To verify the stability of variance, we performed plots of the residuals and used the test of Clemente et al. (1998) to identify the breaks in structure in the two sub-periods (Pre and during the Covid-19 period). *Detrended Cross-Correlation Analysis* (*pDCCA*) methodology was applied to answer the research questions.

*DFA* is an analysis method that examines time dependence in nonstationary data series. This technique avoids spurious results when the analysis focuses on the data series's relationships in the long run by assuming that the time series are nonstationary. *DFA* has the following interpretation: $0<\alpha<0,5$: anti persistent series; $\alpha=0,5$ series exhibits *random walk*; $0,5<\alpha<1$ persistent series.This technique's function is to examine the relationship between $x_k$ and $x_{k+t}$ values at different times (Guedes et al., 2018).

The trend-free cross-correlation coefficient (*pDCCA*) by Zebende (2011) is a method for quantifying the level of cross-correlation between two nonstationary time series. The coefficient is based on the *DFA* (Peng et al., 1994) and *DCCA* (Podobnik and Stanley, 2008) methods. The cross-correlation coefficient depends on the length of the s box (time scale).One of the advantages of this cross-correlation coefficient is centered on the possibility of measuring the correlations between two nonstationary time series on different time scales.This technique's function is to examine the relationship between $x_k$ and $x_{k+t}$ values at different times (Ferreira,Dionísio,Guedes,and Zebende,2018). Tables 2 and 3 show the interpretation of the exponents $\alpha_{DFA}$ and *pDCCA*

**Table 2.** Detrended Fluctuation Analysis $\alpha_{DFA}$

| Exponent | Type of signal |
|---|---|
| $\alpha_{DFA}<0.5$ | long-range anti-persistent |
| $\alpha_{DFA} \simeq 0.5$ | uncorrelated, white noise |
| $\alpha_{DFA} > 0.5$ | long-range persistent |

**Source:** Own elaboration

**Table 3.** Detrended cross-correlation coefficient, *pDCCA*, levels

| Weak | Medium | Strong |
|---|---|---|
| $\cong 0.000 \rightarrow \cong 0.333$ | $\cong 0.333 \rightarrow \cong 0.666$ | $\cong 0.666 \rightarrow \cong 1.000$ |

**Source:** Own elaboration

## 4. RESULTS AND DISCUSSION

Figure 1 depicts the evolution of the banking sectors of the countries of France, Germany, Greece, Ireland, Italy, Portugal, and Spain, in levels, for the period from January 2, 2018, to August 10, 2020, which is a period of considerable complexity since it comprises the outbreak of the global pandemic (Covid-19). Most markets show structure breaks in February and March 2020.

Figure 2 depicts the evolution, in % differences, of the seven banking sectors under analysis. In all series, there is a relatively high dispersion around the average and a relatively synchronized behavior between the data series. Through the graphical analysis, one can observe high volatility, especially in January, February, and March 2020.

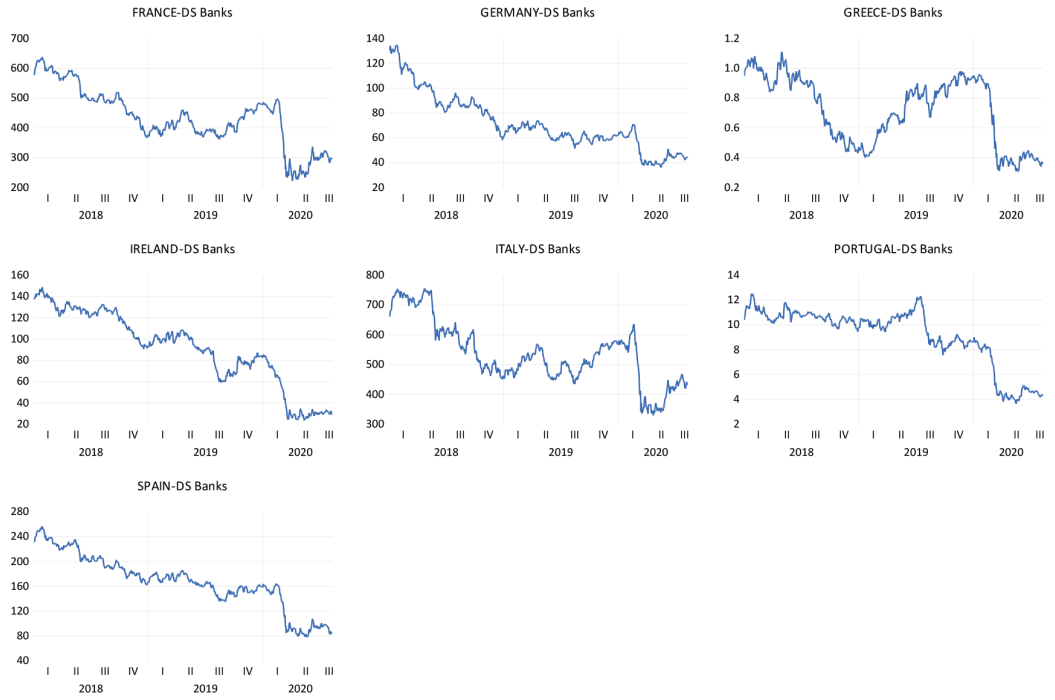


**Figure 1.** Evolution, in levels, of the seven banking sectors, in the period from 01/02/2018 to 08/10/2020

**Source:** Own elaboration

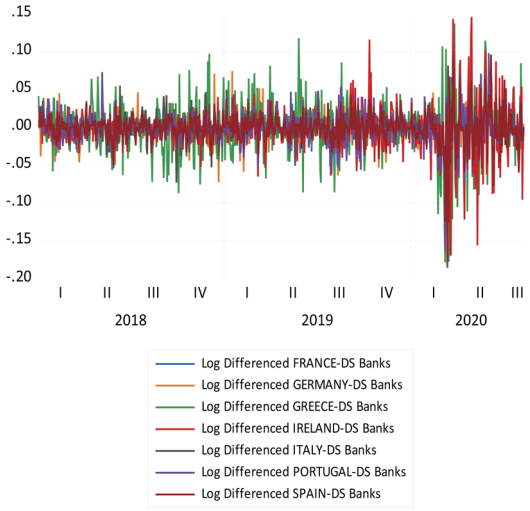


**Figure 2.** Evolution, in % of differences, of the seven banking sectors, for the period from 01/02/2018 to 08/10/2020

**Source:** Own elaboration

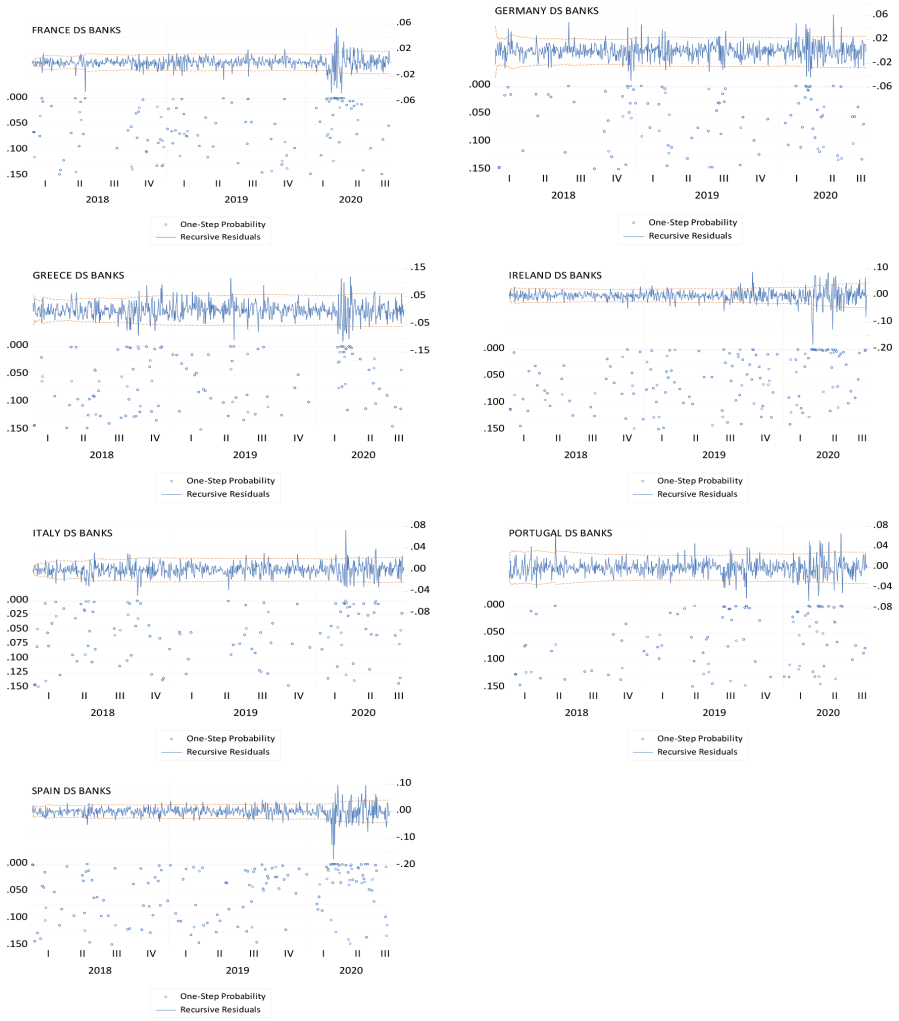


**Figure 3.** Stability tests performed on the residues of the seven banking sectors in the period from 02/01/2018 to 10/08/2020

**Source:** Own elaboration

Table 4 depicts the main descriptive statistics of the returns of the seven banking sectors under analysis. The returns show negative daily averages. The Greek banking sector has the highest standard deviation (0.034856), while the Italian banking sector has the highest kurtosis and asymmetry level. Also, the Jarque-Bera test confirms that we are dealing with time series that do not follow a normal distribution, evidence confirmed previously by the levels of skewness (< 0) and kurtosis (> 3).

Figure 3 depicts the stability tests performed on the stock market residuals, measuring the existence of disturbances in the variance. Additionally, by examining the graphs and the 95% probability bounds, we observed a violation of the probability bounds, evidencing unstable behavior in the time series.

**Table 4.** Descriptive statistics, in returns, of the 7 banking sectors, for the period 02/01/2018 to 10/08/2020

| | FRANCE DS BANKS | GERMANY DS BANKS | GREECE DS BANKS | IRELAND DS BANKS | ITALY DS BANKS | PORTUGAL DS BANKS | SPAIN DS BANKS |
|---|---|---|---|---|---|---|---|
| Mean | -0.000981 | -0.001587 | -0.001425 | -0.002280 | -0.000627 | -0.001285 | -0.001500 |
| Std. Dev. | 0.022146 | 0.022170 | 0.034856 | 0.030538 | 0.020549 | 0.021192 | 0.021040 |
| Skewness | -1.348067 | -0.540280 | -0.476581 | -0.422427 | -1.424886 | -0.831086 | -1.108491 |
| Kurtosis | 14.58472 | 6.443499 | 7.116694 | 10.32545 | 15.60155 | 10.46002 | 14.69286 |
| Jarque-Bera | 4014.348*** | 369.5928*** | 506.6551*** | 1542.920*** | 4736.361*** | 1657.519*** | 4018.978*** |
| Sum | -0.667816 | -1.080719 | -0.970358 | -1.552853 | -0.426859 | -0.875276 | -1.021819 |
| Sum Sq. Dev. | 0.333497 | 0.334239 | 0.826136 | 0.634131 | 0.287124 | 0.305396 | 0.301024 |
| Observations | 681 | 681 | 681 | 681 | 681 | 681 | 681 |

Note: ***. **. *. represent significance at 1%. 5% and 10%. respectively.

**Source:** Own elaboration.

Table 5 depicts the results of Clemente et al. (1998) unit root tests with structural breaks in the Pre-Covid subperiod, through which one can easily observe that the banking sectors mostly exhibit structure breaks in 2018, except for the banking sectors of Ireland and Portugal, which break in July 2019.

**Table 5.** Unit root tests with structural breaks of Clemente et al. (1998), in returns, referring to the seven banking sectors, in the period from 01/02/2018 to 08/30/2019

| Index | t-stat | Break Date |
|---|---|---|
| France DS Banks | -19.81(0)*** | 06/12/2018 |
| Germany DS Banks | -22.24(0)*** | 20/12/2018 |
| Greece DS Banks | -19.51(0)*** | 03/12/2018 |
| Ireland DS Banks | -20.28(0)*** | 29/07/2019 |
| Italy DS Banks | -20.09(0)*** | 28/09/2018 |
| Portugal DS Banks | -20.89(0)*** | 16/07/2019 |
| Spain DS Banks | -20.93(0)*** | 29/05/2018 |

Note: Lag Lenght (Automatic Length based on SIC).
Break Selection: Minimize Dickey-Fuller t-statistic. The lateral values in parentheses refer to lags.
***. **. *. represent significance at 1%. 5% and 10%. respectively.

**Source:** Own elaboration

Table 6 depicts the unit root tests' results with structure breaks of Clemente et al. (1998) in the Covid subperiod. We can observe that the banking sectors show mostly structure breaks in March 2020, except for Italy's banking sector. The results are in line with G.Sudha and V.Sornaganesh (2020) findings, showing that the oil price war between Russia and Saudi Arabia, after an OPEC agreement was not reached, caused a significant drop in financial markets in March 2020.

**Table 6.** Unit root tests with structural breaks of Clemente et al. (1998), in returns, regarding the seven banking sectors, from 03/09/2019 to 10/08/2020.

| Index | t-stat | Break Date |
|---|---|---|
| France DS Banks | -15.94(0)*** | 16/03/2020 |
| Germany DS Banks | -15.49(0)*** | 12/03/2020 |
| Greece DS Banks | -16.24(0)*** | 09/03/2020 |
| Ireland DS Banks | -14.68(0)*** | 19/03/2020 |
| Italy DS Banks | -17.11(0)*** | 13/09/2019 |
| Portugal DS Banks | -16.09(0)*** | 09/03/2020 |
| Spain DS Banks | -16.35(0)*** | 16/03/2020 |

Note: Lag Lenght (Automatic Length based on SIC).
Break Selection: Minimize Dickey-Fuller t-statistic. The lateral values in parentheses refer to lags.
***. **. *. represent significance at 1%. 5% and 10%. respectively.

**Source:** Own elaboration

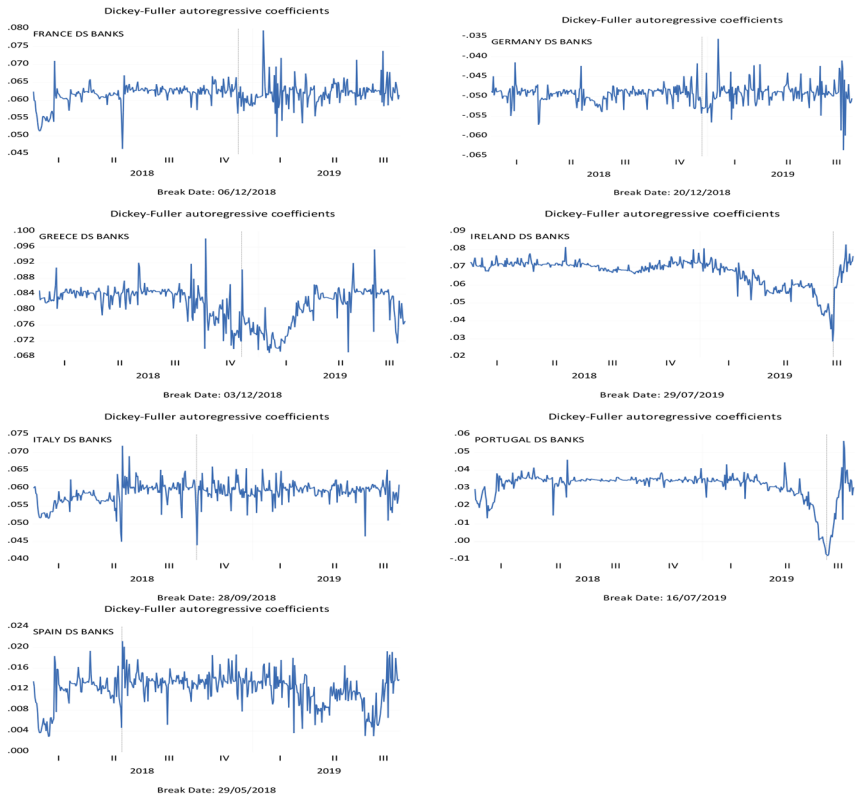


**Figure 4.** Graphical representation of the Clemente et al. (1998) structure breakdowns, in returns, pertaining to the seven banking sectors, from 02/01/2018 to 30/08/2019.
**Source:** Own elaboration

In Table 7, we can observe the DFA exponents for seven banking sectors in Europe. Period I comprises the Pre-Covid time scale and evidences the presence of long memories in France and Italy's banking sectors. In contrast, the remaining banking sectors present signs of equilibrium since the random walk hypothesis was not rejected. Period II encompasses the Covid-19 time scale, and the presence of significant long memories in all banking sectors under analysis was found, except in the banking sector of Ireland (0.49).

**Table 7.** DFA exponent for index and return.
The values of the linear adjustments for α DFA always had R2 > 0.99.

| Stock market | DFA exponent (before the crisis) | DFA exponent (crisis period) |
|---|---|---|
| France DS Banks | 0.55 ≅ 0.0003 | 0.60 ≅ 0.0009 |
| Germany DS Banks | 0.52 ≅ 0.0005 | 0.63 ≅ 0.0055 |
| Greece DS Banks | 0.49 ≅ 0.0032 | 0.57 ≅ 0.0076 |
| Ireland DS Banks | 0.45 ≅ 0.0019 | 0.49 ≅ 0.0066 |
| Italy DS Banks | 0.56 ≅ 0.0034 | 0.64 ≅ 0.0042 |
| Portugal DS Banks | 0.48 ≅ 0.0097 | 0.61 ≅ 0.0050 |
| Spain DS Banks | 0.49 ≅ 0.0086 | 0.57 ≅ 0.0009 |

Note: The hypotheses are $H_0$: $\alpha = 0.5$ and $H_1$: $\alpha \neq 0.5$.

**Source:** Own elaboration.

These findings show that the assumption of the market efficiency hypothesis may be questioned since the prediction of the market movement may be improved by considering the lagged movements of the other markets, thus allowing for arbitrage operations. These findings are in line with the evidence found in the work of Ferreira, Dionísio, Guedes, and Zebende (2018), González et al. (2019), showing that the banking sectors analyzed by these authors do not follow the efficient market hypothesis.

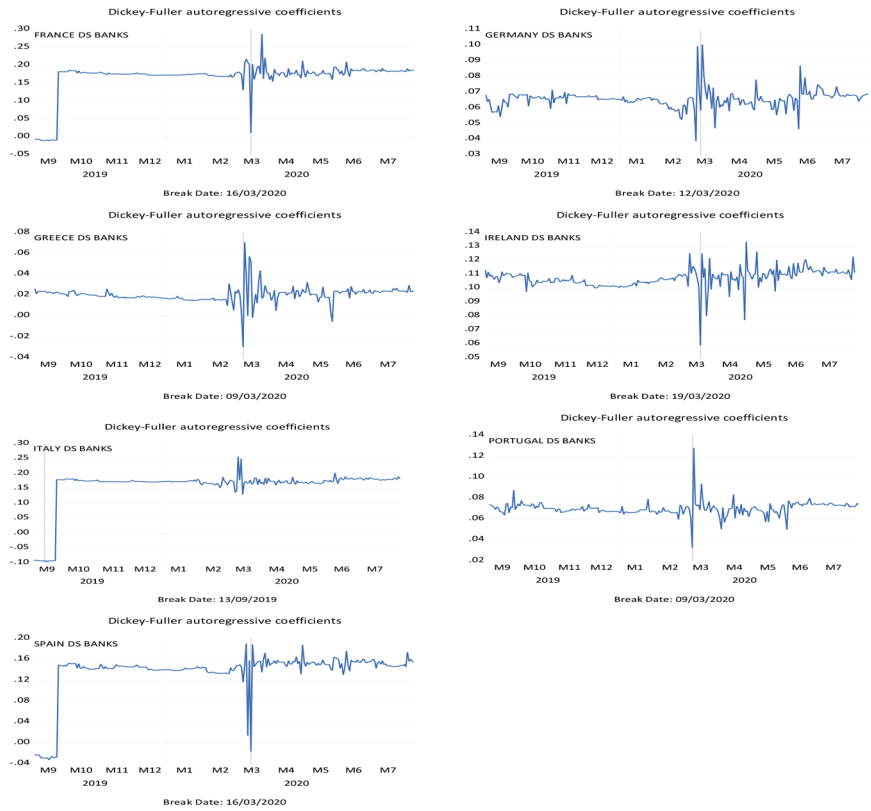


**Figure 5.** Graphical representation of the Clemente et al. (1998) structure breaks, in returns, regarding the seven banking sectors, in the period from 09/03/2019 to 08/10/2020

**Source:** Own elaboration

In Table 8, we can observe the Detrended cross-correlation coefficient ) (out of 21 possible ones), with an exception made to the pairs France DS Banks / Germany DS Banks (0.12), Ireland DS Banks / Italy DS Banks (0.59). These findings show that the banking sectors analyzed show marked levels of integration, which may question the hypothesis of efficient portfolio diversification.

In Table 8, we can observe the *Detrended cross-correlation coefficient pDCCA* referring to the period from January 02,2018,to August 30,2019,encompassing both the Pre-Covid subperiod and the one during Covid-19.The banking sectors show that the *pDCCA* increased significantly during the Covid-19 period,except for the pair France DS Banks / Germany DS Banks which decreased. The banking sectors under analysis show that during Covid-19,there are 19 strong (0.666 → ≅ 1.000) cross-correlation coefficients (λ_DCCA) (out of 21 possible ones), with an exception made to the pairs France DS Banks / Germany DS Banks (0.12), Ireland DS Banks / Italy DS Banks (0.59). These findings show that the banking sectors analyzed show marked levels of integration, which may question the hypothesis of efficient portfolio diversification.

**Table 8.** Summary of the *pDCCA* coefficients, referring to the banking sector, for the period from 02/01/2018 to 10/08/2020

| | *pDCCA* (before Covid-19) | | *pDCCA* (Covid-19) | | |
|---|---|---|---|---|---|
| Index | *pDCCA* Time scale (days) | | *pDCCA* Time scale (days) | | Tendency |
| France DS Banks / Germany DS Banks | 0.87 | n > 63 days | 0.12 | n > 11 days | ↓ |
| France DS Banks / Greece DS Banks | 0.28 | n > 20 days | 0.80 | n > 43 days | ↑ |
| France DS Banks / Ireland DS Banks | 0.65 | n > 92 days | 0.75 | n > 52 days | ↑ |
| France DS Banks / Italy DS Banks | 0.76 | n > 76 days | 0.94 | n > 35 days | ↑ |
| France DS Banks / Portugal DS Banks | 0.59 | n > 35 days | 0.89 | n > 43 days | ↑ |
| France DS Banks / Spain DS Banks | 0.87 | n > 35 days | 0.94 | n > 43 days | ↑ |
| Germany DS Banks / Greece DS Banks | 0.25 | n > 29 days | 0.78 | n > 43 days | ↑ |
| Germany DS Banks / Ireland DS Banks | 0.67 | n > 63 days | 0.74 | n > 52 days | ↑ |
| Germany DS Banks / Italy DS Banks | 0.70 | n > 43 days | 0.91 | n > 43 days | ↑ |
| Germany DS Banks / Portugal DS Banks | 0.62 | n > 43 days | 0.87 | n > 43 days | ↑ |
| Germany DS Banks / Spain DS Banks | 0.82 | n > 52 days | 0.93 | n > 35 days | ↑ |
| Greece DS Banks / Ireland DS Banks | 0.19 | n > 76 days | 0.69 | n > 52 days | ↑ |
| Greece DS Banks / Italy DS Banks | 0.34 | n > 92 days | 0.82 | n > 52 days | ↑ |
| Greece DS Banks / Portugal DS Banks | 0.33 | n > 76 days | 0.83 | n > 52 days | ↑ |
| Greece DS Banks / Spain DS Banks | 0.29 | n > 35 days | 0.81 | n > 52 days | ↑ |
| Ireland DS Banks / Italy DS Banks | 0.51 | n > 52 days | 0.59 | n > 35 days | ↑ |
| Ireland DS Banks / Portugal DS Banks | 0.61 | n > 52 days | 0.68 | n > 43 days | ↑ |
| Ireland DS Banks / Spain DS Banks | 0.65 | n > 63 days | 0.73 | n > 43 days | ↑ |
| Italy DS Banks / Portugal DS Banks | 0.61 | n > 43 days | 0.89 | n > 52 days | ↑ |
| Italy DS Banks / Spain DS Banks | 0.79 | n > 52 days | 0.93 | n > 43 days | ↑ |
| Portugal DS Banks / Spain DS Banks | 0.71 | n > 43 days | 0.87 | n > 63 days | ↑ |

**Source:** Own elaboration

## 5. CONCLUSION

This study has analyzed the impact of the 2020 global pandemic on the banking sectors of the countries of France, Germany, Greece, Ireland, Italy, Portugal, and Spain for the period January 1, 2018, to August 10, 2020. The sample was split into two subperiods. The first subperiod is from January 2018 to August 2019 (Pre-Covid), and the second is from September 2019 to August 2020

(Covid-19). The analysis involved different approaches to verify whether: (i) the global pandemic (Covid-19) stressed the persistence, in the returns, of the European banking sectors; (ii) the presence of long memories increases the synchronizations between markets.

To answer the underlying research questions in our study we employed the Detrended Fluctuation Analysis (DFA) and Detrended Cross-Correlation Analysis (*pDCCA*) methodology. DFA is an analysis method that examines time dependence in nonstationary data series. The *pDCCA*, on the other hand, is a method for quantifying the level of cross-correlation between two nonstationary time series.

Our first test estimated the DFA exponents for seven banking sectors in Europe during two periods. Period I pertains to the Pre-Covid time scale, indicating the presence of long memories in France and Italy's banking sectors. In contrast, the remaining banking sectors show signs of equilibrium since the random walk hypothesis was not rejected. Finally, period II involves the Covid-19 time scale, and the presence of significant long memories in all banking sectors under analysis can be found, except in the case of the banking sector of Ireland (0.49). These findings show that the assumption of the market efficiency hypothesis may be questioned since the prediction of the market movement may be improved if the lagged movements of the other markets are considered, allowing for the occurrence of arbitrage operations. The second test estimated the *Detrended cross-correlation coefficient pDCCA* from January 02, 2018, to August 30, 2019, including both the Pre-Covid subperiod and the one during Covid-19. The banking sectors increased significantly during the Covid-19 period, except for France DS Banks / Germany DS Banks pair, which decreased.

The banking sectors under analysis show that, during Covid-19, there are 19 strong ($0.666 \rightarrow \cong 1.000$) cross-correlation coefficients ($\lambda$_DCCA) (out of 21 possible ones), with an exception made to the pairs France DS Banks / Germany DS Banks (0.12), Ireland DS Banks / Italy DS Banks (0.59). These findings suggest that the analyzed banking sectors show marked levels of integration, which in return questions the hypothesis of efficient portfolio diversification.

As for the first research question raised in our study, the DFA results confirm that European banking sectors present signs of (in)efficiency in its weak form. These findings may have implications for investors, as some returns can be expected and are bound to create opportunities for arbitrage and abnormal profits. Regarding the second question, the fact that the rhoDCCA increased significantly in the Covid-19 period shows that autocorrelation across markets may question the hypothesis of portfolio diversification.

Finally, as a general conclusion supported by the results obtained through the tests using econophysics models, there is evidence that the global pandemic has a significant impact on the analyzed financial markets adjustment. The results of the study also suggest that these markets show significant persistence during the Covid period, causing in return arbitrage opportunities. Additionally, the increase in *Detrended cross-correlation coefficient pDCCA* observed in the Covid period, compared to the preceding subperiod, may suggest that portfolio diversification is difficult to attain under these circumstances. These findings also draw the attention of market regulators to take steps to ensure better information across international financial markets. In conclusion, investors should diversify their portfolios and invest in less risky markets to mitigate risk and improve their portfolios' efficiency.

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# ANALYSIS OF HIGHER EDUCATION POLICY CHANGES DUE TO COVID-19: THE CASE OF BULGARIA

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**Abstract:** *The paper reviews and analyzes the factors influencing higher education public policy, and the impact of COVID-19 as a possible catalyst of change. The paper creates a definition of the public policy change and examines documents that carry public policy weight, assessing whether they represent changes in public policy which is a direct response to COVID-19. At the outset of the pandemic, the Bulgarian higher education sector was characterized by rigid accreditation standards, reliance on traditional forms of instruction, and poor use of technology and distance learning methods. The authors argue that the pandemic represents an unprecedented and currently underutilized window of opportunity for reforming the education sector and practices – especially where there does not seem to be political will or societal readiness to address – an opportunity that is currently not being utilized. The case is made that the pandemic can (and should) be used to provide the extra push to modernize educational models so that the sector emerges stronger and more resilient for the future.*

**Keywords:** *Public policy, Higher education, COVID-19, Distance learning.*

**JEL Classification J18 · I23 · D83**

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## 1. INTRODUCTION AND LITERATURE REVIEW

COVID-19 has sent previously unseen shockwaves across the globe and has had profound and very tragic effects in all countries, showing us in an unambiguous way how truly interconnected the world is, and revealing significant problems and deficiencies of the educational systems across the globe. While affecting different countries and educational systems differently, by its very definition, the pandemic affected virtually all educational systems, even if the effects are diverse for the different (primary, secondary, tertiary) educational levels in a given country. It is an undisputed fact that the majority of students across the globe have been affected:

> *The rapid transition from face-to-face to distance learning and school closures due to the global health crisis has massively affected all levels of education including higher education. According to UNESCO's global monitoring of the covid-19 impact on education about 84% of learners - from pre-primary to tertiary education level - were affected in March and April 2020.* (Eurydice, 2021)

The focus of the paper is on higher education in Bulgaria, but references to primary and secondary education – both in Bulgaria and abroad are made where appropriate. For example, the effects of COVID-19 on the school education in OECD member countries are described in detail in an OECD report "The State of School Education: One Year into the COVID Pandemic" (OECD, The State of School Education: One Year into the COVID Pandemic, 2021). The Bulgarian case for effects on school education is presented in the report by Global Metrics, Ltd, entitled "*Effects of the COVID-19 pandemic on pre-school and school education*" (Global Metrics Ltd., 2021).

In his piece "Acting on lessons from COVID to bring about deeper change in education" Andreas Schleicher, Director, OECD Directorate for Education and Skills, states:

> *This crisis has exposed the many inadequacies and inequities in our education systems – from access to the broadband and computers needed for online education, and the supportive environments needed to focus on learning, up to the misalignment between resources and needs.* (Schleicher, 2021)

A survey among nearly 25,000 university students in the spring of 2020, found out that 95% of the students in Bulgarian higher education institutions studied in majors that switched to an online form of education, with over two-thirds of them expressing satisfaction with the created prerequisites for successful completion of the school year. Dissatisfaction with various aspects of online learning is expressed by between 14 and 21 percent of students participating in this form of learning (Open Society Institute, Sofia, 2020). It is important to note that the survey was conducted in the April-June period, i.e., during the first months of the pandemic, and the very first-semester accessing online instruction.

A detailed report of the Institute for Research in Education has reviewed the effects of distance learning and other remote learning forms of education on the effectiveness of school education (Institute for Research in Education, 2020). Throughout its 192 pages, the author presents a very rich set of 129 Figures on the basis of a framework model for assessing the effects of distance learning in an electronic environment or other absent forms on educational effectiveness.

An example of direct support at the level of primary and secondary schools was the project "Equal Access to school education during the times of crisis", awarded in February 2021 (Ministry of

Education and Science, 2021) with a goal to avoid dropping out of school during distance learning periods. The actions in the BGN 110 million project are directly aimed to overcome the consequences of COVID-19 as they pertain to the technical support of the educational system during periods of distance learning, as well as digital literacy for educators, students, and parents.

By Decision of the Council of Ministers № 184 of March 5, 2021, on the grounds of Art. 91c, para. 2 of the Bulgarian Higher Education Act and in implementation of the Strategy for Development of Higher Education in the Republic of Bulgaria for the period 2021-2030, the policies for the development of public higher education institutions, the Conclusions of the EU Council on digital education in European knowledge societies and the Rome Communiqué, Ministers of the Bologna Process Member States have decided to launch the National Digital Qualifications Program. The specific societal challenges addressed by the program are related to the need to:

- stimulate the higher education institutions to increase the quality of the offered education and of the educational process itself;
- increase the prestige of the teaching profession among ICT specialists;
- update instructions in order to include innovative approaches and modern learning platforms.

However, based on the above, it can be concluded that the basis of this program is not a result of COVID-19.

In response to the rapid spread of the Coronavirus, which has caused serious disturbances in the social and economic life of all countries worldwide and poses serious threats to human life and health, on 28.04.2020 The Managing Authority of Operational Program 'Innovations and Competitiveness' (OPIC) decided to cancel the procedure BG16RFOP002-1.027 "Establishment and development of Regional Innovation Centers'' (RIC), which aims to strengthen the link between business and science in the field of innovation, and reallocates the funds of the program to measures stabilizing micro, small, and medium-sized enterprises as temporary measures to provide an effective response to the crisis. It also demonstrates the readiness of the Bulgarian Government to look for opportunities for the implementation of this procedure within the funds of the new programming period 2021-2027. The decision has a direct financial effect on strengthening the correlation between science and business, which Covid-19 significantly impacts.

## 2. METHODOLOGY

In order to determine the public policy changes that result from COVID-19, the study was conducted with the following steps:

**Step 1.** Review of literature on the effects of COVID-19 on education and various policy responses.
**Step 2.** Definition of Public Policy for the purpose of this analysis.
**Step 3.** Desk review of policy changes, reflected in laws, regulations, strategic documents, and ordinances that may draft public policy changes.
**Step 4.** Interviews with university administrators, faculty members, and current and former members of the Ministry of Education and NGO leadership on the policy changes that may be candidates for review.
**Step 5.** Evaluation of the items identified in Steps 3 and 4 for meeting the test of a policy change due to COVID-19 and the time-frame test (March 2020 to June 2021).
**Step 6.** Summary of the findings and general conclusions.

An in-depth study of changes in public policies in the field of higher education cannot be done without clarifying the nature and meaning of the notion 'public policy'. This is why **Step 2** defines ***Public Policy*** for the purpose of this article. One can define public policy as the combination of basic decisions, commitments, and action steps undertaken by those who hold or affect government positions. Some popular general definitions of Public Policy include:

- "Public policy is a course of action created and/or enacted, typically by a government, in response to public, real-world problems." (Rinfret, Scheberie, & Pautz, 2018)
- Public Policy is „the sum total of government action from signals of intent to the final outcomes" (Cairney, 2012)
- Public Policy is "whatever governments choose to do or not to do" (Dye, 1972)

The combination of the three doctrinal definitions above resulted in the working definition for this article – "***the action, or lack thereof, of the government in response to issues in Bulgarian Higher Education, resulting from the Coronavirus outbreak."***

The narrowing of the definition in this way allows a look through the regulations, laws, and other government-produced and/or sanctioned documents with the goal of selecting the most appropriate pieces for further review and impact assessment.

Additionally, there are two broad ways to look at public policy – through principles and plans of action, and through the specific actions and resulting outcomes. Given the short period since the start of the COVID-19 pandemic, and the speed with which policy actions move through the educational system, this analysis is using the former. As a result, we will look for stated goals, principles, and plans of action in the time frame from March 2020 to June 2021.

## 3. RESULTS AND DISCUSSION

After defining the term Public Policy for the purposes of this paper, a list is compiled as a result of Steps 3 and 4 - see Table 1:

**Table 1.** List of documents compiled during Step 3 and Step 4.

| | **Document Title** | **Effective Date** |
|---|---|---|
| A. | Strategy for the Development of Higher Education in the Republic of Bulgaria | December 2020<br>The decision was adopted by the 44th National Assembly on December 17, 2020. |
| B. | National Recovery and Resilience Plan | February 2021 |
| C. | Ordinance on the state requirements for organizing distance forms of educations in the higher education system. | Promulgated in Official Gazette issue 21, issued on March 12, 2021, enforced on September 1st, 2021. |
| D. | National Map of Higher Education | June 18, 2021 – draft for public discussion |
| E. | National vaccination plan against COVID-19 in the Republic of Bulgaria | 07.12.2020 |
| F. | Law on Measures and Actions during the State of Emergency, announced by a decision of the National Assembly of March 13, 2020, and on overcoming the consequences | Enforced on 13.03.2020, promulgated in Bulgarian Official Gazette issue 28 on 24.02.2021, last amended and supplemented in issue 36 of May 1, 2021 |

Step 5 represents a review of the documents from Table 1 with respect to the stated criteria for policy changes due to COVID-19, i.e.: 1) whether they are within the relevant time frame; 2) whether they represent policy change, and 3) whether the policy change can reasonably be attributed to the COVID-19 pandemic.

### A. *Strategy for the Development of Higher Education in the Republic of Bulgaria*

The new Strategy for Development for 2021-2030 builds on the experiences of the previous strategy and adds a 34-page Appendix for the detailed activities, measures, and instruments for the execution of the Strategy. It is the most natural place to see changes in public policy due to the pandemic, partially because it was approved 9 months after the first COVID cases in Bulgaria. However, despite the serious thought that went into the document, and many valid conclusions on the rigidity of the legal framework (Decision for the adoption of a Strategy for development of higher education in the Republic of Bulgaria for the period 2021 - 2030, 2021), COVID-19 was mentioned only in two instances on the 94 pages of the document. Equally importantly, the mentions are simply to illustrate the need for the "urgent digitalization" of Bulgarian education, which in turn may increase enrollment.

It should be noted that the Strategy starts with a review of the state of the Bulgarian Higher Education at the beginning of 2020, stating the progress made, and remaining challenges from the period 2014-2020 (the period of the recently concluded Strategy for the Development of Higher Education in Bulgaria). During the 7 years of the strategy, the share of the population aged 30-34 has increased from 26.9% to 32.5% (compared to the goal of 36%). This can be seen as a positive development, even though some see it as a challenge with the demographic challenges (with 2020 being the low point year of high school graduates, with increases projected in the next 7 years). At any rate, the number of students in tertiary education in Bulgaria has been decreasing in the last six years, even if there is some flattening in the last two years (see Figure 1 below).

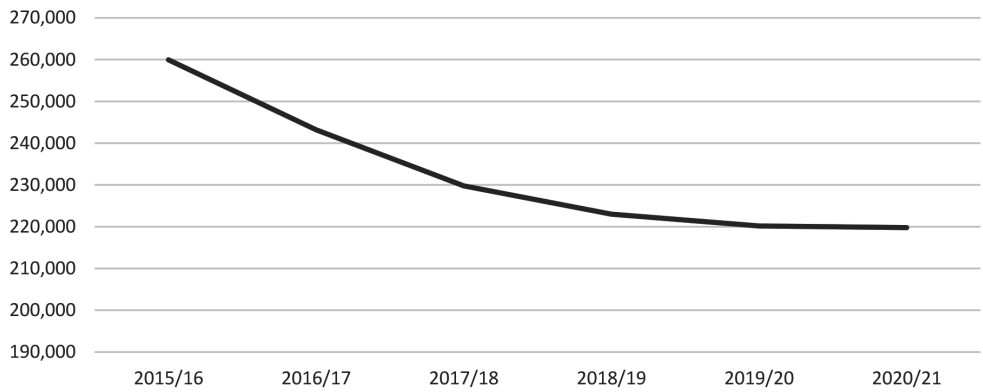


**Figure 1.** Total Students in Tertiary Education (2015/16- 2020/21)

**Source:** National Statistical Institute, 2015-2021

The Strategy also includes 10 goals and several tens of sub-goals – that are addressing issues of creating new and updating of existing programs, introductions of modern, agile, and effective forms and methods of education, among others, with a major focus on digitalization and "modernization" (without a clear definition). It is worth stressing that the first of only two mentions of COVID-19 in the text reads "With the development of the COVID-19 pandemic during 2020 almost all HEIs managed to switch to online mode of instruction, using existing, or updated/further developed digital educational materials. This process showed that there is a very good foundation for much more robust

development of digital instruction methods in the future…" (Bulgarian Parliament, 15). The second (and final) mention states "The need of urgent digitization of the whole education, provoked by the COVID-19 outbreak during 2020, only shows how urgent and important the reforms related to digitization in the sphere of Higher Education and all other spheres of life are" (Bulgarian Parliament, 18). These were the only two mentions and none of the tens of goals and sub-goals could be traced to the pandemic. Digitization is presented as an Opportunity in the SWOT analysis and is listed as a "cure" to long-standing issues of quality, cost-effectiveness, and access to education.

**B.** ***National Recovery and Resilience Plan***

The document that seems most important, and most directly related to COVID-19 is the National Recovery and Resilience Plan. In the document, there is a separate subsection on Education and Skills with an indicative estimate of 1 497.4 million BGN, which seemed promising.

The introduction of the National Recovery and Resilience Plan (Council of Ministers of Republic of Bulgaria, National Recovery and Resilience Plan (ver. 1.1/8.02.2021)) states:

> *In a situation of a high degree of uncertainty caused by the COVID-19 pandemic, limiting and controlling its spread, as well as dealing with its extraordinary consequences are the main tasks of the Government. The current situation requires targeted measures, and their timely and effective implementation is the key to preserving the economic potential and competitiveness of the economy in the subsequent recovery.*

Yet, the hopes for a comprehensive package to address the COVID-19 outbreak did not materialize, despite the 23 mentions of "COVID-19" in the text. The document that was submitted to the EC contained vague language on improving "the quality and coverage of education and training" and "[m]odernization of the educational institutions to create a more attractive and quality environment for learning and innovation" (Council of Ministers, 23-24)

The updated OECD Recommendation on Broadband Connectivity states: "The Internet has been a lifeline during the COVID-19 pandemic, but without good connectivity, millions of people ultimately face greater exclusion." (OECD, OECD Recommendation on Broadband Connectivity, 2021)

The National Recovery and Resilience plan does address the issue of broadband access in the section of "Digital Connectivity". Broadband is mentioned 20 times and there are numerous specific projects mentioned with indicative costs of BGN 1,005.1 million. Upon careful inspection, however, one can attribute the investments to Specific Recommendations from 2019 and 2020:

> *The component is in line with the Council 2019 and 2020 Country Specific Recommendations and will directly or indirectly contribute to the implementation of aspects of SR 2, SR 3, and SR 4 of 2020, as well as SR 3 and SR 4 of 2019. The proposed reforms and investments implicitly or explicitly aim to increase investment in high-capacity digital infrastructure with a view to increasing coverage and distribution. This will ensure equal access to broadband-based services, which will improve the possibility of distance learning and work (SR 2/2020). The envisaged measures will create PAGE | 92 preconditions for the realization of the digital transition in the country (SR 3/2020), with indirect expected positive effects in terms of social inclusion (SR 4/2019), e-government, the efficiency of public administration and therefore of administrative burden for enterprises (SR 4/2020) and the business environment in general (SR 3/2019).* (Council of Ministers, 90)

The conclusion is that this section of the plan will have a profound effect on the availability of broadband access and will have an impact on Higher Education and the delivery of instruction, but its origins cannot be traced to the pandemic.

### C. *Ordinance on the state requirements for organizing distance forms of educations in the higher education system*

The ordinance looked promising since it was adopted in the right time frame (March 2021) and is meant to deal with the issues of digital delivery and distance education (both aspects seemed logical for a policy response to COVID-19). Upon inspection, however, the Ordinance seemed to be the (long overdue) update of Ordinance 292 with a similar name from 2004. It is an example of government action, affecting public policy that is not caused by COVID-19 but rather coincides with the outbreak in time.

### D. *National Map of Higher Education*

The "National Map of Higher Education in the Republic of Bulgaria" (in its full legal name) is a tool, envisioned in the Higher Education Act, to determine and anticipate changes in demand for college graduates based on a number of factors. It can be used by the Ministry of Education as part of the decision-making process for approving the creation of new universities and new academic programs/majors within existing universities. It is introduced like a policy regarding the development of the profile and territorial structure of higher education and like an implementation measure of the Strategy for the Development of Higher Education in the Republic of Bulgaria, rather than as a direct response to Covid-19.

### E. *National vaccination plan against COVID-19 in the Republic of Bulgaria*

According to the National Vaccination Plan of the Republic of Bulgaria, the first deliveries of vaccines are intended for several priority groups in the population, defined by the risk of infection and the need to protect critical structures of society. The 89,000 pedagogical specialists, take priority place in the second phase of vaccination. Prioritizing teachers like first responders in terms of vaccination is also a policy - even just as an „emergency response". This is not the case in some other countries.

### F. *Law on Measures and Actions during the State of Emergency, announced by a decision of the National Assembly of March 13, 2020*

This legal act set the agenda for many sectors in a pandemic situation, including the higher education sector. According to § 24 of the general and final provisions, the terms, established in the Law for the development of the academic staff in the Republic of Bulgaria and the Higher Education Act, effective prior to this law, shall stop running after the declared state of emergency ends. The current accreditation procedures, competitions for admission of Ph.D. students, procedures for holding academic positions, etc. fall under the terms of these two laws.

### G. *Other changes and effects*

Additionally, there were a variety of changes and projects that individual HEIs underwent – mostly addressing the shock of the three lockdowns, but also broader effects of the pandemic. Some of these include virtual campus tours, distance application processes, etc. However, they can also be defined as "reactions" and "emergency responses" and do not seem to meet the policy change definition above.

According to the provisions of Law on Measures and Actions during the State of Emergency and Orders of the Minister of Health to declare an emergency epidemic situation in the country due to the spread of COVID-19, the National Evaluation and Accreditation Agency (NEAA) begins to conduct its accreditation councils and standing committees from a distance, suspending on-site visits to higher education institutions, and informing them by e-mail about the possibility for conducting assessment without site visits.

## 4. CONCLUSION

Our desk review did not find distinct changes in public policy that are specifically resulting from the COVID-19 pandemic. As shown above, some strategic documents, ordinances and other pieces of legislation have been enacted/approved in the period March 2020-June 2021, but we could not trace any policy changes ***directly*** to the COVID-19 pandemic – at least not at the tertiary education level.

Since the Coronavirus outbreak is fairly recent, we were not able to identify any changes in trends for the overall government support to higher education. Aside from the emergency response measures on behalf of HEIs, and the newly negotiated minimum salaries for the different faculty ranks, as well as change in coefficients used to calculate the government subsidy, there did not seem to be a coordinated, conscious effort that can be labeled "Policy Change".

Does that mean that COVID-19 and the processes surrounding the outbreak cannot serve the role of a catalyst in the Bulgarian higher education sector? Not necessarily. It is true, however, that the whole Higher Education sector has mobilized and started using course management platforms and online and distance education tools in a truly short time.

The two major, interconnected impacts, with long-lasting effects of the COVID-19 pandemic, and the policy response are:

1) The realization (albeit forced by the outbreak) that digital education is not "scary" and can be useful – both as a standalone instruction and in hybrid modes, *and*
2) Refuting the myth that digital education may serve as a *panacea* for all discrepancies and imperfections of the higher education system.

The combination and interaction of the two effects above give us the long-lasting impact of the COVID-19 pandemic in Bulgaria. It is important to look at the two effects above in a duality setting – on the one hand, there is the forced push to digitization (and a corresponding realization of certain positives of distance learning), and on the other hand is the sobering effect, the end of the romantic belief that the digital education can solve all issues and problems in the higher education system. In other words – "Pedagogy is the driver; technology is the accelerator." One cannot rely on technology as such, or on a particular method of delivery to solve the issues facing Bulgarian higher education.

## 5. FURTHER RESEARCH DIRECTIONS

Due to the fact that the Coronavirus outbreak is fairly recent, the authors were not able to identify any changes in trends for the overall government support to higher education. Aside from the emergency response measures on behalf of HEIs, and the newly negotiated minimum salaries for the different faculty ranks, as well as change in coefficients used to calculate the government subsidy, there did not seem to be a coordinated, conscious effort that can be labeled "Policy Change".

In several of the documents (most notably the Strategy for Development of Higher Education, but also the National Recovery and Resilience Plan) several "proper" and "adequate" mid-to-long-term processes are listed without any clear idea whether they will stay only on paper, as similar ideas have done many times in the past. So, an area of further review in 2-3 years can be the analysis of trends – in overall and per capita funding on tertiary education, the degree of acceptance of distance education by the NEAA and the Ministry of Education, as well as specific, government-sponsored efforts to address/mitigate the long-term effect of the COVID-19 Pandemic.

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# IMPACT OF THE LEVEL OF DIGITAL PUBLIC SERVICES ON THE FULFILLMENT OF TAX OBLIGATIONS

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**Abstract:** *The purpose of the paper is to find out how digitalization makes it possible to simplify the fulfilment of tax obligations of taxable persons - entrepreneurs. Digital development of tax administration means the level of digital services to tax entities. Taxpayers are perceived by the tax administration as clients who need to be simplified as much as possible. Introducing or increasing the provision of online services, pre-filled forms or electronization of invoices are current trends that reduce the time devoted to taxes. By monitoring the relationship between the development of the level of digital public services and the evolution of the number of hours needed to meet the tax obligations of the entrepreneur, it was found that the gradual introduction of digital projects reduces the administrative burden on taxable persons.*

**Keywords:** *Digitalization, Tax, Digital project, Technology.*

**JEL Classification H25**

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## 1. INTRODUCTION

The tax obligations of entrepreneurs mean not only the payment of taxes, but also the fulfilment of obligations related to registration with the tax administrator, notification of certain information or changes to the tax administrator, filling in and translating tax returns and other tax documents, or carrying out tax control. All these processes represent an administrative burden for the entrepreneur, which is associated with the payment of taxes during the business activity.

The level of digital public services intended for taxpayers affects their burden of bureaucracy and administration in fulfilling their tax obligations. The increasing level of digitalization has resulted in the simplification of the life situations of taxpayers. The low level of digital skills of taxable persons in relation to the provision of new products using the latest information technologies may be a weakness in the expansion of digitalization.

The improvement of the quality of services to tax entities is realized through a change in processes that have been carried out on paper and manually on digitized processes. Data are shared between the State and other public and private sector bodies, so-called third parties. Developments in the digitalization of tax administrations can be summarised as follows: (OECD, 2020, p. 10)

1. The introduction of better-verified reporting through third parties (e.g. integration of information into administrative processes originating from financial intermediaries, other parts of government, other taxpayers and other tax administrations);
2. The adoption of more reliable reporting systems (e.g. digitisation of VAT invoices, online cash registers, incorporation of basic tax rules into accounting software, etc.);
3. Better identification of possible non-compliance through better risk assessment modelling, the use of increasing digital data and advanced analytical techniques;
4. Improvements to services for taxpayers, including through electronic filing, pre-filled filing data, electronic payments, online self-service tools and targeted assistance such as online live chats. This makes it easier for taxpayers to understand and fulfil their obligations.

The research question arises whether digitising processes and services simplify the fulfilment of tax obligations of entrepreneurs. Quality digital services by the State depends on the digital performance of the economy as a whole. This premise further questions whether digitally the best performing countries provide high-level digital public services.

## 2. RESEARCH BACKGROUND – DIGITAL PERFORMANCE WITH A FOCUS ON DIGITAL PUBLIC SERVICES IN EU COUNTRIES

According to the Digital Single Market Strategy for Europe (EC, 2015), the digital single market will ensure that Europe maintains its global leadership in the digital economy. The EU's positive approach to digital transformation is based on the need to adapt to the digital age. The Digital Single Market opens up new opportunities as it closes the gap between the online and offline worlds and removes barriers to cross-border online activity. The efficiency of creating a digital single market in the EU is examined mainly from an economic point of view.

The digitalization of the economy has a predominantly positive impact on the socio-economic development of individual regions and countries and the digitalization of public services benefits the recipients of these services (Agostino et al., 2021) and affects their satisfaction and confidence (Krotel, 2021); but, on the other hand, the threat arising from digitalization is the emergence of obstacles preventing certain social groups from accessing and using technology correctly (Kwi-

linski et al., 2020). Research papers confirm the existence of a digital divide and uneven development of digital competencies (van Dijk, 2009; Cruz-Jesus et al., 2012; Caradaica, 2020). The implementation of new information technologies in the public sector, mandatory digital service delivery strategies, where users are forced to access the service through a digital channel and insufficient digital skills of employees are actual research areas (Pedrosa et al., 2020; Gholami et al., 2021; Tangi et al., 2021).

The relationship between digitalization and the fulfilment of tax obligations is currently not examined in detail. Therefore, the research question will be outlined as to whether a higher digital performance of public services will make it easier to meet tax obligations and thus increase the collection of tax revenues. Other consequences of simplifying tax obligations may be reflected in the promotion of business activities. During the business lifecycle, the tax burden varies from strongly negative to insignificant. The most significant negative effects will be felt in the early stages of the business. The authors (Braunerhjelm et al., 2019) concluded that a 10% reduction in the tax administrative burden increases the susceptibility to the emergence of a new enterprise by 4%. These are certainly behind the idea that simplifying tax obligations is one way to boost entrepreneurship. The burden imposed by tax laws and compliance with tax regulations constitutes an obstacle to entry into business (Braunerhjelm, Ecklund, 2014).

The EU is made up of countries that are economically or demographically different, divergent in their approach to public policies, thus creating an uneven development of digital competencies, and a single digital market is fragmented. The creation of a single digital market, therefore, depends heavily on meeting the commitments of EU countries to implement key digital initiatives. The digital maturity of EU countries is diverse and cannot be derived from the country's economic maturity. This means, for example, that the most economically powerful country does not automatically mean that it is also digitally the most powerful. Consequently, it is necessary to examine the performance and development of sub-areas of digital transformation. In order to optimise public sector processes, the introduction of proactive so-called intelligent electronic services by the State is linked. It is the area of digitalization of public services that is crucial and the EU is monitoring and evaluating developments in the provision of eGov services to states. We can see these digital performance relationships of EU countries compared to the EU-28 average in Figure 1.

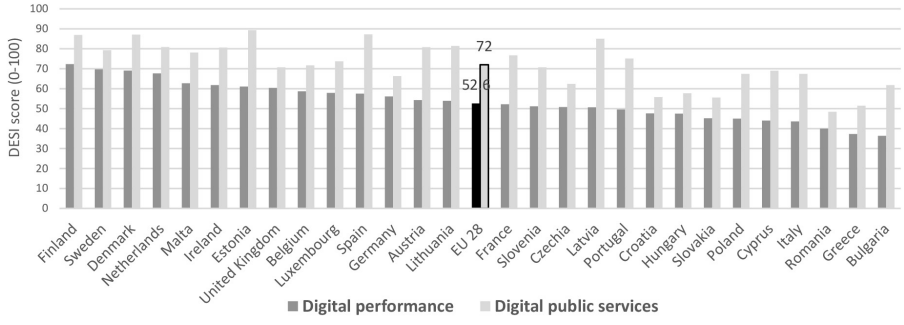


**Figure 1.** Digital performance in EU countries

**Source:** Own processing according to The Digital Economy and Society Index (DESI 2020)

The digital performance of EU countries is diverse, with the EU-28 average at a score of 52.6. Exactly half of the EU countries are digitally powerful above the EU average (scores 53.9 to 72.3) and the other half are digitally powerful below the EU average (scores of 36.4 to 52.6). Finland,

Sweden, Denmark and the Netherlands are the countries using the most advanced digital technologies. Even the largest EU economies in terms of GDP – Ireland and Luxembourg are not among the pioneers in digitalization, which has a significant impact on the overall performance of the Single Market. For example, countries such as Malta, Estonia and Lithuania, whose size is below the EU-28 average, are above the EU average for digital performance. Slovakia, as a country of below-average economic maturity, is also a country with below-average digital performance.

It is economically advanced countries that are lagging in the digitalization of the economy, e.g. Germany, Italy or France. There are introducing targeted investments in all areas of digitalization, i.e. in order to make progress in digitalization initiatives aimed at IT security, supercomputers and artificial intelligence, to facilitate the digitalization of public services and, last but not least, to implement the strategies that put digitalization and innovation in the spotlight and through which the digital transformation of the country is taking place (EC, 2020). The practical implementation of the developed digital market transition strategy will make it possible to manage emerging threats more effectively towards digitalization and to make optimal use of development opportunities. That strategy is also applicable to the public sector, business sector and individual households (Yanina et al., 2021).

Figure 1 shows that electronic public administrations operate effectively in Estonia, Spain, Denmark and Finland, all with scores above 85. Half of the Member States are below the EU rate of 72, but a score of less than 60 is achieved by Croatia, Slovakia, Greece and Romania. In this context, digital performance as a whole and performance only in the area of public services need to be distinguished. While Finland, Sweden and Denmark have been identified as leaders in the overall digitalization of the economy, Estonia, Spain and Denmark lead the way in digitising public services. A more detailed overview of parts of digital public services is provided in Table 1.

**Table 1.** Components of digital public services in the EU (the first three and last three countries)

| | **eGovernment users** | **Prefilled forms** | **Online service completion** | **Digital public services for businesses** | **Open Data** |
|---|---|---|---|---|---|
| **Top** | Finland, Estonia, Denmark | Malta, Estonia, Lithuania | Malta, Portugal, Denmark | Estonia, Denmark, Luxembourg | Ireland, Spain, France |
| **Down** | Italy, Greece, Germany | Romania, United Kingdom, Greece | Romania, Croatia, Cyprus | Romania, Greece, Croatia | Hungary, Slovakia, Malta |

**Source:** Own processing according to the DESI

The disparity in the digital performance of public administration within the EU is large and they alternate between the first and last places of the country when analysing the five-part eGov indicator. However, the result from the digital public service dimension is confirmed, i.e. Estonia and Denmark are the leading eGov leader, and Greece and Romania are the weakest eGov countries, as they are most common in all five eGov areas.

The growing share of the digital economy in GDP is due not only to the digitalization of the private sector but also to the public sector, which includes tax administration. The priority task of the tax administration is to ensure the implementation of the revenue part of the state budget as well as the EU budget. The key task of the tax administration is thus to effectively collect tax revenues to meet the statutory amount of revenue, monitor the fulfilment of revenues and take measures to achieve their fulfilment. Digital leaders in the transition from paper tax administration to electronic are characterized by a high number of digital projects in the tax administration

environment. New tools for communication of tax administration with tax entities are introduced by digitalizing information in the collection and payment of taxes. Tools such as digital assistants and chatbots come to the foreground, that is in absolute terms used the least, but the year-on-year percentage increase in usage has been highest (Ihnatišinová, 2021a). At the same time, the digitalization of processes in the tax administration environment is a tool to simplify the fulfilment of tax obligations by tax entities (Ihnatišinová, 2021b). These are greatly facilitated by the payment of taxes, and the introduction of new technologies in the tax administration environment poses a major challenge for many countries (PwC and World Bank Group, 2019).

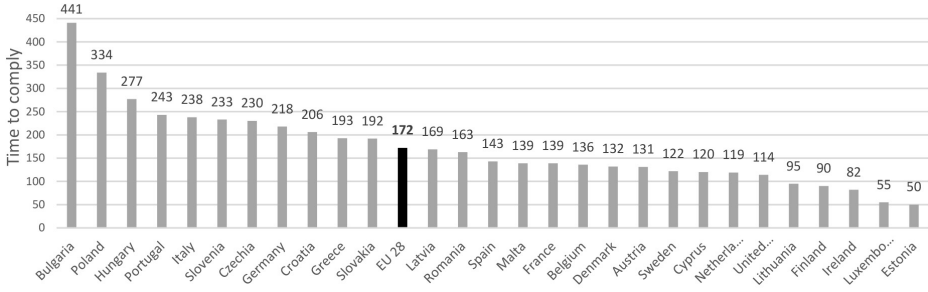


**Figure 2.** Time to comply with taxes in EU countries

**Source:** Own processing according to the Paying Taxes 2020

Figure 2 shows that the number of hours that entrepreneurs need to meet their tax obligations across the EU ranges from 50 hours in Estonia to 441 hours in Bulgaria. Most EU countries are below the EU-28 average of 172 hours. Ireland, Denmark, Finland are at the top of the world in terms of the use of digital public services in the tax administration environment, and in the second ten, it is Estonia, Lithuania, Latvia. In Estonia, entrepreneurs only need 50 hours to meet their tax obligations, well below the EU average. In Slovakia, it is up to 192 hours.

## 3. METHODOLOGY

The examination of the impact of overall digital performance on the level of the state's digital public services and/or electronic services is based on the fact that digitally performing economies also provide high-level digital public services. Consequently, the examination of the impact of the digital performance of public services on the fulfilment of tax obligations is based on the assumption that a high level of digital public services will be reflected in a better and easier fulfilment of tax obligations by taxable persons – entrepreneurs, i.e. in a lower number of hours associated with the administration of taxes.

Inconsistency with the main aim and the research questions the hypotheses to be tested are formulated as below:

**H1:** The higher the digital performance, the higher the level of digital public services;

**H2:** The higher the level of digital public services makes it easier to pay taxes.

To test the hypotheses of the research is used the statistical independence analysis to assess the dependence between the two variables. The digital performance of the economy is expressed by the overall score of the DESI index, the digital performance of public services is expressed by the overall score of the digital public service dimension of the DESI index, and the ease of paying tax-

es is expressed by the number of hours needed to meet the tax obligations of entrepreneurs. The data are drawn from Eurostat, the European Commission, PwC and the World Bank. The review period is 2019 and the UK is also assessed as an EU country.

## 4. RESULTS AND DISCUSSION

Hypothesis 1 that the level of digital public services is also increasing as digital performance grows has been confirmed, with the dependence between overall digitalization and digitalization of public services being weaker in the digital best-performing countries and stronger in digitally less powerful countries. The results are documented in Figure 3.

The relationship between overall digital performance and the level of digital public services is directly linearly dependent, with a very high correlation coefficient of 0.75, i.e. the level of digitalization increases, the level of digital public services also increases. However, if we examine this relationship only within the digitally performing countries, the results are slightly different. This means that of the 14 countries above the EU-28 average in the overall digitalization of the economy and society, 11 countries are digitally powerful, including the area of digital public services, and 3 countries are below the EU average for digital public services. In this case, there was a weak positive correlation with a correlation coefficient of 0.38.

An examination of the relationship between overall digitalization and digitalization in public services in countries that are less digitally efficient shows that out of 14 countries there are 3 countries that, despite the lower overall digital performance, achieve above-average values in digital public services. 11 countries with below-average overall digitalization also achieve below-average to low levels in digital public services. In this case, there was a large positive correlation with a correlation coefficient of 0.62.

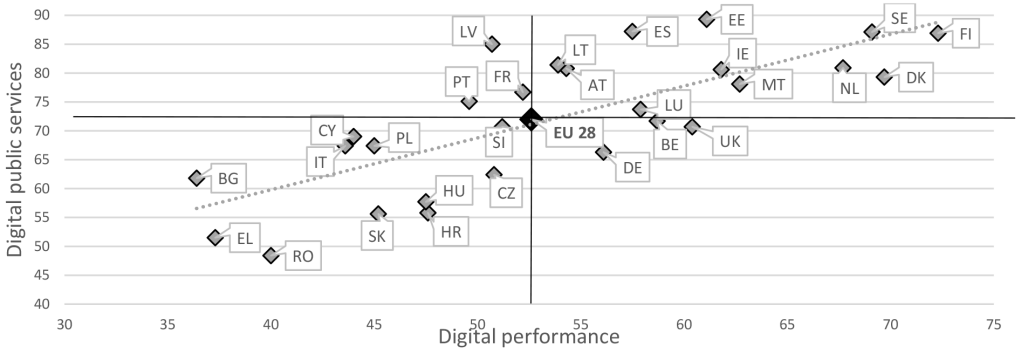


**Figure 3.** Relationship between digital performance and level of eGov in EU countries

**Source:** Own processing

Hypothesis 2 has been confirmed since the correlation coefficient is -0,54. There is an indirect relationship between the level of digital public services and the number of hours to meet tax obligations within the EU, but we can only describe it as moderate. This may be since the state's electronic services are provided in different public areas and digital projects in the tax administration spotlight are only one part of all digital projects throughout the public administration. Nevertheless, the negative relationship between eGov and the ease of paying taxes exists, as documented in Figure 4.

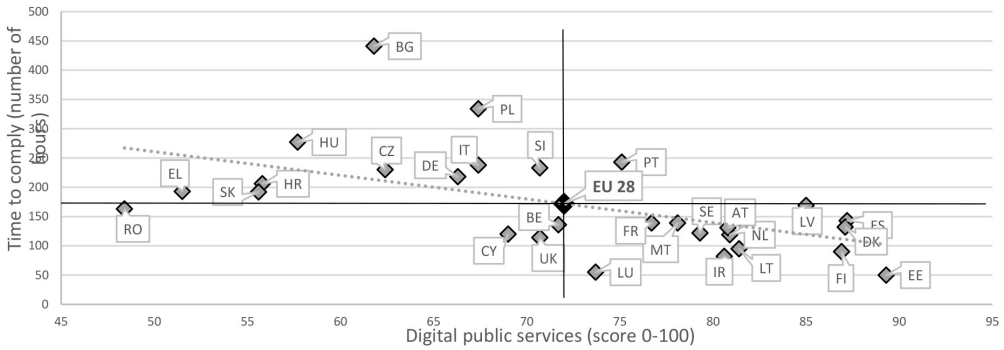


**Figure 4.** Relationship between level of eGov and time to comply with taxes in EU countries

**Source:** Own processing

Of the 14 countries that are above average in the provision of state electronic services, up to 13 countries can be identified as with a simple tax system because the number of hours to meet tax obligations is below the EU average, i.e. between 55 hours and 169 hours. However, the correlation coefficient, in this case, is -0.24, which confirms a very weak negative correlation between variables. The variation range for the number of hours to meet tax obligations is 114 hours in countries with above-average digital public services.

Of the 14 countries with a level of digital public services below the EU average, up to 10 countries do not have a simple tax administration system and thus the fulfilment of tax obligations by entrepreneurs is complicated because it takes between 192 hours and 441 hours. The correlation coefficient, in this case, is -0.06, which confirms too weak or zero correlation between variables. The variation range for the number of hours to meet tax obligations is up to 249 hours in countries with below-average digital public services. This means that these countries have huge scope to implement digital projects in a tax administration environment.

On 9 March 2021, the Commission presented a vision and ways to achieve Europe's digital transformation by 2030. This vision of the EU digital decade focuses on four fundamental areas: skills, the digital transformation of businesses, secure and sustainable digital infrastructures and the digitalisation of public services. Digital public services should include key public services: 100% online, eHealth: 100% availability of health records and digital identity: 80% of citizens using digital ID cards (EC, 2021).

From results of the paper follows a recommendation for Slovakia to modernise the tax administration system with a focus on digitalization, based on the provision of quality state electronic services throughout public administration. According to the Strategy to Improve the Position of the Slovak Republic in the DESI index until 2025, the vision is that: „Slovakia will actively develop digital trends over the next five years and, thanks to innovation, improve the lives of its citizens, conditions for entrepreneurship and make the most of the full potential that digitalization provides across the economy and society." If the Slovak Republic improves its overall digital performance, it will also increase the level of digital public services and consequently simplify the administration of taxes. The implementation of digital projects in the tax administration environment is crucial. Slovakia has been applying a dual model of public administration since 1990, based on which there is a separate existence of state administration and self-government (Belkovicsová et al., 2020); particular attention should be paid to the development of digitalization at the municipal level. Entrepreneurs, as tax taxpayers of local taxes, also fulfil their tax obligations towards municipalities that are local tax administrators.

## 5. CONCLUSION

The importance of digitalization for the fulfilment of tax obligations depends on the level of digital public services, which are one of the dimensions of overall digital performance. The state's electronic services, which are well implemented, allow citizens, businesses and organisations to interact with the government more easily, faster and at a lower cost. The digitalization of public services brings transparency and openness to governance. The results of the article show that the level of digital public services is also increasing as overall digital performance increases, while in the digitally performing countries the dependence between overall digitalization and digitalization of public services is weaker, and in digital less powerful countries this dependency is stronger.

In fulfilling tax obligations, the importance of digitalization lies in reducing the administrative burden on entities. The inversely proportional relationship between digitalization and tax administration has been confirmed, i.e. increasing the level of digital public services simplifies the fulfilment of tax obligations and reduces the number of hours associated with paying tax within EU countries.

Looking at more and less digitally efficient countries in the field of public services, it is necessary to take into account the types of digital projects implemented in the tax administration environment. The results of the article show that as digital performance in public services grows, the number of hours needed to meet tax obligations decreases, while in digitally more powerful countries the dependence between the digitalization of public services and the ease of paying taxes is weaker, and in digitally less powerful countries this dependency is almost zero. Therefore, less developed countries should be able to implement reforms that reduce the cost of paying taxes. The most popular digital reforms are the introduction or expansion of the online system for paying taxes, the use of electronic registration and payment systems, the transition from the manual filing of tax returns to the electronic filing of tax returns. Other digital initiatives that simplify the fulfilment of tax obligations are pre-filled tax returns by the tax administration, which reduce preparation time for taxpayers or mandatory electronic invoicing.

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# LEVEL OF FINANCIAL LITERACY OF ACADEMIC YOUTH FROM RURAL AND URBAN AREAS

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**Abstract:** *Financial literacy is becoming one of the key competencies in the 21st century. In its absence, it is virtually impossible to navigate the market for financial products and services and thus ensure financial stability throughout a whole life. This fact is all the more important given the threats arising from the effects of the pandemic crisis. Thanks to exhausted public budgets and the cooling of the economy, it can be expected that, despite strong regulation, there will be more aggressive sell practices on the market, to which financially literate people are more resilient. The aim of the study is to determine the level of financial literacy of academic youth from rural areas and to compare the results obtained with the level of financial literacy of young people from cities. The source of data used for analysis and inference was primary information obtained from own questionnaire research. To assess the level of financial literacy, the authors use an innovative metric, the personal finance index. In addition to overall success, this approach also makes it possible to analyze knowledge from the eight functional areas of financial literacy. By comparing the results in single areas, the authors reveal that risk management is Achyla's heel of financial literacy. The authors focus on the differences in financial literacy according to the place of residence. The study explores inequalities in the single functional areas of financial literacy between the respondents living in the urban and rural areas.*

**Keywords:** *Decision making, Financial education, Financial knowledge, Financial logic, Financial management, Questionnaire survey.*

**JEL Classification D71 · G41**

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## 1. INTRODUCTION

The exposition to rapid and dynamic changes is one of the characteristic features of life in the modern society of the 21st century. Nearly everyone is aware of the impact of modern technology, but people also need to understand that almost daily their lives are becoming more closely linked to complex financial markets. The post-covid period and the associated aid programs only highlighted this fact. The choice of appropriate assistance, deferral of loan repayments, must always be carefully considered with regard to its possible future impact.

Financial literacy belongs to the core life skills for people living in modern society. One can characterize it as knowledge of personal financial management. It provides a double advantage in protection against financial losses and frauds as well as in planning a financially secure future. Financial literacy gives consumers the necessary knowledge and skills to assess the suitability of the various financial products and investments available in the financial market.

In our study, we focus on academic youth, and our objective is to examine the influence of the socio-demographic factor, which is the nature of the place of residence, on the level of financial literacy. The type of residence is closely linked to the use and availability of financial services and subsequent practical experience. Based on our previous research (Polák, Kozubíková, & Kozubík, 2018), we formulated a research hypothesis:

**Hypothesis One:** The financial literacy of the inhabitants of rural settlements and urban agglomerations is different.

The use of the Personal finance index enabled a structured approach to individual functional areas of financial literacy. Therefore, it was possible to analyze potential differences and verify or refute the validity of hypothesis number two:

**Hypothesis Two:** Respondents' knowledge is uniformly distributed in all functional areas.

Since our expectations were, based on our experience of pedagogical work, entirely the opposite, we also formulated the third hypothesis:

**Hypothesis Three:** For all types of residence, the decline in competencies are reflected in the same functional areas.

## 2. LITERATURE REVIEW

One can find in the literature several more or less complex definitions of financial literacy. For instance, Mandell defined financial literacy as *The ability to evaluate the new and complex financial instruments and make informed judgments about both: choices of instruments and extent of use that would be in their own best long-run interests* (Mandell, 2007). Remund says that financial literacy *is a measure of the degree to which one understands key financial concepts and possesses the ability and confidence to manage personal finances through appropriate short-term decision-making and sound, long-range financial planning, while mindful of life events and changing economic conditions* (Remund, 2010). The study by Giesler & Veresiu (2014) defines financial literacy as *The ability to understand how money works in the world: how someone manages to earn or make it, how that person manages it, how he/she invests it (turn it into more) and how that person donates it to help others.* To measure financial literacy among adults, the OECD/INFE

developed the definition: *Financial literacy is a combination of awareness, knowledge, skill, attitude, and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being* (Atkinson & Messy, 2012).

The PISA Financial Literacy Assessment Framework (OECD, 2019) refines the definition used for adults to make it relevant for 15-year-old students: *Financial literacy is knowledge and understanding of financial concepts and risks, and the skills, motivation, and confidence to apply such knowledge and understanding in order to make effective decisions across a range of financial contexts, to improve the financial well-being of individuals and society, and to enable participation in economic life.*

The importance of financial literacy is emphasized by several authors. A strong positive relationship between financial literacy and the wealth of households is reported in van Rooij, Lusardi & Alessie (2012). *Our findings provide evidence of a strong positive association between financial literacy and net worth, even after controlling for many determinants of wealth.*

A number of studies and research examine financial literacy and financial inclusion in terms of service availability, information, potential benefits, and financial education. Research by Di Giannatale & Roa (2019) examined different barriers to formal saving, considering various interventions and their possible effects at microeconomic and macroeconomic levels. This study used and confirmed the results by Dupas et al. (2019) stating that the possible availability of acquiring free or very affordable savings products, administrative simplicity, and the ability to have a minimum of balances minimize barriers to financial inclusion of poor households. Di Giannatale & Roa (2019) also mention the importance of understanding all the barriers that are linked to the use of financial products. Barriers include social ties that lead to informal transfers, low levels of financial education, lack of trust in formal financial institutions, and behavioral biases. In this light of information, their research states that financial education programs should provide information about savings products as well as the benefits of saving.

Research by Ansong et al. (2019) talks about the positive impact of the availability of possibilities of saving for studies and appeal for financial inclusion. Their results state that treatment effects on school attendance and academic performance were examined using difference-in-difference estimation with bootstrapped standard errors when their results show that treatment effects were significant for attendance but not performance. Their wide study demonstrated the potential of asset-accumulation programs can contribute to improved behavioral outcomes and offers insights for the integration of financial capability programs in youth development policies on pupils from public schools in Ghana.

The paper of Potocki (2019) examines low-income households' financial capability by looking at their financial literacy, financial behavior as well as financial inclusion among low-income households from rural and peripheral parts of Poland. Research has found that financial literacy among these households is very low, but also some positive literacy factors underlining the importance of numeracy, risk literacy, and debt literacy, in particular, can be found. This situation is associated with literacy in general, however, the author emphasizes the need for financial literacy.

The low level of financial literacy may result in the incapability to use a full range of financial opportunities, prevent households from having the capability to make responsible financial choices, like being able to understand product mechanisms and product descriptions, and put at risk some other core functionalities, such as psychological health (Marmot, 2005; Pollack & Lynch, 2009; Potocki, 2019).

Potocki (2019) also mentioned some identified „financial management skills" consisting of abilities allowing to manage a financial budget and keep track of expenditure, which connects more with survival skills and the local culture than with financial education attendance. Thus, households behave responsibly and carefully, they first save before taking any action in the form of decisions, for which they need to be financially informed, which motivates them to financial education. However, they think in the short term, which leads to proper day-to-day money management, but it has implications for the short term thinking in planning and/or low propensity to save. This is evidenced by the study of Kempson, Perotti & Scott (2013).

According to Potocki (2019), it is necessary to take into account the factors of financial inclusion based on research in low-income families from rural areas. Adapting to low income does reduce financial stress and frustration, but structural constraints do not increase household income, leading to further effects. People can have low ambitions, they do not use their abilities, they do not focus on long-term savings, which can have a destructive impact on the financial possibilities of these households. This is especially true for post-communist countries, where risk avoidance, passivity, and survival attitude lead to short-term thinking.

However, the issue of financial literacy and inclusion is not a topic of developing and post-communist countries. From the point of view of the currently solved migration, this issue becomes more important, because it can lead to import ingrained behavioral patterns and complications in the process of integration (Palát, 2014). The need for financial inclusion even in developed market economies is underlined by research (Nam & Loibl, 2021), which states that almost a third of older adults over the age of 55 in the United States have neither retirement savings nor accumulated retirement benefits. Their research focused on low-income adults. Their findings are also reflected in the behavior of middle-income households. They emphasize the need for broad education in financial literacy across all age groups. The authors consider the current formal education at secondary and post-secondary institutions to be insufficient and point to the need for further education in the workplace.

In Europe Huang, Kale, Paramati & Taghizadeh-Hesary (2021) examined the role of financial inclusion in economic output in a sample of 27 EU member countries. To confirm the reliability of the results they classified the full sample into old-EU, new-EU, high-income EU, and low-income EU economies. The authors measured economic development through indicators of GDP and per capita GDP. Their study also controlled for various factors (eg. energy use, capital, labor, and trade openness) and used yearly data from 1995 - 2015 as well as panel econometric techniques. Their study confirmed that financial inclusion has played a significant and positive role in promoting economic performance across EU nations, with the impact of financial inclusion on economic growth being much stronger in the new EU and low-income EU countries. These results point to significant space to expand and develop the markets.

## 3. METHODOLOGY

As a measuring tool of students' financial literacy, we used an innovative measure introduced in Lusardi, Yakoboski & Oggero (2017) as a personal finance index (shortly P-Fin index). This tool measures the knowledge and level of comprehension necessary to manage personal finances effectively and make a financial decision correctly. The authors mentioned above have designed the P-Fin index to cover the eight functional areas of financial literacy that an individual commonly encounters in managing personal finances. These areas are:

- earnings, determinants of wages and income,
- consuming, budgeting and spending,

- saving, comprehension the accumulation factors,
- investing, understanding the types and risks of investments,
- borrowing and debt management,
- risk management, comprehension of the uncertain outcomes,
- insurance and the understanding of coverages,
- accessing and working with information sources.

The data necessary for the analysis we have collected by the method of questionnaire survey. The knowledge testing part of the questionnaire consisted of 30 multiple-choice questions. Each of the functional areas of financial literacy was covered by three or four questions. Respondents entered the answers as a choice of four options, one of which was correct, and one option was the „I don't know" option. Besides the knowledge questions, the questionnaire contained questions concerned with socio-demographic data such as age, gender, education, the residence.

We conducted our questionnaire survey at two universities. One of them is located in Czechia, and the other in Slovakia. From the 425 answer sheets received, 238 were from Slovakia, and the remaining 187 were from the Czech Republic. We focused the research on students of the first (bachelor's) degree in economics and management. It represents young people aged between 18 and 25. All of them had completed secondary education at different types of schools. Almost half of the students, 207 to be precise, were graduates of grammar schools, another 80 were graduates of industrial schools and 86 were graduates of vocational secondary schools. Only 52 respondents, representing approximately 12%, were graduates of trade academies. It is only in this small, latter group that it is possible to assume some foundation of previous formal economic education.

A crucial element was determining which residences we would consider rural and urban. The usual criterion for assessing the type of residence is the number of inhabitants. The distinction into three categories proved to be expedient, namely rural settlements, small and medium-sized towns (we will further refer to as urban) and large metropolises. Following customs, we have chosen 5,000 inhabitants as the upper limit for the rural settlement. Given the total population in both countries, we set the limit for metropolitan centers at 100,000, which is met by regional capitals.

The notion of stochastic dominance was used to compare the empirical distributions. It provides a partial ordering between the random variables. For our purposes, we applied the first-order stochastic dominance rule. Let $X$ and $Y$ be two random variables with the cumulative distribution functions $F_X(x)$, and $F_Y(x)$ respectively. We say that $X$ dominates $Y$ (in the sense of the first-order stochastic dominance) if $F_X(x) \leq F_Y(x)$ for all $x$, where a strict inequality holds for at least one $x$. Expressed by the language of probabilities it means that $P[X \geq x] \geq P[Y \geq x]$ for all $x$, and the strict inequality $P[X \geq x] > P[Y \geq x]$ holds for at least one $x$. So the random variable $X$ tends to reach higher values than random variable $Y$.

The tests of the statistical hypotheses about the equality of mean percentages, we conducted using the Welch t-test that implemented in the R environment. Also, all other calculations and graphical outputs have run in this environment.

## 4. RESULTS

Our sample contained a total of 425 completed questionnaires. Since we distributed 540 questionnaires as a whole, the corresponding return rate is 78.7%. We summarized the numbers of respondents according to the size of settlements in Table 1.

**Table 1.** Counts and percentages of respondents according to the type of their residence

| | Type of residence | | |
|---|---|---|---|
| | **Rural** | **Urban** | **Metropolises** |
| **Count** | 249 | 112 | 64 |
| **Percentage** | 58.59% | 26.35% | 15.06% |

**Source:** Own elaboration

Figure 1 illustrates the percentages of correct and incorrect answers as well as „I do not know" answers in each functional area of financial literacy.

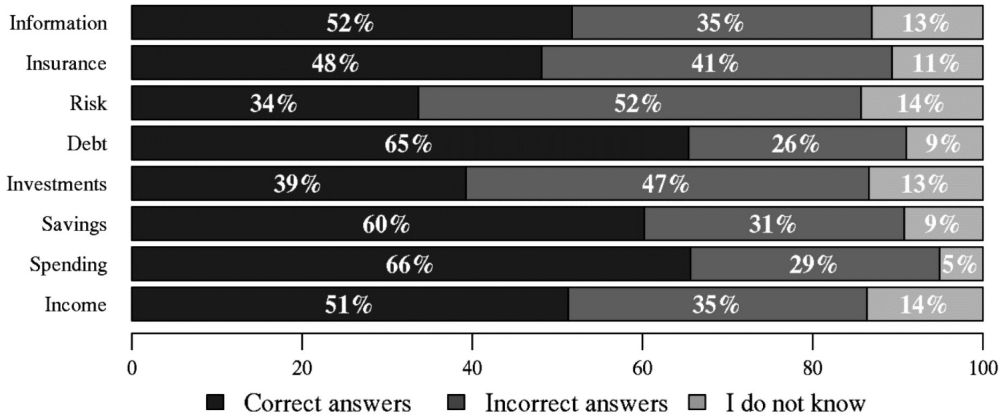


**Figure 1.** Percentages of correct and incorrect answers and „don't know" answers in single functional fields.

**Source:** Own elaboration

In Figures 2-4, we then graphically present these shares broken down by type of residence. The figures document the higher proportion of correct answers among respondents from metropolitan areas. They also show a decrease in the share of „I do not know" responses. The highest proportions of „I do not know" answers were among the inhabitants of small and medium-sized towns, and if this proportion decreased in some functional areas, it was reflected in a higher rate of incorrect answers.

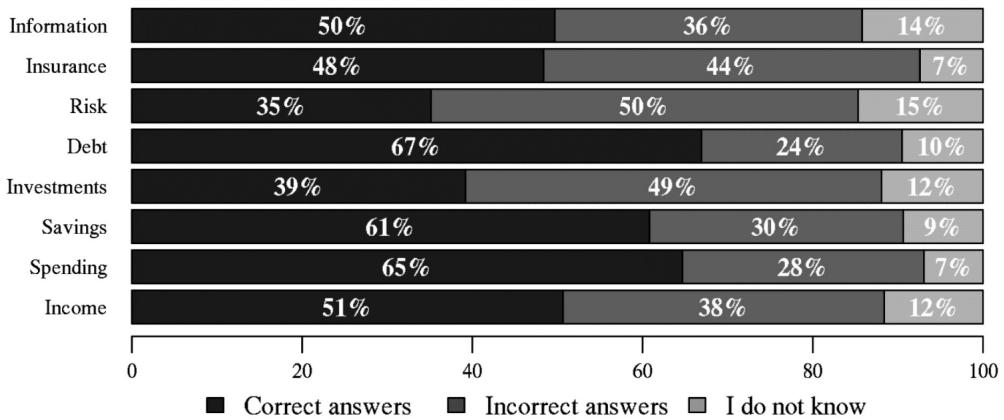


**Figure 2.** Percentages of correct and incorrect answers and „I don't know" responses in single functional fields by rural areas inhabitants

**Source:** Own elaboration

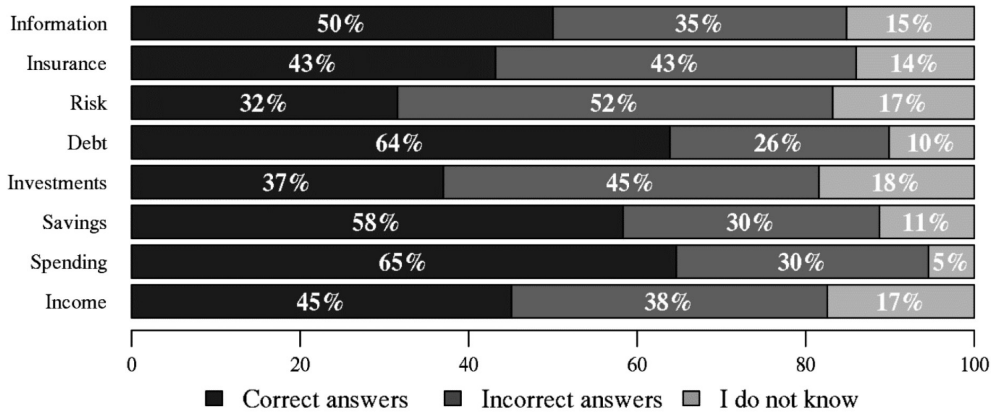


**Figure 3.** Percentages of correct and incorrect answers and „I don't know" responses in single functional fields by urban areas inhabitants.

**Source:** Own elaboration

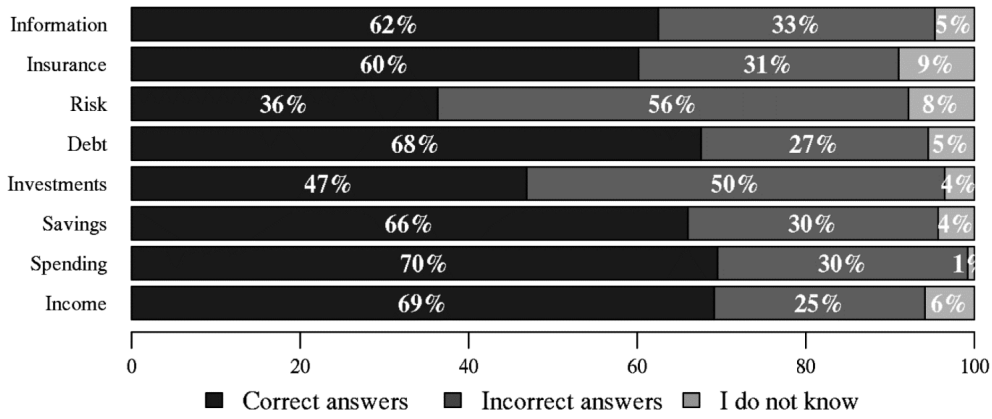


**Figure 4.** Percentages of correct and incorrect answers and „I don't know" responses in single functional fields by metropolises inhabitants.

**Source:** Own elaboration

We confirmed the different average success rates among the respondents from the different types of residence using the Welch t-test for equality of means. We have summarized the results in Table 2-4. We see that we can reject the hypothesis of equality of mean values case by case with very high confidence, *p*-values range between 0.027 and $3.6 \cdot 10^{-6}$.

**Table 2.** Results of the Welch t-test of equality of the mean percentages for the residents of rural areas and small and medium-sized cities

| Type of residence | Mean percentage | t-statistics | p-value |
|---|---|---|---|
| **Rural** | 52.09 % | 1.9286 | 0.02735 |
| **Urban** | 49.16 % | | |

**Source:** Own elaboration

**Table 3.** Results of the Welch t-test of equality of the mean percentages for the residents of rural areas and metropolises

| Type of residence | Mean percentage | t-statistics | p-value |
|---|---|---|---|
| **Rural** | 49.16 % | -4.7592 | 0.00082 |
| **Metropolises** | 59.58 % | | |

**Source:** Own elaboration

**Table 4.** Results of the Welch t-test of equality of the mean percentages for the residents of small and medium-sized cities and metropolises

| Type of residence | Mean percentage | t-statistics | p-value |
|---|---|---|---|
| **Urban** | 52.09 % | -3.2284 | $3.6 \cdot 10^{-6}$ |
| **Metropolises** | 59.58 % | | |

**Source:** Own elaboration

Figure 5 illustrates a comparison of the empirical densities and distribution functions of percentage successes for individual housing types. How one can see, the distribution function graph is shifted to the right in the case of metropolises compared to both other residence types. It is thus clear that the performance of the metropolitan inhabitants stochastically dominates over other localities. Similarly, the graph of the distribution function for the answer percentages of the inhabitants of rural areas is completely shifted to the right compared to the inhabitants of small and medium-sized towns. Thus, even these respondents stochastically dominate the inhabitants of urban areas. So we get a clear ranking of the level of financial literacy according to the type of residence.

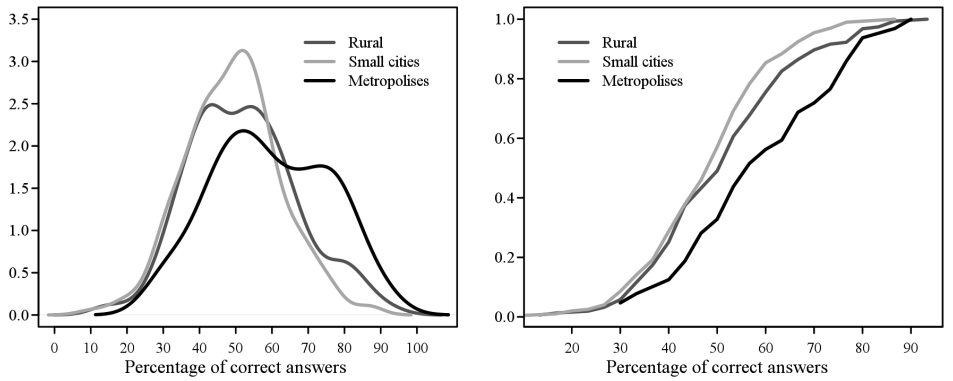


**Figure 5.** Graphs of the empirical densities (on left) and empirical distribution functions (on right) of the percentages according to the type of residence

**Source:** Own elaboration

It is also worth noting the comparison of empirical densities in Figure 5 on the left. While the current percentages of respondents in urban residences have a mode at 50% approximately, bimodal probability distributions appear in rural areas and metropolises. This shift is particularly notable in the case of metropolitan residents. Here, the secondary mode becomes visible at a high level of percentages of almost 80%.

The disparities between the average scores in the individual functional areas of the P-Fin index are easily visible in the radar graphs in Figures 6 and 7. In all four cases, we see a significant drop in average scores in risk management and investment decisions, which is also associated with risk perception.

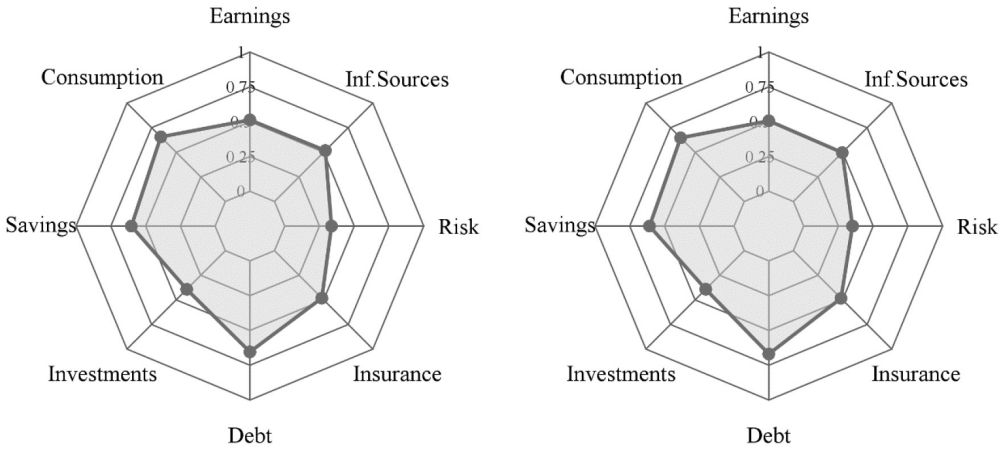


**Figure 6.** Radar graph of average scores by single areas of the P-Fin index in the whole sample (left) and metropolises inhabitants (right).

**Source:** Own elaboration

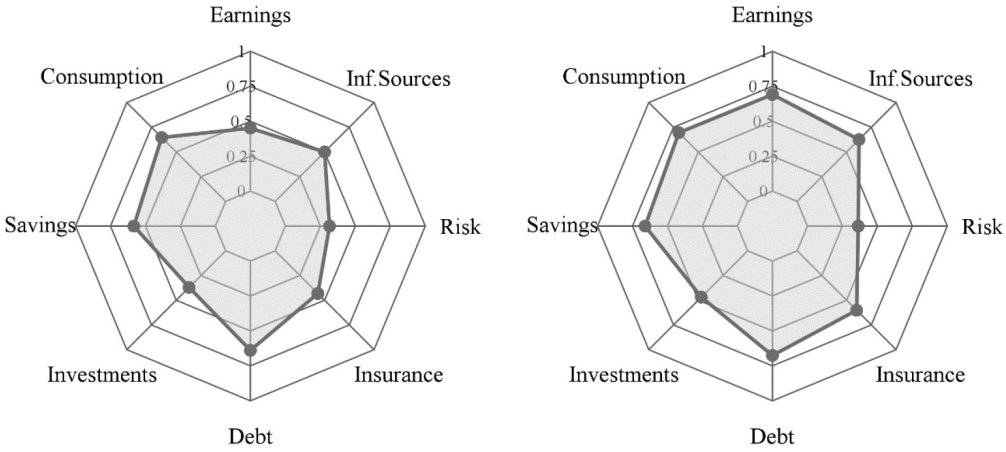


**Figure 7.** Radar graph of average scores by single areas of the P-Fin index according to the residence type: urban areas (left) and metropolises (right).

**Source:** Own elaboration

Further, we can observe significantly better results of the large metropolises inhabitants in the field of earnings, determinants of wages and income. As well as in accessing and working with information sources or consuming, budgeting and spending they achieved higher average score. However, the asymmetry of radar graphs generally indicates a non-uniformity of skills in individual functional fields.

## 5. DISCUSSION

As we can see from the graphs in Figures 1-4, in most functional areas, the respondents achieved more than half the success of the answers. The only exceptions are issues related to risk management, investment, and positioning, which means risk issues in general. However, some positive shift in the population of large metropolises is evident. There were fewer „I don't know" answers, and this decline was reflected in an increase in the correct answers. One can explain this result by

the influence of financial inclusion, which is defined as the availability and equality of opportunities to access financial services. Inhabitants of the large metropolises encounter more likely the issue, thanks to the easier availability of financial services.

Conversely, in smaller towns or rural settlements, the availability of financial services is limited, often offered by a single provider, so there is no need for decision-making and practical experience. It confirms the results of our previous research (Polák, Kozubíková & Kozubík 2018) on the positive impact of practice on financial literacy. The results of the statistical tests presented in Tables 2-4 then confirm the validity of our research hypothesis one.

The surprising result is that in small and medium-sized towns, there was a higher proportion of „I don't know" answers and a lower proportion of correct answers than in rural settlements. It would be under the influence of financial inclusion that we would expect the opposite effect. We can explain this disproportion in a different way of life. A conservative family lifestyle still prevails in rural areas. Young people are thus more involved in all areas of life, including financial decision-making. They have closer contact with parents, take over their experience, and are able to apply them. When comparing the success rate of responses in individual functional areas of financial literacy using radar graphs, we revealed irregularities in the distribution of abilities according to the components of the P-Fin index. This ruled out the validity of hypothesis two. On the contrary, a similar distortion of the symmetry of the graphs in all cases confirmed the validity of research hypothesis three.

If we combine the results of our research with the findings of Di Giannatale & Roa (2019), Ansong et al. (2019) and Potocki (2019) it is clear that the issue of financial literacy and inclusion must start with young people and continue with the development of society and changes in the financial market, otherwise, we face the generations who are on the verge of productive age with low income to relatively fundamental problems in ensuring a dignified life already on the threshold of their retirement age.

From the results of our research and research Huang, Kale, Paramati & Taghizadeh-Hesary (2021) it follows that within the EU there is space for expansion and development of the markets through financial inclusion, but the development of financial literacy and financial inclusion is essential for development. individual regions. This development can be expected to have positive macroeconomic impacts, but at the same time, it will help them to develop rural areas and address the issue of ensuring a decent living for low-income households.

The stabilized development of the lower and middle classes will subsequently be reflected in the corporate sphere thanks to the sustainable purchasing power of a wider range of the population, which will be able to take care of themselves without a higher burden on the social system. In the case of deepening social problems in the lower and middle class associated with the subject area of our research, we can expect a deepening of the negatives mentioned in the research of Nam & Loibl (2021) and Potocki (2019).

## 6. FUTURE RESEARCH DIRECTIONS

The research is beneficial because of primary data and because complements and builds findings of the above investigation carried out in the Czech Republic and Slovakia. These countries are among the newer EU members, where households do not have a high income but have a stable economy. Research has the perspective to be developed in various areas, e.g. in the problems of

regional development in connection with the financial literacy level and financial inclusion. This matter is also related to the issue of expansion and performance of companies and enterprises. Companies need a skilled workforce and also an abundant and stable space for their sales.

## 7. CONCLUSION

Overall, we confirmed that in the academic youth segment, financial skills are unequally distributed among students from large agglomerations and rural settlements. One of the possible causes of this situation is closer contact with financial services. At the same time, we saw that in the functional areas associated with risk assessment, there is a significant decrease in skill in all groups. In education, it is, therefore, necessary to pay more attention to the development of probabilistic thinking as a tool for risk quantification and its connection with practical tasks.

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# MEASURING TOURISM EXPERIENCE: PERSPECTIVES OF DIFFERENT TOURISTS SEGMENTS

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**Abstract:** *The present study explores tourism experience construct and its outcomes at a local heritage site in Croatia. It aims to investigate potential differences in heritage tourism experience in regard to visitors' nationality and frequency of visiting the site. The tourism experience construct was measured with five dimensions (senses, on-site engagement, staff, learning, emotions), while three constructs were deemed as tourism experience outcomes (satisfaction, behavioral intentions, and memory). A sample of 165 respondents was collected from heritage site visitors. Descriptive statistics and t-test were performed to analyze data and to address the research questions. The results revealed that domestic visitors and the repeated ones reported significantly more positive heritage site experience, and expressed significantly higher levels of experience outcomes than foreign and first-time visitors.*

**Keywords:** *Tourism experience dimensions, Tourism experience outcomes, Measurement, Heritage site, Visitors' nationality and the number of visits.*

**JEL Classification L83**

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## 1. INTRODUCTION

Tourists are not merely passive participants in destination experience but can be active seekers of knowledge, engagement, entertainment, recreation, and leisure. According to Joyner et al. (2018), tourists seek experiences where they can be involved with and learn. Moreover, Schmitt (1999) argues that experiences are personal, a response to stimulation, and frequently are a consequence of direct participation in the real or virtual event.

The visitor experience is increasingly recognized as a core product of heritage site offerings (Packer & Ballantyne, 2016). In this context, heritage interpretation aims to educate, entertain and immerse visitors in the physical environment, to consequently enhance their experience.

This paper focuses on measuring tourism experience construct, by exploring its dimensions and outcomes in the heritage tourism context. In particular, the study investigates potential differences between domestic and foreign visitors, as well as between first-time and repeated visitors regarding their tourism experience at a local heritage site in Croatia. In this context, a domestic visitor is defined as the one who stated Croatia as country of residence, while a foreign visitor is not a Croatian resident. Accordingly, a first-time visitor is a person that visited the site for the first time, while a repeated one has already visited the site on a previous occasion.

Therefore, the following research questions were proposed: (a) what are the key tourism experience dimensions and outcomes, (b) how visitors experience local heritage sites, (c) are there significant differences in visitors' experience regarding their nationality and frequency of visiting the site?

Previous research that addressed the role of nationality (e.g. country of residence) and frequency of visiting tourist destinations has found significant differences in visitors' behavior and their perceptions of the destination (Sayan & Karagüzel, 2010; McKercher et al., 2011; Prayag & Ryan, 2011). Thus, in the context of the present study, the assumption is that nationality and number of visits influence visitors' experience in heritage tourism.

The paper is structured as follows. In the conceptual framework, a brief review of tourism experience dimensions and outcomes is provided. In the methodology section, research instrument, data collection, and statistical analysis methods are described. This is followed by a study results presentation. The paper concludes with main research findings, limitations, and future research suggestions.

## 2. CONCEPTUAL FRAMEWORK

Tourists' experiences can be defined as subjective and personal responses to external and staged activities, settings, or events (Packer & Ballantyne, 2016). In addition, experiences are enjoyable, engaging, memorable encounters for those consuming the events (Oh et al., 2007).

According to Chen & Rahman (2018), tourism experience components and dimensions vary widely in research. Pine & Gilmore (1998) identified four dimensions of customer experiences, namely entertainment, education, aesthetics, and escapism. Agapito et al. (2013) pinpointed the importance of visual and non-visual senses as dimensions of tourism experience. Godovykh & Tasci (2020) concluded that the most frequently explained experience components are affective, cognitive, conative, and sensorial.

Furthermore, in the context of cultural and heritage tourism research, several specific tourism experience dimensions were identified. Und & Vong (2010) identified five heritage tourism experience dimensions, namely, history and culture, facilities and service at heritage sites, heritage interpretation, and heritage attractiveness. Kempiak et al. (2017) emphasized the role and importance of audio and visual communication, atmospherics, on-site engagement, information, and heritage preservation. Seyfi et al. (2019) found out that a memorable cultural tourism experience can be defined with the following six key factors: prior perceived significance of the experience, authenticity, engagement, cultural exchange, culinary attraction, and quality of service.

In addition, tourism experience can lead to different outcomes. Ali et al. (2014) found that customer service experience had a positive and significant impact on customer memories and loyalty intentions in resort hotels. Kempiak et al. (2017) proposed satisfaction and likelihood of revisit as post-visit experience factors in heritage attractions. Suhartanto et al. (2020) reported that tourist experience dimensions were significant predictors of tourist satisfaction and loyalty in agritourism settings.

## 3. METHODOLOGY

A questionnaire for collecting primary data was developed based on an extensive literature review and is divided into three parts that measure tourism experience construct, tourism experience outcomes, and respondents' demographic data.

The tourism experience construct was measured with 29 variables, combined in five dimensions, namely, senses, on-site engagement, staff, learning, and emotions. Variables for measuring tourism experience were adopted from Oh et al. (2007), Chandralal & Valenzuela (2012), Anil (2012), Kim & Perdue (2013), Marković et al. (2015), Kempiak et al. (2017), and Chua et al. (2019). Variables were measured with a 5-point Likert scale, ranging from "strongly disagree" as 1, to "strongly agree" as 5.

Moreover, variables for measuring three tourism experience outcomes were included in the questionnaire, as well. Firstly, satisfaction was measured with four items, adopted from Dagger et al. (2007). Next, behavioral intentions were measured with four items, adopted from Zeithaml, Berry & Parasuraman (1996). Three items for measuring memory were adopted from Oh, Fiore & Jeoung (2007). All variables were measured with a 5-point Likert scale, ranging from "strongly disagree" as 1, to "strongly agree" as 5.

Finally, respondents' demographic data included gender, age, country of residence, marital status, employment status, level of education, and personal income, motivation for visiting the site, number of visits to the site, number of people in the group, and number of accompanying children.

Questionnaires were administered to visitors of a medieval stone castle in the central part of Istria County in Croatia during summer 2020. Questionnaires were presented to potential respondents who were willing to participate in the survey. Completed questionnaires were collected from respondents on site.

Data analysis was performed on the sample of 165 valid questionnaires and included descriptive and bivariate statistical analyses. The respondents' demographics, as well as tourism experience elements, and tourism experience outcomes were evaluated with descriptive statistics methods, calculating percentages, mean, and standard deviation. The significance of differences in all examined constructs considering respondents' nationality and frequency of visiting the site, were tested with independent samples t-test.

## 4. STUDY RESULTS

Sample's demographic and visit-related characteristics were as follows. There were more females (55.8 percent) than males (44.2 percent). Respondents' mean age was 40 years, and a majority of them were domestic visitors (62.4 percent). Over one-third of respondents (35.2 percent) had a secondary school degree. Similarly, 35.8 percent of respondents received a university education. About 70 percent of respondents were married and employed, with middle (40.0 percent) and upper-middle (38.6 percent) personal income. Moreover, the sample consisted of 66 percent of first-time visitors, that visited the site in a group of two or more people (63.1 percent), mostly with children (62.0 percent). Those who indicated cultural heritage as the main motive for visiting the site made up about 58 percent of the sample.

Table 1 reports the results of descriptive and bivariate statistical analyses for tourism experience scores.

**Table 1.** The comparison of tourism experience scores

| Variables | Tourist origin | | | Number of visits | | |
|---|---|---|---|---|---|---|
| | Domestic | Foreign | T-value | First time | Repeated | T-value |
| ***Senses*** | ***4.64*** | ***4.47*** | | ***4.52*** | ***4.67*** | |
| Rich cultural heritage | 4.69 (0.543) | 4.53 (0.535) | 1.810 | 4.59 (0.565) | 4.71 (0.494) | -1.490 |
| Visual appearance | 4.83 (0.430) | 4.73 (0.518) | 1.272 | 4.78 (0.459) | 4.80 (0.483) | -0.309 |
| Interior/exterior lighting effect | 4.62 (0.688) | 4.60 (0.610) | 0.015 | 4.57 (0.713) | 4.71 (0.530) | -1.422 |
| Interior/exterior color | 4.70 (0.624) | 4.59 (0.642) | 1.069 | 4.60 (0.696) | 4.77 (0.467) | -1.813 |
| Unique interior | 4.49 (0.752) | 4.10 (0.810) | 3.094* | 4.28 (0.807) | 4.46 (0.762) | -1.430 |
| Cleanliness of the castle | 4.71 (0.554) | 4.60 (0.613) | 1.208 | 4.65 (0.599) | 4.70 (0.537) | -0.473 |
| Unique touch of weapons and armors | 4.62 (0.702) | 4.50 (0.741) | 1.053 | 4.50 (0.789) | 4.73 (0.522) | -2.302** |
| Unique taste of local products | 4.45 (0.943) | 4.19 (0.926) | 1.657 | 4.20 (1.013) | 4.65 (0.705) | -3.253* |
| Local experience | 4.65 (0.684) | 4.53 (0.728) | 1.062 | 4.58 (0.730) | 4.65 (0.645) | -0.678 |
| Castle's atmosphere | 4.44 (0.871) | 4.33 (0.831) | 0.788 | 4.42 (0.763) | 4.36 (1.017) | 0.385 |
| Fresh air inside the castle | 4.76 (0.511) | 4.39 (0.912) | 3.400* | 4.53 (0.803) | 4.80 (0.444) | -2.832** |
| Stimulating smell of castle's traditional products | 4.07 (1.051) | 3.85 (1.071) | 1.265 | 3.90 (1.041) | 4.16 (1.085) | -1.523 |
| Smell of fire and weapons | 4.73 (0.528) | 4.63 (0.633) | 1.083 | 4.64 (0.601) | 4.79 (0.494) | -1.638 |
| Pleasurable music in the castle | 4.74 (0.504) | 4.60 (0.689) | 1.403 | 4.65 (0.614) | 4.75 (0.513) | -1.091 |
| Sound of battles | 4.77 (0.528) | 4.69 (0.561) | 0.846 | 4.68 (0.591) | 4.86 (0.401) | -2.285** |

| Variables | Tourist origin | | | Number of visits | | |
|---|---|---|---|---|---|---|
| | **Domestic** | **Foreign** | **T-value** | **First time** | **Repeated** | **T-value** |
| Sound of history | 4.79 (0.457) | 4.57 (0.618) | 2.336** | 4.67 (0.564) | 4.79 (0.456) | -1.460 |
| Matching music with the atmosphere | 4.76 (0.551) | 4,60 (0.586) | 1.743 | 4.66 (0.597) | 4.77 (0.504) | -1.215 |
| ***On-site engagement*** | ***4.59*** | ***4.49*** | | ***4.49*** | ***4.67*** | |
| Interactive exhibitions | 4.58 (0.667) | 4.56 (0.749) | 0.217 | 4.50 (0.774) | 4.73 (0.489) | -2.315** |
| Educational games | 4.49 (0.782) | 4.32 (0.854) | 1.277 | 4.37 (0.865) | 4.53 (0.690) | -1.184 |
| Special events | 4.69 (0.596) | 4.60 (0.616) | 0.946 | 4.60 (0.643) | 4.76 (0.508) | -1.725 |
| ***Staff*** | ***4.91*** | ***4.73*** | | ***4.80*** | ***4.93*** | |
| Friendly staff | 4.94 (0.235) | 4.89 (0.321) | 1.196 | 4.89 (0.316) | 4.98 (0.134) | -2.646* |
| Knowledgeable staff | 4.90 (0.330) | 4.69 (0.647) | 2.398** | 4.78 (0.537) | 4.91 (0.345) | -1.943 |
| Relevant information | 4.83 (0.422) | 4.54 (0.697) | 2.985* | 4.67 (0.596) | 4.84 (0.458) | -2.057** |
| Helpful staff | 4.96 (0.194) | 4.80 (0.440) | 2.651* | 4.85 (0.382) | 5.00 (0.000) | -4.028* |
| ***Learning*** | ***4.53*** | ***4.11*** | | ***4.26*** | ***4.59*** | |
| Learn a lot | 4.53 (0.752) | 4.03 (1.095) | 3.161* | 4.22 (1.035) | 4.59 (0.596) | -2.878* |
| Learn new things | 4.53 (0.752) | 4.18 (0.915) | 2.588** | 4.30 (0.887) | 4.59 (0.682) | -2.300** |
| ***Emotions*** | ***4.84*** | ***4.62*** | | ***4.71*** | ***4.86*** | |
| Pleasant visit | 4.89 (0.310) | 4.71 (0.555) | 2.389** | 4.78 (0.478) | 4.91 (0.288) | -2.188** |
| Exciting visit | 4.81 (0.486) | 4.60 (0.689) | 2.097** | 4.66 (0.656) | 4.86 (0.353) | -2.503** |
| Funny visit | 40.83 (0.373) | 4.56 (0.617) | 3.123* | 4.69 (0.522) | 4.82 (0.431) | -1.749 |

Note: * significant at 0.01; ** significant at 0.05; values in bold are overall mean scores for each dimension; values in parentheses are standard deviations

**Source:** Authors

As presented in Table 1, domestic visitors evaluated tourism experience elements with mean scores ranging from 4.07 to 4.96. With the lowest score was rated the element "stimulating smell of castle's traditional products", while the highest score was given to the element "helpful staff". Similarly, foreign visitors' mean scores ranged from 3.85 (for the element "stimulating smell of castle's traditional products") to 4.89 (for the element "friendly staff"). Overall, both, domestic and foreign visitors expressed the highest rated experience regarding dimensions "staff" and "emotions". On the other hand, the least rated experience was connected with the dimension "learning".

When comparing experience scores between domestic and foreign visitors, the analysis indicated higher scores in the domestic visitors' sample for all 29 tourism experience elements. The results of the independent samples t-test revealed significant differences in 11 cases. Thus, domestic visitors reported significantly more positive experience than foreign visitors with the following tourism experience elements: "unique interior", "fresh air inside the castle", "sound of history",

"knowledgeable staff", "relevant information", "helpful staff", "learn a lot", "learn new things", "pleasant visit", "exciting visit", and "funny visit".

Furthermore, Table 1 compares tourism experience levels between first-time and repeated visitors, as well. First-time visitors evaluated tourism experience elements with mean scores ranging from 3.90 (for the element "stimulating smell of castle's traditional products") to 4.89 (for the element "friendly staff"). Likewise, repeated visitors' mean scores ranged from 4.16 (for the element "stimulating smell of castle's traditional products") to 5.00 (for the element "helpful staff"). Overall, both, first-time and repeated visitors expressed the highest rated experience concerning dimensions "staff" and "emotions", while the least rated experience considered dimension "learning".

The analysis of difference indicated higher scores in repeated visitors' sample for 28 tourism experience elements. Only for the element "castle's atmosphere" first-time visitors expressed higher tourism experience scores. However, the results show that for 12 elements identified differences were significant between these two groups of respondents. Thus, repeated visitors reported significantly more positive experience than first-time visitors with following tourism experience elements: "unique touch of the weapons and armors", "unique taste of local products", "fresh air inside the castle", "sound of battles", "interactive exhibitions", "friendly staff", "relevant information", "helpful staff", "learn a lot", "learn new things", "pleasant visit", and "exciting visit".

Table 2 reports the results of descriptive and bivariate statistical analyses for tourism experience outcomes scores.

**Table 2.** The comparison of tourism experience outcomes scores

| Variables | Tourist origin | | | Number of visits | | |
|---|---|---|---|---|---|---|
| | **Domestic** | **Foreign** | **T-value** | **First time** | **Repeated** | **T-value** |
| ***Satisfaction*** | ***4.72*** | ***4.56*** | | ***4.58*** | ***4.80*** | |
| I feel good about coming to the castle for the offerings I'm looking for. | 4.61 (0.581) | 4.53 (0.620) | 0.829 | 4.51 (0.633) | 4,71 (0.494) | -2.237** |
| My feelings towards the castle are very positive. | 4.74 (0.484) | 4.63 (0.550) | 1.286 | 4.62 (0.541) | 4.84 (0.417) | -2.833* |
| The extent to which the castle has produced the best possible outcome for me is satisfying. | 4.71 (0.517) | 4.45 (0.739) | 2.407** | 4.53 (0.688) | 4.77 (0.426) | -2.707* |
| Overall I'm satisfied with the castle and the service they provide. | 4.82 (0.437) | 4.61 (0.556) | 2.511** | 4.66 (0.532) | 4.89 (0.366) | -3.326* |
| ***Behavioral intentions*** | ***4.82*** | ***4.61*** | | ***4.66*** | ***4.92*** | |
| I will recommend the castle to other people. | 4.90 (0.357) | 4.75 (0.505) | 2.021** | 4.80 (0.488) | 4.95 (0.227) | -2.683* |
| I will say positive things about the castle to other people. | 4.88 (0.378) | 4.82 (0.426) | 0.955 | 4.81 (0.461) | 4.96 (0.187) | -3.092* |
| I will encourage friends and relatives to visit the castle. | 4.85 (0.429) | 4.68 (0.536) | 2.207** | 4.72 (0.546) | 4.93 (0.260) | -3.393* |
| I will revisit the castle in the future. | 4.65 (0.724) | 4.17 (1.044) | 3.172* | 4.29 (0.971) | 4.82 (0.543) | -4.481* |
| ***Memory*** | ***4.74*** | ***4.50*** | | ***4.56*** | ***4.81*** | |
| I have wonderful memories of experiences in the castle. | 4.74 (0.504) | 4.47 (0.762) | 2.483** | 4.55 (0.687) | 4.80 (0.444) | -2.8571* |

| Variables | Tourist origin | | | Number of visits | | |
|---|---|---|---|---|---|---|
| | **Domestic** | **Foreign** | **T-value** | **First time** | **Repeated** | **T-value** |
| I won't forget my experiences in the castle. | 4.74 (0.542) | 4.46 (0.828) | 2.349** | 4.54 (0.754) | 4.82 (0.431) | -3.070* |
| I will remember my experiences in the castle. | 4.74 (0.559) | 4.57 (0.694) | 1.569 | 4.60 (0.683) | 4.82 (0.431) | -2.513** |

Note: * significant at 0.01; ** significant at 0.05; values in bold are overall mean scores for each dimension; values in parentheses are standard deviations

**Source:** Authors

As presented in Table 2, satisfaction scores for domestic visitors were very high and ranged from 4.61 to 4.82, while for foreign visitors were slightly lower, ranging from 4.45 to 4.63. Overall, domestic visitors were highly satisfied with their tourism experience, while foreign visitors expressed a fairly level of satisfaction. Comparison of satisfaction scores between domestic and foreign visitors revealed higher scores for the domestic sample. Besides, significant differences occurred in 2 out of 4 variables. Hence, domestic visitors were significantly more satisfied than foreign ones.

In addition, satisfaction scores for first-time visitors ranged between 4.51 and 4.66, while for repeated visitors were higher, ranging between 4.71 and 4.89. Overall, first-time visitors reported a fairly level of satisfaction, while repeated visitors were highly satisfied with their tourism experience. Comparison of satisfaction scores between first-time and repeated visitors revealed significantly higher scores in all variables for repeated visitors, meaning that they were significantly more satisfied than first-time visitors.

Behavioral intentions scores for domestic visitors varied between 4.65 and 4.90, while for foreign visitors were slightly lower, varying from 4.17 to 4.82. Overall, both groups of visitors expressed positive behavioral intentions. Comparison of behavioral intentions scores between domestic and foreign visitors revealed higher scores for the domestic sample. Besides, significant differences were found in most of the variables, indicating that domestic visitors are significantly more likely to spread positive word of mouth, and are more likely to revisit the site.

Additionally, behavioral intentions scores for first-time and repeated visitors varied from 4.29 to 4.81, and from 4.82 to 4.96, respectively. Overall, both groups of visitors expressed positive behavioral intentions. Comparison of behavioral intentions scores between first-time and repeated visitors revealed significantly higher scores in all variables for repeated visitors, indicating that they expressed more positive behavioral intentions than first-time visitors.

In relation to the memory, domestic visitors evaluated all variables equally, with a mean score of 4.74, while scores for foreign visitors varied between 4.46 and 4.57. Overall, both groups of visitors expressed positive memory. Comparison of memory scores between domestic and foreign visitors revealed higher scores for the domestic sample. Besides, significant differences were found in most of the variables, indicating that domestic visitors created more positive and memorable memories.

Finally, memory scores for first-time visitors varied from 4.54 to 4.60, and for repeated visitors were much higher, between 4.80 and 4.82. Overall, both groups of visitors expressed positive memory. Comparison of memory scores between first-time and repeated visitors revealed significantly higher scores in all variables for repeated visitors, indicating that they created more positive, unforgettable memories than first-time visitors.

## 5. CONCLUSION

The present study examined tourism experience dimensions and outcomes from the perspective of different tourists segments. Specifically, the aim was to identify potential differences between domestic and foreign visitors, as well as between first-time and repeated visitors regarding their heritage tourism experience.

In order to answer research questions, the study was conducted from a conceptual and empirical point of view. Firstly, the results of the conceptual analysis suggested that tourism experience is a multidimensional construct that comprises both tangible and intangible elements (dimensions), leading to different tourism experience outcomes (e.g. satisfaction, loyalty, memories).

Secondly, the results of the empirical part of the study revealed that visitors experienced local heritage site very positively. Among that, staff and emotions were the best-perceived tourism experience elements. Additionally, considering tourism experience outcomes, heritage visitors expressed high levels of satisfaction, as well as positive behavioral intentions and memory.

Thirdly, in the context of the present paper, the assumption was that visitors' characteristics, in terms of nationality and number of visits, influence visitors' experience in heritage tourism. The study results identified that nationality influences heritage visitors' experience. This is in line with the findings of Sayan & Karagüzel (2010), and Prayag & Ryan (2011).

Domestic visitors reported significantly more positive experiences regarding staff, learning, and emotions at the local heritage site. What is more, they were significantly more satisfied, they were more likely to spread positive word of mouth and revisit the site, as well as they, were more likely to have a highly memorable heritage site experience than foreigners. Moreover, the results confirm that first-time and repeated visitors experience the destination in different ways (McKercher et al., 2011). Repeated visitors expressed significantly more positive experience toward staff, learning and emotions considering local heritage site. In addition, repeaters were significantly more satisfied, they expressed more positive behavioral intentions, and they created more positive, unforgettable memories than first-time visitors.

The study results generate practical and academic implications in the heritage tourism experience context. They indicate tourism experience elements that are well recognized (e.g. staff, emotions, senses), as well as the ones that could be improved (e.g. learning). In addition, results demonstrate that nationality and number of visits have an important role in creating visitors' experiences at the local heritage site. Thus, these visitors' characteristics should also be considered when trying to understand heritage visitors' behavioral patterns and perceptions in terms of experiencing heritage site. These results can help heritage site managers to create an excellent tourism experience tailored to specific tourists segments.

There are limitations relating to the present study. Although the sample comprises the population's characteristics, it should be broadened for conducting more complex analyses. Also, since data was gathered during the COVID-19 pandemic, this could influence visitors' structure and affect the sample structure. While this study discusses the role of nationality and number of visits in creating visitors' experience, other demographic and visit-related characteristics should be taken into consideration, as well. These characteristics can include gender, age, motivations, previous experience at similar sites. Future research could address these issues, as well as examine how different tourism experience dimensions affect tourism experience outcomes.

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