Etikonomi

Jurnal Ekonomi

1412 8967

Published:
Faculty of Economics and Business State Islamic University (UIN) Syarif Hidayatullah Jakarta

Etikonomi
Jurnal Ekonomi

CONTENTS

How Hotel Industry Copes Up with the COVID-19: An SME Perspective

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Abstract
This study aims to determine the plans and strategies adopted by the hotel industry during the COVID-19 crisis. In order to conduct this study, a qualitative research methodology was used where semi-structured interviews were conducted from three countries: Austria, Pakistan, and Indonesia. Interviews were conducted online with the help of applications such as Skype, WhatsApp, and Zoom. A thematic analysis was conducted in which codes, categories, and final themes were generated. The final themes are the study's findings, which are strategies for employees, strategies for customers, strategies for SME hotels, and strategies for the staff. Strategies for employees indicate the planning and programs of the SME Hotels. The study's findings show that strategies adopted by the hotel industries vary from country to country while depending on the contextual factors and role of the government. Most Small and Medium Enterprises (SMEs) hotels in developing countries are less familiar with how to react and survive in the conditions of the crises. Thus, this study can benefit the different stakeholders in the developed and developing countries for adopting strategies and maintain their business during the crises of the COVID-19.

Keywords:
hotel industry, SMEs, covid-19, strategies

Introduction

The COVID-19 pandemic has forced various short-term and long-term negative impacts on the hotel industry at the international level. The immediate effects have become well evident and reflected in the intruded-on incomes incited by unexpected business terminations following the orders of lockdown imposed by the government. Such sudden closure has imperiled the business life span of numerous hotels by slicing their profits and breaking down the well-established and long supply chain. The long-term effects of COVID-19 are yet confirmed; however, prone to be exemplified by the low demand of the consumers for hospitality services because of wellbeing and hygiene factors and precautions (Filimonau et al., 2020). Research on the hotel industry has received increasing attention after the outbreak of the COVID-19 because this fluctuation has penetrated the hotel industry very badly. It is observed that large and famous hotels like Hilton and its 150 chains were closed in China and were prone to the recession because it was conserved a tourist series. In this situation, small and medium enterprise hotels were more vulnerable (Hao et al., 2020).

Initially, the outbreak of the pandemic was taken for granted against the outbreak of the COVID-19. Visitors still crowded many tourist destinations in Asia and Europe, which provoked the COVID-19 and increased rapidly. With the pandemic spread worldwide, the hotel industry's road to recovery has become much longer, and crisis management strategies need to be adjusted over time. So far, recent studies in crisis management practices only focused on a single point in time (Israeli et al., 2011), and research on epidemic crises was conducted in the post-crisis stage (Lee, 2009; Wan, 2013). This research gap, thus, needs to be filled by having a continuing study in the during-crisis stage to answer the research question of what the hotel industry should undertake crisis management practices at different times during an epidemic outbreak.

The hospitality industry is known to be the source of many job opportunities and support the livelihoods of millions of workers and their families. Although the precise number of jobs is difficult to quantify, some estimates mentioned that the hospitality industry employs more than 212 million people across the globe. For some countries such as the Maldives, Cambodia, Thailand, and Fiji, this industry sector- including travel and tourism- is the primary employment opportunity and contributes to the local, regional, and national economy (Jones & Comfort, 2020).

History has noted that the tourism and hospitality industry, including the hotel industry, is vulnerable to the crisis brought by unpredicted disasters such as terrorist attacks, epidemics, and natural catastrophes (Hung et al., 2018; Jiang & Wen, 2020). Various measures were taken by hotel management to strengthen their hotels in facing different attacks of disasters and to address the changing behavior of consumers. COVID -19 "buried" the world in only a matter of weeks. Millions of people's health and lives across the world are at stake. International, and in some countries, domestic tourism as well, have been shut down. The disastrous impacts of COVID-19 have produced temporary, and on some occasions, permanent, loss of jobs in the hospitality industry. The most impacts were felt by the workforces in less developed countries, where it is

little or no financial support from the governments, no organized trade union protection for workers, and millions of people have been thrown into poverty (Jones & Comfort, 2020). The COVID-19 pandemic has changed the relationships between the hospitality industry and sustainability (Kim et al., 2021).

Following the COVID-19 pandemic, the tourists' awareness of health risks and security increases, the hoteliers have many things to do to restore their confidence (Jiang & Wen, 2020). The hotel industry needs to develop innovative technologies to win back the tourists' confidence in the hotels. These technologies should reduce physical contact while still improving operation and service productivity (Rahimizhian & Irani, 2020). The impacts of COVID-19 did not only change the tourists' perception, behavior, and intention to visit. From the employees' point of view, the perception has changed too. The bitter lesson learned is that employment is not something we can take for granted. The organization's resilience and response to COVID-19 affect the senior managers' perceived job security (Filimonau et al., 2020), thus determining their commitments to the organizations.

In the USA, the federal decisions in dealing with the COVID-19 pandemic were somehow slow. The slowness in responding was due to the defunding of the Office of Pandemics and Emerging Threats. It was also found that there was a lack of coordination between the federal government and the states. This situation contributed to the rank of the USA having the highest COVID-19 infection and fatality rates globally (Schismenos et al., 2020). The COVID-19 pandemic situation has impacted the image of the community and the destination negatively. In India, some hotels display irresponsible behavior towards their guests due to panic and mistrust. This kind of action immediately affected the relationship between the host and the guests. However, they also expected some support from the host during this crisis (Kour et al., 2020).

In Wuhan and Hubei Provinces of China, the workers in tourism and hospitality sectors such as hotels, travel agencies, cruise lines, and tourist attractions found looming uncertainty in the short term. A fast response is called to address these issues. For instance, they are implementing governmental subsidies and managing internal cost control while anticipating long-term actions. Some essential steps such as product adjustments, business structure transformation, and restoring market confidence should be taken (Knight et al., 2020). On the opposite side, the virus outbreak affected Chinese tourists' lifestyles, behavior, and preferences in the short and long term. For the Chinese, the new forms of tourism, such as slow and smart tourism, are likely the Chinese tourists' consumption patterns. Such a shift in popularity will force the hospitality industry to redesign its service and distribution channels. (Wen et al., 2020).

While tourists rethink how they will travel during and after the COVID-19 pandemic, tourism and hospitality practitioners need to reflect on creating better and positive changes to the industry. One actionable strategy to help in alleviating the tourists' stress is enriching the tourists' experience. There are very few studies that pay attention to the hostel industry on coping with the COVID-19 situation in specified countries through a qualitative study. Entrepreneurs in the area of the hotel sector are planning

and developing strategies to deal with the COVID-19 crisis. Because, initially, it was thought to be a one-time disaster. However, over time and the increasing intensity of the COVID, the second wave was triggered, which indicated more severity and intensity. Besides this, the rise of the mutated virus from the UK has issued more serious warnings. Therefore, an urgent study is needed to fill this research gap.

This article focuses on SME perspectives. An essential objective of this study is to conduct a comparative analysis among three countries, Austria, Pakistan, and Indonesia, to find out how the hotel industry copes with COVID-19. To pursue the objective, semi-structured interviews were conducted from hotels in these three countries. The findings of the study have emerged from the themes, which are presented here. Few latest research work also emphasized and endorsed the effects of the COVID-19 on the hotel industry and their survival from SME perspectives in the crises (Jiang & Wen, 2020; Gursoy & Chi, 2020; Baum & Hai, N.2020; Alonso et al., 2020).

Methods

In this study, a qualitative approach was used for the data collection, and data was collected through semi-structured interviews. The interview is the common tool of data collection in qualitative research, which provides an opportunity to translate and interpret participants' experiences (Tavory, 2020). Sample size in qualitative research varies according to the research question and scope (Rowley, 2012). Online interviews were conducted from the 12 hotels of the three countries of Austria, Pakistan, and Indonesia (Braun & Clarke, 2021). These three countries were chosen for the study because the authors live in those countries, and it was easy for the authors to collect the data through the snowball technique (Fofana et al., 2020; Jamshed, 2014).

Table 1. Hotel Industry

Case	Hotels	Country	State/Province	City
1.	Hotel - 1	Austria	Carinthia	Villach
	Hotel - 2		Carinthia	Velden am Wörther See
	Hotel - 3		Carinthia	Spittal
	Hotel - 4		Carinthia	Millstatt
2.	Hotel - 1	Pakistan	Sindh	Larkana
	Hotel - 2		Sindh	Khairpur
	Hotel - 3		Sindh	NawabShah
	Hotel - 4		Sindh	Mirpurkhas
3.	Hotel - 1	Indonesia	West Java	Cibinong
	Hotel - 2		West Java	Bogor
	Hotel - 3		West Java	Citeureup
	Hotel - 4		West Java	Tambun

Source: Data processed by authors

After completing the interviews, transcription of the interviews was developed, transcription was assessed and evaluation of the text carefully, from a large amount of

the data of the transcription, codes were generated, from the codes, categories were generated, and from the categories, final themes were generated, final themes are the findings of the study (Guest et al., 2020; Im & Chee, 2006). Thematic analysis is conducted manually because human-read can understand the experiences shared by the participants, and sometimes, the software is unable to interpret in the right way Rowley, 2012). The profile of individual cases is given in Table 1.

Results and Discussion:

Themes

The thematic analysis approach is used to analyze the data because the thematic analysis is supportive of the emerging themes from the codes generated from the transcription (Gioia et al., 2013). Qualitative methods have endorsed that thematic analysis conducted manually is more specific, relevant, and informative, translating and interpreting the terminologies, words, and expressions (Braun & Clarke, 2006).

In the analysis, every case was written down as a story format to observe and analyze entrepreneur views and experiences during COVID-19, which led us to derive the themes. Therefore, to extract themes, we repeatedly read the interview text to familiarize and develop our understanding. The next step was to create a manual coding (Seale and Kelly, 3014) to label and code text patterns. Finally, repeated patterns gave rise to themes. This procedure resulted in four main themes. After the emerging of the themes, these were presented in the tabular presentation to interpret the data (Alhojailan, 2012). Table 2 presents the first codes, categories, and themes of this research.

Table 2 provides information on the thematical analysis process. This analytical table indicates the serial number, list of the codes generated from the transcriptions, and themes consequently. It provides information on the total codes that emerged from a transcription of the interviews and the final findings in the form of final themes.

In the thematic analysis, codes, categories, and themes are generated. Through thematic analysis, four themes emerge in the form of significant findings: strategies for employees, strategies for customers, strategies for SME hotels, and strategies for the staff. Strategies for employees indicate the planning and programs of the SME Hotels. SME exists in different forms in the countries, industries, organizations, and communities around. Numerically, SMEs have 1 to 100 employees, while in some exceptional cases, 250 employees are considered. In this way, small-scale enterprises are considered to have 50 to 100 workforces, and medium-sized enterprises are considered to have 250 workforces (Inyang, 2013). Therefore, SME Hotels are considered on the strength of the workforce (Serrasqueiro & Nunes, 2014).

Strategy for employees

This study tried to explore the strategies adopted by SME hotels (Donthu & Gustafsson, 2020). In the emergency of the COVID-19 pandemic, SMEs in the hospitality sector have played a very responsible role by considering the needs, issues, and concerns.

Addressing the issues of the staff varies from country to country, depending on the strength of the country's economic status.

Case 1: Austria. "Announcement of the government of the relief to the hotel as well as staff of the hotel, however, responsibilities performed by the hotel management gave us a feeling of safety by all means."

Table 2. Thematic Analysis

No.	Codes	Categories	Themes
1.	Salary was not stopped during COVID-19	Continue salaries	
2.	Continue support for the families of staff	Family support	
3.	Extra logistic support like dressing, pick and drop	Logistic support	Strategy for employees
4.	Daily counseling and meetings to discuss issues and ideas	Counseling	
5.	Proper cleaning, disinfecting, and ventilating of rooms, and public spaces	Preventive measures	
6.	Medical staff available, connected, and medical aid	Medical facility	
7.	Proper produces, patterns, and behaviors	New norm	Strategy for customers
8.	Medical staff available, connected, and medical aid	Coordination	
9.	We were very much concerned about the clients and customers safety	Concerns and care	
10.	Cancellation of the bookings	Decline in demand	
11.	Drop of bookings		
12.	Quick price reduction	Decline in income	
13.	Heavy discounts		
14.	Revenues are dropping		
15.	Decline in occupation	Restrictions	
16.	Collapse in travel market		
17.	Travel restrictions		Strategy for SME hotels
18.	Health risks		
19.	Extra cost on preventive measures		
20.	Loss of demand		
21.	Not travel to certain regions	Risk involved	
22.	Cancellation of policies		
23.	Sales loss		
24.	Maintain liquidity		
25.	Avoid insolvency		
26.	No bank loans		
27.	Uncertain payments	Lack of support	
28.	Pause to luxuries		
29.	Three months hit hard		Strategy for the staff
30.	Victim of unemployment	Job insecurity	
31.	Layoff huge workers		
32.	Stay at home	Restrictions	

Source: Created by author

In this condition, it is a very responsible role of the SME hotels to contribute in the supporting, cooperating, and developing of their staff in the developed countries because most of the European countries, including Austria, respective governments declared incentives and financial support to the workers in the different organizations including the SMEs Hotel.

> Case 2 Pakistan: "It was very terrible to perform our duties during the pandemic situation, but we appreciate the hotel management taking care of us along with playing social responsibilities."

In the case of the European countries, the management of the SME hotels ensured to extend and continue support for the families of staff in the COVID-19 situation because there were several uncertainties and threats to everyone. However, the situation in developing countries like Pakistan and Indonesia, where the respective governments did not declare any support scheme, was exposed to several challenges.

> Case 3 Indonesia: "Initially, the situation of COVID-19 was taken non-seriously. However, people started to believe it when it became a severe issue. Thus, in this situation, the government announced support for the affected people only. However, hotel management was not relying on such support. But provided some marginal support to the staff for the survival and safety of the staff and their families."

Daily counseling and meetings to discuss issues and ideas and educate them about the COVID-19 situation, consequences and preventive measures in the work routine were delivered to the staff to keep them informed about the changed situation. Proper cleaning, disinfecting and ventilating of rooms and public spaces.

Strategy for customers

This theme focuses on the facilities and support provided by SME hotels. It is mentioned here that the hotel management provided medical aid and medical consultation to the customers whenever required. This theme indicates that SME hotels were very much concerned about the clients' and customers' safety.

> Case 1 Austria: "It was our priority to provide all the facilities and the basic immediate aid to the customers and tourists. During their stay, all the customers were provided with the proper orientation and guidance. They were instructed to abide by the rules and preventive measures to follow social distance, use of the marks outside the rooms and hotels and use the sanitizers frequently and wash their hands again and again when they are exposed to the external environment."

This shows that the SME hotels in the developed countries are well equipped with sound infrastructure, environment, and facilities. Therefore, these are in the position to support their customers and consumers. Therefore, these hotels go out of the way to support their customers and make them safe and secure. They provide all medical facilities when required in the COVID-19 and offer them all preventive measures.

> Case 2 Pakistan: "We tried out best to facilitate our customers with available facilities and services. However, due to small enterprises with limited resources, we could not do everything possible and provide the standard protocols as compared to internationals".

On reflection of the above case of Pakistan, it seems developing countries are not in the position to support their customers in the way customers are supported in the developed countries. It means developing countries want to offer all facilities and provide satisfaction to the customers, but their income is not sufficient enough to develop a support system.

> Case 3 Indonesia: "During the COVID-19 conditions, there was a lockdown and due to this, all hotels were closed from the functions. Hence, there was no chance to offer or perform CSR practices for the customers".

However, in contracts to the case 1 and 2, case 3 Indonesia, indicates that there was no practice of the CSR for the customers during the COVID-19 situation as there everything was close, travel and transport were stopped, and thus, mobility of the people was paused.

Strategy for SME Hotels

This theme focuses on the spillover effects of the COVID-19 on the performance of the SME hotels in Austria, Pakistan, and Indonesia. Hence, this theme determines the challenges faced by SME hotels. The challenges were in different forms and in different ways. Theme indicates that the travel restrictions caused a collapse in the hospitality market and caused the cancellation of policies for advance booking in certain regions. People avoided unnecessary travel to avoid the health risks, loss of health, and lose of life.

> Case 1 Austria: "Due to the ban on the travel and transportation, mobility of people was limited. Limited travel either for tourism or for business was given a short pause".

However, further, it is indicated that SME hotels experienced the spillover effects of the COVID-19 on the financial condition in different forms and different ways. It was mentioned that revenue was dropping, the sales were decreasing, and expenses were increasing

> Case 2 Pakistan: "In the situation of the COVID-19, income was decreasing due to the cancellation of the bookings, extra cost needed on the proper protocols, preventive measures and heavy discounts to the customers"

This shows that COVID-19 created challenges for the SME hotels in both ways, one, by reducing the customers' demand and rapid flow of the people and second, by offering heaving discount and extra care to attract and satisfy the customers.

> Case 3 Indonesia: "We need to close the services because it was getting very expensive to earn less and expense high than income. Therefore, being a small enterprise, we cannot bear the cost of CSR"

In this regard, it is mentioned under this theme that SME hotels were losing their revenue, sales bookings, and prices in the emergency situation of the COVID-19. The extra cost of preventive measures increased the economic burden for SME hotels. Besides this, quick price reduction and heavy discounts created serious challenges.

Strategy for the staff

This theme mentions the challenges faced by the employee of the SME hotels during the COVID-19 situation.

> Case 1 Austria: "It was a stressful situation for me and my colleagues to work and manage, we were worried for our safety as well as performing duties. In such a situation of fear, we were afraid of losing jobs, and there was the refusal of the banks as well for any loan."

This shows that the employee of the SME hotels was highly afraid of losing health, jobs and even life. In this condition, it was very challenging for them to manage work and life balance during the hard hit of the three months.

> Case 2 Pakistan: "Fear of losing a job was high and there was stress that who will be refused from the employment by the hotel management. However, it was also very stressful to navigate between hotel and home, and most of the time we needed to stay at either home or hotel in order to avoid being affected"

The above-mentioned statement shows that the employees were under the double stress of the job and fear of being affected. Job fears kept them in the active position to prove their best in the performance so that management may not feel something low regarding their performance, and satisfaction from the service in the developing country of case 2.

> Case 3 Indonesia: "Tension was high due to the shutdown of the hotels and half salary was given which was not sufficient to run home and maintain home expenses. In this situation, we were unable to find any other kind of work, as well as the market, was sinking already from the work or employment opportunities."

The above statement indicates that there were serious challenges faced by the employee of the hotels in developing countries like Indonesia. COVID-19 created issues for the staff in getting low salary or half salary from the hotel where they were working and due to the lockdown situation, they were helpless to find any other kind of work for their survival. Hence, it created a big challenge for the employee of the SME hotels in the developing country.

There is a uniqueness in being small or medium-sized enterprises. When larger enterprises have great assets that will clear up their path in many ways, small and medium-sized ones may lack the necessities in taking advantage in the marketplace (Bögenhold & Fachinger, 2007). However, many proofs have shown that there were times smaller enterprises were able to defeat the disadvantage of being small and develop at an astounding rate (Hisrich & Soltanifar, 2021). They surprised the marketplace as the survivors and grew with prosperity (Pett et al., 2019). To do this, the managers of small and medium-sized enterprises (SMEs) need to have strategic innovations to meet the firm's goals. (Haddad et al., 2019) found that some of this success is owed to the top management's role in encouraging an innovative culture (Bögenhold et al., 2021).

To be able to build a firm name in the marketplace, SMEs need to have good branding. SME's brand-building attempts comprise these factors: (1) implementing various approaches in promoting the brand; (2) using the unique yet recognizable brand name; (3) offering different products; and (4) showing product/service offerings by attending exhibitions.

For a service-based SME, the use of a brand name contributes to the firm's performance. This condition happens because a service-based SME's primary products are intangible. Thus the brand name is automatically woven into the brand name (Odoom et al., 2017).

Open innovations seem to be the keywords for SMEs to have sustainable growth. (Yun et al., 2015) mentioned that a knowledge strategy and business model are the two kinds of open innovation needed. SMEs with limited human resources and resources need to have various resources from external parties rather than forcing themselves to prepare all resources and capabilities. Another innovation required for the sustainable growth of SMEs is the adoption of Information and Communication Technology (ICT).

Interestingly, the paradigm shift in the ICT brings dynamism and complexity to the SME's competition level. Within accessible environments, the ICT capabilities are more distributed in larger SMEs, both internal and external oriented processes. In contrast, medium-sized enterprises tend to develop ICT capabilities internally and fail to manage ICT capabilities for their external environments. How well the ICT is adopted in the firms depends on the environmental influences (Neirotti et al., 2018).

Conclusion

This study contributes to the contemporary realm of research on COVID-19 to understand how SME hotels respond to the pandemic situation in Austria, Pakistan, and Indonesia and what strategies were implemented by these while working in this crisis time. The study results provide an understanding of the strategy for employees and customers, as well as the challenges for SMEs, hotels, and their staff from COVID-19 incidents.

The findings of the thematic analysis mention the apparent difference in the strategies. Results show that the strategies of the hotels vary from country to country in developed and developing countries. A developed country, Austria, mentioned the suitable approach by all means and in every possible way, but the strategy is not similar in the developing countries. Hotel show planning for employees in Austria. However, in Pakistan and Indonesia, there was a problem in the proper implementation of the strategies. Furthermore, it shows that hotels agree to bear the cost of safety precautions and implement cleaning procedures and necessary safety measures. Further research ensures the importance of these safety precautions, measures that influence customers' attitudes and behaviors, and whether customers are willing to pay for them. Hotels and restaurants believe that applications of emerging technologies and different software can ease the business in the service delivery during the COVID-19 situation, and it is necessary to develop an environment to reduce physical contact.

Practical implications are provided from this study for the hotels, employees, visitors, travelers, governments, and other associated stakeholders. Hotels should adopt technical tools like service robots, introduce contactless payment such as apply pay or contactless bank cards, digital menus that can be viewed on personal mobile devices via QR codes, contactless digital payments, keyless entry, touchless elevators, and other facilities. Furthermore, the hotels must provide free COVID-19 tests for the staff, customers, and suspected people. In this regard, the government should support the hotels.

Acknowledgement

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The Heterogeneous Effects of COVID-19 Outbreak on Stock Market Returns and Volatility: Evidence from Panel Quantile Regression Model

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Abstract
The purpose of this study is to probe the impact of the novel coronavirus (COVID-19) outbreak on stock market returns and volatility in developed markets. We employ a panel quantile regression model to capture unobserved individual heterogeneity and distributional heterogeneity. The study's findings reveal that there is a heterogeneous impact of COVID-19 on stock market returns and volatility. More specifically, there is a negative impact of COVID-19 on stock returns in the bearish stock market; however, there is an insignificant impact of COVID-19 on stock returns in the bullish stock market. Furthermore, COVID-19 has a positive impact on stock market volatility across all quantiles.

Keywords:
Coronavirus, covid-19, stock market returns, volatility, panel quantile regression model

Introduction

There are a plethora of studies that investigate the factors that affect stock market returns and volatility. However, one strand of literature probes the impact of events on stock market returns and volatility. These events include; sports (Buhagiar et al., 2018), news (Li, 2018), environmental (Alsaifi et al., 2020; Guo et al., 2020), disasters (Kowalewski & Śpiewanowski, 2020), and political events (Bash & Alsaifi, 2019; Shanaev and Ghimire, 2019). Thus far, there is limited literature that examines the effect of pandemic diseases (e.g., SARS and EVD outbreak) on stock markets (Chen et al., 2007, 2009; Ichev & Marinč, 2018). Therefore, it is essential to scrutinize the impact of pandemic diseases on stock market returns and volatility.

Parallel to this, on December 31, 2019, WHO (world health organization) reported the first case of novel coronavirus (COVID-19) in China. This virus has spread to almost every country of the world. As of May 5, 2020, there were 4014436 confirmed cases of coronavirus around the globe. Countries worldwide follow protective measures to mitigate the spread of this outbreak, such as the social distancing and lockdown policy. Therefore, this outbreak has enormous economic impacts. The global GDP growth rate has plunged due to the coronavirus outbreak. Energy markets are also affected by this outbreak. On March 23th, 2020, Brent oil prices plunged about 24%. Next, the manufacturing industry has been affected by the coronavirus outbreak. 98% of respondents of a survey conducted by the British Plastics Federation speculate that the coronavirus outbreak has harmed the manufacturing industry in the next few quarters.

Moreover, there is also a surge in the unemployment rate due to this outbreak. Thirty million people have become unemployed in the US within few months due to this coronavirus outbreak. Furthermore, it is well known that investment and doing business positively impacted economic development (Činčalová et al., 2021). However, the COVID-19 pandemic adversely impacts investment and doing business (Donthu & Gustafsson, 2020). Moreover, the COVID-19 pandemic also hits the creative industry (Bhowmik et al., 2021). Next, Baker et al. (2020a) note that coronavirus outbreak generates economic policy uncertainty. Next, Baker et al. (2020b) conclude that the coronavirus pandemic decreases household spending. Sharif et al. (2020) find that the COVID-19 outbreak affects economic policy uncertainty, geopolitical risk, oil prices, and stock markets. Thus, the novel coronavirus (COVID-19) outbreak affects each sector of an economy.

Coronavirus outbreak has profound impacts on stock markets. Researchers have been examining the relationship between the stock market and COVID-19 since the pioneer study of Goodell (2020). Yarovaya et al. (2020) propose a conceptual framework that could be used to investigate the relationship between pandemics (e.g., COVID-19) and the Stock market. In this background, Ashraf (2020) examines the effect of COVID-19 on stock markets using pooled OLS, fixed effect, and random effect models. The author reports that COVID-19 harms stock market returns. Baker et al. (2020c) investigate the impact of coronavirus on the stock market through newspaper articles. The findings of the study conclude that stock market returns decrease due to coronavirus. However, coronavirus increases the volatility in the stock market.

Similarly, Liu et al. (2020) probe the effect of coronavirus outbreaks on stock markets of developed countries using event study analysis. The findings from the study show that the coronavirus outbreak affects the stock market returns and volatility. Moreover, Zhang et al. (2020) employ a minimum spanning tree approach and conclude that coronavirus outbreak surges the stock market volatility. Al-Awadhi et al. (2020) employ a panel fixed effect model and note that the coronavirus outbreak negatively impacts stock market returns in China. Further, the study also concludes that coronavirus outbreaks positively impact a few sectors (e.g., medical, information technology, and medical). The studies above on the relationship between COVID-19 and stock markets mainly employed panel data regression models (e.g., fixed effect model). There is a limitation of these studies above, such as they ignore the unobserved individual heterogeneity and distributional heterogeneity. If we overlook these heterogeneities above, then we may get misleading results.

There is a limited amount of literature that explores the impact of outbreaks on stock markets. This section, therefore, reviews some studies that investigate the effects of outbreaks on stock markets. Delisle (2003) investigates the cost of the SARS outbreak and finds that the SARS outbreak has a significant impact on the financial market. Further, the author reports that the economic cost of the SARS outbreak is almost equal to the cost of the global financial crisis. Similarly, Nippani & Washer (2004) examine the effect of the SARS outbreak on stock markets and note that the SARS outbreak harms the stock markets of China and Vietnam. Next, Del Giudice & Paltrinier (2017) probe the impact of Arab Spring and the Ebola outbreak on equity markets. The findings reveal that their equity markets are affected by these outbreaks above.

Moreover, Macciocchi et al. (2016) scrutinize the effect of the Zika virus outbreak on stock markets and report that there is a negative relationship between the Zika virus outbreak and the stock market in the case of Brazil. Chen et al. (2007) note that the SARS outbreak negatively affects the hotel stocks. Wang et al. (2013) conclude that outbreaks caused by any infectious disease affect biotechnology stock. Moreover, Conlon & McGee (2020) conclude that bitcoin does not behave like a safe haven during the COVID-19 pandemic. Next, Goodell & Goutte (2020) also find that COVID-19 escalates the prices of bitcoin.

Recently, Bouri et al. (2021a) used DECO-GARCH models on selected industries of the New Zealand stock market to explore the effect of three policies, namely, the lockdown, the stimulus package, and the travel ban. The study's findings conclude that there is a heterogeneous impact of these policies on selected stock indices. Moreover, healthcare, technology, and real estate stock indices are found immune to these policies. Next, Abuzayed et al. (2021) examine the systematic risk spillovers between global and selected countries' stock markets using DCC-GARCH models during the COVID-19 period. The findings reveal that the spillovers are profound during the COVID-19 pandemic.

Moreover, Bouri et al. (2021b) employ the TVP-VAR connectedness approach to investigate the connectedness among selected financial assets during the COVID-19

pandemic. The results show that the Bond and USD indices are the net transmitter, while the equity indices are the net receiver. Furthermore, a few research outlets examine the safe haven properties between gold and Asian stock markets during the COVID-19 outbreak (Yousaf et al., 2021). Parallel to this, a line of research explores the asymmetric volatility spillover between stock markets during the COVID-19 pandemic (see, e.g., Shahzad et al., 2021).

Similarly, using two-step GARCH models, Hoang & Syed (2021) probe whether VIX and CSFB predict the volatility of currencies and commodities in the pre-and post-COVID-19 period. The results note that both VIX and CSFB do not explain the volatility of currencies and commodities during COVID-19. Likewise, Hashmi et al. (2021) explore the asymmetric impact of the COVID-19 outbreak on stock prices of the E7 economies. The findings from quantile-on-quantile regression reveal the asymmetric impact of the COVID-19 pandemic on selected stock indices. Yousfi et al. (2021) compare the correlation between US and China stock markets for the first and second waves of the COVID-19 outbreak. The findings reveal that correlation between the considered stock markets is relatively profound during the COVID-19 period. One strand of the COVID-19 & stock market literature uses event study analysis. For instance, Sun et al. (2021) noted that the COVID-19 had a detrimental impact on the Chinese stock market during the pandemic. Recently, Gao et al. (2021) used a wavelet-based QQ regression approach to examine the effect of the volatility of the COVID-19 outbreak on the volatility of the US and Chinese stock market. The study finds that the COVID-19 pandemic positively impacts US stock market volatility, and that effect is relatively significant compared to the effect on the Chinese stock market. Likewise, Rahman et al. (2021) also reported that the COVID-19 outbreak harms the stock market in the case of Australia.

In this background, the present study scrutinizes the impact of coronavirus outbreaks on stock market returns and volatility in developed markets. This study contributes to the literature in three ways. First, as there are limited studies that probe the impact of outbreaks on stock markets, the present study fills this gap. Second, the present study employs a panel quantile regression model that captures the unobserved individual and distributional heterogeneity. Besides, this model also minimizes the problems of heteroscedasticity, multicollinearity, and estimation bias (Baltagi, 2008; Woolridge, 2010). Next, to the best of our knowledge, no study investigates the impact of coronavirus outbreaks on stock markets during different trends (e.g., bearish, normal, and bullish). Therefore, this study fills this gap by scrutinizing the impact of covid-19 on bearish, normal, and bullish stock markets. Furthermore, this study provides empirical evidence on whether COVID-19 affects stock returns and volatility in developed stock markets to help investors and policymakers in portfolio diversification and policy implications.

Methods

The purpose of this study is to investigate the impact of novel coronavirus outbreaks on stock market returns and volatility using a panel quantile regression model. The study uses daily data ranging from December 30, 2019, to March 24, 2020. Further,

we use seventeen developed stock markets, including Austria, Australia, Canada, Finland, France, Germany, Ireland, Japan, Netherlands, New Zealand, Norway, Spain, Singapore, Sweden, Switzerland, US, and the UK. Further, we choose countries and periods based on data availability.

Further, we also take log differences of stock prices data in order to calculate stock returns. Moreover, to calculate volatility, we employ the GARCH (1, 1) model on stock prices. The key independent variable of the present study is the number of daily deaths from coronavirus pandemics. The data on deaths from coronavirus are taken from World Health Organization (WHO) database. The study also includes daily oil prices as a control variable to eradicate omitted variable bias. Furthermore, we convert all independent variables into log difference series.

Table 1. Summary of Descriptive Statistics

	COVID	Oil	Stock
Mean	0.377443	-0.001481	-0.198646
Std. Dev.	1.052633	0.032201	1.288404
Skewness	3.319868	-0.589610	-0.659903
Kurtosis	14.28354	10.16411	8.628119
Jarque-Bera	(0.000000)***	(0.000000)***	(0.000000)***

Note: "COVID" shows deaths from coronavirus. "oil" shows log difference of oil prices, and "stock" represents stock returns. (.) is the p-value. Also, *, **, *** represents level of significance at 10%, 5%, and 1%.

Table 1 reports descriptive statistics of all data series. As can be seen, on average, stock market returns and oil returns are negative. Moreover, stock market returns are highly volatile as the standard deviation value is highest for stock market returns. Next, all data series are skewed. Further, kurtosis illustrates that the tails of all variables are thick. At last, the Jarque-Bera test concludes that all variables are not normally distributed. As the data are not normally distributed, employing OLS (ordinary least square) may give misleading results (Binder & Coad, 2011). Thus, it is appropriate to employ quantile regression methodology.

Table 2. Summary of Unit Root Tests

Unit root test	COVID I (0)	Oil I (0)	Stock I (0)	COVID I (1)	Oil I (1)	Stock I (1)
LLC- test	(0.42)	(0.23)	(0.14)	(0.00)**	(0.00)**	(0.02)**
ADF - Fisher	(0.21)	(0.11)	(0.27)	(0.00)**	(0.01)**	(0.00)**
PP - Fisher test	(0.13)	(0.24)	(0.10)	(0.00)**	(0.00)**	(0.00)**

Note: (.) is p-value. ** shows level of significance at 5%.

Table 2 demonstrates the results from unit root tests. We apply three different unit root tests to discern the order of integration of data. The results from these tests

reveal that all variables have the problem of unit root at the level. Further, all variables are stationary at the first difference at a 5% level of significance.

We employ a panel quantile regression model to probe the impact of novel coronavirus outbreaks on stock market returns in developed economies. This model describes the impact of coronavirus outbreak on all selected quantiles of stock market returns and volatility. Most of the time, studies employ traditional OLS methodology, leading to misleading results due to the non-normal distribution of data. On the contrary, quantile regression gives unbiased & efficient results even in the case of non-normal distribution. Moreover, this methodology is not outlier sensitive, which is another advantage of this methodology. These properties above quantile regression prompt many researchers to employ this methodology.

$$Q_{yi}(\emptyset|x_i) = x_i^{/}\alpha_{\emptyset} \tag{1}$$

Equation (1) demonstrates the conditional quantile Yi in a given xi. However, $\emptyset$ it denotes the quantile. While using quantile regression methodology in panel data, unobserved heterogeneity is taken into account, which prompts a panel quantile regression model with a fixed effect. This model enables us to control unobserved individual heterogeneity. The panel quantile regression model with fixed effect is mentioned as follows.

$$Q_{yit}(\emptyset_k|\varphi_i, x_{it}) = \varphi_i + x_{it}^{/}\alpha(\emptyset_k) \tag{2}$$

In equation (2), φi captures the fixed effect that brings the incidental parameter problem (Lancaster, 2000). With fixed time-series observations for each cross-sectional unit, the estimator becomes inconsistent when the cross-sectional unit approaches infinity (Kato & Galvao, 2010). Thus, we cannot use conventional linear approaches in the panel quantile regression model. Koenker (2004) develops an approach known as the shrinkage method to solve the problem mentioned above of panel quantile regression. This method introduces a penalty term to eliminate the unobserved fixed effects. The parameters of the model are estimated as follows.

$$(\hat{\alpha}(\emptyset_k), \eta), \{\varphi_i(\eta)\}_{i=1}^{N}) = \arg\min \sum_k^K \sum_t^T \sum_i^N \Omega_k \rho_{\emptyset k}(y_{it} - \varphi_i - \overline{x_{it}}\alpha(\emptyset_k)) +$$
$$\eta \sum_i^N |\varphi_i| \tag{3}$$

In equation (3), "i" and "t" represent country and year, respectively. Further, "k" represents the quantile; however, ρ∅k shows the quantile loss functions. Moreover, Ωk shows the given weight that is assigned to k-th quantile. Ωk Captures the contribution of different quantiles. Similar to Lamarche (2011), we also set Ωk =1/k. η is tunning term/parameter used to plunge the individual effect to zero for better estimation of slope coefficients in the model. We also set the value of η = 1 as many studies, for instance, Zhu et al. (2018), set the value of η =1.

As this study scrutinizes the impact of coronavirus outbreak on stock market returns and volatility, we develop the panel quantile model mentioned as follows.

$$Q_{Yit}(\emptyset_k|\varphi_i, x_{it}) = \varphi_i + \alpha_{1\emptyset}COVID_{it} + \alpha_{1\emptyset}OIL_{it} \tag{4}$$

In equation (4), we denote country and time with indices "i" and "t" respectively. φi shows unobserved heterogeneous effects across countries. Moreover, yit represents the stock market returns (volatility). Next, COVIDit demonstrates the number of deaths from coronavirus. To eliminate omitted-variable bias, we include an additional variable such as daily oil prices (OIL_{it}).

Results and Discussion:

We also employ pooled OLS and fixed effect models to compare these models' results with the panel quantile regression model. From panel quantile regression, we report results of 25th percentile (bearish market), 50th percentile (normal), and 75th percentile (bullish market) of conditional stock market returns (volatility). Table 3 reports the results from pooled, fixed effects, and panel quantile regression.

Table 3. Summary of Results for Stock Market Returns

Variable	OLS Regression		Quantile Regression		
	Pooled	**Fixed Effects**	**25th**	**50th**	**75th**
Constant	-0.17***	-0.17***	-0.44***	-0.04	0.27***
	(0.00)	(0.00)	(0.00)	(0.20)	(0.00)
COVID	-0.07**	-0.10**	-0.57***	-0.17**	0.12*
	(0.04)	(0.01)	(0.00)	(0.02)	(0.05)
Oil	-7.52***	-7.57**	-8.63***	-6.60***	-3.7*
	(0.00)	(0.01)	(0.00)	(0.00)	(0.07)

Note: (.) represents the p-value.
Also , *, **, *** represents level of significance at 10%, 5%, and 1%.

As can be seen in Table 3, the results are heterogeneous. Pooled OLS concludes that a 1% rise in deaths from coronavirus is responsible for a 0.07% plunge in stock market returns in developed markets. Further, the slope coefficient of COVID from the fixed effects model finds that a 0.10% decline in stock returns is fostered by a 1% increase in deaths from coronavirus.

Findings from the panel quantile regression model reveal that coronavirus outbreak has a negative and statistically significant impact on stock market returns. Our findings are in line with the findings of Al-Awadhi et al. (2020), Baker et al. (2020c), and Liu et al. (2020). It is worth reporting that our results are contrary to the findings of Liu et al. (2020), who argued that the COVID-19 pandemic escalates the stock returns. Furthermore, results from panel quantile regression are also heterogeneous across the distribution. At the 25th quantile, the coefficient of COVID is -0.57, which means that a 1% increase in deaths reduces the stock returns by 0.57% in the bearish market.

This outcome is also backed by the findings from the study of He et al. (2020). Also, Apergis & Apergis (2020) noted that the COVID-19 pandemic plunges the stock

returns in the Chinese stock market. Meanwhile, at the 50th quantile, the coefficient of COVID describes that a 1% increase in deaths from coronavirus outbreaks will cause a 0.17% decline in stock returns. This conclusion is similar to the results of Anh & Gan (2020), who report that the COVID-19 outbreak has a detrimental impact on the Vietnam stock market. Next, at the 75th quantile, the coefficient of COVID is statistically insignificant. It implies that the coronavirus outbreak does not affect the stock returns in the bullish market. This finding is somehow in line with Cepoi's (2020) conclusions, noting that panic due to the COVID-19 outbreak does not affect the bullish stock market.

The effect of oil prices on stock returns is also heterogeneous. At lower quantile, the effect of oil prices on stock returns is profound; however, the effect is meager and statistically insignificant at upper quantile. The results are also backed by the conclusion of Lee & Zeng (2011), who report that oil prices plunge the stock prices at different quantiles. Moreover, Kilian & Park (2009), and Kang et al. (2015) conclude the same findings that oil prices negatively impact stock returns. It is worth reporting that our findings are somehow backed by the conclusion from the study of Bouri (2015) and Bouri et al. (2017) that expound the impact of oil prices on the stock market. Thus, findings show a profound impact of coronavirus outbreak on stock returns at lower quantile compared to upper quantile. The findings postulate that stock returns of bearish stock markets are more vulnerable to coronavirus outbreaks than bullish markets.

Next, Table 4 reports the impact of coronavirus outbreak on stock market volatility from pooled OLS, fixed effects, and panel quantile regression model. The impact of coronavirus outbreak on stock market volatility varies from one methodology to another. In table 4, pooled regression model reveals that a 1% increase in deaths from coronavirus generates 1.43% volatility in developed stock markets. Next, the fixed effects model concludes that volatility increases by 1.55% due to a 1% increase in deaths from coronavirus outbreaks.

Table 4. Summary of Results for Stock Market Volatility

Variable	OLS Regression		Quantile Regression		
	Pooled	Fixed Effects	25th	50th	75th
Constant	1.11***	1.08***	0.01*	0.09***	0.37***
	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)
COVID	1.43***	1.55***	0.15**	0.55***	1.52***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
Oil	39.71	26.39	12.95*	82.03*	337.37*
	(0.42)	(0.58)	(0.07)	(0.06)	(0.09)

Note: (.) denotes the probability value.
Also, *, **, *** represents level of significance at 10%, 5%, and 1%.

On the contrary, the panel quantile regression model highlights that coronavirus outbreak has a positive and statistically significant impact on stock market volatility.

Our findings align with Zhang et al. (2020) study, which notes the market risk impact of coronavirus outbreaks in developed stock markets. However, we find heterogeneous results across the distribution. At the 25th quantile, a 0.15% rise in volatility is fostered by a 1% increase in deaths from coronavirus. Further, at the 50th quantile, a 1% surge in deaths from coronavirus is responsible for a 0.55% increase in volatility in developed stock markets.

Moreover, at 75th quantile, volatility in developed stock markets escalates by 1.52% due to a 1% increase in deaths from coronavirus. Table 4 shows that the coefficient of COVID is increasing with the increase in quantile. The findings from the panel quantile regression model reveal that the coronavirus outbreak generates less volatility in developed stock markets at 25th quantile and high volatility in markets at 75th quantile. These results are somehow backed by Baek et al. (2020), who argued that the COVID-19 outbreak surges the stock market volatility. Moreover, Papadamou et al. (2020) note that Google search related to the COVID-19 pandemic positively impacts stock market volatility. Similarly, Uddin et al. (2021) described that the COVID-19 outbreak increases the volatility of 34 developed and emerging stock markets.

Our findings propose that investors should not invest in bearish stock markets during the pandemic as bearish markets are vulnerable to the COVID-19 outbreak. Therefore, the government should initiate measures to stabilize the economy that will eventually keep the stock market safe from the detrimental impacts of the COVID-19 pandemic. Next, bullish stock returns are immune to COVID-19; therefore, investors may invest in these markets in times of outbreaks. It is worth reporting that investors ought to inject their investment in the bullish stock market whenever the wave of the COVID-19 outbreak occurs in order to get capital gains. Moreover, markets with high uncertainty are relatively more vulnerable to COVID-19 outbreaks. Thus, risk-averse investors should not invest in these markets mentioned above during outbreaks. Hence, during the pandemic, it is better to invest in a stock market with meager volatility. Next, COVID-19 harms stock markets; therefore, policymakers should introduce measures to offset the adverse effects of the COVID-19 outbreak. For instance, the US announce quantitative easing to escalate investment. Economies should take these kinds of measures to facilitate investors.

On the contrary, Policymakers from emerging countries have to keep an eye on the policies of developed markets as they have spillover effects on emerging markets. For instance, Syed et al. (2019) conclude that US quantitative easing has a spillover effect on emerging economies' stock markets. Thus, emerging economies should propose policies that could keep the financial markets safe from COVID-19 outbreak and spillover effects from developed economies' quantitative easing.

Conclusion

This study aims to probe the impact of coronavirus outbreaks on stock market returns and volatility in developed markets. We employ a panel quantile regression model to examine the non-linear effects of coronavirus outbreaks. The findings conclude that

coronavirus harms stock market returns at the 25th quantile. Moreover, there is an insignificant impact of coronavirus on the stock market at 75th quantile. Next, there is a positive impact of coronavirus outbreak on stock market volatility. At the 25th quantile, there is a meager impact of coronavirus on stock market volatility. However, at 75th quantile, there is a profound impact of coronavirus outbreak on stock market volatility.

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Industry 4.0 and Business Policy Development: Strategic Imperatives for SME Performance

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Abstract
Industry 4.0 presents companies with new prospects to renovate industrial manufacturing processes and increase value creation, has promised several optimizing strategies for improved business performance. The purpose of this research is to examine the relationship between innovation capability and employee capability on organizational performance among Small and Medium Scale industries entrepreneurs. Following a positivist research philosophy with a quantitative, cross-sectional descriptive study design, the study addressed three direct and two indirect relationships in the model. The research followed the expectation Resource-Based View Theory to test the theoretical model. Following stratified random sampling, this research using 384 SME entrepreneurs from the Selangor state of Malaysia. The study applied Smart PLS-SEM to analyze the data. The results show that SME firms' innovation capability and employee capability positively correlate with business performance. The study also shows the partial mediation effect of technology change on innovation capability and business performance and employee capability and business performance. Research extends practical and theoretical implications to the stakeholders of SMEs and businesses.

Keywords:
innovation capability, employee capability, business performance, small and medium scale industries

Introduction

Industrial Revolution 4.0 is being emphasized among SMEs in Malaysia. SMEs have made and because they are constituting 98.5% of businesses in Malaysia. Several industries across the globe have well acknowledged the role of emerging technologies. Swift extension of machines and tools with advanced technologies and IoT applications in production and services is well-acknowledged across industries. The industries can use cutting-edge software and networked sensors to schedule, forecast, adapt, and monitor business outcomes. Process Innovation with digitalization has supported several SMEs to enhance the productivity and quality of production. Industrial 4.0 trends like digitalization have enabled real-time data exchange and improve flexibility, pace, efficiency, and quality of output (Thoben et al., 2017; Li et al., 2017). Although SMEs broadly depend on production proficiency for value enhancement, they are expected to gain revenue from Industry 4.0 investments associated with process innovation, acceptance, and execution of Industry 4.0 technologies.

The term industry 4.0 denotes 'fourth industrial revolution. The term reflects its real meaning in transformative aspects related to industry and technology that include the design, production, implementation, operation, and service of manufacturing systems, products, and components. Industry 4.0 digitizes and assimilates procedures and practices upright from corner to corner in the entire organization, from product improvement and purchasing, manufacturing, logistics, and service (Adler & Shenbar, 1990; Bauernhansl et al., 2014; Jämsä et al., 2011). One of the significant features of Industry 4.0 is the adoption of sophisticated industrial technologies that are coined as Smart Manufacturing. A varied number of product manufacturing processes and services are automated flexibly following the real-time data and exchange of information (Schuh et al., 2017). Enhanced quality of large-scale production by ensuring productivity and flexibility is assured with the digital integration processes. The process innovation and product innovation capability with smart manufacturing have supported customized products at a large scale and balanced way with improved resource utilization (Dalenogare et al., 2018).

Industry 4.0 moreover contemplates the inter-exchange of data and incorporation of the technology-oriented supply chain. By integrating an amalgamation of applications like Artificial Intelligence, machine learning, and predictive analytics, businesses can automate warehouse processes, improve delivery times, efficiently maintain inventory, enhance strategic sourcing relations, and generate new customer data that increase satisfaction and improve sales. This assimilation also allows firms to merge resources in joint production, letting firms' owners emphasize their essential capabilities and product and service innovation, with more value-addition (Chien & Kuo, 2013).

The advantages envisioned by the smart technology applications in firms also include final products produced out of the smart process (Dalenogare et al., 2018). Smart technologies assist the managers in giving real-time data regarding the production of new products (Tao et al., 2018) by analyzing the customer's well-informed preferences Smart product process with innovation capabilities augment the service quality of the

current operating system, and it intern support the business development (Porter & Heppelmann, 2015). A Smart Factory is the outcome of industry 4.0 and is vigorous, and it improves efficiency by communication flows among people, systems, and all resources available in the faculty. SMEs will have to adopt such technology innovation to cope with the local and international market changes.

Previous literature indicates barriers, challenges, and lack of adoption for several reasons like unclear possible benefits, unclear implementation details, and sizeable required investment (Galati & Bigliardi, 2019; Theorin et al., 2017; Mohamed, 2018). With the increased adoption of Artificial Intelligence and the Internet of Things-based applications, there are still some grey areas linked to the real benefits and requirements and the influence on the business models. Hence, it is necessary to explore the challenges posed to the SMEs in the form of capabilities and resources on the business performances with specific references to small and medium scale business owners.

SMEs have a substantial role in Malaysia's economic development. Collectively SMEs in Malaysia are composed of 98.5% of all industrial firms (SME, 2020). Based on the statistics in SME annual report 2018-19, the national micro-target under DKN (Dasar Keusahawanan Nasional) 2030 is to increase SME contribution to GDP to 50 %, which was 38.3 % in 2018; generation of employment is raised to 80 %, which was 66.2% in 2018; contribution to total export value to 30.0%, which was 17.3% in 2018; and for the turnover of co-operatives to grow to RM60.0 billion, which was RM40.3 billion in 2018 (SMEAR2018-2019).

To remain competitive in the market, services, manufacturing, and trade-based SMEs face numerous challenges, particularly technology integration, human capability upskilling, hiring, and innovation capabilities. Several SMEs are far behind in the acceptance and execution of Industry 4.0 types of machinery. Since any technology change invites changes in capabilities and resources, the operating models of existing businesses must be relooked into for effective automation during IR 4.0 (Safar et al., 2018; Stentoft et al., 2019). Digitalization invites radical changes in service and manufacturing operations, further necessitating digital literacy, digital competencies, and artificial intelligence capabilities.

Malaysian SMEs are aware of several adaption deficits. SMEs face constraints related to resources to make an effective industrial 4.0 based technology transformation that needs to be studied. Some of the significant threats raised among SMEs in this context include coping with technology change, the need for innovation capabilities and worker capabilities, and subsequent business performance opportunities. The smaller the SMEs are, the greater the threat since they will not cope with the change and make any gain from the digital transformation. Such scenarios open the need for more exploration and action plans for organizing SMEs in a technological and administrative path (Sommer, 2015). Though several studies were conducted in large-scale industrial establishments, there are limited studies focused on SMEs, exploring the intervening effect of technology change in its relationship with innovation capability, employee capability, and business performance.

Industry 4.0 has developed an ecosystem where there is an integration of evolving technologies. These new technologies are transforming the labor market, particularly in an individual's competencies and abilities to meet the new industrial conditions and requirements. Consequently, there is a requirement for newfound professional profiles. The application of new wave tools and techniques affects equally workers working in firms and the organization itself. Reliant to the business sector, precise skills and individual tasks may differ from one job to another due to the divergence of procedures and methods. Past research on human resources influence indicates that people at work directly positively affect firm performance (McKelvie & Davidsson, 2009). Based on the Resource-Based View Theory, internally oriented personnel knowledge, unique skills, and capabilities can give the firm a competitive advantage. The human resource department can achieve this objective by recruiting and maintaining a well-trained labor force and managers who will accelerate innovation (Zahra & Nielsen, 2002). As expected, any changes in the technology will invite corresponding changes in the employee capabilities to handle the new technology and innovation-driven operations. This condition directs that a workforce quality that will be fine-tuned with the technology is an essential factor determining the success of technology change.

Samson et al. (2017) researchers have found Innovation Capability as the significant theme for research. Innovation capability defines as "the way enterprises can generate innovative outputs" (Esterhuizen et al., 2012). Innovation capacity or capability entrenched in the organizational procedures and collective workplace behaviors used by the firm to segregate innovation opportunities, seamlessly share information, encourage discussion, and call for new ideas (McGrath, 2001).

Industry 4.0 developed an aura of a "smart and sensible" automated industrial unit where production systems, employees, commodities, and consumers are associated with each other (Karre et al., 2017). The advent of Industry 4.0 boosts the organization's technological capacities development as one of the highly critical operating forces to ascertain the effectiveness of organizational flexibility into the art of digitization in the production and business environment (Laugsand, 2017). The firms' resource is to be in tune with the required product and service changes expected by the market, and it should be generated from customer appreciation. Several research reports indicate that innovation plays a vital role in determining the growth and competitiveness of any organization (Kim & Maubourgne, 2005). Nevertheless, a considerable volume of businesses has adopted innovation practice without great accomplishment. In the majority, situation organizations reported an average, very little or no effect with the efforts of their innovations (Wolff & Pett, 2004). In this context, it is rightly pointed out that a firm's performance is associated with the capability to earn profit and growth to meet the strategic objectives (Hult et al., 2004). Consequently, innovation has become a prerequisite closely knit with the growth, performance, competitiveness, profit maximization, and firm's survival for an extended period (Jiménez & SanzValle, 2011).

Work and work organizations are substantially changed with the use of technology and technology innovation. SMEs can thus bring substantial improvement in doing

business by aligning the technology-based innovation with organizational changes like dealing with equipment, managing resources, evaluating environmental protection, stimulating clean production, and better R & D of new materials and new energy sources (Adepoju et al., 2017). Technology change turned to be the emphasis of considerations across the world. Several technological changes are witnessed by the industrial world, such as cyber-physical systems, the Internet of Things, big data and data analytics, cloud and information technology, robots and automated machinery, 3D printing, simulation, portable devices. A great initiative at the organizational level is in need to cope with the ever-changing work processes with the modern technological assimilation. Organizations are facing challenges related to the acceptance and adoption of technology based on the technology changes. Technology change has created several implications at the managerial level, looking at the projected competencies with its integration into business opportunities. There will be a need for different forms of managerial, diplomatic, and social skills that are in tune with the expected technology changes facilitating decision-making processes by accommodating new organizational structures so that employees can perform the tasks and functions effectively.

Jobs in industries are affected by the changes in technological applications, where innovation is widely diffused (Durowoju, 2017). On the contrary, the technology change is considered a threat, where fewer human resources are required to perform the traditional intensive people-oriented tasks. However, the changes based on innovation have enhanced the workflow and facilitated better production effectiveness and efficiency.

Performance can be attributed as the primary indicator in assessing the operation of an organization. The evaluation of performance can be understood from an impartial viewpoint that is more associated with the monetary valuation to the firm's performance in return on equity, return on assets, and growing sales (Shariff et al., 2010). Davood & Morteza (2012) viewed performance as the ability of a firm to create acceptable outcomes and actions.

Technological change is considered as "the engine of growth." Technology change and the state of technology have an explicit connection to the company, workers, and performance. Besides that, technology, labor, and capital are interrelated. A change in the technology invites corresponding changes in the employee capabilities to handle the new operations. This condition indicates that workforce quality that is fine-tuned with the technology is an essential factor determining the success of technology change. Technologies can lead to increased productivity or performance when combined with other resources effectively by human resources or when done effectively (Dauda & Akingbade, 2011). Studies have established the relationship between technological development and capability augmentation of employees, which equips them with relevant labor market skills, drives into a firm's performance. This condition specifies that technology change envisages corresponding resource management changes at the organizational level that facilitate organizational performance. Despite these notable studies, less attention has been given to the technology change readiness of SMEs concerning expected changes in employee capabilities. Hence it is argued that a better employee capability facilitated

by technology change thus extends better among SMEs. The technology understandably changes act as a moderator.

Though the direct relation of Innovation capability on organizational performance is well established, several factors enhance or decrease its influence act as moderators. The researchers inferred that failure to adopt an appropriate new technology or the failure to realign a firm's strategy to the new technology deteriorates the organization's competitive position and further affects its performance. The firm's innovation capability is the most crucial factor for competitive advantage in highly turbulent market conditions. Innovation capability leads organizations to develop innovations continuously to respond to the changing market environment (Slater et al., 2010). It is embedded with all the strategies, systems, and structures that support innovation in an organization (Gloet & Samson, 2016). Though such claims exist with remarkable studies, less attention has been given to the technology change readiness of SMEs. The firm's performance will be decided by its readiness to fine-tune the required innovation capability with the technology change. A better innovation capability is thus seconded with appropriate technology change at the production level. The technology changes justifiably act as a moderator. Hence the role of technology change is hypothesized as a moderator between innovation capability and organizational performance among SMEs.

The fourth industrial revolution is known as industry 4.0, seeing the progress in the industrial way of doing with the coordinated push for automation, big data, and internet-of-things. Therefore, the purpose of this study is to explore the industrial 4.0 based technology transformation challenges in small and medium-sized service industries, specifically wholesale and retail industries. The question raised in this context is how far the small and medium scale industries are ready to absorb the industrial revolution, which invites innovation capacities with automation, big data, and internet-of-things.

It is hypothesized in this study that the higher the technology change, the higher the competence depletion will lead to a lower level of business performance. A better innovation capability of the organization with the support of Industry 4.0 oriented human skills can reduce the competence depletion of the workforce and enhance business performance. The study applied quantitative research with standardized instruments to analyze the relationship between innovation capabilities and employee capabilities on organizational performance, and the study followed standardized instruments to measure it. The research site was the Klang Valley region of the Selangor state of Malaysia. Study finding provides better insight into the need for innovation capabilities and human resource competencies preparedness towards Industry 4.0 in its adaption to SMEs for better business performance in the Malaysian context.

Methods

The Resource-Based View theory in Figure 1 delivers a complete view on the efficacy of resource utilization. Resource amalgamation is a vital part of joining the inside and outside an enterprise. When resources are exposed and efficiently used by a

firm, the value will appear. Applying RBV theory in this research, the employee and innovation capabilities are linked to the organization's technological innovation systems with the changes initiated by industry 4.0 to bring better production processes, product quality, and market orientation (see Figure 2). It is argued in this context that employee capabilities and innovation capabilities determine the control of resource adequacies that would lead to better organizational competence and performance.

Figure 1. Resource Based View Theory
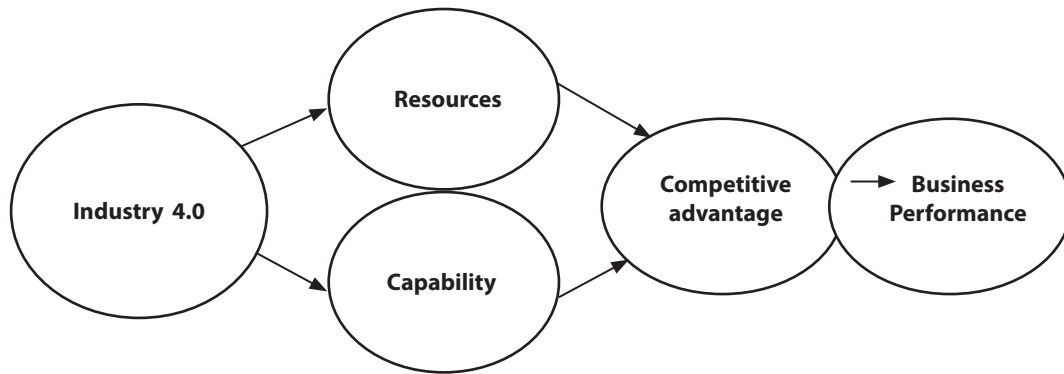
Source: (Barney, 1991)

Figure 2. Resource Based View Theory Integrates into Industry 4.0.
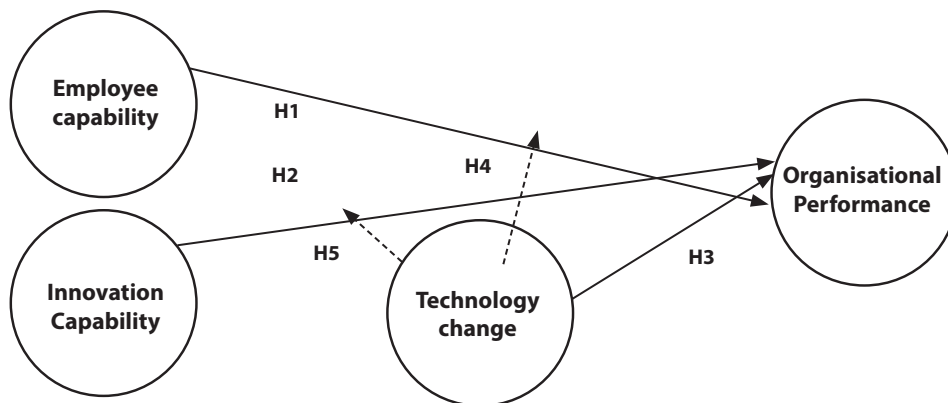
Most of the measurements that have been utilized in this current study were adapted from past-established instruments (see Table 1). The questionnaire is divided into five sections: technology change /disruption (Ryan & Harrison, 2001, and dimensions from Kaufman (1974), innovation capacity (Tang, 1999; Poolton & Ismail, 2000; Walker et al., 1996; Bjurwill, 1993; Gobeli & Brown, 1994; Canfield & Miller, 1998; Moorman & Miner, 1998), employee capability (Hosseini & Kamal, 2012), and organizational performance (Brewer & Selden, 2000), and all were evaluated with a five-point Likert scale, where a higher score indicates stronger agreement than the lower score.

A sample was drawn from the SMEs directory available from SME Corporation Malaysia that consists of all SMEs in the Klang Valley region of Malaysia. Further,

SMEs belonging to the service sector were identified and isolated. Finally, SMEs for the wholesale and retail sector were drawn from Selangor, where 19.5% of the service sectors are located from this state. Sample size can be determined based on the method recommended by Krejcie & Morgan (1970). This condition is achieved based on Krejcie & Morgan's (1970) simplistic rule of thumb table for determining sample size from a given population. The study followed stratified random sampling because the sample industries belong to different strata of industrial segmentation (small & medium), followed by the purposive sampling technique.

Table 1. Measurements

No	Variables	No. of Items	Scale	Cronbach's Alpha	Author
1	Employee Knowledge competence (capability)	9	5 Point	0.79	Hosseini & Kamal (2012).
2	Innovation Capacity	23	7 Point	0.80	Tang (1999). Poolton & Ismail, 2000. Walker et al. (1996); Lester et al. (1998); Bjurwill (1993), Gobeli & Brown, (1994), Canfield & Miller (1998); Moorman & Miner (1998)
2	Technology disruption	14	7 Point	0.81	Ryan & Harrison (2001) (dimensions from Kaufman (1974)
4	Organisational performance	6	5 Point	0.80	Brewer & Selden (2000)

The purposive sampling has engaged due to the unavailability of the already existing list of SMEs. Also, there is a crossover of many firms based on the latest SME definitions of Malaysia. Those small-scale entrepreneurs with at least five years of experience running the organization were considered for the study. Such selection aims to ensure that the respondents can provide adequate information on the impact of technology change in the SMEs where they are working. The researcher collected 384 questionnaires back from 425 sets of questionnaires distributed.

Table 2. Summary of Cronbach's Alphas RHO_A, Composite Reliability, Average Variance Extracted (AVE)

Measurement Items	Item	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Employee Capability	14	0.812	0.910	0.920	0.799
Innovation Capability	23	0.801	0.905	0.911	0.812
Technology Change	9	0.792	0.921	0.934	0.790
Organisational Performance	6	0.803	0.909	0.923	0.691

The study followed validity analysis to measure the accuracy of the instruments. The content validity did through 10 experts who were elected. All the wordings inside the items are well appraised into their suitability for pilot testing to ensure the item's difficulties and ease. Hair et al. (2014) suggested using the Average Variance Extracted (AVE) as it has become a widespread method. The general rule would be that the AVE of each latent construct needs to be much greater than 0.50 for determining adequate convergent validity (Hair et al., 2014). The following table provides the details of validating the convergent validity on the construct level. Table 2 indicates that all the merits of AVE were in the acceptable range between 0.501 and 0.820, indicating an adequate convergent validity. Thus, the convergent validity was confirmed in the study.

Table 3. Discriminant Validity – Hetrotait Monotrait Ratio

	Technology Change	Innovation Capability	Employee Capability	Organisational Performance
Employee Capability				
Innovation Capability	0.798			
Technology Change	0.801	0.811		
Organisational Performance	0.799	0.780	0.756	

Based on the questionnaire adopted, table 3 shows that the Cronbach's Alpha for the technology disruption is 0.81, innovation capability is .80, employee capability is 0.79, and organizational performance is .80. Overall scores show that Cronbach's Alpha is exceeding 0.7 (Nunnaly, 1970). Hence, it can be assumed that internal consistency for this questionnaire is good.

Result and Discussion
Empirical Result

Table 4 indicates the results of the hypotheses testing using the SmartPLS path model analysis resulted in three important observations: firstly, employee capability has a positive and significant relationship with organizational performance (β = 0.456; t = 2.345); hence H1 is supported. Secondly, the innovation capability has a positive relationship to organisational performance (β = 0.421; t = 2.267). Hence H2 is supported. Besides that, technology change has a positive and significant relationship with organizational performance (β = 0.521; t = 2.891). Including employee capability, innovation capability, and technology change into the Smart PLS path model analysis contributes 63.7 percent of the change in the dependent variable. The structural framework from this study shows in Figure 3.

Figure 3. Structural framework
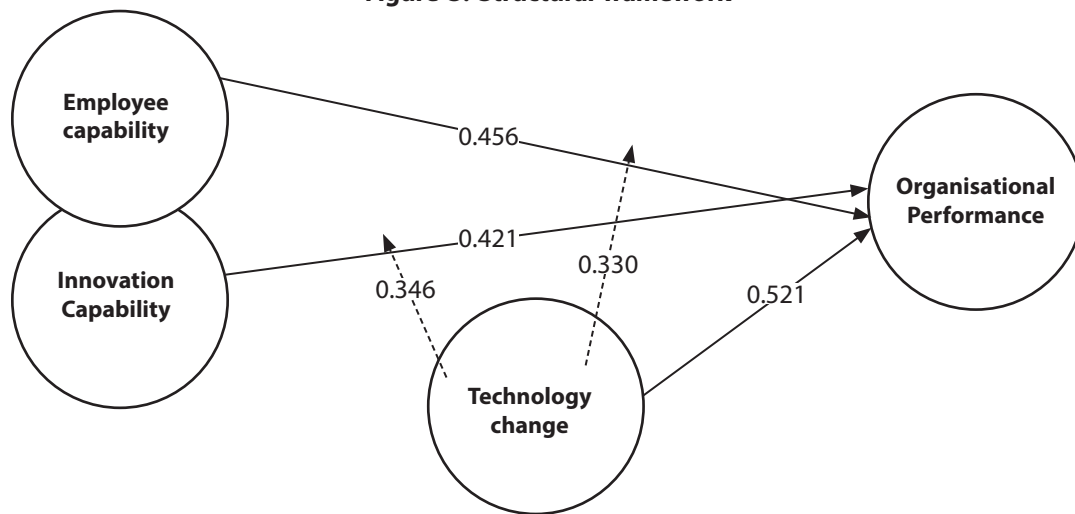
Table 4 Results of Direct Hypothesis

Relationship	Beta (β)	t-Value	p-Value	R² Value
Employee Capability ➝ Organizational Performance 0.456		2.345	0.040	
Innovation Capability ➝ Organizational Performance 0.421		2.267	0.032	0.637
Technology Change ➝ Organizational Performance 0.521		2.891	0.034	

Significant level= *$p<0.05$, $t>1.65$

Table 5 shows the test findings of hypotheses 5 and 6. The findings indicate that the indirect relationship between the independent variables (employee capability, innovation capability, and technology change) and the dependent variable (organizational performance) is partially significant. Chin (1998) suggests that the R-squared values of 0.67, 0.33, and 0.19 in PLS-SEM can consider as substantial, moderate, and weak, respectively. Interestingly, the relationship between employee capabilities, innovation capability, and technology change on business performance is reduced but remains significant as complimentary. Followed by the direct and indirect hypothesis testing, the study also applied Stone-Geisser's test to get the predictive relevance to confirm through Q square values, which is carried out as predetermined. The Q^2 is a criterion to measure how well a model predicts the data of omitted cases (Chin, 1998; Hair et al., 2014).

Table 5 Results of Indirect Hypothesis

Relationships	Direct Effect β	t-Value	Significant (p>0.05)	Indirect Effect β	t-Value	Significant (p>0.05)	Effect
EC ➝OP	0.456	2.345	Yes (*p* = 0.000)	0.346	1.928	Yes (*p* =0.000)	Partial Mediation (Complimentary)
IC ➝OP	0.421	2.267	Yes (*p* = 0.000)	0.330	1.791	Yes (*p* =0.000)	Partial Mediation (Complimentary)

A research model with Q2 statistic (s) greater than zero is considered to have predictive relevance. Furthermore, a research model with higher positive Q2 values suggests more predictive relevance. The test results show that Q square values are between 0.341 and 0.389 (Hair et al., 2017). The values are above the standard that is more significant than zero (Henseler et al., 2014). Therefore, the findings generally support the predictive relevance of the SmartPLS path model used in this study. Finally, the effect of square size of the relationship between the variables (employee capability, innovation capability, and technology change) ranges from 0.0356 to 0.437 (organizational performance). These values are categorized as small and medium-size effects, as stated by Hair et al. (2017). The value of f square = 0.02 is categorized as small, 0.15 as moderate, and 0.35 as large.

Discussion

The industrial revolution, which is closely knit with industry 4.0, has witnessed several technology changes at the organizational level. A new form of organizational understanding is related to implanting personal capabilities, structures, strategies, resources, and organizational processes. Nevertheless, such invasion of technology disruption, how far has paved better insight into resource management, people management, and business performance, is less researched. This study has investigated the influence of employee capability, innovation capability, and technology change on organizational performance of SMEs in the Malaysian service industry, mainly focused on the retail and wholesale firms and the moderating effect of technology change between employee capabilities, innovation capability on organizational performance. It is well established that there is a strong and positive relationship between employee capability, innovation capability, and technology change on organizational performance. The moderation effect further indicates the partial mediation effect of technology change in its relationship between employee capability, innovation capability, and technology change on organizational performance in SMEs.

Several organizations have started their technology adoption and working in a very competitive environment. The execution of new digital tools and technical know-how is affecting both employees working in businesses and companies. The challenge of the competence context involves a three-factor approach, including the level of the company management, the areas of the production methods, and the kinds of competencies (Erol et al., 2016). Industry 4.0 has thus given a redirection to all types of organizations where the companies must focus on new generation skills and competencies in tune with digitalization (Da Silva et al., 2019). Better integration of employee capabilities will pave better business performance opportunities and is a vital indicator of any organization's success or failure (Sanders et al., 2016).

Operationally rigorous firms have joined a fresh wave of automation and digitization. Such changes will have a significant effect on the skills they require to stay on competitive. There are several strategies before the SMEs to look at to reduce the skills gap and improve business performance. One option is upskilling and reskilling of the existing employees. They can develop skills inside the company by retraining their existing workforces to

make ready individuals for new positions and tasks. Alternatively, they can adopt a hybrid method by using skilled contract staff to deliver short-term demands while creating the required skills within the company.

The study finding indicated the relationship between employee capabilities and organizational performance. In line with such established relationships, the increased use of technology in day-to-day operations offers an uncomfortable situation of lacking appropriate skills to manage such technologies in SMEs. Progress in technology application has led to skill obsolescence. The degree to which specialists lack updated information or skills essential to sustain adequate performance in their existing or forthcoming work roles (Kaufman, 1974), or there is an inconsistency between an individual's job performance and the fundamental capability level (Mirabile, 1998; Chauhan & Chauhan 2009; Rita et al., 2012), because of an upgrade of required worker skill level and a shift in types of skills required. The SME sector currently needs a major revamp in the skill sets to cope with the procedural and production process changes.

The innovation capability identifies as the company's capability to produce new technologies, methods, and commodities (Gewe et al., 2016). It is recognized as the company's capacity to obtain, introduce, and develop a new understanding that tacitly permits the organization to accomplish the directed performance. Similarly stipulated to the company's ability to cultivate new goods, processes, competencies, and knowledge on the physical, organizational environment in a constructive manner and utilize it in model formation, permitting the organization to competently obtain targeted performance (Olusula, 2011; Salisu & Bakar, 2018).

The current research results indicated the relationship between innovation capabilities and organizational performance. Innovation capability directs firms to constantly develop innovations to react to the varying market situation (Slater et al., 2010). It is rooted in all the strategies, systems, and structures that upkeep a firm's innovation (Gloet & Samson, 2016). Beyond technical innovation, SMEs should increasingly develop their innovation capabilities to lead the organizational performance by providing customer attention and market requirements. Innovation has confirmed a robust and significant relationship with performance. The innovation capacity extends an organization's comprehensive set of capabilities that facilitate and support aligning organizational strategies for better organizational performance.

In general, many SMEs associate digitization with words such as Digital Marketplaces, Platforms, Big Data, Industry 4.0, Digital Manufacturing, Online Marketing, Internet of Things (IoT), websites, and much more. Such changes at the technology level have been highly influencing the day-to-day business processes, and its intern is highly affected by the methodical use of physical forces through various forms of technology. The availability of fine-tuned technology determines the quality and quantity of commodities and services delivered.

Industry 4.0 changes the structure, method, or experience from on-going as predictable or as expected. Modern companies must realign their value chain following

the technological change for performance. Firms will have to rethink the way they do business. Companies will have to drive the digital transformation of their business to succeed in the new environment. SMEs, however, massive projects generally invite uncontrollable risks. Consequently, several actions and projects require vast supplies of capital, know-how, and time to execute them. Hence, it assumes that projects cannot be carried out purely due to a dearth of resources and capabilities.

The research finding shows a direct relationship between technological change and organizational performance. When a new technology abruptly supersedes the old, disruption occurs, and the entire ecosystem needs to readjust the environmental interaction conditions to suit the new technology. Technology change or disruption has necessitated organizations. The change can destroy the current competence or enhance the capabilities existing in the industry for competitive advantage (Hill & Rothaermel, 2003). To cope with the dynamics of change, small and medium enterprises should focus their attention on improving their obsolete machinery and other equipment since it is necessary to follow the latest standardized procedures and market expectations.

The research also shows a partial moderating effect between innovation capability and business performance. This result indicates that innovation capability is a more substantial variable with its direct effect on business performance than technology change. SMEs need to investigate current innovation capabilities and fine-tune their organizational culture according to the expected technological change. Innovation capability is of utmost vital constituents for evolving good innovation results within the firm to permit the application of resources and continuous transformation of knowledge and skills into product, process, and system for the benefit of firms and stakeholders. During changes, the firms that facilitate such innovative culture remain ahead of their contestants because such innovation capabilities eventually contribute to organizational performance, marketing performance, and overall financial performance.

The study results will support practitioners and top-level managers to comprehend the concept and role of employee capability and innovation capability during technology changes in SMEs and its effect on organizational performance. It is promising that firms leverage technology, innovation, and employee capabilities to deliver better innovation outcomes and organizational performance. When technology change is widely adopted in SMEs, the company management must look into the employee capabilities in tune with the changes initiated. Any failure to restate the required human capabilities will result in companies turning into remnants of the century, and a vast volume of employees turn outdate due to the lack of skills to compete in the changed business scenario.

Competence depletion is a severe concern for SMEs as they grapple with the ever-changing competence requirements to keep up with the technology demands. Innovation is the prerequisite to manage such technological changes. Innovation capabilities in product, process, design, machinery, operations are highly significant in coping with technological changes. The change initiatives at the competence level can bring better business scenarios

to SMEs. Technology disruption depletes accumulated competence required for the current line and offers competitive opportunities to appropriate competence.

There are some practical decisions for improving the innovation capability ecosystem for SMEs, such as: (1) Integrate innovation into new operating models. (2) Induce big data and artificial intelligence skills. (3) Knowledge of digital marketing and data analytics. (4) Assimilate data analytics into process and product innovation decision-making. (5) Support SMEs in adopting ICT and adapt to the digital uprising. (6) Investment increases in idea generation. (7) Follow changing customer needs for better insights. (8) Promote innovative marketing tools or more general innovation marketing. (9) Creating, enabling, and catalyzing business links. (10) Collaborate with suppliers and allied stakeholders for new ideas. (11) Espousal of a customer-focused firm alignment. (12) Commit supplementary resources for innovation. (13) Support the attainment of explicit technological capabilities. (14) Internationalization support to access external markets for their innovative products, processes, or services. (15) Facilitate technology transfer from public research labs and institutions. (16) Captivation of new knowledge traced through external partners. (17) Implement flexible innovation cash schemes. (18) Operational change from simple to more progressive technologies. (19) Facilitate continuous improvements in product quality.

Besides that, the government should take some action to improve the innovation capability for SMEs, such as. (1) Facilitate the ability to innovate. (2) Ensure broad absorptive capacity that integrates external knowledge and adaptive capability. (3) Embrace different management capabilities that spread across all functions. (4) Facilitate service innovation. (5) Locate, engage, and reconfigure external partners. (6) Develop a well-defined set of abilities focused on firms' ecosystems for service innovation. (7) Continuous scanning, filtering, and exploring technologies and s to be analyzed by the focal firm. (8) Immersive and collaborative working skills inducement. (9) Adaptability in the development of new skills and capabilities. (10) Organize co-created workshops between the innovation group and the facilitation team. (11) Flexible, intelligent, and innovative human resources. (12) Support activities address creativity thinking and product conception. (13) Induce the research capabilities. (14) Develop inter-personnel attitudes and communications for the exchange of ideas in groups. (15) Induce leadership skills for exploration, ideation, adaption, and transfer. (16) Encourage awareness of the significance of innovation-based supervision skills. (17) Problem-solving competencies that enable productivity improvements. (18) Increasing Intellectual Property Rights related skills in SMEs through education and training and making.

Resources are in the form of knowledge, infrastructural assets, digital technologies, human capital, and other tangible and intangible factors owned or controlled by the firms. From this theoretical framework, SME firms comprise a variety of assets and individuals that retain competencies. The harmonious influences created by their permutations lead to most in the means of creating competitive advantage. Essential resources positively affect various performance features for consistently functioning SME activities.

This study follows the resource-based view (RBV) to develop the research frame, to align the observations with SMEs' competitive advantage and organizational performance. SMEs should pool the resources in the form of tangible and intangible assets. SMEs should take initiatives in bringing tangible resources. In the form of the latest technology, technical know-how, and algorithms from outside in the wake of technology disruption and that should be aligned with the intangible assets which include the resources as capabilities viz., intangible bundles of abilities and skills of a business, that are distinct from assets (Ethiraj et al., 2005), developed inside the business over time, fine-tuned with the latest technological disruption.

The current research thus once again proves the application of resource-based view (RBV) theory to inform the practitioners and scholars to investigate the tangible and intangible resources that can lead to better organizational and market performances. The performance of SMEs is crucial for their development and existence within an industry. This performance is receiving more attention in the current global market environment than ever before (Jämsä et al., 2011). The research throws a better understanding of the thoughtful situation of technology disruption and the resultant business performance problems the SMEs face during industry 4.0, and it supports better competency preparedness among SMEs in Malaysia for technology changes.

Conclusion

Industry 4.0 has paved several trends of automation, data exchange in service and production technologies. SMEs are in a perplexing mode to look at technological change with all available resources and capabilities. The study findings establish the strong relationship between the independent variables (employee capability, innovation capability, and technology change) and dependent variables (organizational performance), explaining the impact of technology disruption on the organizational performance of SMEs in Malaysia. The study findings pave better practical briefings to the line managers and HR managers of SMEs in their prominent role in workforce competence building and developing innovation capabilities by ensuring innovative and proactive strategic decisions. During the technology disruption of industry 4.0, it is expected that the SME entrepreneurs should take initiatives to ensure a work culture that uses innovation capabilities of the people and organization for better product and process performance, which will lead to better market performance. The study leaves strategic obligations to the policymakers in drafting sound industrial 4.0 policies for better business performance.

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The Impact of Special Economic Zones (SEZs) on Economic Growth: Where the Absorption Capacity of Domestic Labor Stands?

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Abstract

This study designs to assess and infer the effect of Special Economic Zones under China-Pakistan Economic Corridor on the economic growth of Pakistan through technological spillovers and the absorption capacity of domestic laborers. The present study develops a theoretical model and an empirical panel model to test whether the intervention of Special Economic Zones in the Asian developing countries has affected their economic growth through domestic Human Capital. For relevant results, we have employed the GMM model for the panel data set. The results indicate that the technological enhancement accumulates the economy through various other selected indicators rather than domestic labor productivity. The human capital remains inconsequent in this nexus. This condition gives us guidelines to follow pro-human capital policies to accumulate domestic human capital before the intervention from the foreign firms on our soil. Subsequently, much waited for dynamic or long-run benefits in terms of human capital can be attained rather than static effects.

Keywords:
total factor productivity, human capital, technological transfer, CPEC, special economic zones

Introduction

A generally acceptable instrument among the researchers to upsurge and boost the growth of an economy to successfully attain the status of a "developed country" is to provoke the nation to transform into an export-oriented economy. This condition becomes possible only after taking critical initiatives regarding uplift in the overall sectors of the economy. One suggestive approach is to encourage the development of infrastructure and related projects. Along with a secure and stable business environment to gain the interest and confidence of especially those foreign business communities who may possess exceptional business ideas and prodigious investment and are actively engaged in discovering the nations crammed with utmost human capital, effortlessly accessible at economical rates.

This ideology attracts foreign investment after focusing intensively on the establishment of technology-based industries, necessary to produce products adequate to meet the international standards and, hence, improve the nation's exports. It is considered a significant device to gain a satisfactory degree of physical and capital productivity. For this purpose, the provided literature documents that the nations in the 21st century have adopted specific policies to expand their exports. Among these strategies, a considerable policy has been developing "industrial clusters" through structural changes after keeping appropriate locations into account. This concept was first established in Southeast Asia in 1704; however, the first globally acknowledged industrial zone was constructed in Ireland in 1959. Since then, various economic zone setups holding different policies have evolved that are subsumed under Special Economic Zones (SEZs). These include Free Trade Zones, Export Processing Zones (EPZs), Enterprise Zones (EZs), Free Ports (FPs), single factory EPZ, and specialized zones.

The phenomenon of SEZ has not been cryptic for Pakistan as the manufacturing sector that was considered a non-functional sector stimulated in the 1970s after establishing various industrial zones throughout the nation. The majority of the industrial zones collapsed because of political instability, weak governance framework, rent-seeking behavior. This condition deteriorated the share of the manufacturing sector at an aggregate (Zia et al., 2018).

Once well known for its unparalleled potentials, a country is considered unfeasible as far as the business environment is concerned. In such situations, China believes Pakistan to play a viable role in a megaproject "Belt and Road Initiative (BRI)" through the "China-Pakistan Economic Corridor" (CPEC). CPEC is based on a 1+4 portfolio that comprises the construction of Gwadar port, up-gradation of the energy sector, and significant improvements in Pakistan's infrastructure. Instead of making all this functional, the development of SEZs has been the sole constituent in CPEC projects. Therefore, in a modified context, developments of EPZs/SEZs have been the point of interest. In this manner, CPEC SEZs are focused on the uplift of Pakistan through sustainable economic growth, keeping intact essential indicators. All of this is to facilitate foreign firms to operate in Pakistan. In this regard, Pakistan has already signed MoUs with the Chinese government to establish nine SEZs under CPEC.

As discussed earlier, SEZs are introduced in an economy to upsurge the FDI, exports, and employment rate of the domestic workforce. However, the received literature opposes the expected outcomes mainly in the ASEAN countries, where SEZs were meant to prosper economies through static and dynamic outcomes (Zia et al., 2018). We have observed static outcomes in most countries, but the presence of dynamic effects was a question mark. The factors responsible for the prevailing situation included poor location choice, lack of infrastructure, administrative procedure, and lower labor productivity (Amirahmadi & Wu, 1995).

In Pakistan, the intervention of Chinese enterprises is anticipated to provide countless opportunities to the economy. In this association, we are focused on empirically assessing how the economy of Pakistan can benefit from Chinese intervention in the light of its intervention in the Asian developing countries. Therefore, in particular, this study aims to empirically assess the static and dynamic effects of SEZs in the economic growth process. Keeping in view the existing dilemma in most Asian countries, we shall analyze a crucial component of the long-term dynamic outcome of the technological-based projects, such as the effect of technological shift through SEZs on the up-gradation of the human capital of domestic laborers after analyzing its effect on the economic growth.

International trade plays a significant role in unfolding technology across the world. The developing countries heavily rely on import liberalization, demanded by the domestic firms to increase productivity through foreign innovated technology. Adopting imported technology has a positive and robust impact on domestic production. In consequence, economic growth is furtherly skewed within the host country. Likewise, Coe & Helpman (1995) indicate that international trade is a significant factor in international knowledge spillover to developed and developing countries (Coe et al., 1997). Zeren & Ari (2013) do research a bi-directional causal relationship between trade liberalization and economic growth in G7 countries. Mercan et al. (2013) also study a relationship between trade openness and economic growth in a panel of BRICS countries. Dritsakis & Stamatiou (2016) examined a uni-directional causal relationship in a panel of the European Union.

The study's objective is to analyze the impact of technological spillover on manufacturing sector productivity, namely TFP. Along with our variable of interest (technological spillover), we have several control variables common to each regression.

Methods

An empirical model is formulated to identify the effect of SEZs on the economy through the channel of the human capital of domestic labor. Coe & Helpman (1995) and Coe et al. (2008) suggested that the new growth theories have been under consideration to build the model. They are beginning from the endogenous growth framework on technological spill over through trade. The studies above have analyzed the effect of trade liberalization on the domestic technological stock. The Total Factor Productivity has identified the change in the technological stock. Assuming the Hicks-neutral production function:

$$Y_t = A_t K_t^a L_t^{(1-a)} \tag{1}$$

Where, Y_t is the total output, K_t represents the capital stock and the L_t represents labor. However, the total factor productivity "A_t" captures the effectiveness of capital and labor or any other input that does not categorize under the typical boundaries of capital and labor. After taking logs on both sides, the model will take the following shape

$$lnY_t = lnA_t + alnK_t + (1-a)lnL_t \tag{2}$$

In this model, the Total Factor Productivity (TFP) will capture the effect of technological spillover. After incorporating the Schumpeterian growth framework, the model shall take the form in which the contribution of conventional factors, capital, and labor will be subtracted from the total output to measure the TFP. Moreover, the domestic and foreign R&D investment will be added to the model to capture the technological improvements. In the following, we shall illustrate the proposed model.

$$lnA_{it} = lnY_{it} - alnK_{it} - (1-a)lnL_{it} + lnRD_{it}^d + lnRD_{it}^f + lnX_{it} \tag{3}$$

Where: A represents TFP, Y represents the total output, K represents the capital employed in the production process, and RD is the expenditure executed for domestic and foreign Research and Development in a given economy.

Dependent Variable

Total Factor Productivity explains the share of output that is not explained under the traditionally measured inputs of labor and capital utilized in the production process. For instance, the level of efficiency and intensity of the inputs involved in the production process. TFP is highly correlated with the output. Therefore, to capture the implicit mechanism in the output, it provides valuable insights. The process of measuring TFP has been discussed earlier under eq. 2, after keeping A_t, i.e., TFP on the left-hand side of the equation. The data set for TFP is collected from the Penn World Table 9.0 data set.

Independent Variable

Certain variables are used as proxies to transform a theoretical model into an empirical model and estimate the desired hypothesis. Acknowledging this fact, we shall use the proxies of all the available data to capture the picture of the analysis. For instance, to capture technological spillover, we have identified three variables, Foreign Direct Investment, Trade Openness, and Imported Technology.

Foreign Direct Investment is an indicator to depict a firm's investment or individual to gain business interest in another country. Generally, this type of investment is made in a relatively deprived country to concentrate on value addition through sophisticated technologies. Therefore, it is considered as a gateway towards introducing new technologies. The data of FDI utilized in this paper has been collected from World Development Indicator (WDI).

Trade Openness is the ratio of trade volume to real GDP, which illustrates trade liberalization. Trade liberalization indicates the volume of tradable commodities transferred between countries. This phenomenon does not only have inherent benefits in terms of trade and integration. Rather other benefits such as knowledge transfer are also considered as a significant element. For instance, a commodity transferred through trade conveys the knowledge of packing similar kinds of commodities in the importing countries. However, if sophisticated technologies transfer, the existing obsolete knowledge drastically accumulates in the importing country. Therefore, the variable Trade Openness has been utilized as a proxy of the technological spillover. It will be interesting to see its impact on the prevailing human resources. The data has been collected from WDI.

Technological Transfer is another indicator to capture the technological spillover. It is calculated by the imports of machinery and transport equipment as a percentage of total imports. This variable indicates the intensity of technology transfer in the economy. Studies suggest that high technological Transfer is explored, particularly in those economies where such firms are operating which tend to produce products on international standards. In effect, sophisticated technologies are used, which is possible only after the intervention of foreign firms in the case of developing countries, especially in the SEZs of developing countries. In this regard, SEZs are captured by the mentioned variables like Foreign Direct Investment, Trade Openness, and Technological Transfer. The data has been collected from UN Comrade Statistics.

Human Capital has been utilized to capture the impact of absorption capacity of domestic workers in accumulating the economy through technology. It is an index of human capital per person, constructed by the average years of schooling and the return to education. This indicator portrays the level of knowledge available in an economy. There is a threshold exceeding from which the individuals can absorb the foreign technologies and operate accordingly.

Table 1 *Correlation* matrix of the selected variables

	TFP	TO	FDI	TECH	GSIZE	RDEV	INDUST	FD	HC	INSQUA
TFP	1.00									
TO	0.1368	1.00								
FDI	0.1968	**0.8551**	1.00							
TECH	0.1346	**0.6928**	**0.6546**	1.00						
GSIZE	-0.0517	0.1776	0.1026	0.3153	1.00					
RDEV	-0.0630	0.5133	0.4636	**0.7822**	0.2822	1.00				
INDUST	0.1287	-0.6410	-0.4747	-0.5722	-0.3174	-0.4586	1.00			
FD	0.1386	0.1658	0.1764	0.3039	0.1385	0.1986	-0.2953	1.00		
HC	-0.0847	0.4990	0.4036	**0.6152**	0.3161	0.5466	**-0.8393**	0.2976	1.00	
INSQUA	-0.0976	**0.7923**	0.6267	0.7371	0.4601	**0.7029**	**-0.7098**	0.1660	0.6664	1.00

As we can see from Table 1 that some of the variables are correlated. Trade Openness and FDI are positively correlated. We can also analyze the same for Trade Openness, technology, and institution quality. Table 1 shows the correlation between these variables to see whether the data is reliable to regress. Technology, on the other hand, is positively correlated with Research and Development and Institution Quality. However, in all of the above cases, we can conclude that none of the variables are highly correlated, and therefore, multicollinearity also does not exist. Secondly, we have estimated the results using STATA. This software tends to omit the regressors due to which multicollinearity exists.

Three proxies, such as Foreign Direct Investment, Trade Openness, and Technological Transfer, will be utilized for SEZs or technological spillover, while Human Capital will be used for the absorption capacity of domestic labor along with other five indicators. First, Financial Sector Development such as the Composite index of Money supply (M3), Bank credit to the private sector, and Stock market capitalization. Second, Research and Development Expenditure, i.e., R&D investment as a percent of GDP. Third, Government Expenditure, i.e., General government final consumption expenditure (% of GDP). Fourth, Industrial Structure such as the Share of the Industrial Sector to GDP and finally Institutional Quality, i.e., Composite index of control of corruption, political stability and absence of violence/Terrorism, Regulatory Quality, the rule of law, Voice and accountability.

To transform the Cobb Douglas model into an empirical model and utilize the data above to extract the hypothesis. The following empirical models are regressed. All of which will include in every model and other interaction terms like Trade Openness with Human Capital, FDI with Human Capital, and Technological Transfer with Human Capital.

Model 1

In the first model we shall analyze the effect of Human Capital with the Foreign Direct Investment. In effect, the model will take the following form:

$$TFP_{it} = a + B_1 FD_{it} + B_2 RD_{it} + B_3 GSIZE_{it} + B_4 IQ_{it} + B_5 INDUST_{it} + B_6 HC_{it} + B_7 FDI_{it} + u_{it} \qquad (4)$$

Where, the *FD* (Financial Development), *RD* (Research & Development), *GSIZE* (Government Expenditure), *IQ* (Industrial Quality) and *INDUST* (Industrial Development) are the controlled variables while *HC* (Human Capital) will be analyzed with the FDI. Likewise, 3 models are regressed for every proxy of technological spill over separately with the Human Capital.

Model 2

$$TFP_{it} = a + B_1 FD_{it} + B_2 RD_{it} + B_3 GSIZE_{it} + B_4 IQ_{it} + B_5 INDUST_{it} + B_6 HC_{it} + B_7 TO_{it} + u_{it} \qquad (5)$$

Where, TO_{it} is the Trade Openness for selected Asian countries.

Model 3

$$TFP_{it} = a + B_1FD_{it} + B_2RD_{it} + B_3GSIZE_{it} + B_4IQ_{it} + B_5INDUST_{it} + B_6HC_{it} +$$
$$B_7TECH_{it} + u_{it} \qquad (6)$$

Where, $TECH_{it}$, is the technological transfer.

Model 4

In this model the interaction term is included with other control variables. The model takes the following form:

$$TFP_{it} = a + B_1FD_{it} + B_2RD_{it} + B_3GSIZE_{it} + B_4IQ_{it} + B_5INDUST_{it} + B_6FDI_{it} *$$
$$HC_{it} + u_{it} \qquad (7)$$

Here in this model, $FDI_{it} * HC_{it}$ has been included which shows the indirect relation of technology with the economic growth. Interaction terms with other proxies have been regressed in separate models. Therefore, two more models are regressed by constructing the interaction term of HC with TO (Trade Openness) and TECH (Technological Transfer).

Model 5

$$TFP_{it} = a + B_1FD_{it} + B_2RD_{it} + B_3GSIZE_{it} + B_4IQ_{it} + B_5INDUST_{it} + B_6TO_{it} *$$
$$HC_{it} + u_{it} \qquad (8)$$

Model 6

$$TFP_{it} = a + B_1FD_{it} + B_2RD_{it} + B_3GSIZE_{it} + B_4IQ_{it} + B_5INDUST_{it} +$$
$$B_6TECH_{it} * HC_{it} + u_{it} \qquad (9)$$

The data employed in this paper is panel and secondary in nature, as the effect of technological improvements shall be analyzed in the Asian countries where the Special Economic Zones are already operational. Therefore, the relevant data for the selected Asian countries where we found interventions of foreign firms in Special Economic Zones such as Bangladesh, Bhutan, India, Indonesia, Nepal, Malaysia, Maldives, Singapore, Sri Lanka, Philippines, Thailand and Pakistan were under consideration. The data for the Total Factor Productivity and Human Capital has been utilized from Penn World Table 9.0 after incorporating own calculations, while the data of Industrial Structure, Government Expenditure, Institutional Quality and Trade Openness has been collected from the World Bank. Whereas, the data for Technological Transfer has been collected from UN COMTRADE Statistics, and finally, the principal component index constructed the data of Financial Sector Development.

Result and Discussion

As our data set comprises both selected South and East Asian countries, our empirical model is estimated with pooled OLS as the results of pooled OLS are considered inefficient in panel data. We have moved on to apply the Breusch-Pagan test to examine that either intercept values remain the same for all cross-sections or not. This test

provides direction to either run the analysis keeping Fixed Effects or Random Effects, which directed us to go for the Random Effects. The result of the Breusch-Pagan test shows in Table 2.

Table 2. Bruesch-Pagan Test Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Chai²	24.35	20.50	14.30	22.95	20.48	24.73
Probability	0.000	0.000	0.0000	0.0000	0.0000	0.0000

Then, we applied the Hausman test to justify whether the fixed effect results are more consistent than the random effect. For all specifications, the null hypothesis of the Hausman test has not been accepted, indicating a fixed effect. The result of the Hausman test shows in Table 3.

Table 3. Hausman Test Results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Chai² Values	256.98	449.92	345.56	453.89	356.98	478.98
P-Values	0.008	0.000	0.000	0.001	0.000	0.000

Next, we applied the Redundant Fixed Effects test to choose between cross-sections, time effects, and cross-sections and time effects as the null hypothesis was rejected for all specifications that clearly show the existence of fixed effects. Table 4 shows the result of the redundant fixed effect test.

Table 4. Redundant Cross-Sectional Fixed Effects Test

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
F-Values	48.4574	36.062	48.354	47.785	47.456	35.254
P-Values	0.000	0.000	0.000	0.000	0.000	0.000

After the results, we have applied the LM test to examine the existence of serial correlation. The null hypothesis of "no serial correlation" was accepted in all specifications. Table 5 shows the result of the LM test. On these bases, we used GMM by Arellano and Bond (1991) to estimate the dynamic panel data model.

Table 5. Serial Correlation (LM) Test

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
F	47.282	63.527	98.524	46.036	64.154	103.837
P-values	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000

Table 6 presents the estimated results of the Total Factor Productivity (TFP) model. In model 1, we acquired the technological spillover through trade openness $(TO)it$ and its impact on manufacturing sector productivity, however, the role of absorptive capacity is captured through interaction term of trade openness, and human capital $(TO * HC)_{it}$, which shows that $(TO)_{it}$ has a positive impact on TFP_{it} in selected countries. The coefficient of $(TO)_{it}$ is positive, which is statistically significant This result signifies that trade liberalization of the host country improving total factor productivity through spillover channels in the sample countries. The results are in line with the empirical findings of (Coe & Helpman 1995; Coe et al., 2008) or instance, the results supported by Coe & Helpman (1995) argued that "trade liberalization in intermediate goods is an important channel of international knowledge spillovers."

Table 6. Dependent Variable is TFP Growth

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
FD_{it}	-.04809*** (0.000)	-.05254*** (0.000)	-.02907*** (0.001)	-.03722*** (0.000)	-.0224*** (0.002)	-.01734** (0.013)
$GSIZE_{it}$	-.00098 (0.486)	-.00114** (0.043)	-.00106** (0.039)	-.00019 (0.878)	.0003 (0.790)	-.00026 (0.836)
$RDEV_{it}$	.0252* (0.080)	.00812 (0.572)	.00043 (0.972)	.01433 (0.320)	.0048** (0.043)	.00232 (0.998)
IQ_{it}	.01341 (0.146)	.01275 (0.168)	.01261 (0.160)	.01858** (0.030)	.0180** (0.038)	.02112** (0.027)
$INDUST_{it}$	.00058 (0.338)	.00082 (0.185)	.00024 (0.660)	.00132** (0.012)	.00108** (0.033)	-.00186 (0.234)
HC_{it}	.0588*** (0.004)	.0556** (0.010)	.0352** (0.035)	---------	---------	---------
TO_{it}	.0064*** (0.000)	---------	---------	---------	---------	---------
FDI_{it}	---------	.097** (0.022)	---------	---------	---------	---------
$TECH_{it}$	---------	---------	.0038** (0.040)	---------	---------	---------
$TO*HC_{it}$	---------	---------	---------	-.0012** (0.034)	---------	---------
$FDI*HC_{it}$	---------	---------	---------	---------	-.0047 *** (0.002)	---------
$TECH*HC_{it}$	---------	---------	---------	---------	---------	-.00155** (0.026)
Lag Dep	.5367*** (0.007)	.4525*** (0.001)	.7255*** (0.000)	.79880*** (0.000)	.2134*** (0.004)	.7689*** (0.009)
No of Obs	394	394	380	379	394	384
Number of Instruments	152	149	151	148	167	139
Serial Correlation	0.88	0.5594	0.3465	0.8627	0.5593	0.8979
Sargan Test	195.736	195.6324	184.1094	194.209	195.694	198.3461
P-Value	0.1871	0.2016	0.1730	0.2221	0.2007	0.1658

Note: ***, **, * shows significance level respectively at 1%, 5% 10%. Values in parenthesis are t-statistics. The dependent variable is total factor productivity growth.

The coefficient of the interactive term $(TO * HC)_{it}$ is statistically significant and negative, indicating that manufacturing sector productivity rises, as with an increase in technological spillover through trade openness with less absorptive capacity in sample countries. Similarly, the coefficient of human capital carries a significant and positive coefficient, which signifies the impact of human capital on total factor productivity in selected countries. This result is consistent with the findings of (Kuo & Yang, 2008; Coe et al. 2008), who argued that investment in human capital raises the output level through the channel of improving labor efficiency, increasing output productivity. In a similar line, several studies postulate that imported technology from developed to developing countries cannot be fixed or reinstate by firms' workers (firms employ foreign workers to install and replace imported technology). This condition will lead to enhance absorptive capacity to learn advanced technology and knowledge spillover. The interactive term significantly enters the model, and with a negative sign, technological spillover has been negatively related to absorption capacity in sample countries.

In model 2, technological spillover is captured through $(FDI)_{it}$ inflow, and absorption capacity is acquired with $(FDI * HC)_{it}$. The coefficient of $(FDI)_{it}$ inflow is positive and statistically significant, indicating that FDI inflow exerts a significantly positive impact on TFP growth in sample countries. In a similar line, Coe and Helpman (1995) argued that capital inflow is an energetic force for TFP growth. In addition, the net inflows of FDI play a crucial role in transferring knowledge spillover to the host country due to the imports of intermediate goods and capital goods, which will lead to the productivity of the manufacturing sector.

Similarly, model 3 captured the technological spillover effect through imported technology $(TECH)_{it}$, and absorptive ability is acquired through the interactive term of $(TECH * HC)_{it}$. The imported technology is a prominent channel of technological spillover. Its coefficient value is positive, revealing that imported technology positively contributes to TFP growth in selected countries. Our fitted values are in line with the findings of Kuo & Yang (2008). While, the interactive term $(TECH * HC)_{it}$ is captured absorptive capacity in the selected countries. The coefficient is negative and statistically significant, which indicates that technological spillover through the channel of technological imports cannot efficiently adopt by host country workers.

The coefficients of $(FD)_{it}$ and $(GSIZE)_{it}$ are negative which indicates significant impact on economic growth in selected countries. While, the empirical estimate of $(INDUST)_{it}$ and $(IQ)_{it}$ indicates that both the output growth of the manufacturing sector and the institution's role positively impact economic growth in selected countries. Similarly, $(RDEV)_{it}$ holds a positive sign that is statistically significant, indicating that research and development expenditure has a positive and significant impact on TFP growth in sample countries.

To analyze the effect of SEZs on economic growth, we have focused on those indicators that can describe SEZs. SEZs, as discussed, are a specified boundary that is intended to provide facilities to attract foreign investors. Pakistan has introduced nine special economic zones that are focused on uplifting the economy. This condition will help the investors to either relocate their firms or start a new firm in these zones. The

economy can benefit from such kinds of investments in the short-run (static effect) and the long-run (dynamic effect). As SEZs are introduced, this ensures cash inflow or FDI to rise, more technological Transfer, and more trade openness. In this study, we have examined how these indicators affect the Asian economies where China has intervened through FDI, Trade Openness, and Technological Transfer. The results indicate that an increase in the indicators above positively affects the economy but not through the channel of Human Capital or by increasing the absorption capacity of the domestic labor. This result indicates that in these economies, the benefits experienced by the selected countries are static and not dynamic. To identify this, we have included human capital that has been inconsequential in this nexus.

Trade liberalization is an effective way to diffuse technology from developed to developing countries (Kousar et al., 2018). This condition increases the domestic firm's efficiency and enables it to compete in the international market. The Transfer of foreign technology through FDI and imports provides more significant opportunities to stimulate Domestic firms' productivity in developing countries (Keller, 2004). Chuang & Hsu (2004) argued that China is integrated with advanced countries to gain foreign information and technology to improve efficiency and economic output. The host countries acquire modern technology and skills due to foreign investment (Blomstrom & Kokko, 1998). Liu (2008) conducted a study about the Chinese manufacturing firms and concluded that FDI generates externalities in the form of technology transfer, i.e., FDI inflow increases human capital as the domestic firm establish a business relation with foreign-invested operations or move from foreign to domestic firms. In this connection, Walz (1997) argued that investment in the manufacturing sector due to FDI enhances the knowledge spillover in the Research and Development (R & R&D) sector and leads to a positive contribution to the recipient country's economic growth. Borensztein et al. (1998) found that FDI flows enhanced economic growth in developing countries. In a similar line, Wang & Wong (2009) argued that FDI affects economic growth through the channel of capital accumulation and total factor productivity (TFP). In addition, FDI is a more significant spillover than trade openness.

Similarly, the impact of knowledge spillover through FDI is smaller than trade openness (Tang & Koveos, 2008). Furthermore, the production technology of domestic firms is obsolete, and workers are low-skilled unable to learn from multinationals (Gorg & Greenway, 2004). Furthermore, Keller (2004) examined that technological diffusion is one primary source of productivity growth.

Numerous theoretical and empirical work indicates that the origin of knowledge in one country positively contributes to the technological advancement and productivity growth in neighboring countries. In this perspective, the existing literature (Grossman & Helpman, 1991; Coe & Helpman, 1995; Meyer & Sinani, 2009) concluded that trade openness and FDI are the main contributing components of technological spillover. At the same time, Miller & Upadhyay (2000) illustrated the positive effect of openness on total factor productivity in the cross-section of both developed and developing countries. Moreover, human capital and Total Factor Productivity (TFP) move positively in developing countries, whereas this relationship is damaging in advanced countries.

The innovative technology is primarily beneficial for the developing countries as from the developed ones. When developing countries import intermediate goods from the developed countries through import liberalization, these intermediate goods enhance the domestic firm's productivity. However, Edwards (1993) argued that open economies most effectively utilize innovative technology and where economic growth is faster than the closed economies. Chuang & Hsu (2004) emphasized that China's trade with advanced countries helps gain new technology, leading to improved domestic firms' productivity in China. Salinas & Aksoy (2006) argued that export-oriented strategy enhances the domestic firm's output that may positively contribute to economic growth. Therefore, it is beneficial for domestic industrialists to increase their productivity via the expansion of trade volume. This condition will raise the knowledge spillovers because of the links with foreign firms and the access to international markets. As Bresnahan et al. (2016) concluded, the manufacturing sector's growth is critical for sustainable economic growth in African countries.

Considering an instance of a developing country whose economy is liberalized with developed ones, are likely to gain more from technological externalities along with increase the stock of R&D. In the early 1990s, the new growth theory argued that technological advancement tends towards innovation, which leads to enhance the pace of economic growth. Substantial empirical work has been carried out to measure and explore the extent to which investment in R&D positively contributes to a sustainable country's production capabilities. The empirical findings concluded that investment in new technologies is beneficial not only for domestic countries but also for their counterparts. The increase in the foreign stock of R&D drives up TFP of developing countries due to imports of capital equipment and machinery (Seck, 2012).

The view of endogenous growth theory is different from the neoclassical due to the explicit introduction of R&D that affected long-run economic growth. The formation of human capital and R&D activities are the subject matter to increasing returns and lower diminishing returns to capital. Its views can be broadly classified into two groups in the sense of "engines of growth." First, several renowned studies (Lucas Jr, 1998; and Barro, 1990) emphasized that growth is generated through the positive externalities associated with the accumulation of either physical or human capital. In the 1990s, R&D spillovers across the countries have significantly boosted due to developing new growth models (Romer, 1990; Grossman & Helpman, 1991; and Aghion &Howitt, 1992). These models are known as investment-based growth models. The second group, referred to as growth, is created through technological progress. These models (Romer, 1990; Grossman & Helpman, 1991; Aghion & Howitt, 1992) are typically considered as R&D-based growth models.

Some of the existing studies measured host country absorptive capability through human capital accumulation. As LDC's importing an intermediate goods to follow technological imitation of developed countries. Borensztein et al. (1998) took data of 69 developing countries, spanning from 1970-89, and found that FDI enhances productivity in countries with minimum threshold stock of human capital. Furthermore, FDI positively contributes to economic growth only when a host country has sufficient absorptive foreign technologies (Griffith et al., 2003). In this connection, Lai et al. (2006) argued

that long-run economic growth arises from improved absorptive capability and higher human capital stocks. Similarly, Coe et al. (2008) confirmed that domestic and foreign R&D capital stocks significantly impact TFP.

Furthermore, technology spillover affects long-run growth depends on the host country's human capital investment and degree of openness (Lai et al., 2006; Seck, 2012). In addition, Kuo & Yang (2008) explore a positive association between spillover from FDI and R&D expenditure of the host country. Absorptive ability determines the degree of technology spillover through institutional and financial development (Durham, 2004; Chee-Lip, 2015). Leahy &d Neary (2007) emphasize that R&D expenditure increases a firm's absorptive capacity and positively contributes profitability of a firm. They further argue that firms' R&D help absorb external knowledge from outside the industry will lead to a firm's absorptive capacity.

Human capital accumulation plays a crucial role in affecting the level of economic growth positively. As the human capital accumulation increases, the level of higher value-added goods has produced domestically. This condition may positively affect growth at the aggregate level (Barro, 1990; Gemmell, 1996). Studies like McGrath (2016) and Sarwar et al. (2021) examined the bi-directional causality and revealed that increased economic growth causes the accumulation of human capital positively due to higher investment. Similarly, Mincer (1996) states that an increase in the investment ratio positively increases economic growth. In addition, technology transferred from developed to developing countries has a statistically significant impact on the productivity of the host country.

Conclusion

As CPEC is considered a 1+4 portfolio in which the end goal of the whole project is to improve the overall infrastructure, including road, highways, and transmission lines, building and enhancing the energy sector to ensure the availability of energy to the industrial cooperation and finally construct a port. All of which only improves the growth of Pakistan when utilized appropriately in a definite sector. Therefore, the development of SEZs has also been included in the CPEC projects. Until now, 9 SEZs were notified, of which three are under consideration to be built as early as possible. As confirmed by the literature and the relevant authorities, the SEZs comprise those industries that are not currently operating in Pakistan. These will undoubtedly employ foreign technology and knowledge that the domestic workforce should possess. Therefore, these analyzes were intended to portray the existing situation in the labor market using the data of Asian countries. The SEZs are mostly functioning in these regions of the world. The existing analyzes are necessary to be taken into account as shortly when foreign technology will be employed how the domestic workforce will benefit still a question to be answered.

The current scenario depicts the picture that foreign technology helps in the enhancement of the overall economy. However, the role of domestic human capital does not play a sufficient role in transmitting this effect. We have observed that the prevailing knowledge and skills in the domestic labors are not compatible with the domestically available foreign technology. When this is the situation, how come the foreign industries

and firms can positively affect the domestic laborers and uplift living standards. For this, we suggest the following policies in order to rectify this issue in the future.

An extensive study is required to identify the vocational and training skills required in CPEC projects that are possible only after identifying the foreign firms more likely to shift in Pakistan under the SEZs scheme. A reliable way to overcome this problem is a joint venture of domestic vocational training institutes with foreign firms. We can anticipate that the workforce can be enhanced and molded according to the projects under CPEC. Otherwise, the positions will remain vacant, and a massive chunk of domestic laborers will remain unemployed, giving all the benefits to the foreign workers to yield. In effect, opportunities in the lower segment will be more than the managerial positions that will benefit Pakistan in terms of static outcomes, though dynamic or long-run benefits should be concentrated.

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Fiscal Policy of Economic Development: Comparative Characteristics of Ukraine and Poland

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Abstract

In order to achieve the purpose outlined, this research uses the following methods: analysis and synthesis; economic and statistical analysis and comparison; economic and mathematical; generalization. The result shows that Poland's fiscal policy aims at developing economic infrastructure and building an economic model of the state based on the manufacture of products with a high share of value-added. However, the fiscal policy of Ukraine does not have significant effects on economic development due to the use of such instruments as public debt and capital expenditures. However, the external debt dependence of the state is relatively high. Nevertheless, it proves that the fiscal policy of Ukraine does not increase the level of economic complexity and development of the processing industry through the implementation of tax benefits. It proposes to increase the efficiency of tax authorities in Ukraine in terms of combating the shadow economy, boost the share of capital expenditures and raise the level of conversion of public debt into economic growth.

Keywords:
total factor productivity, human capital, technological transfer, CPEC, special economic zones

How to Cite:

Sliusarchuk, O., Lavrov, R., Kuybida, V., Slatvinskyi, M., & Zelenskyi, A. (2021). Fiscal Policy of Economic Development: Comparative Characteristics of Ukraine and Poland. *Etikonomi, 20*(2), 275 – 296. https://doi.org/10.15408/etk.v20i2.22013.

Introduction

Fiscal policy, as a policy of managing state revenues and expenditures in influencing aggregate demand and economic development, has always been the subject of scientific discussions in world economic thought. Particular attention is paid to the fiscal policy under the conditions of the economic crisis. After all, thanks to the operative decisions of the government in the field of mobilization of state budget revenues and structuring of its expenditures towards anti-crisis purposes, it is often possible to achieve macroeconomic stability.

At the same time, one of the research areas is the study of the role of fiscal policy in ensuring economic development, analyzing the strategies for using specific fiscal instruments. Considering Ukraine's economic development level and permanent political and economic crises, studying the best experience in implementing the fiscal policy of economic development is a highly urgent objective. The experience of those neighboring countries, with which Ukraine has a common historical past and today are at a higher level of development, deserves special attention. Consequently, a comparative analysis of the fiscal policy of Poland and Ukraine is intended to answer the question concerning the role of fiscal policy in economic development, the effectiveness of its instruments, and strategic orientation.

This study aims to compare Poland and Ukraine's economic development levels to determine the baseline conditions for the direction of fiscal policy of these countries. The purpose of the research is to do a comparative analysis of the fiscal policy of Poland and Ukraine to determine the advantages and disadvantages of its impact on economic development and outline the vectors of adaptation of best experience for the national economy. Besides that, this research also investigates the impact of the state budget deficit, expenditures and revenues, and debt policy on the GDP in Poland and Ukraine. Moreover, this research also analyses the effectiveness of preferential taxation of enterprises in Poland and Ukraine. In terms of their compliance with the structure of economic development and development objectives of the state.

The investigation of the background on the use of fiscal policy towards stimulating economic growth has had a long-term history. However, Keynes took a fundamental approach towards this issue, forasmuch as he substantiated the effectiveness of budget financing of aggregate demand. The basic postulates of the Keynesian theory were practice by US President F. Roosevelt during his anti-crisis policy (Renshaw, 1999). The Keynesian theory was continued in the works of Lerner, in which the theory of the so-called "functional finances" was substantiated (Niggle, 2010; Hart, 2013).

Later, in the scientific literature, there were discussions about the advantages and disadvantages of using expansive fiscal policy to stimulate economic growth, combining its instruments with monetary policy instruments, introducing restrictive fiscal rules. In addition, research on modeling fiscal policy in the context of determining its impact on economic growth is relatively standard. Public investment impacts long-term economic growth (Barro, 1990; Bah & Kpognon, 2020; Nguyen & Trinh, 2018). Other studies

show that budget deficit harms economic growth in the long term (Adam & Bevan, 2005; Arjomand et al., 2016; Molocwa et al., 2018; Tung, 2018). Besides that, the growth of external debt harms the state budget because external debt can lead to a debt trap (Kusumasari, 2020). Reinhart & Rogoff (2010) conclude that if public debt increases by more than 90% of GDP, economic growth slows down. David (2017) shows that capital expenditures of the state budget have a significant effect on economic growth in Paraguay. Public debt had an impact on economic growth (Wibowo, 2017; Djulius, 2018). Dey & Tarque (2020) reveal the negative impact of external debt on GDP growth.

In addition to empirical studies of fiscal policy, investigations that assess the features of applying theoretical postulates of fiscal theories in practice are worth noting. From among such works, Stawska (2017) whose indicates that the expansive fiscal policy, often caused by economic fluctuations, contributes to the deepening of the imbalance of public finances with frequent downturns in GDP. Restrictive policies improve the situation in the public finance sector from the long-term perspective, contributing to moderate economic growth. Stoilova & Patonov (2020) prove that taxation is a more reliable instrument than government spending in a small open emerging-market economy.

Benos (2009), examining the impact of fiscal policy on economic growth in European countries, notes the importance of the structure of public spending. After all, state budget expenditures on infrastructure and defense have a positive impact on economic growth. An increase in the tax burden suppresses economic growth. Besides that, expenditures on education and the social sphere do not significantly impact economic development. David (2019) also emphasizes the importance of capital expenditures for economic development. The development of the country's infrastructure leads to the growth of all industries involved in its construction and maintenance. Infrastructure in the key factors that determine economic growth (Esfahani & Ramírez, 2003; Palei, 2015; Khan et al., 2020)

Publications concerning the assessment of fiscal rules occupy a rather important place in studying the role of fiscal policy in economic development. For instance, Działo (2012) shows that the use of fiscal rules positively impacts economic growth and macroeconomic stability. They allow reducing excessive political pressure on the state budget towards increasing its deficit and public debt to finance political programs. Fiscal rules are beneficial for macroeconomic stability (Gomez-Gonzalez et al., 2021). Nizioł (2018) proves that, in addition to fiscal discipline in public spending, the fiscal rule effectively limits the growth of public debt, which has a positive effect on macroeconomic stability. Ardanaz et al. (2021) state that fiscal rules are flexible if they include features to accommodate exogenous shocks.

Owsiak's (2016) work deserves considerable attention, in which a thorough analysis of the development of the Polish tax system. The conclusion is that Moderate fiscals characterize Poland's tax policy; shrinkage of tax thresholds for personal income tax has harmed state budget revenues. Therefore, Poland needs to expand the number of such "thresholds" to the level of advanced countries with long-continued tax traditions, where

there is a progressive tax scale. The reconstruction of the tax system should aim to support a relative balance between direct and indirect taxes, which will make it possible to return to the more significant role of direct taxes in reducing excessive income inequality in society. The effectiveness of the tax system and fiscal policy depends on the people who implement this policy. The emphasis on the subjects of the implementation of fiscal or tax policy is essential in analyzing the effects of fiscal policy on economic development, forasmuch as it takes into account the qualitative component of the policy.

When it comes to scientific research of the fiscal policy of Ukraine in the context of its impact on economic development, it is worth noting the publication of Shevchuk & Kopych (2018) conclude that the advisability of an income-based financial consolidation policy in Ukraine, forasmuch as better tax collection can contribute to economic growth even in the short term perspective. Grazhevskaa & Virchenkoa (2014) prove the significant dependence of the effectiveness of the mechanism of fiscal policy transfer in the Ukrainian economy on such institutional factors as public expenditure management, consumer expectations, and the level of fiscal decentralization.

This research will provide policy recommendations for economic development in the two countries. Based on the various studies above, it shows that fiscal policy has a significant impact on economic development in a country. Thus, the contribution of this research is to provide recommendations for appropriate fiscal policies in each country to improve the development process in each country.

Methods

The following methods have been used in the course of the research, namely: First, **synthesis analysis** - in studying the scientific literature and determining the directions of the impact of fiscal policy on economic development. The second step is **doing economic and statistical analysis and comparison** while studying the dynamics of economic development of Ukraine and Poland. Next, we do **economic and mathematical methods** while studying correlation relationships between economic development indicators and fiscal policy indicators in Ukraine and Poland. Finally, we **generalize** –to form scientific-theoretical and practical recommendations for improving the fiscal policy of Ukraine because of the experience of Poland.

Result and Discussion

The comparative characteristics of the fiscal policy of economic development of Poland and Ukraine will not be complete if we leave untouched the fundamental indicators determining the economic development of these countries (see Table 1). Thus, the dynamics of GDP and the dynamics of GDP per capita are such indicators, forasmuch as they indicate the overall level of economic development. According to data of Table 1, Poland is four to five times better than Ukraine in terms of GDP and GDP per capita, which is a phenomenal result taking into account the common historical past (as of 1990, Poland's GDP was 69, 98 billion USD and Ukraine's GDP was 81,46

billion USD) and almost the same starting conditions for economic development after the collapse of the USSR.

Table 1. Dynamics of some indicators of economic development of Poland and Ukraine in 2004-2019

Indicators		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
GDP of Poland GDP, billion USD		255,4	306,2	344,7	429,2	533,6	440,3	479,8	528,2	498,4	526,7	542,4	477,7	472,6	526,7	587,1	595,8
GDP of Ukraine GDP, billion USD		64,9	86,1	107,8	142,7	180,0	117,2	136,4	163,2	175,8	183,3	131,8	90,6	93,3	112,2	130,8	153,8
GDP of Poland per capita GDP, billion USD		6681,4	8021,5	9035,4	11254,5	13996,0	11526,1	12613,0	13879,6	13097,3	13696,5	14271,3	12578,5	12447,4	13864,7	15468,5	15692,5
GDP of Ukraine per capita GDP, billion USD		1366,0	1571,7	1748,9	3065,6	3887,2	2543,0	2965,1	3569,8	3855,4	4029,7	3104,6	2124,7	2187,7	2640,7	3096,8	3659,0
The share of some industries in Poland's GDP, %	Industry	22,4	22,0	22,1	21,9	21,5	21,9	21,5	21,9	22,4	21,8	22,3	23,0	23,3	22,2	21,8	21,4
	Agriculture	3,3	2,9	2,7	3,0	2,6	2,6	2,9	3,1	2,9	3,1	2,8	2,4	2,5	2,9	2,3	2,3
	Construction	6,3	6,7	6,7	6,8	7,2	7,6	7,4	7,6	7,0	6,5	6,9	7,1	6,2	6,2	6,7	6,5
	Trade	16,4	16,4	16,4	16,1	15,9	16,7	17,0	16,2	16,8	17,0	15,8	15,7	15,5	15,5	15,6	15,5
The share of some industries in Ukraine's GDP, %	Industry	21,0	22,4	22,6	22,6	21,3	18,5	18,8	18,1	17,9	16,5	16,0	16,2	16,7	17,6	17,7	17,0
	Agriculture	10,4	8,9	7,2	6,3	6,5	6,9	7,4	8,2	7,8	8,7	9,6	10,8	12,5	11,2	10,6	9,9
	Construction	4,4	3,9	4,1	4,5	3,3	2,6	3,3	3,0	2,8	2,5	2,2	2,1	2,2	2,4	2,3	2,7
	Trade	11,5	12,2	12,1	12,6	13,1	13,6	14,5	15,0	14,4	14,6	13,3	13,8	14,0	13,4	13,9	13,3
The structure of export in Poland, %	Raw materials	24,7	26,9	26,9	26,5	26,4	23,6	25,3	25,9	27,4	26,4	25,2	23,7	22,4	22,6	22,4	21,1
	Processing industry	75,3	73,1	73,1	73,5	73,6	76,4	74,7	74,1	72,6	73,6	74,8	76,3	77,6	77,4	77,6	78,9
The structure of import in Poland, %	Raw materials	27,7	30,5	30,0	30,5	30,7	27,8	29,7	32,3	32,6	31,2	30,0	26,8	25,8	27,2	28,1	26,4
	Processing industry	72,3	69,5	70,0	69,5	69,3	72,2	70,3	67,7	67,4	68,9	70,0	73,3	74,2	72,8	71,9	73,6
The structure of export in Ukraine, %	Raw materials	63,3	65,1	63,4	61,3	65,6	63,0	63,0	63,5	61,3	63,0	66,9	66,5	67,3	68,4	68,1	69,2
	Processing industry	36,7	34,9	36,6	38,7	34,4	37,0	37,0	36,5	38,7	37,0	33,1	33,5	32,7	31,6	31,9	30,8
The structure of import in Ukraine, %	Raw materials	50,3	45,6	43,7	42,5	44,9	50,1	50,5	50,5	46,8	45,5	45,0	44,1	35,5	38,1	37,9	34,4
	Processing industry	49,7	54,4	56,3	57,5	55,1	49,9	49,5	49,5	53,2	54,5	55,0	55,9	64,5	61,9	62,1	65,6
Index of economic complexity of Poland, %		25,0	25,0	23,0	21,0	21,0	21,0	23,0	21,0	24,0	23,0	22,0	22,0	23,0	21,0	23,0	п/д
Index of economic complexity of Ukraine, %		32,0	37,0	38,0	41,0	44,0	44,0	45,0	44,0	42,0	43,0	43,0	46,0	50,0	45,0	44,0	н/д
Coefficient of openness of the economy of Poland, %		63,4	62,3	68,2	70,6	71,7	65,0	70,4	76,2	76,9	78,8	82,6	83,3	85,8	87,8	91,1	89,4
Coefficient of openness of the economy of Ukraine, %		114,0	98,2	92,6	91,8	99,6	90,5	99,1	108,8	106,6	97,7	102,8	108,2	105,6	104,0	99,2	90,8

Source: calculated by the author based on data: State Statistics Service of Ukraine: national accounts; Bank danych Makroeconomicznych: Handel zagraniczny; Worldbank: World Development Indicators.

The data comparing the indicators of economic development of Ukraine and Poland. Table 1 shows that Poland achieves high results in GDP dynamics and GDP per capita due to the development of the industry. The data in Table 1 shows that there are negative trends in the structure of GDP in Ukraine. The share of the industry over the past 12 years has decreased by 5% to 17% of GDP. In Poland, on the other hand, this indicator is stable and ranges from 21-22% of GDP. Beyond that, it should note that the share of construction in Poland's GDP is significantly higher than in Ukraine, which indicates the focus of Poland's economic policy on the development of infrastructure. A high share in the structure of Ukraine's GDP is occupied by agriculture, which is relatively objective, taking into account agricultural land and soil fertility. However, agriculture is not an innovative industry that produces goods with high added value and can contribute to rapid economic growth. Trade-in these two countries is actually at the same level in the structure of GDP.

The structure of foreign trade in goods is an important indicator. After all, Ukraine's economy demonstrates a gradual transformation into a raw material appendage of advanced countries, forasmuch as the share of raw materials in the structure of exports by the end of 2019 amounts to 69,2%. By contrast, in the structure of Poland's exports, 78,9% is accounted for exports of industrial products. As for imports, the indicators here are also quite unambiguous, forasmuch as in the structure of imports of Ukraine, 34,4% is accounted for imports; previously this indicator was about 50%. While in Poland, imports of raw materials account for 26,4% of total imports of goods. The high share of exports and imports of raw materials in Ukraine makes its economic development dependent on raw material cycles (see Figure 1).

Figure 1. Dynamics of price indices on raw materials and GDP of Poland and Ukraine in 2004-2019
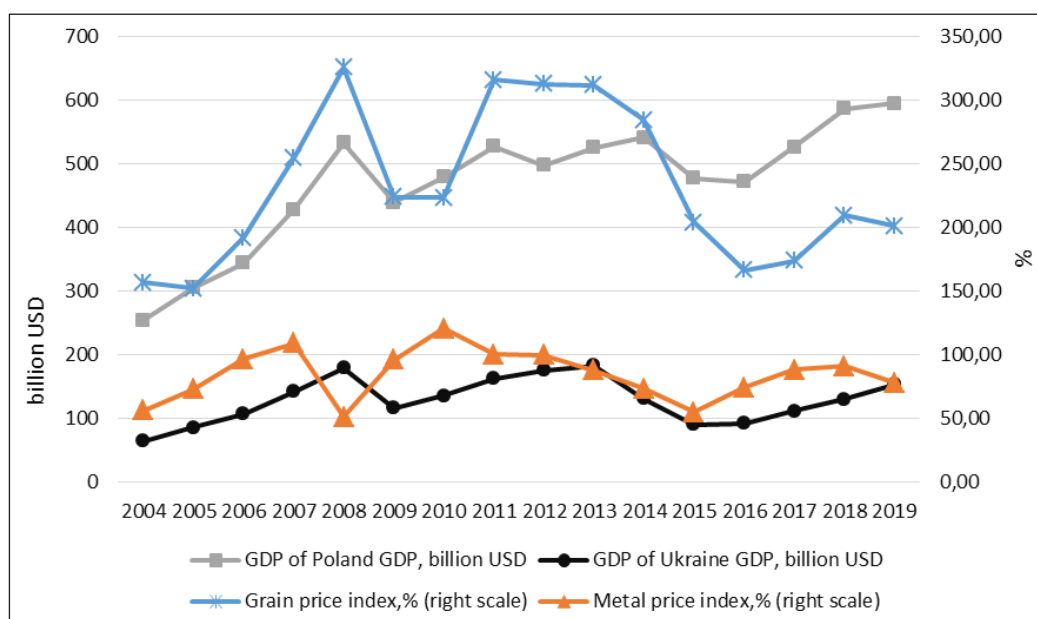
Source: Calculated by the author based on data: State Statistics Service of Ukraine: national accounts; Bank danych Makroekonomicznych: rachunki narodowe; Commodity Metals Price Index Monthly Price; FAO Food Price Index.

According to data in Figure 1, the GDP of Ukraine almost repeats the dynamics of grain prices. It confirms with the correlation coefficient between these indicators, which is 0,8821, while the correlation coefficient for Poland's GDP is significantly below – 0,5065. Regarding the correlation coefficients for the metal price index of GDP of Ukraine and Poland, it is 0,3310 and 0,1398, respectively. Changes in the dynamics of prices for raw materials significantly affect the profitability of ferrous metallurgy and agriculture enterprises in Ukraine that are the leading exporters of raw materials to international commodity markets; this, in turn, negatively affects the dynamics of GDP.

Conducting a brief analysis of the economic development of Ukraine and Poland, it is worth noting the dynamics of such an indicator as to the index of economic complexity, which reflects the number of complex products in the country's production. The complexity of the product means a measure of the amount of technology used to manufacture the product and expresses the value added. According to this indicator, Poland twice exceeds Ukraine, which means that its industry has a higher level of technology, and manufacturing plants produce goods with a higher level of value-added, which is the basis of economic development. In addition, the coefficient of openness of the economy is a vital indicator for comparing Ukraine and Poland in terms of the level of economic development, forasmuch as it reflects the ratio of the volume of foreign trade in goods and services to GDP. According to this indicator, Ukraine is also inferior to Poland. This data indicates the actual absence of the domestic market because production is export-oriented and consumption is imported.

Thus, based on the analysis of the trends mentioned above in the economic development of Poland and Ukraine, the inference should be drawn that Ukraine needs to pursue a policy of stimulating the development of industry and production of goods with value-added, reduce the share of raw materials in exports and increase the share of capital-intensive industries. Achieving these goals is impossible without implementing effective fiscal policy and taking into account international experience in this area. Therefore, a comparison of the fiscal policies of Poland and Ukraine should take place, taking into account the existing problems and opportunities of the economies of these states. It is essential to identify the vectors of fiscal policy to answer whether fiscal policy considers existing trends in the economy and whether it is aimed at creating conditions for further economic development.

In a general sense, fiscal policy regulates the state's revenues and expenditures to influence aggregate demand and national income or gross domestic product. In practice, fiscal policy is implemented through deficit financing of aggregate demand, establishing the structure of state budget expenditures and public investments, pursuing debt policy, implementing income policy, and administering taxes. Using these instruments, we will carry out a comparative analysis of the fiscal policy of economic development of Poland and Ukraine applying the methods of correlation analysis (Table 2 and 3). Taking into account the postulates of Keynesian theory, the analysis of deficit financing of aggregate demand is one of the directions of the analysis of the fiscal policy of Poland. However, the Polish government did not use this method from 2004 to 2019, forasmuch as

the indicator of correlation between the dynamics of the state budget deficit and the dynamics of GDP is not significant.

At the same time, based on the analysis of the structure of public expenditure and debt policy, it should be noted that in Poland, the principle of functional finance is used, described in A. Lerner's theory. Thus, Table 2 shows that the correlation coefficient between capital and current expenditures of the state budget and GDP is significant. The higher correlation coefficient is observed between current expenditures and entirely objective GDP because the time lag of the impact of current expenditures on GDP is less than the time lag of the impact of capital expenditures used to finance economic infrastructure, which is the core basis of economic development. However, implementing infrastructure projects takes much longer than the growth of final consumption that increases current expenditures.

Table 2. Correlation matrix of indicators of fiscal policy of Poland's economic development in 2004-2019

	GDP, billion USD	State budget deficit, billion USD	Capital expenditures	Capital expenditures including financing of the EU Funds and co-financing of the EU projects	Current expenses	External public debt, billion USD	Domestic public debt, billion USD	Total public debt, billion USD	Tax revenues, billion USD	VAT refunds, billion USD	The level of the shadow economy, %
GDP, billion USD	1										
State budget deficit, billion USD	-0,2789	1									
Capital expenditures	0,7145	-0,2147	1								
Capital expenditures including financing of the EU Funds and co-financing of the EU projects	0,6141	-0,1275	0,7814	1							
Current expenses	0,9184	-0,1774	0,7714	0,8493	1						
External public debt, billion USD	0,7887	0,0333	0,4209	0,1984	0,5889	1					
Domestic public debt, billion USD	0,9514	-0,0923	0,7006	0,6874	0,9528	0,7359	1				
Total public debt, billion USD	0,9542	-0,0524	0,6441	0,5536	0,8821	0,8807	0,9688	1			
Tax revenues, billion USD	0,9649	-0,4285	0,7755	0,7075	0,9383	0,6246	0,9155	0,8690	1		
VAT refunds, billion USD	0,8652	-0,5396	-0,0094	-0,4228	0,5671	0,4760	0,4580	0,5784	0,7250	1	
The level of the shadow economy, %	-0,6731	0,3696	-0,5064	-0,1171	-0,4131	-0,6717	-0,4782	-0,5803	-0,6061	-0,6065	1

Source: calculated by the author on the basis of data: Bank danych Makroeconomicznych; Sprawozdanie z wykonania budżetu państwa.

Analyzing the policy of expenditures of Poland's state budget, it notes that an essential element that has no analogs in Ukraine, namely: the financing of infrastructure projects at the expense of the funds of the European Union and co-financing of projects of the European Union at the expense of the Polish budget. Such measures automatically increase the share of capital expenditures in the state budget structure (see Figure 2).

Figure 2. The Structure of Expenditures of The State Budgets of Poland and Ukraine by Elements in 2004-2019
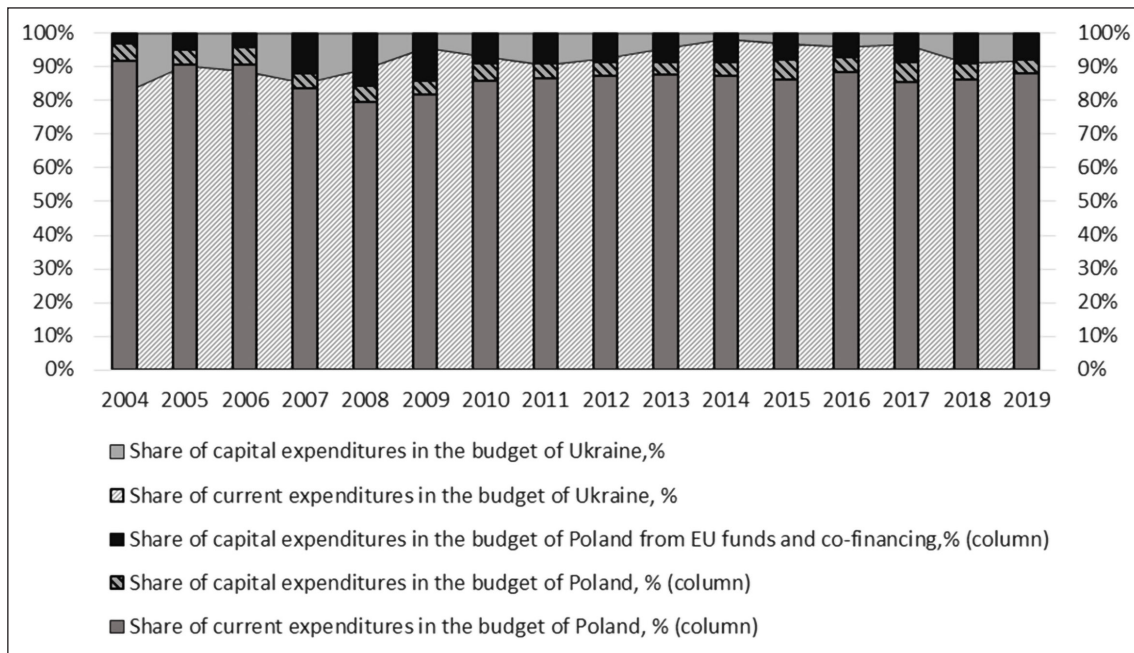
Source: calculated by the author based on data: Sprawozdanie z wykonania budżetu państwa; Budget of Ukraine.

The data in Figure 2 indicate that in 2004-2009 Ukraine dominated Poland in terms of the share of capital expenditures in the total expenditures of the state budget. However, the accession of Poland to the European Union in 2004 allowed using two additional clauses of capital expenditure, namely: expenditures of the European Union Funds and allocation of funds for co-financing of projects implemented under the EU convergence policy. Therefore, since 2004, Poland has been gradually increasing capital expenditures at the expense of the European Union. The example of Poland is especially indicated in the context of overcoming the consequences of the financial and economic crisis of 2008-2009 when capital expenditures were increased to finance the development of infrastructure (primarily transport), which made it possible to attract related sectors of the economy by raising the level of economic activity and aggregate demand. At the same time, it should note that fiscal policy is a change in the volume or share of financial resources directed to the economy and primarily the decisions of people in power at a particular time. No wonder, according to the Greek word, politics is the art of governing. The increase in capital expenditures due to an increase in funds for co-financing the EU projects and attracting funds from the EU funds provides for targeted financing of the infrastructure development of the Polish economy, in particular, the construction of roads and highways, social institutions, industrial complexes, and shopping hubs; consequently, this directly affects the share of construction in GDP, and, thus, contributes to economic development.

In contradiction from Poland, Ukraine does not have the opportunity to raise funds from the EU funds, the targeted use of which is strictly controlled (including corruption); as a result, this does not increase capital expenditures in the face of a crisis

in the national economy. Such trends show in Figure 2, where during the economic crisis of 2014-2017 in Ukraine due to the war with the Russian Federation, the share of capital expenditures approached zero.

According to data of Table 2, debt policy plays an essential role in the fiscal policy of Poland's economic development, forasmuch as the correlation indicators between total public debt and GDP have a strong relationship (R2=0,9542). In contrast, the correlation indicators of domestic public debt are higher than the correlation indicators of external public debt and GDP. In contrast with Poland, the fiscal policy of economic development of Ukraine is radically different (see Table 3); after all, the primary emphasis is placed on deficit financing, the dynamics of capital expenditures has a medium correlation with GDP, and debt policy indicators are almost not correlated with the dynamics of GDP.

Table 3. Correlation Matrix of Indicators of Fiscal Policy of Economic Development of Ukraine in 2004-2019

	GDP, billion USD	State budget deficit, billion USD	Capital expenditures	Current expenses	External public debt, billion USD	Domestic public debt, billion USD	Total public debt, billion USD	Tax revenues, billion USD	VAT refunds, billion USD	The level of the shadow economy, %
GDP, billion USD	1									
State budget deficit, billion USD	0,5131	1								
Capital expenditures	0,5555	-0,1586	1							
Current expenses	0,9504	0,6388	0,3211	1						
External public debt, billion USD	0,2955	0,2813	-0,2897	0,5190	1					
Domestic public debt, billion USD	0,4085	0,5196	-0,3203	0,6396	0,9051	1				
Total public debt, billion USD	0,3553	0,3990	-0,3110	0,5877	0,9803	0,9713	1			
Tax revenues, billion USD	0,9675	0,4131	0,4971	0,9427	0,4354	0,4744	0,4641	1		
VAT refunds, billion USD	0,9187	0,5679	0,3760	0,9368	0,5002	0,5744	0,5469	0,9162	1	
The level of the shadow economy, %	0,1365	0,6053	-0,5482	0,3032	0,4128	0,4185	0,4255	0,1552	0,2096	1

Source: calculated by the author according to the data of State Statistics Service of Ukraine; Budget of Ukraine.

As the data in Table 3 evidence, Ukraine's fiscal policy is based on deficit financing of economic development. After all, there is an average level of correlation relationship between the dynamics of the state budget deficit and GDP and between the state budget deficit and current expenditures, which in turn have a significant correlation relationship with GDP. The mean level of the relationship between the state budget deficit and GDP can explain the consequences of the economic crisis of 2014-2017 caused by the war with the Russian Federation and internal political and economic imbalances, which has harmed the dynamics of macroeconomic indicators.

Comparing the policy of state budget expenditures and the debt policy of Ukraine and Poland, it should note that there is a clear and constitutionally established debt

fiscal rule in Poland (limitation of public debt at the level of 60% of GDP and the use of intermediate triggers of public debt - 50 and 55% of GDP). Along with this, the fiscal rules of the EU supranational government are in force (limiting the state budget deficit at 3% of GDP, structural budget at 1% of GDP), which, despite some criticism in Polish scientific circles, ensure a sufficient level of fiscal discipline in the country. At the same time, and what is especially important, the Polish government is obliged to comply with supranational fiscal rules by using the following sound prudential practices, namely: opening an excessive deficit procedure; directing governments towards reducing structural deficits; setting annual rates of debt reduction; the government's obligation to take fiscal rules into account when conducting fiscal policy.

Therefore, analyzing the data in Table 2, we can conclude about the successful fight against political pressure towards motivating the government to fulfill the populist wishes of deputies in the field of financing social expenditures, which constitute the basis of current expenditures of the Polish state budget; after all, there is no correlation relationship between the dynamics of the budget deficit and the dynamics of current expenditures.

Ukraine also has certain fiscal constraints, which the Budget Code of Ukraine determines. The constraints are the state budget deficit for each year of the medium-term may not exceed 3 percent of the projected nominal GDP of Ukraine for the corresponding year; total public debt and guaranteed state debt at the end of the budget period can not exceed 60% of annual nominal Ukraine's GDP. However, in contrast to Poland, where the European Commission in Ukraine monitors the process of enforcing the rules, such measures are not carried out in practice, which leads to a violation of fiscal discipline.

In terms of debt policy, the data in Table 3 make it possible to conclude debt financing of the budget deficit and the lack of correlation between public debt and its structural elements and GDP. After all, based on the data in Table 3, an intermediate level of correlation relationship between the budget deficit and current expenditures is observed, while there is no correlation between the budget deficit and capital expenditures. However, the relative indicators of public debt indicate a higher level of debt dependence in Ukraine than in Poland (see Figure 3).

According to data in Figure 3, the absence of a debt rule in Ukraine led to a significant increase in debt dependence in 2014-2018; after all, the ratio of public debt to GDP exceeded 60%. In addition, as contrasted with Poland, Ukraine's debt policy is aims to attracting external debt. The share of total public debt is more than 60%. While in Poland, the share is only 30-35%. The attraction of Ukraine's external public debt in foreign currency has an objective explanation, taking into account the openness of the national economy, dependence on imports, primarily on energy resources. However, in contrast to Poland, where all external public debt is attracted on the international money and capital markets, 20-30% of Ukraine's external public debt is owed to international financial institutions.

Figure 3. Dynamics of debt policy indicators of Poland and Ukraine in 2004-2019
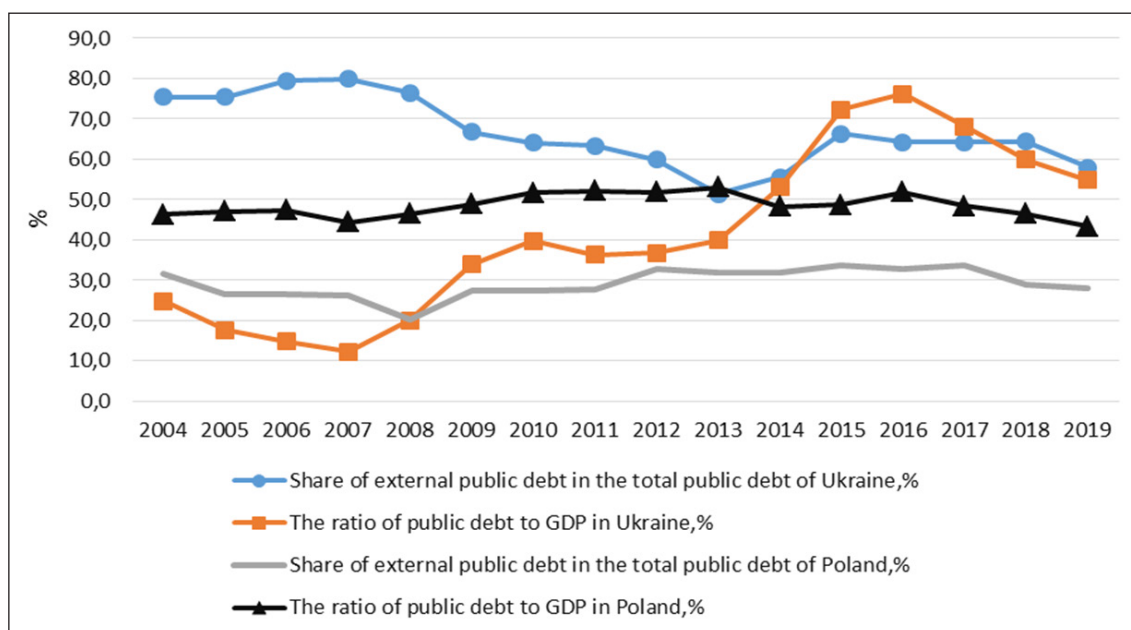
Source: calculated by the author according to the data of State Statistics Service of Ukraine; Bank danych Makroeconomicznych.

In terms of the cost of servicing external debt, borrowing from international financial institutions is a justified strategy for debt policy. However, it should note that international financial institutions provide loans to the state. In addition to financial commitments, often involve political commitments that may be contrary to national interests, such as increase of tariffs for communal services without modernization of heat supply, adoption of laws on land reform without the creation of proper infrastructure of regulation of the market of agricultural lands; prohibition to impose export and import duties on specific groups of goods. From these perspectives, the debt policy of Ukraine needs to be optimized to reduce external debt dependence on international financial and credit organizations.

In addition, comparing the debt policy of Poland and Ukraine, it should be noted that the correlation relationship between debt policy and Poland's GDP is relatively high, which indicates the debt financing of economic development and a high level of conversion of public debt into economic development. Herewith, the high share of domestic debt in the structure of Poland's public debt creates opportunities for the government to carry out mutual writing off debts in the event of an aggravation of crisis phenomena in the economy. In Ukraine, the situation is entirely different: public debt dynamics are not related to GDP dynamics, which indicates the inefficient use of debt resources for stimulating economic growth.

In addition to expenditure and debt policies, an essential element of fiscal policy is revenue policy. This fiscal policy is implementing through tax policy. Consequently, analyzing the data on the correlation dependences of tax revenues and GDP of Poland and Ukraine, we can conclude about the significant role of taxes in states' economic development. The same applies to VAT refunds as a tax benefit, the dynamics of which has a significant correlation relationship with the dynamics of GDP in both countries.

As an element of fiscal policy, income policy is essential for economic growth, forasmuch as it affects aggregate demand through changes in tax rates, the mechanism of tax administration, and the formation of the structure of tax revenues. Regarding the types of taxes, the tax systems of Poland and Ukraine are approximately the same. The differences lie in applying taxes that are insignificant in terms of mobilization of funds to the Polish budget, such as forest, vehicle, and tax on games.

There are differences in the personal income tax, which in Poland has two thresholds: if earnings during the year have amounted to less than 85 528 PLN, the tax rate is 18%; if earnings during the year have amounted to more than 85 528 PLN, the tax is 32%. There is a simplified progressive system of personal income taxation in Poland, which, on the one hand, considers the principles of social justice. On the other hand - it leads to higher budget revenues. In Ukraine, there is a simple system of personal income taxation, which provides a tax rate of 18% regardless of the number of wages, which introduces significant imbalances in the tax burden on employees who receive the minimum wage.

Figure 4. Dynamics of the share of consumption taxes and final consumer expenditures in Ukraine and Poland in 2004-2019
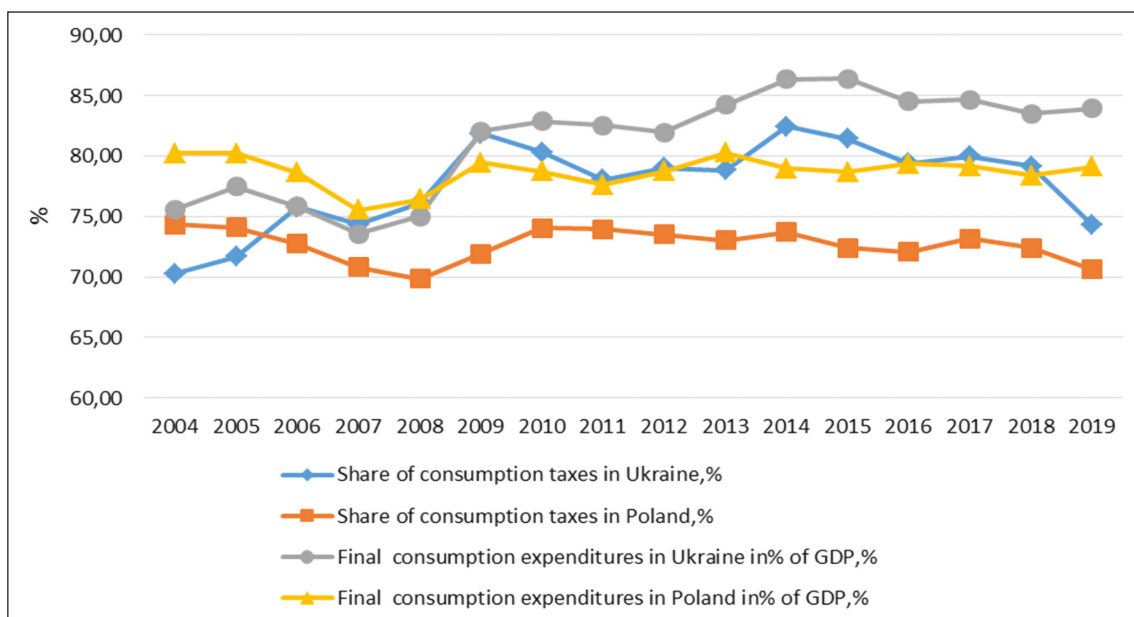
Source: Calculated by the author according to the data of State Statistics Service of Ukraine; Bank danych Makroeconomicznych.

In terms of the structure of tax revenues, in our opinion, it is ineffective both in Poland and in Ukraine, forasmuch as consumption taxes are more than 70% and 80%, respectively. The high level of fiscal consumption is since the basis of the GDP of both countries is made up of final consumption expenditures, and gross capital formation occupies an insignificant share (Figure 4).

According to Table 4, the share of consumption taxes exceeds in Ukraine the same indicator in Poland by 10-12%. Along with this, the share of final consumer expenditures

in GDP is about 85%, which indicates negative trends in economic development and the short-term effects of fiscal policy. The increase in the share of consumption taxes indicates a decrease in the base of taxes on income. In turn, it concludes about a decrease in the number of enterprises and employment in Ukraine. What is more, the high level of final consumption expenditures in Ukraine indicates a low share of gross capital accumulation, which is the basis of economic growth, and, therefore, requires fiscal policy to use instruments that would stimulate production. Such instruments include public investments, which are implemented through the mechanism of capital expenditures within the framework of state development programs, providing targeted financing, and preferential taxation of certain types of entrepreneurial activity.

We have considered the trends of capital expenditures hereinbefore. However, it should note that the results of such expenditures in Poland are higher than in Ukraine, forasmuch as the lion's share is implemented at the expense of the European Union Funds and through co-financing mechanisms of the EU projects under strict monitoring for targeted use.

Regarding tax incentives, both in Poland and in Ukraine, several tax benefits are using, among which it is worth noting those that have similar goals, namely: exemption from taxation of educational, cultural, medical, and sports institutions; exemption from taxation of medical technologies and medicines; exemption from taxation of goods for national security and defense. However, there are pretty significant differences in preferential taxation of industry and agriculture (Tables 4 and 5).

Analyzing the types of tax incentives for agricultural and non-agricultural enterprises in Poland, we can conclude that their concept is consistent with the general trends in the development of the Polish economy, forasmuch as none of the incentives aims to stimulate raw materials' production. On the contrary, the existing tax incentives aim to develop infrastructure, innovation, and the processing industry with a high share of added value. This approach is to the implementation of the entire fiscal policy of Poland that has led to a high level of economic development compared to Ukraine.

As for Ukraine, the tax policy also provides several benefits used for various sectors of the economy. Analyzing the Directory of tax benefits of Ukraine, we can conclude that in addition to benefits for education, culture, medicine, sports, and the social sphere, a significant number of benefits are used for industries involved in trade under interstate agreements on free trade zones, or within other interstate agreements. However, it is rather difficult to analyze the importance of such benefits for economic development because, on the one hand, there is no necessary statistical data. On the other hand, revisions will require the effects for the national economy from the activities of the existing free trade zones, which we will leave for further scientific research. In addition, it is worth noting the temporary tax benefits that apply to the production and trade of goods intended for national defense and the anti-terrorist operation in eastern Ukraine.

Table 4. Groups of the Basic Tax Incentives for the Economy and Agriculture in Poland and Their Features

Groups of the tax incentives	The role for economic development
Incentives for agricultural enterprises	
Exemption from taxation for the purchase of land up to 100 hectares to create a new farm or expand an existing one.	Tax incentives are aimed at encouraging productive and organic farming, forasmuch as farms are again exempt from almost all types of tax.
Investment incentive for farmers for the construction or modernization of livestock buildings for breeding and keeping farm animals and environmental protection facilities; construction of drainage structures and purchase of a water supply device for the farm; purchase of devices used for production purposes for natural energy sources (wind, biogas, sun, falling water). The investment incentive is granted after the completion of the investment. It consists of a deduction from the agricultural tax on land located in the commune where the investment was made - in 25%, documented using investment accounts. However, incentives for the same investment cannot be used for more than 15 years.	From our viewpoint, the investment incentive applied to farms and family farms that build livestock buildings is essential for developing animal husbandry in Poland. In addition, in contrast to crop production, animal husbandry has a higher degree of added value and contributes to the introduction of organic fertilizers into the soil, which allows maintaining their quality at the proper level.
Tax incentives for farmers in mountainous areas and tax credits in the event of a natural disaster.	An incentive for the development of agritourism is quite an innovative benefit in the Polish tax system. In order to stimulate the development of wastelands, land reclamation is also an essential measure of the state for the development of agriculture as one of the drivers of economic growth and employment growth.
Income from the sale of farm real estate is exempt from taxation.	
Income received from agritourism is exempt from personal income tax (rent of rural houses, rooms in villages, etc.).	
Income from the sale of processed agricultural products is exempt from personal income tax.	
Remuneration received by members of agricultural production cooperatives for the use of land contributions by cooperatives is exempt from personal income tax	
A tax incentive for agriculture is applied, which consists in reducing the tax in the first year by 75%, and in the second year by 50% in the case of acquiring land or expanding an existing farm with an area of up to 100 hectares (5 years), land resulting from the development of wastelands (5 years), and land after exchange or consolidation (1 year).	
Parts of arable land, meadows, and pastures resulting from soil reclamation that led to the destruction of crops due to drainage works were exempted from taxation by the agricultural tax. The exemption covers the tax year in which the crops have been damaged.	
Incentives for non-agricultural enterprises	
Accelerated depreciation. It is applied for small taxpayers (the amount of income from the sale of which for the previous year does not exceed 1,2 million EUR) and those taxpayers who start production. It is applied for the purchase of intangible assets, except for passenger vehicles. The write-off limit for depreciation may not exceed 50 000 EUR during the tax year.	Tax incentives for non-agricultural enterprises aim to support investment activities carried out by small taxpayers and taxpayers who start their businesses. Such measures of the state encourage the creation of start-ups, the modernization of already established enterprises that positively affects a business climate.
Expenses for the purchase of new technologies by taxpayers engaged in non-agricultural activities are exempt from taxation.	
The settlement of investment loss for previous years, possibly write off tax payments in the current tax year and for the next five years, but not more than 50% in case of losses on a particular source of income in previous years.	Benefits to support innovation are important; they are applied to enterprises of various forms of ownership and of various sizes.
Subsidies from local state budgets are exempt from taxation.	
Tax credit. After submitting the relevant declaration and fulfilling the conditions provided by the Law on PIT (including support for a certain level of employment), taxpayers who have started a business for the first time are entitled to an annual exemption from the obligation to pay advances on income tax.	Benefits for producers of bio components, biofuels, electricity from renewable sources also stimulate innovation and production of goods with a high share of value-added.
Income received from activities in special economic zones based on appropriate permits is exempt from taxation. A limited state aid quota is used.	
Bio components are exempt from excise duty intended for liquid fuels, fuels with bio components, biocomponents that make up an independent fuel.	
Production of electricity from renewable sources is exempt from excise duty.	

Source: compiled by the author on the basis: Cel i mechanizm preferencji podatkowych.

Tax incentives for enterprises are particular and, in our opinion, do not always correspond to the national objectives towards stimulating the economic development of Ukraine. Along with this, it should note that at the request of the International Monetary Fund. The special tax regime for activities in agriculture, forestry, and fisheries has been canceled. Consequently, in Ukraine, as contrasted with Poland, there are no tax incentives for the development of agriculture. In our viewpoint, it negatively affects the development of farms, family farm units, agricultural cooperatives, animal husbandry and the state of soils, and the social-economic situation in rural areas. The lack of benefits for agricultural enterprises leads to the development of high-margin agricultural raw materials production or primary processing, which does not help reduce the level of dependence of the Ukrainian economy on raw material cycles. In addition, the lack of support for animal husbandry and the development of agricultural infrastructure negatively affect the soil's quality due to the low level of organic fertilization. Consequently, in the long term, Ukraine runs the risk of losing the benefits of fertile black soil, which will undoubtedly affect the pace of economic development. The tax incentive for non-agricultural enterprises in Ukraine is shown in Table 5.

Based on the analysis of tax incentives for Ukrainian enterprises, we can conclude that there is no effective strategy for fiscal policy in particular and a strategy for the development of the state in general. After all, the existing tax incentives do not make it possible to modernize the national economy from a raw material appendage of the world's advanced countries to a competitive, innovative, and technological economy. This industry produces goods with a high level of added value.

Nowadays, the fiscal policy of Poland can be an exemplary example for the government of Ukraine in the field of optimization of fiscal policy. However, while borrowing the experience of Poland, one should not forget that those practical recipes for fiscal policy can work in Ukraine only if the legal support is at the same level. This condition refers to the quality of legislation, the efficiency of the judiciary, and tax authorities' efficiency. This conclusion confirms the correlation relationship between the level of the shadow economy and the GDP of Poland and Ukraine (see tables), forasmuch as in Poland, the decrease in the level of the shadow economy ($R2 = -0.6731$) leads to GDP growth. However, there is no relationship between such indicators in Ukraine.

Table 5. Groups of the Basic Tax Incentives for the Economy of Ukraine and Their Features

Tax incentives in Ukraine	A role for economic development
The income from which is exempt from taxation. Temporarily, until January 1, 2025, the profit of the enterprises - the subjects of aircraft construction that are subject to norms of article 2 of the Law of Ukraine, "On the development of the aircraft industry" is exempt from taxation. The freed-up funds (tax amounts that are not paid to the budget and remain at the disposal of the taxpayer) are used for research and development work on aircraft construction, creation or re-equipment of the material and technical base, increase in production, the introduction of new technologies. The use of such funds must be related to the activities of the taxpayer.	Analyzing the available tax benefits for Ukrainian enterprises, we can conclude that tax incentives for economic development in Ukraine are practically not implemented.

Thus, in the list of tax benefits, only four groups of tax incentives can be distinguished to contribute to economic growth. These are benefits for aircraft construction and the space industry, for horticulture and viticulture, for carrying out scientific and research activities, for the import of vehicle bodies for the production of cars in Ukraine. |
Until December 31, 2021, the zero interest rate is applied to income taxpayers whose annual income does not exceed three million hryvnias. Also, the amount of salary (income) accrued for each month of the reporting period to each employee with the taxpayer in labor relations is not less than two minimum wages, the amount of which is established by law.	
Temporarily, until January 1, 2022, transactions on the supply of coal and/or products of its commodity enrichment in the customs territory of Ukraine are exempt from value-added tax.	
Temporarily, until December 31, 2022, transactions on the supply of vehicles equipped exclusively with electric motors (one or more) in the customs territory of Ukraine are exempt from value-added tax.	Without contradiction, the aircraft and space industries are capital-intensive sectors with a high share of value-added. However, stimulating the development of one industry will not impact the overall economic growth of Ukraine. The same applies to the support of horticulture and viticulture.
Transactions on the sale of liquefied gas at specialized auctions for the population's needs are exempt from excise tax in the manner established by the Cabinet of Ministers of Ukraine.	
The excise tax is levied at the rate of 0 UAH per 1 liter of 100% alcohol from bioethanol used by enterprises to produce motor gasoline containing bioethanol, ethyl tert-butyl ether (ETBE), and other additives based on bioethanol.	
Transactions on the sale of bodies for passenger vehicles in the customs territory of Ukraine are exempt from taxation, subject to the subsequent manufacture of vehicles from them.	It is worth noting the benefit for taxpayers, whose annual income, determined by the accounting rules for the last annual reporting period, does not exceed three million hryvnias, forasmuch as this tax preference somewhat facilitates the development of small and medium-sized businesses.
The financial result before taxation is reduced: by the amount of the negative value of the object of taxation of the previous tax (reporting) years.	
Land tax is not paid for land plots of agricultural enterprises of all forms of ownership and farms occupied by young orchards, berries, and vineyards before they entered into the period of fructification and hybrid plantations, gene pool collections, and nurseries of perennial orchards.	
Transactions on the supply of services for fundamental investigations, research and development activities are exempt from taxation if a person directly receives payment for their value from the account of the body providing treasury services to the budget supplies such services and/or works.	Privileges for the import of electric vehicles and biofuel production may positively affect the development of these sectors of the economy, however, not on the overall economic development.
Temporarily, until January 1, 2023, the subjects of space activities, which are subject to the Law of Ukraine "On Space Activities", are exempt from value-added tax on transactions for the supply in the customs territory of Ukraine of the results of scientific and research, development and construction works, which are performed for the needs of space activities. The Cabinet of Ministers of Ukraine shall establish the procedure for monitoring the register of scientific and research, development, and construction work to apply this privilege. Temporarily until January 1, 2022, transactions on the supply of waste and scrap of ferrous and non-ferrous metals and paper and cardboard for recycling (waste paper and waste) are exempt from taxation. The Cabinet of Ministers of Ukraine approves lists of such waste and scrap of ferrous and non-ferrous metals.	Benefit concerning tax exemption for the import of car bodies is also ineffective, forasmuch as it stimulates imports rather than domestic production, and, therefore, has little effect on economic growth. Most of the tax incentives in Ukraine aim to stimulate the production of raw materials, namely: ethyl alcohol, petroleum products; coal; waste and scrap of ferrous and non-ferrous metals; raw tobacco materials.
Temporarily, until January 1, 2022, export transactions under the customs regime for the export of waste and scrap of ferrous and non-ferrous metals, as well as paper and cardboard for recycling (waste paper and waste) are exempt from taxation. The Cabinet of Ministers of Ukraine approves lists of such waste and scrap of ferrous and non-ferrous metals.	
Petroleum products can be sold as raw materials for production in the chemical industry at a zero excise tax rate.	
Transactions on the sale of tobacco raw materials to tobacco fermentation plants by persons who produce tobacco raw materials in the customs territory of Ukraine are exempt from taxation. Transactions on the sale of fermented (processed) raw tobacco materials by tobacco-fermentation plants to manufacturers of tobacco products are exempt from taxation.	

Source: Compiled by the author based on the Directory of tax benefits.

A comparative analysis of the fiscal policy of economic development of Poland and Ukraine based on the application of a wide range of statistics has made it possible to conclude that there are fundamental differences between the regulatory approaches of both countries. The fact remains that Poland's fiscal policy aim to stimulate the development of infrastructure, an industry with a high level of added value, efficient agriculture by pursuing a policy of "functional finances" with a high level of conversion of public debt into economic growth. In Ukraine, the effects of fiscal policy on economic growth are insignificant, except for tax revenues and VAT refunds. Such tendencies can be connected with lobbying by deputies of interests of corporations dealing with raw materials during the drawing up of the State Budget of Ukraine.

The conducted economic and mathematical analysis of expenditures of the State Budget of Ukraine confirms the conclusion of Grazhevskaa & Virchenkoa (2014) conclusion shows that the management of public expenditures is at a low level. Admittedly, more than 90% of expenditures from the State Budget of Ukraine are current expenditures; capital expenditures aimed at infrastructure development and laying the foundations for long-term economic development in a specific time amounted to 2-3%.

This result confirms the conclusions of Działo (2012) on the importance of using fiscal rules in Poland and the positive impact of limiting the growth of public debt on macroeconomic stability. However, at the same time, the correlation analysis has shown that Poland's GDP directly depends on the dynamics of the domestic public debt. Stricter fiscal rules are associated with more sustainable fiscal policies (Bergman et al., 2016). Larch et al. (2021) show that deviation from fiscal rules and the accumulation of government debt foster pro-cyclical fiscal policy.

This conclusion is important for Ukraine, where it is advisable to introduce the rule of conversion of public debt into economic development, that is, to carry out public borrowing not only to finance the budget deficit but specifically for the implementation of a targeted state program towards stimulating economic growth. In this case, fiscal policy will significantly affect economic growth (Ahuja & Pandit, 2020). However, the effect of public expenditures on growth is limited by the debt-to-GDP ratio (Teles & Mussolini, 2014; Chen et al., 2017).

In addition, analyzing the experience of Poland in the field of public expenditure management, it is worth noting the significant role of the European Union in financing them through direct payments from the EU funds and by attracting co-financing from the budget of Poland for the implementation of the EU projects. Such collaboration in the capital expenditures of the state budget has allowed Poland to significantly improve its economic and transport infrastructure over the past 15 years, which in turn has created a basis for long-term economic development. Ukraine does not have such opportunities to attract grants from the European Union to increase capital expenditures in development. However, the high level of the shadow economy opens up prospects for fiscal consolidation in the area of revenues by increasing the efficiency of tax authorities and reducing regulatory pressure on the business. Government should do fiscal transparency to increase

the government effectiveness (Montes et al., 2019). The public sector efficiency improves consolidation policies and outcomes (Heylen et al., 2013).

Conclusion

The analysis of the level of economic development of Poland and Ukraine has made it possible to conclude that Poland has dominated over Ukraine in terms of GDP by 4-5 times. Even though after the collapse of the Soviet Union, Ukraine somewhat overrode Poland in this respect. One of the reasons for such a rapid pace of economic development in Poland is an effective fiscal policy based on the concept of "functional finances," where the main emphasis is on capital expenditures on economic infrastructure; this is the basis of long-term economic growth, as well as fiscal discipline, which allows ensuring a high level of conversion of public debt into economic development. In addition, Poland's fiscal policy is characterized by an extensive system of tax benefits, which aims to stimulate the development of products with a high share of value-added. The result of the fiscal policy of Poland was the achievement of a high share of industrial products in exports, which significantly reduces the dependence of the country's economy on raw material cycles.

From these standpoints, we believe that the fiscal policy of Poland can be an excellent example for the government of Ukraine, particularly in terms of establishing fiscal discipline, converting public debt into economic development, establishing a system of tax incentives aimed at stimulating economic growth. In our viewpoint, the fundamental goal of fiscal policy of economic development should be stimulation of the development of the processing industry with a high share of value-added, reducing current expenditures from the state budget, and increasing expenditures on economic infrastructure, which is the basis of long-term economic growth.

Due to the limited statistical data or their complete absence, it was impossible to assess the effectiveness of the tax authorities of Poland and Ukraine in the academic paper. It is not possible to assess the actual effect on economic development from tax benefits in both countries. Therefore, promising areas of scientific research in this area can be studies of the quality of fiscal decisions, forasmuch as the effectiveness of any policy (as the art of managing) depends on the decisions made by people who are currently in power. Furthermore, to get a complete picture of the level of fiscal policy in Poland and Ukraine, it is essential to study the level of efficiency of the tax authorities and take measures to unshadow the national economy.

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The Inductiveness of Agricultural Village-Type Cluster Creation in Developing Countries

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Abstract

The assessment of emerging risks is substantial risk in implementing and creating various types of clusters used in the agricultural sector of the economy. In this regard, the goal is to develop practical measures to ensure the creation of a cluster of an agricultural settlement at the regional level, taking into account various types of risk that directly affect its creation and development. The study revealed that within the framework of the policy of substitution for domestic production and marketing of agricultural products during the formation of a cluster, it would allow combining more into a standard established system from production, processing to the sale of finished agricultural products both at the local level and at the federal level. This approach will significantly harmonize the interests of all participants of the agroindustry, as well as significantly simplify and expand access to external export markets, thereby reducing the cost of marketing research. At the same time, clustering will increase the overall economic impact on individual farmers, which will have a more significant impact on the development of non-resource zonal territories employed to produce agricultural products. Therefore, it will affect the increase in jobs in small villages.

Keywords:

Agro-Industrial Complex, Clusters, Agricultural Products, Exports, Economies

Introduction

In order to influence the country's agri-food security, especially in the current conditions caused by the impact of COVID on the economies of most states, a study of policy of import substitution and gradual transition to the development of domestic products is of high importance. At the same time, an important aspect is the state policy supporting domestic agricultural producers in terms of competitiveness concerning imported ones and state subsidies. It should be noted that subsidies, preferential customs procedures, prices, and loans provided to both the most prominent companies and small businesses can be used as effective instruments of state support for agricultural producers. In this regard, the levers of state support are significant from the standpoint of macroeconomic policy, and the assessment of their effectiveness may largely depend on the degree of government intervention in the economy. In particular, economic researchers using the example of the impact of macroeconomic aspects in 2020 due to Brexit and Covid highlighted the activity of manufacturers as capable of supporting the supply of food products at an appropriate level, and at the same time, market constraints due to inequality of final buyers on the part of the state politics (Sanderson et al., 2021).

In turn, the policy of protectionism pursued by individual states, including in the agricultural sector, according to Caselli et al. (2021), mainly pursues political interests, taking into account the integration of the current WTO rules into the sphere of the plane of a particular jurisdiction. On the other hand, the introduction of unilateral tariff restrictions allows one to provide support both from agricultural products designed for mass consumption and the introduction of 4G technologies (Brisbois et al., 2019), which allows influencing the value of the costs of a trading company in the direction of their reduction (Ahmed et al., 2016). In turn, the construction of various models that can represent the dependence of the state's trade policy on the influence of various restrictions, we are talking about an increase in export duty rates or a decrease in tariffs on imported agricultural products, according to Bouët & Debucquet (2012), is more capable of influencing an increase in world prices for agricultural products (Magdouli et al., 2016). This circumstance will directly affect countries' economies for which import consumption is the only way to provide their citizens with products. In this regard, customs and tariff methods and the fiscal policy pursued by the state rely to a greater extent on those food market participants who are capable of not leading to a price break in chains from the producer to the final buyer, as well as a violation of competitiveness for all entities (Warr, 2001; Du & Li, 2020). In this regard, the emerging economic risks in the development of the agricultural sector of the economy can directly affect the distribution of labor and material resources.

Thus, the nature of understanding the sustainability of the goal based on an adequate perception of systemic relationships about the production and sale of agricultural products should first provide for the principle of interconnection. In practical terms, identifying various risks in the agricultural economy, such as under the influence of unfavorable natural conditions, climate change, obsolescence, and wear and tear of equipment, all directly affect the nature of investment activity (Brunori et al., 2020). At the same time, the nature of the seasonal influence, due to natural locations, directly affects the level of

provision of a particular state with agricultural resources (Bacaria et al., 2015; Rahman & Shavier 2018; Poghosyan, 2018).

When designing models for the functioning of comparative advantages about agricultural producers, an important place should be given, according to Baldos & Hertel (2015), to the practical results obtained, taking into account the characteristics of the climate, in order to characterize the optimistic and pessimistic results of rational distribution for further research of the global trading system in terms of ensuring improved long-term food security up to 2050 (Antimanon et al., 2018). Various economists propose these features as a scientific and practical solution. In terms of integration into a single model, as a rule, they include various quantitative estimates that allow achieving a systemic relationship between the quality and the number of activities carried out (Zheng, 2016). When studying the value of creating clusters in the agricultural sector of the economy, potential advantages and limitations of their development are also identified or based on the generated experimental data, widely used cloud systems are presented that allow achieving the desired effect of load balancing between the clusters themselves (Farhad et al., 2016; Leena et al., 2020; Genys & Krikštolaitis, 2020; Dunets et al., 2020; Dudukalov et al., 2021). In this regard, to preserve the nation's health, especially in the current global conditions after 2020. One of the determining factors will be the improvement of the agricultural sector of the economy based on the concept of the current system of food consumption for the formation of individual agro-industrial clusters that can take into account not only primary processing, storage, and sale of products, but also the social sphere, which has a corresponding well-established infrastructure.

Methods

When studying the activities of agricultural producers, the authors have applied statistical analysis methods and used a cluster approach based on the structure of metadata received from Rosstat of Russia. In terms of research in the subsector aspect of agricultural commodity producers for crop production, an indicator of the gross harvest was adopted for all enterprises, farmers, and households from 1990-2018. (see Figure 1).

Figure 1. Dynamics of Changes in The Structure of Agricultural Producers in The Crop Production Subsector,%
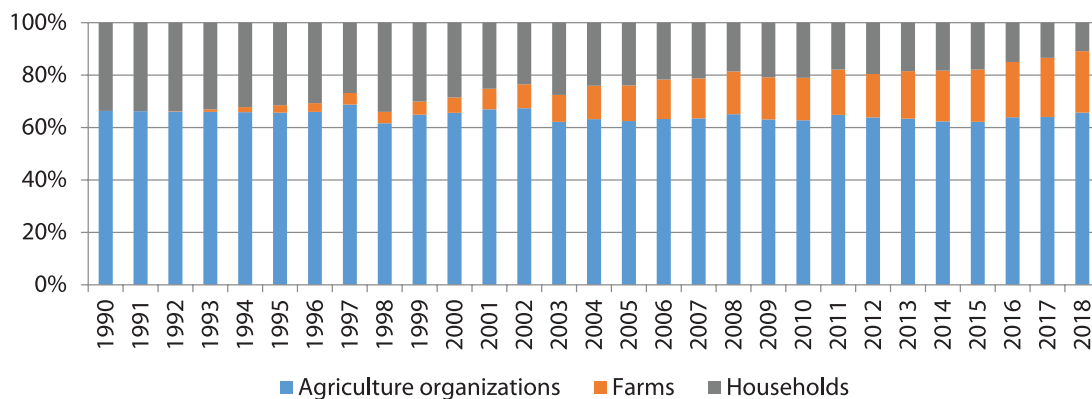
In the process of the identified relationships, built using the method of comparative analysis, we will outline the main factors that are mainly responsible for changes in the structure of gross receipts. In particular, if until 1990, the primary approach to the development of crop production was based on the development of new areas, in the analyzed period, the basis is technological irrigation, the transition to natural conditions, and the expansion of the range of individual farming for the production of an expanded range of products. When analyzing the structure of the gross harvest of crops for the period, it was revealed that the largest share in the gross harvest fell on organizations considered as agricultural producers. Moreover, for the period 2015-2018. the gross collection rate for agricultural producers has increased by 1.8%. The gross harvest from peasants and farms for the same period has not exceeded 0.95%. At the same time, for the period 2017-2018, the largest share in the structure of the studied indicator has been noted for companies engaged in agribusiness, based on the larger cultivated areas.

This aspect was primarily influenced by economic sanctions from the EU member states, considering the expansion of crop production potential concerning individual farmers. At the same time, the risk of returning the available potential land plots to the general turnover may, to a greater extent, affect the pricing policy, an increase in offers, which is not beneficial for large companies with an already established infrastructure. To a greater extent, the nature of the impact of EU sanctions on agricultural producers is a ban on obtaining cheaper borrowed funds from the banking and corporate sectors – obtaining longer-term loan funds at lower interest rates in comparison with the proposed domestic Russian banking structures. As a part of a comprehensive assessment of the structure of the gross harvest, of all the indicators of structural differences, reflecting the rate of change of the entire population for individual groups (Gatev's coefficient, Salai's index, Spearman's correlation coefficient), the authors have chosen the Salai index. At the same time, to differentiate the level of significance of the analyzed factors, the authors used an index adapted to the conditions of the task at hand:

$$J_S = \sqrt{\sum_{i=1}^{n} \frac{l_i}{\sum_{i=1}^{n} l_i} \left(\frac{d_{2i} - d_{1i}}{d_{2i} + d_{1i}}\right)^2} \qquad (1)$$

where d1i - is the share of the i-th agricultural producer in the reporting period;

d2i - is the share of the i-th agricultural producer in the base period;

li - is the coefficient of significance.

Figure 2. Characteristics of Changes in The Structure of Gross Harvest for All Agricultural Producers for The Period 1991-2018, %
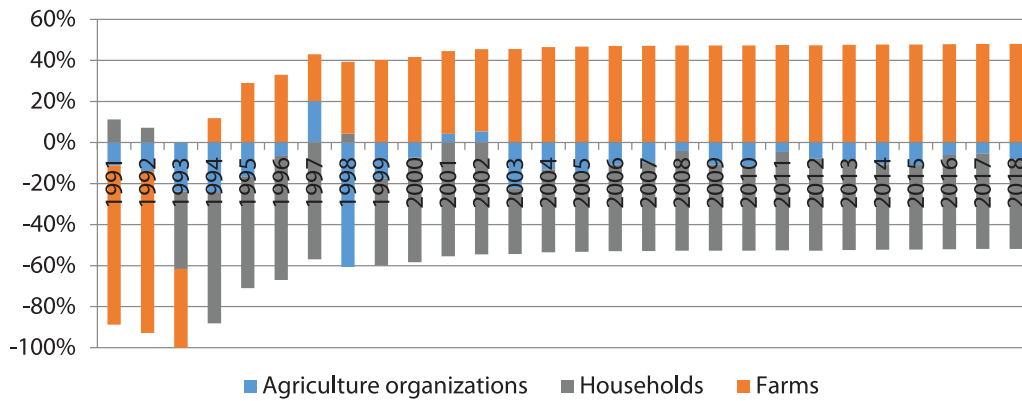
The results of the applied analysis show in Figure 2. It should be noted that the study of the dynamics of indicators in the structure of studies of gross harvest concerning agricultural producers to a greater extent for 1991-2018. showed the dependence of the quality characteristics. Thus, the analysis of statistical indicators showed that the dynamics of the summary indicators of the assessment of structural changes, which correspond to a measurement scale from 0 to 1 (the closer the value of the coefficient is to 1, the stronger the differences in the structure), are more adaptive and sensitive to the ongoing structural changes. Based on the calculation of the index of structural differences and the rank correlation coefficient in assessing the structural changes in the gross harvest of crops, the authors of the study used the adapted Salai index since it meets the basic requirements for the criteria: standardization, universality and sensitivity, and its interpretation is similar to other coefficients of structural changes. Note that the Salai index distinguishes from others the dependence on the specific share of each group, as a mathematical feature of the fraction formula (the denominator tending to 0 displays the value of the fraction 1, which leads to conclusions distorting reality). However, the calculations of the index (see Figure 2) showed that none of the shares of the gross collection structure in any period turned to 0, and therefore the use of the Salai index can be considered legitimate (Moreno et al., 2020).

Results and Discussion

When studying the nature of agricultural production, it is essential to consider the peculiarities of regional aspects that directly affect the structure of the gross harvest of crops. While analyzing relevant features for the concrete constituencies of the Russian Federation, which to a greater extent serve as the basis for the production of various crops, it has concluded that the most significant share falls on the Central Federal District, 30.0%, and the smallest - in the Far Eastern Federal District - only 2.0% (see Figure 3).

Figure 3. Characteristics of The Volume of Gross Harvest of Agricultural Crops in The Context of Individual Constituent Entities of The Russian Federation,%.
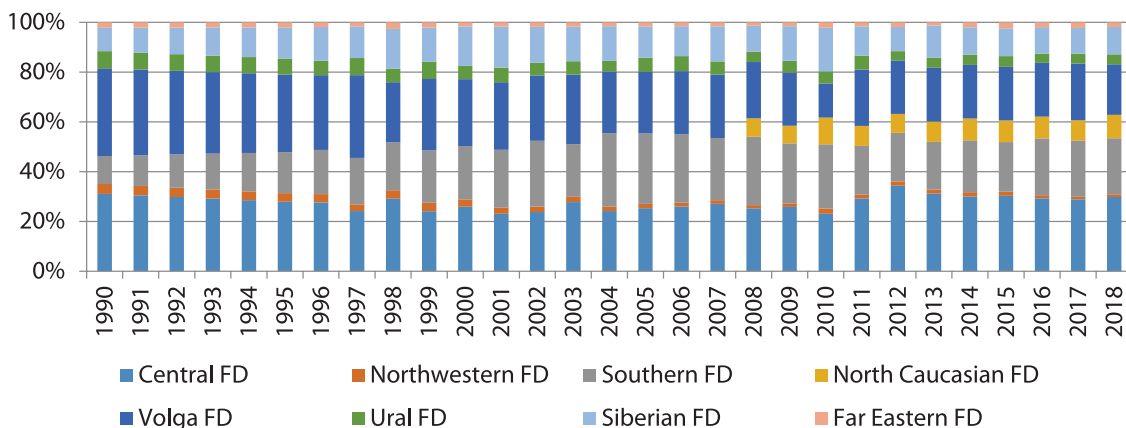
It should be noted that the identified features in the structure of the gross harvest for the corresponding constituent entities of the Russian Federation are determined both by various natural and climatic conditions suitable for growing crops and the value of the corresponding smallest value of their specific value, in particular for the Far Eastern Federal District. On the other hand, for the Central District, which is more significant in terms of relevant indicators, the most influencing factor is the indicator of the development of the financial and banking system compared to other federal districts. In this regard, most producers have opportunities to obtain preferential bank loans for the development and implementation of innovations. At the same time, analyzing the period 2015-2018, it can be noted that crop producers have been facing a choice: on the one hand, there was a prospect of more favorable development for domestic companies due to the introduction of a food embargo for EU countries, and on the other – since recurring macroeconomic problems have affected the agricultural industry as a whole, the lack of investment at the appropriate level did not allow to calculate cost recovery in the form of permanent investments in the industry, and cheap credit money stopped flowing into the Russian economy after 2015. Consequently, in the current situation, the agricultural industry needs support from the public sector, which is more supportive towards larger companies – and farmers and small entrepreneurs can rely only on their resources, particularly on the purchase of seeds and seedlings breeders fertilizers, agricultural machinery. At the same time, if in 1991 the largest share in the structure of the gross harvest of agricultural products was in the Volga Federal District (the share was 35.2%), and the smallest in the Far Eastern Federal District (2.2%), then by 2018 the share in Privolzhsky Federal District has decreased by 15%. The reason for this change was a decrease in the level of availability of financial and technological resources for agricultural producers (see Figure 4).

Figure 4. Characteristics of The Dynamics in The Structure of The Gross Harvest by The Constituent Entities of The Russian Federation,%
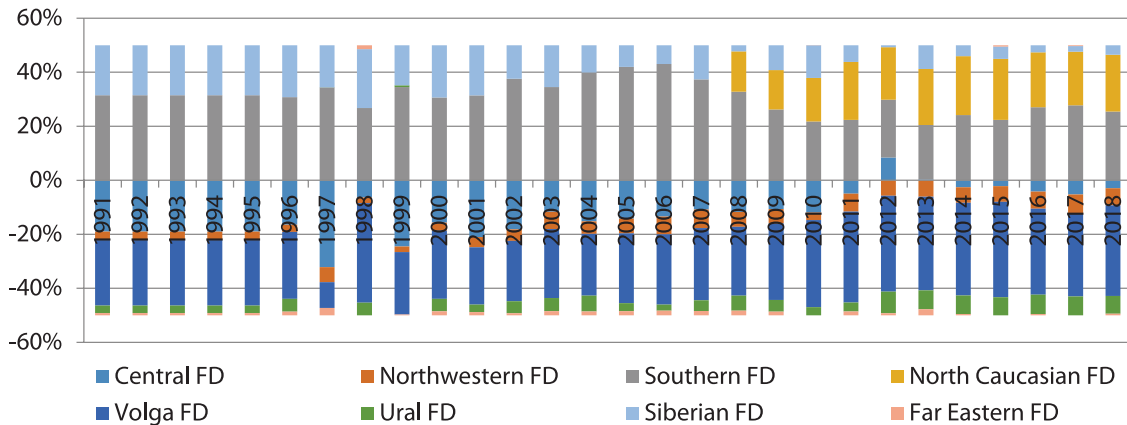
It should be noted that the dynamics of crop production are also influenced by various factors, in particular, the sown area, which is the most significant since it is characterized by the provision of land resources for agricultural producers. At the same time, in 2018, the largest share in the structure of sown areas was in the Volga Federal District (27.49%), the most minor - in the Northwestern Federal District (1.29%). In the base year 1991, the largest share in the structure of sown areas has also belonged to the Volga Federal District (30.18%). This condition is because the chernozem and meadow-chernozem soils of this region are the best for cultivating crops. Therefore, in comparison with 1991, the change in the structure of sown areas was insignificant. When studying the characteristics of the state of agriculture, it is necessary to take into account the indicators of the crop production sub-sector and such indicators as the volume of production of meat, milk, and eggs. These products are classified as strategic due to their high nutritional value. Therefore, it is necessary to identify the federal districts that are the leading suppliers of meat and meat products to the Russian market. The results obtained can be used in the formation and adjustment of the tasks of the state (see Figure 5)

The regional differentiation revealed in the study of the dynamics of dynamics in the structure of sown areas of crops for 1991-2017 allowed the authors to form the following conclusions. Firstly, the most significant volume of production by categories: crop, livestock, and poultry, belongs to the Central Federal District. Secondly, based on the volume of the cultivation area of crops and taking into account the production of milk and eggs and the types of feed consumption, the category of livestock and poultry is correlated to the Volga District. For the analyzed districts, only the Far Eastern district is characterized by the lowest values of agricultural development indicators. In this regard, for the development of agriculture in the medium term, it is necessary to attract sufficient financial capital, primarily for small farms, considering the acceleration of measures on the part of the state. At the same time, for large agricultural enterprises that have consistently changed their export orientation after 2015 to the Asian market, it is necessary to expand the offered range of livestock and poultry products to the Far

Eastern District. In this regard, the prevailing international competition from South American states may, to a greater extent, affect the general domestic market situation for crops.

Figure 5. Characteristics of Dynamics in The Structure of Sown Areas of Agricultural Crops,%
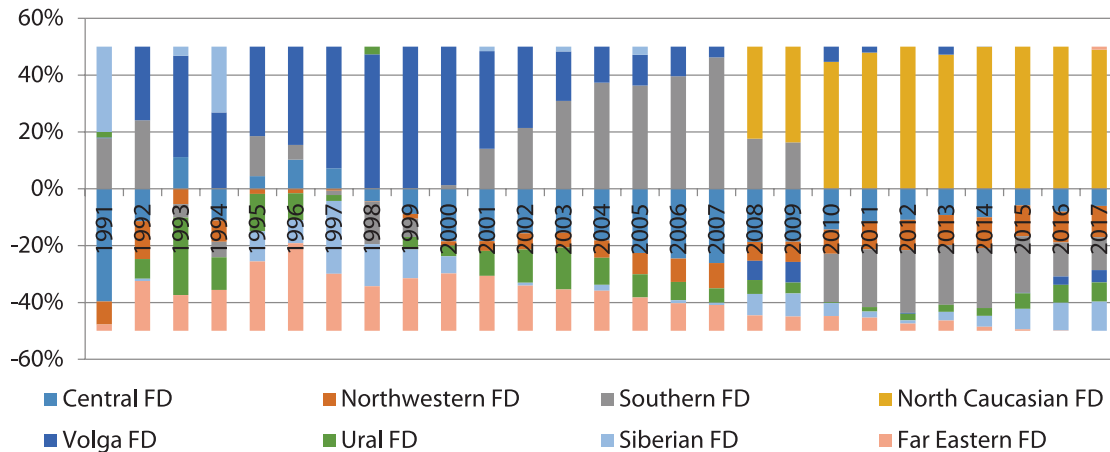
To ensure a high-quality food supply within the urban districts of most states depends on the level of concentration of agricultural and agro-industrial territories. At the same time, the use of anaerobic digestion based on the synthesis of biogas, which belongs to renewable energies, is a valid model associated with treatment to protect fertile soil. When studying the order of formation of the cluster formation of the agro-industrial type, modern researchers tend to use an integrated, hierarchical, and interdisciplinary approach (Silva et al., 2017). We can mostly agree with this since a critical approach in the foreground can contribute to more sustainable development and improve the quality of life (Ho et al., 2020).

At the same time, when conducting cluster analysis in the agro-industrial sector of the economy, it is possible to substantiate the need for further comparison of the results of evaluating standard regression models and taking into account variations within each subgroup for different periods of Taipova (2020). This approach is widely used in practice in agriculture and other spheres of the national economy (Decimo et al., 2017; Aleksandrova & Agapoya, 2019). However, when building a cluster analysis methodology, not only information technologies and economic and mathematical modeling can be used, but also statistical data sources contained in open sources (Luk'yanova & Kovshov, 2019; Vasconcelos et al., 2019). In particular, in the practical studies of European economists, the current connection between statistical methods and software products on the example of the Italian agroindustry made it possible to build clusters in agriculture and identify their relationship with industrial territories based on a generalization of the current regional policy (Toccaceli, 2015). Researchers cannot always suggest the extent to which it is necessary to maintain interaction between the state and private partnerships at the level of local self-government in the formation of clusters (Mollard, 2001). For

example, which factors should be considered when strengthening individual agricultural settlements based on direct budget subsidies (Toccaceli, 2006) or forming clusters to increase competitiveness in the production and marketing of agricultural products (Conti et al., 2019).

It is crucial to ensure the appropriate standards to create centralized water supply, gas supply, or liquefied gas systems for collective use to develop infrastructure support for the cluster of an agricultural settlement (Iacondini et al., 2015; Ostapets, 2019). Streets with at least 80% hard road surface and a network of road surfaces that provide communication with settlements in the service area. Digital infrastructure facilities provide communication in hard-to-reach areas and warning systems against forest fires (Memarzadeh et al., 2013) and objects of social sphere and housing and communal services and organization of ecological tourism (Kokkinos et al., 2019).

Conclusion

Direct budget subsidies (usually in the form of special road maps) are mostly used to implement state support for the agro-industrial sector of the economy. In addition to subsidies, the state can implement other support methods in terms of tax incentives and other non-tax measures. As a rule, these methods must be carried out on a systematic basis, taking into account various incentive tools. The methods through the formation of the advanced technologies that have been introduced in states with appropriate industry specialization, taking into account the consumption of financial resources for the development of domestic technologies in the field of the agro-industrial complex and the harmonious agricultural environment through the use of institutions capable of becoming incubators for farmers producing products. In order to reduce the systemic risks inherent in the activities of business entities in the field of agriculture - the agro-industrial cluster, one of the existing ones in practice is the creation of a rural municipal formation of a mixed type (agricultural settlement cluster, ASC). This approach is based on an average settlement in which the majority of the population is engaged in agriculture that considers the corresponding infrastructure's functioning. In terms of its function, the ASC cluster can attribute to the structure of the agro-industrial. This aspect is understandable since it combines digital infrastructure in the production, primary processing, storage, and marketing of agricultural products. As the operating principles of ASC activities, they can be as vertically integrated farming complexes, carried out based on a unified management system, taking into account the peculiarities of the development of social infrastructure, which is capable of ensuring an appropriate quality of life for the population and preserving the ecological component. In turn, in the horizontal plane - small localizations, built on the principle of a single agricultural park capable of timely diversification of its production (vegetable growing and cattle breeding, before crop production and provision of services in the core innovation sphere).

Thus, the formation of a cluster in the form of ASC will allow to a greater extent, to combine into a common established system from production and processing to the

sale of finished agricultural products both at the local and federal levels. This approach will significantly harmonize the interests of all participants in the agroindustry and significantly simplify and expand access to external export markets, thereby reducing the cost of marketing research and secondary service industries and contractors. At the same time, a cluster in the form of ASC will increase the overall economic impact on individual farmers, which will have a more significant impact on the development of non-raw material zones employed to produce agricultural products. Therefore, it will increase jobs in small townships and contribute to the non-transfer of competent workers to large cities and metropolitan areas.

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Smart-Specialization of The Agro-Industrial Complex in The Context of Digital Transformation of Regional Economic Systems

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Abstract
This article presents a domestic and foreign experience of "smart specialization" in agriculture in the digital economy. The method of calculating the indicators of digital maturity of the agro-industrial complex is considered. The forecast of indicators value of the agro-industrial digital maturity is presented until 2030. The article proposes a mechanism for adapting the smart specialization in agriculture. We consider it appropriate to introduce an online digital platform in agriculture, which allows creating conditions for interaction between sellers and buyers of regional agricultural machinery and related products. Based on the presented mechanism of adaptation of "smart specialization "in the field of agro-industrial complex, it should be noted that" smart specialization" is aimed at using the links that arise between the regions of economic activity. The priority areas of activity of the agro-industrial complex are presented.

Keywords:
smart specialization, agro-industrial complex; digital technologies; digital maturity

Introduction

Modern regional economic systems operate in conditions of global competitiveness. In the context of digital transformation, the foundation for achieving such competitiveness, including in the agro-industrial complex, can be intensifying interregional cooperation on the principles of "smart specialization." Developing "smart specialization" mechanisms in the agro-industrial complex requires research and improvement of the existing experience of implementing its principles, methods, and approaches in various countries. The activation of "smart specialization" can be a factor in the effective digital transformation of the agro-industrial complex of regional economic systems. The introduction of digital technologies provides a new stage in the development of the agro-industrial complex. Based on the use of advanced foreign experience, digital technologies are already introduced in the agro-industrial complex of many regions of the Russian Federation. However, the so-called "digital skills gap" between regions is constantly growing at the same time. At the same time, according to many experts, in the foreseeable future, it is the personnel with the necessary digital skills that will have competitive advantages in the labor market. Today, an acute shortage of such specialists acts as a powerful deterrent to the digitalization of the economy, including the agro-industrial complex. The preparation of students of an agricultural university is impossible without using practice-oriented training, the concept of smart technologies, ERP systems, e-learning, digital educational resources, and the participation of students in innovative projects.

The Smart Specialization Strategy is core to the economic development and growth policy. It is the central pillar of the Europe 2020 strategy and represents a profound structural revolution in developing regional innovation policy (OECD, 2013), which seeks to identify potential and real regional development priorities. "Smart specialization" arose from the idea that regions across the European Union have different economic and institutional structures that shape opportunities for their future development (Foray et al., 2011; Camagni & Capello, 2013; Kroll, 2015). The goal of "smart specialization" is not to make the economic structure of the regions more specialized (that is, less diversified), but to use existing strengths, identify hidden opportunities, and create new platforms on which the regions can create competitive advantages in high-value-added activities.

Foray (2018) argues that "smart specialization" involves selecting and identifying new effective and efficient activities. There is a need to consider the heterogeneity of research models and technological specialization (Giannitsis & Kager 2009). The development of the "smart specialization" strategy is the result of a "paradigm shift" in the development of the European Union's cohesion policy, from the predominantly redistributive logic typical of the last century's approach to the logic of development (Capello & Cerisola, 2020). The previous logic was based mainly on the perceived need to compensate the lagging regions for the lack of particular prerequisites for growth, infrastructure, and access to education and health care (Fernandez, 2011). The new logic, driven by the general conditions for reducing public resources and achieving overall spatial efficiency and competitiveness, mainly advocates endogenous development, continuous innovation, and the prospect of growth (Foray, 2018).

Zemtsov & Barinova (2016) justified the need for a differentiated regional innovation policy in Russia based on "smart specialization" principles, which are aimed at preserving human capital and forming innovative entrepreneurship. The papers from Kutsenko et al. (2018) and Kutsenko et al. (2019) show that traditional regional innovation strategies in Russia meet most of the criteria for smart specialization. At the same time, in the absence of common rules for selecting, verifying, and synchronizing innovation development priorities, a common analytical database, organizational support tools, and expertise, even regions with high innovation potential find it challenging to form and implement unique strategies that fully comply with the principles of smart specialization. The formation of nonlinear network models of production and export diversification requires the formation of innovative clusters with "smart" specialization as local nodes of the GVC and the priority of improving the economic environment for continuous technology updates throughout improving the technologies themselves. The article by Kupriyanov (2019) considers the main aspects of using the concept of "smart specialization" in the activities of domestic and foreign companies, the influence of the cluster structure of the economy on the specialization of regions, the problems of forming regional economic strategies, the models of the innovation cycle, the model of the process of developing and implementing the strategy of innovative development of the region, the conditions of state support for the innovation system of Russia.

Currently, there are many difficulties in introducing "smart expertise" in agriculture and the digital evolution of the region's economic systems. In the light of the transition to the fourth industrial revolution, traditional systems of interaction and organization of production processes lose their former relevance and become uncompetitive. To increase competitiveness in the domestic and global markets, enterprises of various industries need to follow modern trends and modernize the production base and management system by introducing technologies based on artificial intelligence. Enterprises of the agricultural sector search and test various intelligent technologies get positive results from their application, which is reflected in profitability (Fedotova et al., 2019). Salnikov et al. (2018) analyze the technological system changes in the agro-industrial complex, the growth of the market volume of agricultural products in Russia due to the introduction of advanced information and technological solutions. The "road map" for developing the food market developed by the Agency for Strategic Initiatives is considered. Priority market segments are identified: "smart" agriculture, accelerated breeding, new sources of raw materials, affordable organic products, personalized nutrition.

This research aims to present a study of domestic and foreign experience of "smart specialization" in agriculture in the digital economy. The most popular areas in developing new information and communication technologies, automation, and robotics are noted: unmanned aerial vehicles, unmanned tractors and combines, the Internet of Things in agriculture, GIS technologies (remote sensing of the Earth), and distributed registries (blockchain). It is planned to integrate the technologies listed above for use in the management of agricultural enterprises in a single complex. It is noted that the data of

the Russian federal state statistics service on the dynamics of agricultural development show successful attempts of the state authorities to digitize the agro-industrial sector. This action through the development of state programs and creation of an agricultural ecosystem; the comparative characteristic of small businesses and start-ups is given. Key difficulties in the development and implementation of start-ups in the agricultural sector of the economy are identified (Sheina & Zavyalova., 2019).

Methods

This study is based on bibliographic, institutional, comparative methods of analysis, and the method of ranking and expert assessments. The object of the analysis is the concept of "smart specialization" in the agro-industrial complex, the experience of application in foreign countries, and the forms of development of "smart specialization" in Russia.

The following methods have been considered/applied to achieve the objectives: (a) Methodological approaches to development priorities; (b) Orders from the Ministry of Finance of the Russian Federation No. 600 of 11/18/2020 and No. 601 of 20.11.2020, which are quantitative indicators of digital transformation, the method of predicting the values of these indicators determine and predict the digital transformation of the people of the Russian Federation (Orders of the Ministry, 2020).

The article considers the method of calculating the "digital maturity" of the agro-industrial complex of the Russian Federation (1) (Orders of the Ministry, 2020). The percentage of achieving the target value of the number of ICT specialists in 2019 (base) - (1)100%; 2030 (target) - 125%. Percentage of achievement of the target value information technology expenditures in 2019 (base) - (1)100%; 2030 (target) - 200%. The share of achieving the target value of the maturity of the agro-industrial complex in 2019 (base) -0%; 2030 (target) -125%.

$$\text{Digital Maturity} = 0.25*(ICT) + 0.25*(IT) + 0.5*(IDM), \qquad (1)$$

Where are ICT- share of specialists in information and communication technologies, %; IT- share of the spending on information technology, %; IDM- the index of maturity of the agro-industrial complex, % (2).

$$IDM = (x_1 + x_2 + ... + x_{15})/(n)) *100\% \qquad (2)$$

n - number of indicators of the agro-industrial complex.

Table 1 shows the indicators for calculating the "digital maturity" of the agro-industrial complex (Orders of the Ministry, 2020). Using this method, we will determine the base value of the "digital maturity" indicator of the agro-industrial complex in 2019. Further, the dynamics of "digital maturity" values over the years, i.e., forecast, are formed by attracting expert knowledge. The source of statistical indicators used to assess the level of digital transformation of regions is the official publications of statistical bodies, the Ministry of Economic Development, the Ministry of Agriculture, and the Ministry of Digital Development, Communications, and Mass Media of the Russian Federation.

Table 1. Indicators for calculating the "digital maturity" of the agro-industrial complex

No	Indicator name	2019
X_1	The share of agricultural producers with a digital profile that characterizes their economic activities	0.007
X_2	Percentage of farm animals with a digital profile	0.003
X_3	Percentage of breeding farm animals with a digital profile with data on genetic potential	0.003
X_4	The share of paperless transactions aimed at the sale of agricultural products, raw materials and food	0.024
X_5	The share of agricultural producers that generate industry and financial and economic reports automatically based on the data of accounting systems	0.045
X_6	The share of agricultural producers with a digital profile that characterizes their economic activities	0.012
X_7	Percentage of agricultural machinery and equipment with a digital profile	0.023
X_8	Percentage of agricultural land with a digital profile	0.036
X_9	The share of paperless transactions aimed at the sale of agricultural products, raw materials and food	0.039
X_{10}	Share of arable land processed by unmanned tractors and self-propelled machines	0.004
X_{11}	The share of agricultural producers that generate industry and financial and economic reports automatically based on the data of accounting systems	0.042
X_{12}	The share of agricultural producers with a digital profile that characterizes their economic activities	0.012
X_{13}	Percentage of vessels engaged in paperless document management within the framework of catching aquatic biological resources	0.018
X_{14}	The share of paperless transactions aimed at the sale of agricultural products, raw materials and food	0.006
X_{15}	The share of agricultural producers that generate industry and financial and economic reports automatically based on the data of accounting systems	0.015

Results and Discussion

The practice of foreign experience in the field of "smart specialization" in the field of the agro-industrial complex made it possible to develop new directions of digital transformation and develop a conceptual apparatus of "digital maturity". The digital maturity of the agro-industrial complex shows the degree of readiness for the implementation of digital solutions in the agro-industrial complex (Orders of the Ministry, 2020). The methodology for calculating the "digital maturity" of the agro-industrial complex proposed by the Ministry of Digital Development, Communications and Mass Media of the Russian Federation makes it possible to identify not only the level of readiness for implementation, but also to prepare strategies for the digital transformation of regions (features of the digital transformation of the agro-industrial complex). They also include assessing the current level of digitalization, defining target prospects and key performance indicators, providing human resources, creating a digital transformation management system and financial models, as well as roadmaps. To form a forecast for the development of digitalization and the achievement of "digital maturity" of the agro-

industrial complex, it is necessary to determine the basic value of "digital maturity". The authors of the article take 2019 as the base year. Using the formula (1), we calculate the index of maturity of the agro-industrial complex (see Table 1).

$$IDM = (0.007 + 0.003 + 0.003 + 0.024 + 0.045 + 0.012 + 0.023 + 0.036 + 0.039 + 0.004 + 0.042 + 0.012 + 0.018 + 0.006 + 0.015)/(15)) *100\% = 1.9\%$$

Next, authors have calculated the "digital maturity" of the agro-industrial complex in the Russian Federation (2).

Digital Maturity (the agro-industrial complex) = 0.25*(100) +0.25*(100) + 0.5*(1.9) =50.75%

Figure 1. Forecast of The Value of The Agro-Industrial "Digital Maturity" Indicator until 2030
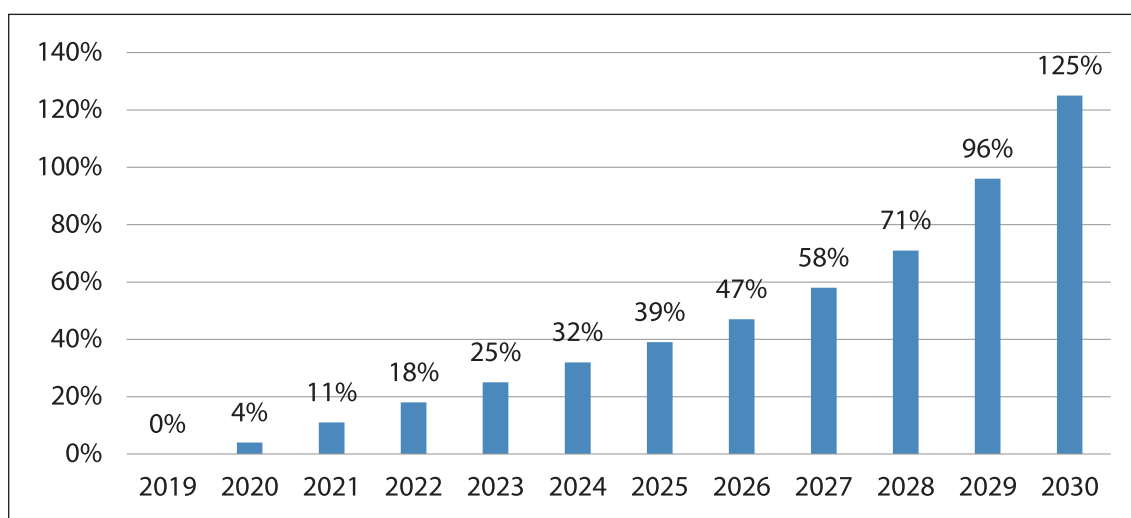
The "digital maturity" of the agro-industrial complex in the Russian Federation in 2019 is 50.75%. This corresponds to the intensive pace of digitalization of the regions of the Russian Federation. We equate this value to 0% for the forecast assessment of "digital maturity" until 2030. Based on the data received, we will predict of the "digital maturity" of the agro-industrial complex of the regions of the Russian Federation (see Figure 1). The planned level of "digital maturity" of the agro-industrial complex in 2021 is 11% and is projected to reach 100% of the "digital maturity" of the agro-industrial complex by 2030 (See Figure 1).

To effectively implement the planned digital transformation strategy of the regions, a mechanism for implementing "smart expertise" in the field of agriculture has been proposed, which we call the "online digital platform in the field of agriculture", which allows for interaction between sellers and buyers of agricultural products Provides regional, related equipment and products. "Digital online platform in agriculture" acts as an effective online tool for agro-industry complexes with price collecting performance, CRM and ERP systems, business analysis, etc. It is also worth mentioning the benefits of this operating system in the difficult conditions that have arisen in the world in connection

with the epidemic of COVID-19. The market allows you to trade any distance, which means it has another important option - it helps keep you healthy" (see Figure 2).

Figure 2. The Mechanism of Adaptation of "Smart Specialization" in The Field of Agro-Industrial Complex
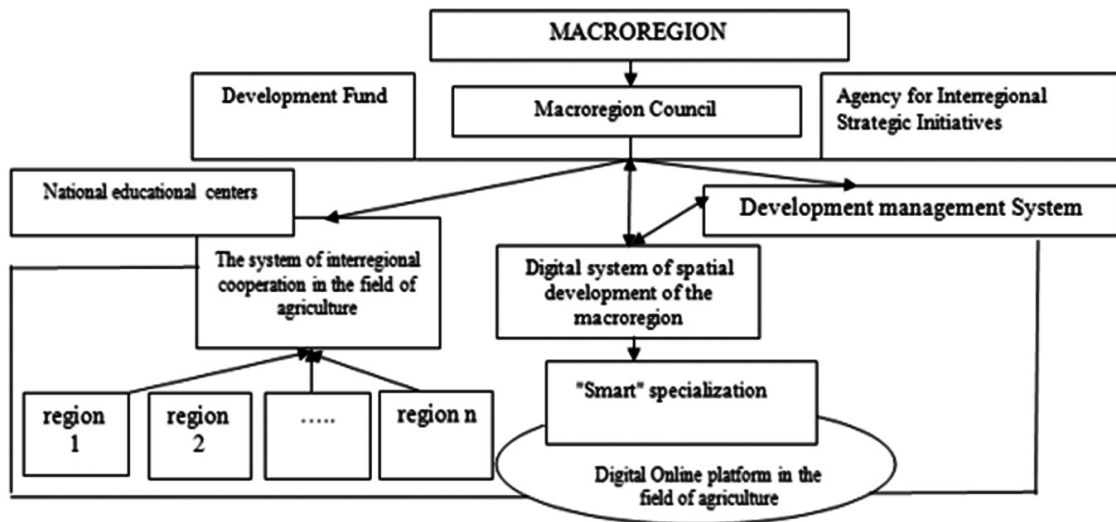
Based on the presented mechanism of adaptation of "smart specialization" in the field of agro-industrial complex, it should be noted that "smart specialization" is aimed at using the links that arise between the regions of economic activity. The agro-industrial complex is an element of the innovation ecosystem of the regions, while "smart specialization" is a much broader policy aimed at transforming the system itself. "Smart specialization", which includes an online platform in the field of agro-industrial complex, involves the inclusion of a development management system, interregional cooperation in the field of agro-industrial complex, a digital system of spatial development of the macro region, which will stimulate new areas of knowledge dissemination with a high degree of impact on economic growth in the context of digital transformation.

Thus, it is possible to consider the priority areas of activity of the agro-industrial complex of the Belgorod region in 2019 (see Table 2). Authors have found that livestock product (in particular, pig production and products of primary processing of livestock), as well as the production of cereals and legumes are the leaders in the production market of food products in the Belgorod region. Based on the above, we can conclude that the most significant innovations in the food sector of the agro-industrial complex of the Belgorod region should be in these industries. To implement the concept of "smart specialization", it is important to pursue a policy of holistic economic development and only in tactical terms it is advisable to allocate temporarily priority industries. The core of the region's "smart specialization" industries should sustainably reproduce itself on a new technological basis, constantly involving other industries in the orbit.

Table 2. Priority areas of activity of the agro-industrial complex of the Belgorod region for 2019 Calculation based on (Russia in numbers, 2019)

Industries, products	Million rub	As % of total
Crop production, total	19447	27.6
Grains and seeds of cereals and legumes	12050	17.1
Soy Sunflower	3748	5.3
Seeds	2326	3.3
Open ground vegetables	119	0.2
Sugar beet root vegetables	560	0.8
Vegetable feed	495	0.7
Production of fruit and berry perennial plantings	94	0.1
Livestock products, total	30459	43.3
Live weight of pigs	20301	28.8
Live weight of poultry	2288	3.3
Raw cow's milk	5067	7.2
Eggs	2918	4.1
Commercial fish farming products	93	0.1
Production of primary processing of crop raw materials, total	930	1.3
Products of primary processing of livestock raw materials, total	19029	27.0
Industrial processing products, total	506	0.7
Total	70371	100

Conclusion

A distinctive feature of the "smart specialization" strategy is its scalability, i.e., the possibility of using it outside the EU. This strategy has been implemented in Australia, Korea, South America, and other countries. It is necessary to pay attention to the characteristics of the institutional environment of regional development to use the "smart expertise" strategy in Russia. An essential component of strategies is the availability of an appropriate institutional framework, as "smart expertise" means a significant change in existing agro-industry policy and interaction principles between inter-regional development stakeholders. The concept of "smart specialization" is the combination of innovative and regional approaches. The concept must ensure the interaction between regional "smart specialization" in agriculture, considering regional economic systems and digital development processes. Since the Russian Federation is expected to achieve 100% "digital maturity" of the agro-industrial complex by 2030, we have proposed a mechanism for adapting "smart expertise" in the field of agro-industrial complex in the process of digital transformation of regions.

Acknowledgment

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The Relationship between ES-QUAL Model and Online Purchase Intention in the Context of Rising Global Marketplace of E-Commerce

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Abstract

The global ecommerce has fostered the global trade many folds. The electronic service quality (ES-QUAL) of the e-commerce service providers plays a central role. The primary purpose of this paper is to investigate the effect of the ES-QUAL model's four dimensions (efficiency, fulfillment, privacy, and system availability) on purchase intention and examine ES-QUAL's relationship with electronic word-of-mouth (EWOM), brand image, and purchase intention. This research uses Structural Equation Modeling (SEM) for empirical analysis. Results show ES-QUAL model positively and significantly impacts purchase intention, and the effect of the ES-QUAL model relatively increases when mediated by electronic word of mouth (EWOM) and brand image. This research provides insights to E-marketers, entrepreneurs, and e-commerce players to improve online consumers' purchase intention, sales, and services. Practitioners can gain customers' attention by enhancing the quality of their websites and by assuring efficiency, privacy, system availability, and fulfilling their promise about delivering products. They also need to consider EWOM and brand image, as both positively impact online purchase intention, which can lead to the overall sustainable development of an organization.

Keywords:
ES-QUAL model, electronic word of mouth (EWOM), brand image, purchase intention, digital marketing, e-commerce

Introduction

Global e-commerce has increased global trade many folds. Multinational and global companies, startups, and small and medium enterprises (SMEs) sell their products online. E-retailers observe buying and selling trends in individual target markets and offer customized products to match the local customers' needs and demands. It translated into the emergence of hyper-localization, which became a new strategy in global e-commerce (Singh & Keating, 2018). With the advent and advancement of globalization and digitization or so-called digital-globalization, the global supply chain has been reshaped due to technological breakthroughs (Baqai & Qureshi, 2020; Herold et al., 2021). In the wake of the sudden assault of the pandemic COVID-19, the global e-commerce industry observed an unexpected boost to US$26.7 trillion in 2019, as per the available statistics. However, a few sectors like ride-hailing and online travel services recorded losses. The top three countries in the global e-commerce marketplace include China, the USA, and the UK. While surprisingly, the Republic of Korea is at number four. In the arena of business to consumers (B2C) e-commerce companies, two China-based global companies won two slots in the top-three companies, including Alibaba, followed by Amazon USA and JD.com from China (United Nations Conference on Trade and Development, 2021).

The spectrum of online shopping is one of the widely growing business developments, altering the way customers shop (Nagra & Gopals, 2013). Online shopping possesses an apex position to increase customers' satisfaction and loyalty. In developed countries, online shopping is now considered the most convenient medium of buying. Since in e-business, everything is just one click away where customers shop ubiquitously or 24/7. This trend is getting widely popular in Asia, specifically in the least developed countries (Bashir et al., 2015), because it is considered the most convenient way of shopping. It provides a wide variety and choices with one click, and customers can easily match prices in their range and compare the different products in terms of quality and prices to make decisions. In today's fast and busy life, online shopping provides contentment and peace to those customers who desire to get a more convenient way to shop without wasting time (Yu & Wu, 2007). Despite its wide popularity and convenience, online shopping in Pakistan is not growing on the ideal model. The majority of the customers do not rely on the services or products being sold online as they display something else and deliver something else, and customers end up disappointed. Researchers claim that looking at the shoppers can provide vital guidelines for its growth (Bashir et al., 2015).

For fostering global trade, ecommerce has played the foremost essential role. Ecommerce requires interaction between the global buyers and sellers through the Internet, i.e., via websites, social media, emails, and other digital means including the digital marketing tools. In this nexus, e-service quality plays a pivotal role. ES-QUAL model's four dimensions (efficiency, fulfillment, privacy, and system availability) have been extensively used to measure the quality of E-shopping (Chiou & Shen, 2006; Enzmann & Schneider, 2005; Ribbink et al., 2004). Some researchers (Ribbink et al., 2004) posit that purchase intentions of E-shoppers can have long-haul sustained effects on customers' satisfaction and loyalty (Yu & Lee, 2019).

Parasuraman, Zeithaml, & Malhotra (2005) studied the dimensions of ES-QUAL model and designed its scale. Jalilvand & Samiei (2012) and Charo et al. (2015) investigated the impact of EWOM on brand image and purchase intention. Ahmed, Romeika, Kauliene, Streimikis, & Dapkus (2020) ascertained ES-QUAL model's efficacy on customer satisfaction. Thus, there is a need to bridge this research gap by empirically examining the influence of ES-QUAL model on purchase intentions by examining the mediating effects of E-WOM and brand image in this context, which forms the basis and core objective of conducting this probe. This paper diffuses three models and contributes to the theory of service quality and ES-QUAL model in the contexts of online consumer behavior, online shopping, and ecommerce.

Purchase intention can be categorized as the decision in which we focus why a customer buys a product or brand online in particular. It is about how a customer prefers buying one product or brand over another to make a purchase. A customer focuses on specific brands and intends to purchase not only because of his/her attitude towards specific brands, but also focuses on other brands' features before making a choice (Porter, 1974). Engel et al. (1995) divided purchase intention into three layers of buying including unplanned, partially planned and fully planned. Unplanned buying can be defined as a consumer's plans to buy while s/he is in store (physically or virtually), which is also referred as the impulse buying. Partially planned buying is the decision of the customer in which s/he decides the category and specification of a product before making a purchase. Fully planned buying behavior refers to the customer who has already decided what brand, product or type with the specification and attributes s/he is going to buy. For sustainable business development, firms need to build goods or service brands with unique features, attributes and benefits, which should be available online too for the sake of convenience of the customers (Enache, 2015). Credibility of websites appears crucial for forming online purchase intentions (Siddiqui et al., 2021).

Online shopping has been fostering in Pakistan, but the quantity of users is yet beneath the world average, but people have some understanding of online shopping. According to experts, the reason why less people shop online is "payment mode", but as per an estimation, about 28% of the country's population will have access to the internet in coming five years. The electronic products like computers and cell phones are making 40% online sales, and this size seems to grow in future too. It is revealed that those retailers who have virtual and physical stores observed 23% growth in the business (Ahmed, 2015). The State Bank of Pakistan's payment system review in the year 2018, about 344 E-commerce merchants were registered in Pakistan and the number reached to 905 till the end of 2017, which points out the popular trend of online shopping (Khan, 2018). Most people living in the rural to urban areas of Pakistan have become familiar with online shopping and online banking, and have intentions to purchase online (Ahmed, et al., 2020; Baqai & Qureshi, 2019). Jain and Sareen (2014) investigated various elements that affect online customer's behavior. The study recognized individual beliefs of the members of a society, technological environment, attitude of customers, and effort expectancy as essential factors, which alter customers' purchase

intentions. Kushwah & Bhargav (2014) studied young people's perceptions of online shopping and differences in their expectations. The results show that if someone wants to attract customers for online shopping, they need to work on websites to enhance the performance, so that they can bridge the gap between perceptions and expectations of people about online shopping.

Electronic service quality can be defined as customers' judgment and evaluation of E-service quality and how it delivers service to them. In connection with service quality theory (Hill, 1997), previously SERQUAL model which is a multi-item scale contained five dimensions, which include: tangibility, reliability, responsiveness, assurance and empathy. But afterwards, its validity was challenged because previously it was used for investigating customers' satisfaction for the service industry. Now the trends have been changed, online shopping has gained more attention and popularity; many people are moving towards online shopping instead of using that conventional mode of shopping. That is the reason, authors realized the need to upgrade SERQUAL model (Zeithaml, Parasuraman, Malhotra, 2002) with ES-QUAL model.

Parasuraman et al. (2005) introduced the ES-QUAL model in 2002 but Parasuraman & Zeithaml proposed its modified version in 2005. This model is basically used for measuring the service quality delivered by a website from where customer shops. First, they examined the ES-QUAL model by using a focus group in a qualitative study and found eleven dimensions, then they compressed and modified it, and came up with four dimensions only. They contain: *Efficiency* - this dimension can be defined as having easy-to-use, user-friendly, and speedy attributes of a website. *Fulfillment* - it is related to the fulfillment of promise about delivering the item. *Privacy* - this is the assurance that the website is free from any danger regarding protection of customers' information and transactions. *System Availability* - it is related to the technicality and practicality or functionality of the website (Ahmed, et al., 2020; Baqai & Qureshi, 2019). If a website or web service is not efficient, does not fulfill its promise, for instance delivering goods on time, does not keep the customers' data confidential, and is not technically sound, the overall e-service quality will be affected, which generally translates into customer dissatisfaction and brand switching. Such conditions create negative perceptions of online consumers and global customers towards ecommerce and online shopping. ES-QUAL model has a linear relationship and effect on purchase intention (Ahmed, et al., 2020; Chang & Liu 2009; Chen & Hitt, 2002; Kenova & Jonasson, 2006; Khalifa & Shen, 2005; Parasuraman et al., 2002; Wenying & Sun, 2010).

The extant literature indicates that E-service has a relationship with online purchase intention, so our proposed hypotheses for ES-QUAL model and purchase intention include:

H1. Efficiency has a positive and significant impact on purchase intention.

H2. Fulfillment has a positive and significant impact on purchase intention.

H3. Privacy has a positive and significant impact on purchase intention.

H4. System availability has a positive and significant impact on purchase intention.

Recently the heavy usage and widespread popularity of social media sites for example, Google, Facebook, Yahoo, and Twitter completely altered word-of-mouth (WOM) communication into electronic word of mouth (E-WOM). Now it does not matter for individuals to share information face-to-face or electronically. EWOM is not only limited to friends' circle, it can be shared even with a wide audience on a platform, called social network. With the arrival of advanced technology, the reach of WOM has been extended in the form of EWOM. After having access to the internet facility of 3G and 4G in smartphones, now social networks have become necessities of life for everyone, and it has become a trend for customers to seek information on social sites before buying any product (Charo et al., 2015). In the context of EWOM/eWOM, opinion leaders, so-called influential marketers heavily influence public opinions (Zhou et al., 2019). To measure the effectiveness of Facebook advertising, it was uncovered that EWOM influenced purchase intention (Chetioui et al., 2021). The usage and efficacy of EWOM has been witnessed in various industries around the world, such as online shopping, online banking, booking of hotels, and digital commerce (Lee et al., 2021; Verma & Yadav, 2021).

Many researchers have studied the effects of electronic word of mouth on purchase intention in different parts of the world. According to Henning-Thurau, et al. (2004), EWOM is considered as any negative or positive review or statement made by current or former customer or consumer about a product, service, or company, which is available to a large population to review before buying the product. Researchers are more concentrating in analyzing the motives for searching EWOM (Goldsmith & Horowitz, 2006) and to share and express their opinions that have logical implications to marketers, so that they can understand in a better way about online customer behavior (Hennig-Thurau et al., 2004). Considering the scenario when consumers want to buy a product, they mostly seek information about quality, and with the help of internet search, information has become more frequent. EWOM in the form of online reviews is an essential source to get information about products' quality and in several cases, it builds customer loyalty (Gruen et al., 2006). According to one survey conducted by Comscore (an internet marketing research company), it found that about 24% are those who check online reviews and give importance to offline service delivery; and firms are increasing in number that concentrates on online mode and enjoying its benefits (Dellarocas, 2003).

By the end of 2020, the Internet users in the country reached to 44.6 million (Pakistan Advertising Society, 2020). It is estimated that 20.6% of Pakistan's population used social media (Datareportal, 2021). Pakistan's social media introduced an attractive scenario for different firms and brands to take advantage of this platform. As per one estimation, about 60% of those who used the internet interacted with brands only and around 53% out of total users on social media used Facebook. The total number is increasing quarterly as in Pakistan one out of five Facebook users made decisions induced by Facebook ads (Pakistan Advertising Society, 2020). With the heavily increased usage of social networks, consumers are more aware about different choices and EWOM is playing a pivotal role in it. The digital customer-brand engagement has further corroborated the relationship between companies and customers (Eigenraam et al., 2018), which strengthens global ecommerce.

Hence, on the basis of extant literature, our hypotheses include:

H5. Electronic word of mouth mediates the relationship between efficiency and purchase intention.

H6. Electronic word of mouth mediates the relationship between fulfillment and purchase intention.

H7. Electronic word of mouth mediates the relationship between privacy and purchase intention.

H8. Electronic word of mouth mediates the relationship between system availability and purchase intention.

H9. Electronic word of mouth has a positive and significant impact on purchase intention.

Brand image can be defined as the perception of a consumer regarding a specific brand that what image s/he possesses in mind about it. A consumer interprets a brand's image on the basis of the personality of a brand. It takes time to be developed; it depends whether it develops through advertisements or publicity or with the personal usage experience of consumers (Aaker, 1996). According to previous studies, Wu & Lo (2009), a consumer perceives a brand subjectively and/or objectively. They perceive a brand's image objectively by seeing its promotional activity cost, its market share, and strong distribution channel, then on that basis consumers consider a brand as inferior or superior. While they perceive a brand subjectively by seeing its advertising and other communication messages, they develop feelings and opinions based on their experiences. Regarding brand image, Jalilvand & Samiei (2012) thought that the customer is not buying only the product/service, but s/he also has the image associated with that product/service. Brand images must be positive, different, and even instant. Brand image has the ability to strengthen a brand with the help of brand communications for instance, advertising, packaging, word of mouth publicity, and other promotional tools. Siddiqui, et al. (2021) found that the credibility of social media websites plays a salient role in developing brand image and online purchase intention. The brand experience paves the way for building brand image and brand love (Joshi & Garg, 2021).

Globally, firms have tremendously invested for the creations and development of the brand. Creating a brand means creating an image of the brand in a unique way that the entire firm's competitors associate with that brand. Aaker (1991) defined brand equity as "a set of brand assets and liabilities linked to a brand, its name and symbol that add to or subtract from the value provided by a product or service to a firm and/or to that firm's customers". After Aaker's study, Keller (1993) also built a behavioral concept that was about customer-based brand equity (CBBE). He emphasized on brand awareness and brand image's dimensions explained that customers' responses vary according to knowledge about a brand, and this knowledge differs from person to person. On the basis of that knowledge, each brand contains some benefits and attributes with it and these assist consumers in distinguishing one brand from the other. According to Keller & Lehmann (2006), attributes are basically the features that portray a brand in a way

that they want their consumers to perceive it. Benefits are an individual's values that connect to the brand attributes, or in other words what a consumer perceives a brand could do for him/her. In the customer relationship of every firm, customers turn into an input for a brand image. Firms keep a close eye on their customers and maintain close relationships with them through communication and commit to provide valuable experiences. They need to pay attention to assure that each and every individual in the firm must understand to deliver consistent and good quality service to the customers (Webster & Keller, 2004). Sometimes customers become disappointed if a firm fails to fulfill customers' expectations. Therefore, customers generally trust those product or service providers who continuously provide them high quality product and improve the quality with passage of time (Cousins & Menguc, 2006). Shukla (2010) analyzed that brand cues also play a central role in shaping up a customer's purchase intention.

Hence, on the basis of extant literature, our hypotheses include:

H10. Brand image mediates the relationship between efficiency and purchase intention.
H11. Brand image mediates the relationship between fulfillment and purchase intention.
H12. Brand image mediates the relationship between privacy and purchase intention.
H13. Brand image mediates the relationship between system availability on purchase intention.
H14. Brand image has a positive and significant impact on purchase intention.

The conceptual framework is connecting the ES-QUAL model with the purchase intention, and adding EWOM and brand image into the framework as mediating variables for testing the relationships through hypotheses, which is exhibited in Figure 1 (portrayed in two ways). The model is taken from the study of Jalilvand & Samiei (2012) and is expanded and diffused with the models of Ahmed, et al. (2020) and Parasuraman, et al., (2005).

Figure 1. Conceptual Framework (portrayed in two ways)
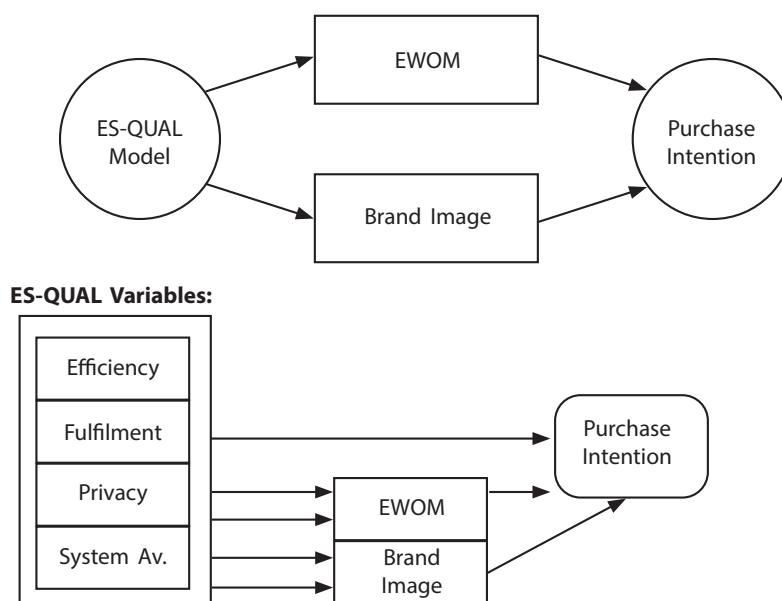
Source: Adapted from: (Ahmed, et al., 2020; Jalilvand & Samiei 2012; Parasuraman, et al. 2005)

Methods

The post-positivist philosophy is used as research philosophy since theories are employed to test the relationship between the variables. Therefore, the deductive approach of quantitative research methodology is employed in this study. Data was collected through a close-ended and structured questionnaire for the survey to take pertinent insights. The questionnaire was adapted from Jalilvand & Samiei (2012) study and was diffused with the ES-QUAL model's instrument/scale by Parasuraman et al. (2005). The efficiency dimension contains eight items in the ES-QUAL model, whereas fulfillment, system availability, and privacy contain 7, 4, and 3 items, respectively (i.e., total 22 items). EWOM and brand image are mediating variables, containing 3 and 6 items sequentially, and purchase intentions. The dependent variable contains three items, which makes overall 34 items. A five-point Likert scale is used.

According to the Pakistan internet usage report from the World Bank sources (Global Economy, 2017); by the end of 2020, it reached 44.6 million (Pakistan Advertising Society, 2020), but there is no estimate available for Karachi users. As youth is considered to be more tech-savvy and inclined towards online shopping and e-commerce, we have taken youth as the respondents. People living in Karachi with access to the Internet regardless of their gender, age, education, and professions are the population of this study. The unit of analysis includes all the individuals who use online reviews before engaging in online shopping. Due to the lack of availability of a sampling frame or structured data about samples, the convenience method of non-probability sampling is employed, which is a limitation of this study. Our sample size was 325, which was determined by using the formula Nx30, i.e., the number of variables multiplied by 30 samples (Sekaran & Bougie, 2016), which became 120, but we surveyed 325 respondents.

A pilot study using 46 questionnaires was conducted, and ten questionnaires were unused as they contained more than 50 percent missing values. After confirming reliability and validity tests, we conducted a survey and analyzed the data. SPSS and PLS software were utilized for data analysis. SPSS was used to deal with the missing values and to track the participants' demographics. PLS assisted in predicting the relationship among pertinent constructs. Several authors recommended preferring SmartPLS software when the data is not normal and/or the sample size is small. Although our sample size of 325 is considered good, it is not a very large sample. Therefore, we used PLS-SEM according to the guidelines (Reinartz et al., 2009; Rigdon, 2016).

Result and Discussion

The structural equation modelling (SEM) was employed on PLS software for empirically testing our hypotheses. While assessing the measurement model, Confirmatory factor analysis (CFA) technique was applied, which is a factor reduction technique that identifies strong factors in the model, while the weak ones are eliminated. The data normality test found that Skewness and Kurtosis for each construct appeared within the range of ±1.5, which indicate that there is no issue of univariate normality of constructs. In CFA

analysis, some items with loadings less than .5 and insignificant *T* values were deleted, and only significant factors with loadings greater than .7 were kept (Byrne, 2013; Hair Jr et al., 2015).

Figure 2. Measurement Model
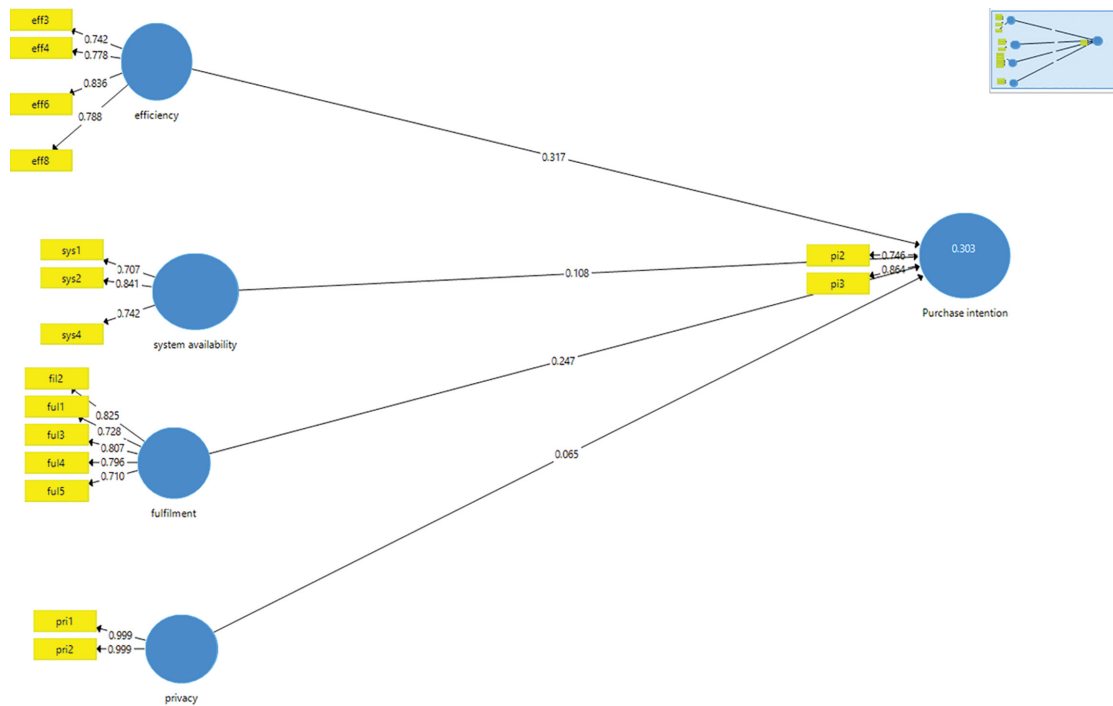
In Table 1, alpha and composite reliability (CR) values fall greater than the cut off value of .7, whereas the values of average variance extracted (AVE) fall greater than .5. About constructs validity, convergent validity suggests that all the measures of a construct or all variables theoretically correlate. These values appear greater than the benchmark of .40. Non-convergent or discriminant validity shows shared validity between pairs of constructs fell within the range of 0.05 to 0.45, which should be less than AVE of each construct, and it fell within the range of 0.51 to 0.61 (Hair Jr et al., 2010; Marsh, Morin, Parker, & Kaur, 2014). The individual item loadings of all the constructs, obtained through the measurement model, are present in Figure 2 and Table 1. The Figure 2 displays the measurement model with direct relations and factor loadings of the predictors and outcome variables.

Using SmartPLS bootstrapping method performed the structural model assessment. It analyzed the direct relationships by considering t-values and path coefficients among all the variables and then, the mediating relationships. The output is displayed in Figure 3 and Table 2. Table 2 shows the direct effect. The results indicate that the predicting variables have a positive and significant effect/relationship with the outcome variable and had t-values more than 1.96 and p-values below 0.05. Efficiency has a positive and significant effect on purchase intention (t = 2.510, *p* < 0.010). Then, fulfillment and system availability also have positive and significant effects on purchase intention

(t = 2.210, p < 0.010; t = 2.101, p < 0.020). Privacy does not have a positive and significant effect on purchase intention (t = 0.081, p < 0.071). Thus, hypotheses H1, H2, and H4 are supported, whereas H3 is not supported. EWOM has a positive and significant mediating effect on purchase intention (t = 2.620, p < 0.010). Thus, H9 is supported. Brand image has a positive and significant effect on purchase intention (t = 2.910, p < 0.000). Thus, H14 is supported.

Table 1. Reliabilities and Validities (N=325)

Indicators	Efficiency	Fulfillment	System Availability	Privacy	EWOM	Brand Image	Purchase Intention
Efficiency3	.742						
Efficiency4	.778						
Efficiency6	.836						
Efficiency8	.788						
Fulfillment1		.825					
Fulfillment2		.728					
Fulfillment3		.807					
Fulfillment4		.796					
Fulfillment5		.710					
System Av.1			.707				
System Av.2			.841				
System Av.4			.742				
Privacy1				.999			
Privacy2				.999			
EWOM1					.814		
EWOM2					.861		
EWOM6					.822		
Brand Image2						.810	
Brand Image3						.805	
Purchase Int.1							.715
Purchase Int.2							.746
Purchase Int.3							.864
Alpha (a)	.821	.853	.831	.835	.811	.820	.841
AVE	.510	.557	.580	.615	.521	.534	.540
CR	.861	.882	.890	.875	.831	.851	.878

Figure 3. Structural Model Assessment
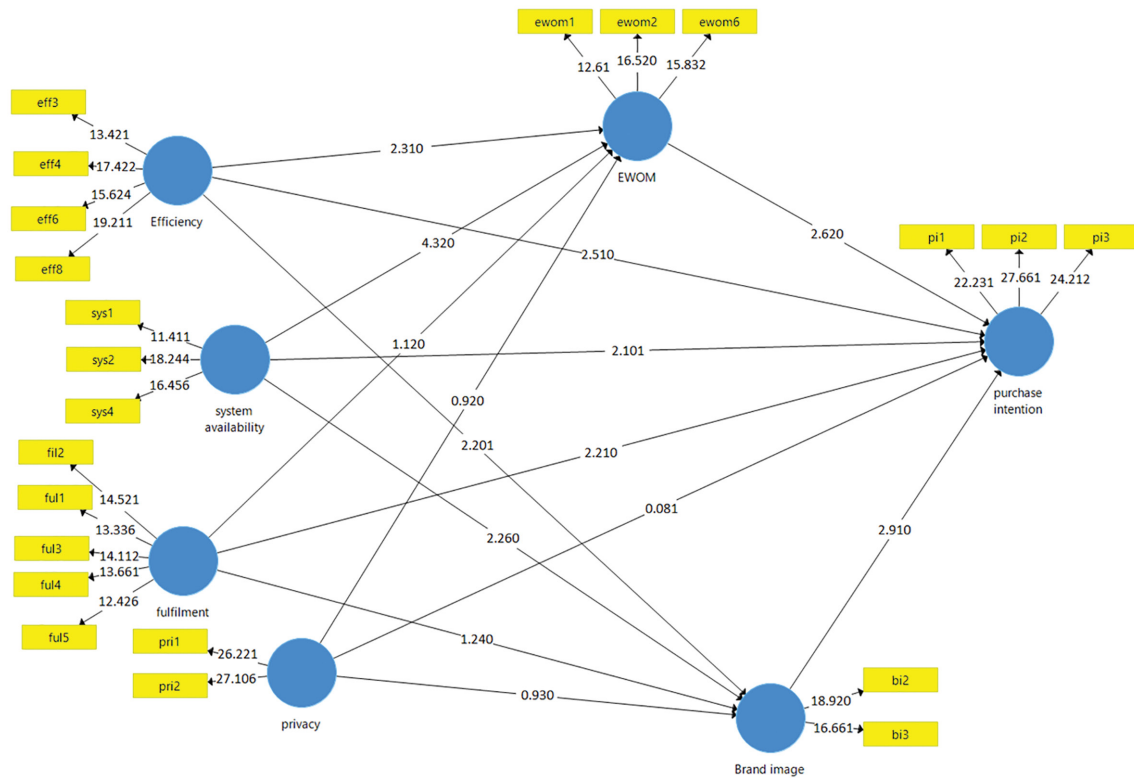
Table 4 shows the indirect effect examined through resampling mediation technique. The results show that EWOM mediates between the relationship of efficiency and purchase intention (t = 2.310, $p < 0.001$). Then, EWOM mediates between the relationship of system availability and purchase intention (t = 4.320, $p < 0.00$). EWOM does not mediate between the relationship of fulfillment and purchase intention as well as privacy and purchase intention (t = 1.120, $p < 0.070$; t = -0.920, $p < 0.090$). Thus, hypotheses H5 and H7 are supported, whereas H6 and H8 are not supported. Regarding the second mediating variable, brand image mediates between efficiency and purchase intention (t = 2.201, $p < 0.010$). Then, brand image mediates the relationship of between system availability and purchase intention (t = 2.260, $p < 0.001$). Brand image does not mediate between the relationship of fulfillment as well as privacy and purchase intention (t = 1.240, $p < 0.070$; t = 0.930, $p < 0.090$). Brand image has a positive and significant effect on purchase intention (t = 2.91, $p < 0.01$). Thus, hypotheses H10 and H12 are supported, whereas H11 and H13 are not supported. Brand image has a positive and significant effect on purchase intention (t = 2.91, $p < 0.01$). Thus, H14 is supported. The original sample mean and sample mean fall within the range of .029 to 0.334 and 0.221 to 0.376 respectively. The standard deviation falls within the range of 0.112 to 0.1.61. All the variables have moderate effect size denoted by f^2, which ranges between 0.15 until 0.34.

Table 2. Structural Model Assessment (Direct Effect)

Path Coefficients			t Statistics	P Values	Supported or not
Efficiency	→	Purchase Intention	2.510	0.010	Supported
Fulfillment	→	Purchase Intention	2.210	0.010	Supported
Privacy	→	Purchase Intention	0.081	0.071	Not Supported
System Availability	→	Purchase Intention	2.101	0.020	Supported
EWOM	→	Purchase Intention	2.620	0.010	Supported
Brand Image	→	Purchase Intention	2.910	0.000	Supported

Directly ES-QUAL model had 27% impact, but once we introduced EWOM and brand image as mediating variables, the explaining power jumped to 44% (see Table 3). The value above .33 is considered substantial. Table 4 displays standardized regression coefficients of the constructs.

Table 3. R-Square (R²) Value

Direct Relationship	R-Square	Adj. R-Square	Indirect Relation	R-Square	Adj. R-Square
Purchase intention	.303	.273	Brand Image	.194	.159
			EWOM	.220	.186
			Purchase intention	.447	.410

First, we estimated the model with an independent variable (the ES-QUAL model's four dimensions) and the dependent variable (purchase intention) to test the four hypotheses, and found that the dimensions, efficiency, fulfillment, and system availability have a direct effect on purchase intention. The aggregate results appear consistent with the extant literature but also differ in some way due to indigenous contextual differences, Pakistan is an emerging market where ecommerce is a relatively new phenomenon. The variables of the ES-QUAL model, efficiency, fulfillment, and system availability appear to be positive and significant predictors of purchase intention, but privacy is not significant. Sequentially, efficiency, fulfillment, and system availability are the strong predictors of purchase intention.

Both mediating variables, EWOM and brand image have positive and significant relationship/effect on purchase intention. But regarding the mediating effect of EWOM with the variables of the ES-QUAL model, efficiency and system availability appear positively significant, whereas fulfillment and privacy appear vice versa, which is also the case with the brand image. In estimating the mediating effect of brand image, a positively significant effect is found with efficiency and system availability, whereas fulfillment and privacy have insignificant relationship.

Table 4. Structural Model Assessment (Indirect Effect)

Path Coefficients			T Statistics	P Values	Decision of Mediation
Efficiency →	EWOM →	Purchase Intention	2.310	0.001	Mediation
Fulfillment →	EWOM →	Purchase Intention	1.120	0.070	No Mediation
Privacy →	EWOM →	Purchase Intention	0.920	0.090	No Mediation
System Av. →	EWOM →	Purchase Intention	4.320	0.000	Mediation
Efficiency →	Brand I. →	Purchase Intention	2.201	0.010	Mediation
Fulfillment →	Brand I. →	Purchase Intention	1.240	0.070	No Mediation
Privacy →	Brand I. →	Purchase Intention	0.930	0.090	No Mediation
System Av. →	Brand I. →	Purchase Intention	2.260	0.001	Mediation

The three dimensions out of four corroborate that the ES-QUAL model has a positive impact on purchase intention, which support the previous studies (Chang & Liu 2009; Chen & Hitt, 2002; Kenova & Jonasson, 2006; Khalifa & Shen, 2005; Parasuraman et al., 2005; Wenying & Sun, 2010). This condition could lead to customer satisfaction (Ahmed et al., 2020; Duarte et al., 2018; Dash et al., 2021) and loyalty (Yu & Lee, 2019). This condition will affect customer loyalty (Yoo et al., 2013; Tran & Strutton, 2020).

Once we tested the direct impact, we moved towards analyzing the relationship between the ES-QUAL model and purchase intention by keeping EWOM and brand image as mediating variables. The results of the mediating variables support a previous study that EWOM and brand image have a positive impact on purchase intention (Baqai & Qureshi, 2019; Jalilvand & Samiei, 2012; Siddiqui et al., 2021; Sun et al., 2021) show that e-WOM influences consumer ethnocentrism, and these effects are contingent upon brand origin.

Conclusion

The core research problem and purpose tried to unearth the impact of the ES-QUAL model on online purchase intention by using SEM multivariate approach. First, we assessed the direct relationship or impact of all four dimensions of the ES-QUAL with purchase intention, and then, by keeping brand image and EWOM as mediating variables, we tested these relationships. The results reveal the positive and significant relationship between the ES-QUAL model's three dimensions (efficiency, fulfillment, and system availability) and purchase intention, except privacy that observed an insignificant effect. Efficiency, fulfillment, and system availability are respectively the strong predictors of purchase intention. EWOM and brand image mediates the relationship of purchase intention. EWOM and brand image positively and significantly mediate the relationship between the ES-QUAL model's dimensions, efficiency, and system availability, but this is not the fact regarding fulfillment and privacy that have insignificant effects.

The results and analysis reflect the local indigenous context, meaning that contextual differences exist in different countries. Our analysis concluded and substantiated that the ES-QUAL model can be applied in the context of Pakistan to improve the online purchase intention of customers, which can lead to more significant sales, exports, profitability, and customers' satisfaction to loyalty and business sustainability. For sustainable business development, businesses need to focus on quality, innovative attributes that make their brands unique, stylish or differentiated, make them available online, and add features that provide customers with a wide range of options. Digital marketers need to develop easy-to-use, user-friendly, and speedy attributes of a technically excellent or functional website. They need to fulfill their promise of delivering the appropriate products on time and in a transparent way and should ensure pre-sales and post-sales services. Moreover, it will assist in nurturing a well-established e-commerce marketplace in the country, which could substantially benefit the local economy in the form of a collection of tax revenues to the exchequer, will enhance its capability to compete well in the global markets, and raise its market share in the global e-commerce. However, this mandatorily requires improving the overall quality and innovative features of products, brands, and overall electronic services.

The results demonstrated that marketers and entrepreneurs engaged in the online business should focus on improving the quality of their websites as online shoppers are increasing daily, and they want an effective delivery system. They like to visit websites that are easy-to-use and always have stock available. If the stock falls short, they get disappointed, which would affect any online business. The e-commerce firms should strategize to have an effective transaction system, which does not create problems for customers to make payments for their desired products and brands. In addition, they need to encourage and motivate consumers to share their experiences regarding the brands on online portals. This condition could motivate potential customers to share their views, which can inspire others or provide hints to the online players for their shortcomings and areas of improvement. Consequently, they would get insights, which appear substantially helpful for them towards brand building. If they establish positive electronic word-of-mouth (EWOM) communication, it will reduce marketing outlays. They also need to concentrate on their existing satisfied and loyal customers as their positive EWOM leads to sustainable business.

This probe appears to be limited in methodological design, sample size and method, and variables. Due to any sampling frame's unavailability, we used a convenient sampling method, which is not suitable for generalizing results. We took a variable, brand image, related to attitudinal and behavioral measures, while EWOM also reflects such measures. For future studies, it will be helpful if our expanded model could add more variables like more attitudinal and behavioral dimensions to get consumers' insights for improving purchase intention.

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Role of The ICT in Women Empowerment and Achieving SDGs: A Case Study of Women Labor Force in Developing Countries

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Abstract

This study aims to analyze the ways women are empowered through Information and Communication Technology (ICT) and fostering the process of achieving the Sustainable Development Goals (SDGs). Women in developing countries face economic and social hurdles and have limited access to ICT, which transforms into their lack of skills, lower literacy rate, and limited social engagement. Therefore, this study explores the role of ICT on women empowerment in 51 developing countries by conducting panel data modeling throughout 2000-17. The study finds that ICT has a positive contribution to the female labor force participation rate by applying the Generalized Method of Moment (GMM). Control variables like GDP growth and government expenditure on education have a positive and statistically significant role in enhancing women's empowerment. The findings of this study explain that the ICT impacts women's empowerment and returns, beneficial for fostering the process of achieving SDGs 2030.

Keywords:
women, developing countries, empowerment, education, female labor force

Introduction

Information and Communication Technology (ICT) have been recognized as an essential indicator for women's empowerment. There is no exact and universal definition of ICT. It includes all devices, networking components, applications, and systems that allow individuals and institutions to act efficiently in the digital world like cell phones and the Internet. ICT access through mobile phones and broadband has increased more rapidly than those of other technologies. Broadband subscribers increased more than double in eight years, it was 527 million in 2010, and in 2018 it became 1.1 billion (GDR 2019). Internet users worldwide have increased up to three-fold in the last few years, from 1 billion users in 2005 to 3.2 billion users in 2015 (ITU 2017). According to the latest Global Digital Report, the Internet users are 4.39 billion, while cell phone users are 5.11 billion (GDR 2019). It has been found that 1.3 billion Internet users are women (37% in the whole world are using the Internet), while 1.5 billion men online (41% of all men), which correspond to 200 million fewer women online (World Bank, 2016).

The United Nations member states in 2015 agreed on the agenda named Sustainable Development Goals (SDGs) 2030 (UN 2015), which includes 17 goals, and each goal comprises several targets and indicators. International organizations (United Nations and World Bank) promote ICT to empower women, and ICT is also a primary attribute of the SDGs 2030. The easy and quick access of ICT for women can facilitate and accelerate the achievement of the SDGs. Women's use of ICT is significantly lagging behind men's in the developing world (Perryman & Arcos 2016). Therefore, gender inequality is a pressing policy concern in the SDGs agenda (Asongu & Odhiambo 2018). It is essential to understand that for the development of a nation, steps should be taken to empower women.

The way ICT has transformed our lives over the last two decades has been effectively captured by the global literature. ICT-related research has given birth to a whole stream of theoretical and inter-disciplinary empirical research. A significant part of this literature has tried to assess the economic impact of ICT on women's empowerment as well. The ICT's definition and scope have attained different dimensions in the literature. It is like Information Technology (IT), but its main concern is on communication technologies. ICT is confined to the use of the computer, the Internet, cell phones, and telephone lines, but it is also about information and communication (Dlodlo, 2009). Herman (2020) concludes that there is a strong positive correlation between the economy's digitalization level and labor productivity.

World Bank explains the ICT as the combination of hardware, software, networks, and media for assemblage, storage, processing program, and demonstration of information in the form of voice, data, text, and description (World Bank, 2016). The ICT provides people with access to and sharing information that can increase their capabilities and lead them to empower (Obayelu & Ogunlade, 2006). According to (Mansell & Wehn 1998), effective use of ICT can develop and empower societies through greater inclusion,

wellbeing, cooperation, and participation. ICT affects the quality of life through knowledge, education, and skills. Similar to ICT, there is no worldwide definition of 'empowerment. Many empirical studies are based on measuring ICTs impact on female participation in the labor market and showed that an increase in the use of ICT would, in turn, increase the participation of females in the labor force (Chen, 2004; Efobi et al., 2018; Nikulin, 2017; Shehata, 2017). Easy access and the use of ICT positively impact closing the gender employment gap, as ICT tends to provide employment opportunities for women (Shehata, 2017).

ICT is one of the fastest ways for empowering historically disadvantaged groups, such as women and minorities (Hafkin & Huyer, 2006). ICT gives empowerment by giving access to complete information, excellence, and reliability of such information that helps make decisions (Ogato, 2013). Thus, ICT empowers women by increasing their purchasing power, making decisions, and controlling issues that improve their lives.

Globally, the number of women accessing ICTs and ICT devices is 12% lower than men (ITU, 2017). According to the ITU, Internet access costs about 11% to 30% of the average monthly income in developing countries, with more than half of the monthly income in developed countries (ITU, 2017). The World Wide Web Foundation (WWWF) has revealed that these high costs have limited women's access to ICT, information, and knowledge, increasing their exposure to the global digital economy. This condition has made access to ICT a challenge for many families, especially for women who face more gender discrimination. Developing countries suffer from many economic and social crises that they cannot provide ICT services to disadvantaged people or rural communities. Even within a country, there exist inequalities among urban and rural populations in accessing ICT.

In our study, we take empowerment as a process that makes women recognize themselves for accomplished tasks and lead them to make decisions about their lives in economic, social, and cultural aspects. The study's main objective is to determine the role of ICT in enhancing women's empowerment and to help in fostering the process of achieving SDGs 2030. The study seeks to identify and further understand the possible ICT indicators and process of indices formation. The study conducts an in-depth quantitative and qualitative analysis to evaluate the effectiveness of ICT on female labor force participation and women's empowerment.

The study's research question is, to what extent does ICT play a role in the equation of women's empowerment and economic development in developing countries? The study contributes to the existing literature by examining the role of ICT on women's empowerment by focusing on Goal 5 (Gender Equality and Empower all Women and Girls) and target 5b specifically focus on enhancing the use of technology to empower women. Also, find to what extent technology plays a role in the equation of economic development and women's empowerment in developing countries. Therefore, this study aims to identify the role of ICT in women's empowerment for fostering SDGs and provide policy relevance to foster the process of achieving the SDGs 2030.

Methods

In this section, we will discuss the source of data and define the variables. This study uses World Development Indicators (WDI) of the World Bank for ICT indicators and control variables. The study analyzes the panel data of 51 developing countries for the period 2000-17. The study constructs an ICT index from several ICT indicators. The study uses the following indicators to develop the ICT index, mobile phone users per 100 people, internet users per 100 people, fixed broadband subscribers per 100 people, and telephone users per 100 people. The study used the weighted average method to convert the ICT indicators into a composite index. We also use different control variables in order to avoid the problem of omitted variable bias. Table 1 presents the detailed definition of all variables.

Table 1. Definition of Variables

Variables	Symbols	Source	Description
Dependent Variables			
Female labor force participation	FLFP	WDI	Labor force participation rate of female from the total working population of age 15-64. It is a proxy used for measuring women's empowerment taken.
Main variable of interest			
ICT index	ICT Index	WDI	It is a main independent variable and also an important indicator of SDG goal 5(5b). i) the Internet users per 100 person who have access the worldwide networking, ii) mobile phone users per 100 person, iii) telephone main line users per 100 person by connecting a customer's equipment to the public network iv) the fixed broadband subscribers per 100 person.
Control Variables			
GDP	GDP	WDI	It is an indicator of SDG goal 8 (Decent work and economic growth) GDP per capita is taken as the proxy for economic development.
Gross fixed capital formation	GFCF	WDI	Gross fixed capital formation is taken as annual growth rate of investment.
Fertility rate	FR	WDI	Fertility rate total birth per women.
Urban ratio	UR	WDI	Urban Population divided by total Population.
Government consumption expenditure	GCE	WDI	General government final consumption expenditure (annual growth rate).
Government expenditure on education	GEE	WDI SDG	GEE is the financial variable from SDG goal 4 focus on indicator 4.5.4 and 4.5.5. Government expenditure on education (annual growth rate).
Trade openness	TO	WDI	Import plus export divided by GDP.

The previous studies have used different econometric techniques like OLS, GLS, IV, ARDL, and GMM techniques to investigate the impact of ICT on women empowerment (Chen, 2004; Islam, 2015; Nikulin, 2015; Efobi et al., 2018; Asongu & Odhiambo, 2018). In the present study, we are using the GMM approach (Asongu & Odhiambo, 2018). The reason for adopting GMM is that it produces more efficient estimates, avoids the proliferation of instruments, and tackles the issues of endogeneity, heterogeneity, and over-identification.

In this study, the female labor force participation rate has been used as a dependent variable, while the ICT index is our primary independent variable supported by several control variables. Hence the model is provided below.

$$FLFP_{it} = \beta_1 + \beta_2 FLFP_{it\text{-}1} + \beta_3 GDP_{it} + \beta_4 ICT_{it} + \beta_5 FR_{it} + \beta_6 UR_{it} +$$
$$\beta_7 lnTO_{it} + \beta_8 lnGFCF_{it} + \beta_9 gce_{it} + \beta_{10} gee_{it} + \varepsilon_i + \eta_t + \mu_{it} \qquad (1)$$

$$FLFP_{it} - FLFP_{it-1} = \beta_2 (FLFP_{it\text{-}1} - FLFP_{it-2}) + \beta_3 (GDP_{it} - GDP_{it-1}) +$$
$$\beta_4 (ICT_{it} - ICT_{it-1}) + \beta_5 (FR_{it} - FR_{it-1}) + \beta_6 (UR_{it} - UR_{it-1}) +$$
$$\beta_7 lnTO - lnTO_{it-1}) + \beta_8 (lnGFCF_{it} - lnGFCF_{it-1}) + \beta_9 (gce_{it} -$$
$$gce_{it-1}) + \beta_{10}(gee_{it} - gee_{it-1}) + (\eta_t - \eta_{t-1}) + (\mu_{it} - \mu_{it-1}) \qquad (2)$$

Where ε_i is the country-specific effect, while η_t time-specific constant and μ_{it} is the residual of the model.

The current analysis is based on the GMM approach. Our purpose of using two differenced GMM is to take care of the following issue. Firstly, the number of cross-sections is greater than the number of time series, i.e., N>T, 51>18. Secondly, to handle the endogeneity problem for time-invariant omitted variables and simultaneity handled by taking instruments that also control heterogeneity. Thirdly, there should be panel data for the GMM method, which shows that cross-country differences are considered (Asongu & Nwachukwu, 2017; Efobi et al., 2018). Fourthly, the female labor force participation with lag value is consistent over time as the correlation coefficient between the level and first lag of the indicators is higher than 0.8 (Asongu & Odhiambo 2018).

The United Nations says the need for ICTs is the third most important problem facing women worldwide, after poverty and violence against women. ICTs can influence the gender discrimination found in many areas of development, such as education, health care, and access to economic opportunities (UN Women 2020). Many international organizations now support projects in developing parts of the world and introduce new ICTs to aid social and economic development (United Nations 2009).

Advances in ICT have brought new opportunities for information sharing and information collection for women and men. ICT offers unlimited opportunities for economic development and social engagement through innovative thinking and innovative tools. If access to and use of ICT is directly linked to social and economic development, it is crucial to ensure that women in developing countries understand the importance and use of this technology. ICT can be used as a tool for women's empowerment, leading to equality and economic stability. Without the inclusion of ICT in the information age, countries are less likely to develop.

It is widely distributed that ICT enables the inclusion of low-skilled and traditionally marginalized groups, such as women, people with disabilities, and workers, as the basis of the pyramid in the labor market. Therefore, ICT empowers women, and this empowerment focuses on the importance of developing their capacity and controlling the decisions and issues that shape their lives.

Result and Discussion

Table 2 shows the descriptive statistics of the given variables. Summary statistics show that almost 46% of the women in the given countries participate in the labor force. While across countries, variation in the labor force is 15%. As provided in Table 2, the average value of the ICT index in developing countries is very low (25.81), and across the country, variation is 17%.

Table 2. Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
Flfpr	918	45.82	15.044	11.893	81.841
ICT	918	25.81	17.526	0.167	70.966
GDP	918	4.344	3.368	-14.759	18.287
Fr	918	2.622	0.975	1.085	5.58
Ur	918	0.552	0.194	0.182	0.988
Gfcf	918	6.027	13.15	-41	57.964
Gce	918	4.395	6.643	-23.076	85.359
Gee	918	4.394	2.023	1.012	14.059
Trade	918	0.742	0.354	0.156	2.473

Table 3 provides the correlation matrix for all variables that are used in estimation. It has been observed from the Table that the ICT index has a positive association with the outcome variable. Also, the ICT index has a significant association with other control variables, and there is no multicollinearity observed among variables.

Table 3. Correlation Matrix:

Variables	1	2	3	4	5	6	7	8	9
Flfpr	1								
ICT	0.047	1							
GDP	0.073	-0.238	1						
Fr	0.032	-0.445	0.036	1					
Ur	-0.044	0.423	-0.218	-0.464	1				
Gfcf	-0.014	-0.131	0.407	-0.01	-0.033	1			
Gce	0.082	-0.137	0.238	0.159	-0.179	0.036	1		
Gee	0.09	0.119	-0.148	-0.135	0.187	-0.077	-0.147	1	
Trade	0.276	0.214	0.017	-0.183	-0.027	-0.007	-0.015	0.241	1

To ensure the robustness of our results, we have estimated three models by including a set of additional variables to find that our results are consistent. The ICT index is statistically significant. The ICT has a positive impact on FLFP and can strengthen the efforts for achieving SDG 5. The result shows that if 1 unit increases the ICT index, the female labor force participation rate will increase by 0.037 percent. Although this result shows lower influence than other indicators, all three models suggest that the ICT positively impacts women's empowerment and helps foster the process of SDGs 2030.

Table 4. Dependent Variable: Female Labor Force Participation Rate

	(1)	(2)	(3)
L.flfpr	0.371*** (11.44)	0.336*** (8.73)	0.415*** (16.77)
ICT	0.0314*** (3.71)	0.0418*** (5.26)	0.0373*** (4.57)
GDP	0.028** (3.12)	0.0344*** (3.83)	0.0516*** (11.96)
fr	-0.142 (-0.32)		
gce	-0.0568*** (-7.28)	-0.0621*** (-7.40)	-0.0554*** (-4.57)
lnTO	-2.194*** (-6.52)	-2.486*** (-7.32)	-1.977*** (-6.40)
ur	-4.186 (-0.56)	-10.28* (-2.58)	-14.12** (-2.81)
lngfcf	0.061* (2.41)	0.0425 (1.47)	
gee	0.467*** (4.05)	0.573*** (6.09)	0.719*** (8.46)
N	816	816	816
AR(1)	0.018	0.037	0.001
AR(2)	0.674	0.587	0.392

Table 4 shows the expected signs of control variables; the GDP growth has a positive and significant impact on women's empowerment. The results indicate that economic development is inclusive concerning women's empowerment in developing countries. The government expenditure on education has a positive impact on FLFP, and it helps foster the process of SDGs regarding goal 4. GFCF has a positive association with women's empowerment, which shows that investment positively impacts women's empowerment.

On the other hand, trade openness has a significant but negative impact on FLFP, that is, in the case of developing countries. Firstly, trade openness leads to an increase in capital accumulation that raises per capita GDP, and this increasing income discourages female participation. Secondly, more import means less domestic economic activities that in turn imply lower FLFP. Thirdly, it increased the demand for skilled labor, which caused fewer job offers for females (Wood 1998). Our estimates suggest that, on average, a 1 percent rise in the government final consumption expenditure is associated with

about a 0.057 percent reduction in women empowerment in developing countries due to low earn income of women in developing countries and dependency ratio high. In the case of developing countries, the urban ratio has a negative impact on FLFP. The reason could be that women focus on more education attainment, and in urban areas, mostly work required factories rather than at home, which causes a reduction in female participation in the labor market (Mitra, 2019).

Women's empowerment is driven by their living standards and increasing educational attainment and opportunities created in modern countries (Klasen & Pieters 2012). ICT is knowledge-based, and many aspects influence its entry into the labor market, and education is one of the most vital factors in determining access to its labor market. Involvement of the ICT with the support of educational needs helps empower women in society (Chen, 2004; Aydin, 2021).

Many studies have emphasized women's empowerment through ICT, such as education, knowledge formation, and employment (Hafkin, 2000; Chen 2004; Islam 2015). The ICT can improve women's social and economic conditions in developing countries (Asongu & Odhiambo, 2018; Tam et al., 2020; Ngoa & Song, 2021). Several reports have discussed opportunities for women's empowerment through ICT, e.g., through education and knowledge building, poverty alleviation, and job creation (Hafkin, 2000; Samargandi et al., 2019). The most important determinant of a country's competitiveness is its human strength and talent, skills, education, and productivity. Women write for half the available talent. Closing gender gaps is therefore not just a matter of human rights and equality but also economic productivity. ICT utilization plays an essential role in middle-aged and older females (Kuo et al., 2013).

Conclusion

As having almost an equal proportion in terms of population, it is necessary to highlight the issues to provide suitable solutions for women as for men so that both can contribute towards economic betterment. The ICT has played an essential role in empowering women over the past couple of decades and has a distinctive consideration in the setting of SDGs. This study finds that the ICT positively impacts women's empowerment, which shows that easy access and use of the ICT can improve the female labor force participation rate. Another feature variable like GDP growth rate, government expenditure on education, and gross fixed capital formation also positively impacts women empowerment.

Our finding supports the positive role of the ICT on female labor force participation rate, which implies the SDGs goal 5, in many perspectives notably, empowering women, enhancing technology, increasing participation of women in the labor force, inclusive development, and economic growth in developing countries. It is necessary to make women feel empowered and an essential part of society to participate in economic activities. There is a need to feel women motivated enough to lead them to achieve self-actualization, increase their productivity, and foster achieving SDGs 2030 through

ICT. Therefore, it is beneficial for any society to empower women, and ICT is one of the crucial tools to achieve this objective.

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Women in the Whirlpool: Traversing the Tie-up of Personality and Work-Life Balance of Pakistani Academicians

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Abstract

This research strives to explain the impact of personality type on the work-life balance of women academicians. With the positivist paradigm and quantitative approach, this study has been conducted with a survey methodology. Data was collected from 362 women academicians on adopted instruments and analyzed with multiple regression and ANOVA tests. Results revealed a positive effect of agreeableness, extraversion, and openness personality types on work-life balance. Those women academicians who are with agreeableness personalities are more in a capacity to manage their work-life balance. The results also show a difference in managing the work-life balance between those who are single and married, those who belong to a nuclear family, and those who belong to joint or extended families. This study will facilitate them to develop the personality type which has more capacity to manage work-life balance. It will help policymakers to facilitate women academicians to ensure better work-life balance.

Keywords:
Work-Life Balance; Extraversion; Agreeableness; Consciousness; Neuroticism; Openness.

Introduction

Work-life balance among women academician has become a crucial subject in the past two decades for researchers as time has changed from the world where men were the only source of earning for their family to the world where men and women both equally gain share in fulfilling family, life, job, health and societal requirements (Saranya & Gokulakrishnan, 2013). Women have shown their contribution in every field of the world, from sports to the medical profession, from politics to engineering, and from teaching to aeronautics. Work-life balance among women academicians in private or public universities is our focal point which has gained significant attention over the few decades by the researchers (Zaheer et al., 2016). Academic carrier demands multiple roles to be fulfilled as a teacher, researcher, or service provider (Beigi et al., 2016). They are teaching professional serve extra time on managing student records, preparing for the following lectures, attending the functional meetings, providing update and feedback to students while focusing on their research work and other activities for their personal growth (Rahman & Avan, 2016).

However, it is a significantly broader aspect in which women have to grow for their carrier development and fulfill responsibilities. Professional and personal life are two different domains in which women take care of home, family, health, and child while developing a career path and earning respect from society. The achievement of educational, social, and economic standards was the challenge to a greater extent have now been improved for some women in balancing personal or professional life whereas, some women still faced challenges in maintaining both domains as they have to make tough choices in balancing work and life according to their variation in cultural, social, psychological and emotional values (Saranya & Gokulakrishnan, 2013).

With the advent of the industrial revolution, time, space, life, and work functions have changed. It has become an active process for female academicians to maintain limitations over their work and life. Work-life balance among women academicians has become a crucial subject for researchers in the past two decades (Zaheer et al., 2016). Academic carrier demands a multiple-roles to be fulfilled as a teacher, researcher, or service provider. Though, it is a broader aspect in which women have to grow for their carrier development or personal growth on one side and fulfillment of family responsibilities on the other, making it challenging to satisfy the requirement of both domains. This research aims to explain how the personalities of women academicians impact their work-life balance and whether their work-life balance differs by their marital status and family structure.

The work-life balance of women academicians has gained immense significance among researchers as Pakistan's women academicians are entering the labor force due to ever-changing trends of demographic, economic, social, and technological requirements. Entering into the professional field on one side and meeting the demands of a family on the other made balance difficult among both domains (Umer & Zia-ur-rehman, 2013) as it has a climacteric challenge that needs to be considered by researchers, institutions, and women herself as well (Saeed & Farooqi, 2014).

According to Arulkumar (2014), Greenhaus et al. (2003), Maxwell & McDougall (2004), Shagvaliyeva & Yazdanifard (2014), Umer and Zia-ur-rehman (2013)**,** work-life balance is a complex phenomenon, devoiding in a universal definition (Arulkumar, 2014; Shagvaliyeva & Yazdanifard, 2014; Umer & Zia-ur-rehman, 2013)**.** Several types of research defined WLB as the tendency of an individual to manage potential conflict between desires by using time and energy intellectually to accomplish different roles (Saeed & Farooqi, 2014), as an individual involved with and equally satisfied with personal and professional life (Marafi, 2016), equilibrium between work and family (Yadav & Dabhade, 2014), as the satisfaction with work and life without any role conflict (Galea et al., 2014; Nishaat, 2017), and individual perception about how well his or her work and life are balanced that can vary from person to person throughout their carrier and life stages (Russo et al., 2015).

Previous research showed that work-life balance is a term usually used in the context of employees, but nowadays, whether the person is corporate CEO, manager, employee, or academician, it has been identified in every aspect of an individual's life. Therefore, work-life balance has become a significant issue among all employees (Irfan & Tabassum Azmi, 2015)**.** Ample research has been done on the phenomenon of work-life balance in which different authors have different observations regarding their particular fields of study (Irfan & Tabassum Azmi, 2015). According to Peter et al. (2003), most research is accompanying work-life balance in western countries. However, there is a strong indication that awareness of work and life requires more analysis in Asian countries (Achour et al., 2017). The seminal contribution has been made on the ''work-life balance among teachers" based on different dimensions of work-life balance as Work Interference with Life, Life Interference with Work, and Work-Life Enhancement (Irfan & Tabassum Azmi, 2015). This model was adopted by Hayman (2005), which was called further as a direction of WLB (Rao, 2015).

Numerous authors have recognized that an individual's need for achievement leads people towards an extra effort that require long working hours. Consequently, people lost their work-life balance accordingly Maeran et al. (2013)**.** Zedeck (1992) highlighted that flexi-time and flex place are the two significant characteristics of achieving work and life balance which lay benefits in increasing productivity, lowering absenteeism within the workplace, and increasing organizational commitment (Erdamar & Demirel, 2016; Hill et al., 2001; Marafi, 2016; Russo et al., 2015; Shagvaliyeva & Yazdanifard, 2014)**.** Correspondingly, a flexible working pattern positively influences work-life balance and life satisfaction (Thriveni & Rama, 2012; Winefield et al., 2014). Conversely, this view was further extended by the argument that flexible schedules may only be positively associated with work-life balance if managerial support in utilizing flexible time arrangements inconsistently (Galea et al., 2014).

Subsequently, job flexibility in time and place on work-life balance was analyzed by conducting the online survey from IBM diversified workforce based on the substantive spillover theory and ecological theoretical framework (Hill et al., 2001), which was also adapted by Bronfenbrenner (2009). The results measured by multivariate analysis reported

a positive relationship between perceived flexibility and WLB (Hill et al., 2001) but with fewer children (Adkins & Premeaux, 2012). These findings were similar to those studies conducted by Maeran et al. (2013) with an extension of irregular work schedules, child care, and family matters (Sandhu & Mehta, 2006). Similarly, the study was further elaborated by finding that managerial support, connubial influence, and several children average work-life balance (Adkins & Premeaux, 2012).

Some preliminary work was carried out on female executives working in service sectors of Punjab made several interesting points that women executives' perceptions and level of educations are pretty obvious, which direct low work-family conflict in India. Women who work in educational sectors are more directing toward synchronizing their work tasks and family commitment simultaneously due to fewer working hours than other organizational service sectors (Sandhu & Mehta, 2006). However, the preceding conclusion was further criticized by the study conducted by women academicians in the Mauritius education sector claimed that the academic profession contains an enormous work demand with long working hours at the expense of personal life. Additionally, women must be hard workers to reach their desired position as they are less knowledgeable than men (Nishaat, 2017).

A recent study proposed a model of supportive culture within an organization where one author reported the importance of supervision and managerial support for employees to balance work and life by collecting data from 628 employees of the health unit in the U.S where it was analyzed that work is negatively correlated with WFI when a person perceives supervisor high work-family behavioral integrity (Paustian-Underdahl & Halbesleben, 2014).

The study was employed from a part-time student group, which found a positive relationship between workplace support and WLB. In contrast, there was no significant relationship between family support and WLB because they were not engaged in a spousal relationship. In comparison, data from the Industrial employee and Physician group demonstrated a positive relationship between work and family support with WLB (Russo et al., 2015; Thriveni & Rama, 2012). In response to these results, the study was carried in the State University of Singapore where Behson, (2005) and Goh et al. (2015) showed that informal support (supervisor support) is more dignified than formal support (workplace Support), which do not overcome the job demands but help an individual to reduce the impact of job requirement on work-life balance in various ways (Goh et al., 2015). To put it another way, work-life balance is a phenomenon prevailing in every aspect from socio-cultural to organizational levels (Mazerolle et al., 2015), such as organizational culture, work schedules, family-friendly policies, and managerial supports (Rao, 2015). Notably, organizational culture and managerial/supervisor support are perceived as gatekeepers to establish a healthy culture that promotes employees to balance work and life (Arulkumar, 2014; Mazerolle et al., 2015) rather than establishing family-friendly programs (Russo et al., 2015).

Personality consists of extraversion, agreeableness, neuroticism, openness, and conscientiousness, and these variables are also called the big five models of personality

(Aziz et al., 2014). Conscientiousness is the predictor of well-being and health. People with conscientiousness and agreeableness have a positive mindset towards their work (Wickramaaratchi & Perera, 2018). Personality significantly impacts work-life coordination, which is positively correlated with conscientiousness but negatively correlated with neuroticism. Several studies indicated a negative relationship between work and life enhancement. Neuroticism refers to the emotional stability that had a positive relationship with work-life balance (Opie & Henn, 2013). People who possess extraversion personalities are more sociable as compare to other personality indicators. Accordingly, they are likely to use dumb behavior (Demirkasimoglu, 2015). Individuals who possess extroversion personalities are more committed and energetic in a particular situation and at work. Therefore, they have a positive relationship with work-life balance compared to their counterpart introverts (Wickramaaratchi & Perera, 2018). Individual showing conscientiousness spends most of their time and efforts towards their work. Women academicians who are highly conscientious face some problems in their work-life balance due to their high involvement with their work (Opie & Henn, 2013). Furthermore, researchers indicated a positive relationship between agreeableness, conscientiousness, openness, and extraversion with work-life while a negative relationship of neuroticism with both domains (Wickramaaratchi & Perera, 2018). The personality of women academicians plays an essential role in building a nation, and human resource managers should recognize the traits of personality when they involve in recruitment and selection practices (Aziz et al., 2014).

A prior explanatory study was conducted from working women in Pakistan's two public and three private universities, where female teachers discovered minor differences in WLC. In addition, Hammer et al. (1997) proposed that a high level of WLC was occurring in married women rather than a single one (Umer & Zia-ur-rehman, 2013). Moreover, the study revealed that most Muslim women with several children frequently indicate a high family issue (Achour et al., 2017). Therefore, accomplishing different roles as researcher, teacher, mother, and service provider further leads to role conflicts among job requirements and family responsibilities resulting from the positive correlation of child care and family matters with WLC and FWC (Achour et al., 2017). These general results were similar to the study by (Butler & Skattebo, 2004), which demonstrated that parental role is more associated with women than men. Thereby, the number of children is the primary cause of family-to-work conflict.

This ambitious but flawed study criticized prior results by analyzing the data collected from 100 respondents working in Chidambaram town contended that marital status has no significant impact on WLB (Arulkumar, 2014; Sandhu & Mehta, 2006). In contrast, the data were collected from 100 women working at a retail organization in South Africa, where the study has conclusively shown that married women were facing more FWC than those who were single (Achour et al., 2017). In addition, one study claimed that the connubial influence of a husband as a breadwinner is threatened throughout the women's professional life and directs negative work-life conflict. Notwithstanding, the number of children does not influence work-family conflict (Patel et al., 2006).

Traditionally, women spent most of their time at home while cooking, cleaning, and looking after their children, but now the scenario has changed as time passes, and many requirements are increasing day by day due to economic pressures. Therefore, women tend to do work outside their homes. They also have more concern regarding their traditional roles of cooking and the proper growth of their children in a better environment (Thriveni & Rama, 2012). Research indicates that women who possess children are facing more problems in balancing their work and life. There are two categories of women whose priority is home while doing the job. Therefore, they do not further require training and education for their career path, and the second is goal-oriented towards their job.

Additionally, there is also mentioned about the on-job mothers and their impact on work by analyzing marital status on the work of women academicians (Patel et al., 2006). Women academicians usually face stress in basically their income ratio, spending time with spouse and giving proper time to their families (Thriveni & Rama, 2012). There are two ways for reducing this issue of work-life imbalances suggested by the ambitious author (Marafi, 2016). The first way is to give equal time to family and work (Marafi, 2016), and the second way is to reduce the working hours of women academicians by their institutions to make flexibility within the nature of their work (Thriveni & Rama, 2012). In today's modern society, it has been a significant challenge for all women academicians to balance their work with life as certain factors influence balancing work with life, including personality and demographic factors.

Demographic variables include income, age, and marital status, which significantly impact the work-life balance of women academicians. One empirical study from Bangalore, India, examined data with a chi-square test revealed that demographic variables such as age, experience, connubial influence, income status, education, and caste of an individual have a significant influence on work-life balance, particularly for women employees (Thriveni & Rama, 2012) that the management should consider in formulating family-friendly strategies for work-life balance (Rao, 2015; Russo et al., 2015).

Exploratory analysis was adapted on the public and public sector with cross-sectional in Ireland to identify the impact of age throughout an individual's career cycle on WLB (in each carrier stage from earlier to Pre-retirement) and reported a positive relationship with Work-life balance on the dimensions of managerial support. In contrast, a negative relationship was found on the dimension of job involvement and carrier development (Darcy et al., 2012). The study further illustrated these results where older academic staff responded with more work pressures, low job satisfaction, high Work-life conflict, and low organizational commitment (Winefield et al., 2014).

Much research studies have been conducted in the western context showing employee satisfaction in juggling family and work than in the non-western context, which requires enormous awareness of how faculty members balance their life and work simultaneously (Beigi et al., 2016). It was quoted by the great scientist Albert Einstein

that "Life is like riding a bicycle, to keep its balance, we must keep moving ahead" (Thriveni & Rama, 2012). One descriptive study asserted that women reported more work interference with family and family interference with work than men (Arulkumar, 2014). It makes a very valid point for women employees who have to balance home and work to juggle repercussions. With the pressures at the workplace and demands at home, WLB is at stake (Thriveni & Rama, 2012).

Work-life balance is a phenomenon of today's life in the modern world where technology and globalization have changed the way of working as women are entering into the labor force made it difficult to spend time with family. Significantly, the impact of work-life balance on women academicians gains necessary attention in a present environment (Achour et al., 2017; Darcy et al., 2012). A more exploratory study conducted by 86 Muslim women researchers in Malaysia highlighted that the women participating in the labor force are due to socio-economic change and faced enormous WLC. Additionally, Lynch et al. (1999) view women require more social support in 4 significant psychological aspects involving emotional, physical, appraisal, and information from her supervisor (Achour et al., 2017).

Women perform multiple tasks as a mother, wives, and service provider are very conflicting or create a sense of failure when women lack control toward those responsibilities assigned to them and further destroys marital harmony. Researchers have a consensus in determining Work and Life domains that positively or negatively influence each other (Sandhu & Mehta, 2006). The qualitative study conclusively identified that childcare and household are considered the primary responsibility while the carrier is the second responsibility even though it contributes financially (Nishaat, 2017).

A series of recent literature have identified work-life balance in terms of flexibility in work hours and place, connubial influence, supervision, job satisfaction, work experience, life satisfaction, age, number of children, marital status, supervision, and individual personality. In addition, women are entering into the different service sectors due to the increased pace of modernization and economic pressure that requires the accomplishment of multiple tasks as being a service provider on the one hand and fulfillment of responsibilities at home on the other which further creates not only imbalances between these two domains but also become a hindrance in the human development process. Consequently, work-life balance has gained immense attention among researchers and human resource management practices.

Much of the recent literature add to our understanding of how Work-Life Balance is affected by demographic, Individual personality, work, and life-related factors in different sectors of multiple countries. However, no studies to date have shown the comparison of these factors among women academicians of both public and private universities of Pakistan except the influence of marital status on WLB as resulted by Umer & Zia-ur-rehman (2013), which was not enough in WLB application as he just focused on marital status. However, previous studies were either limited to identify the factors affecting WLB of gender or comparative study of these factors among multiple service sectors. To fill the literature gap, the objective of this study is to

test. It compares the relationship between work and life-related factors, demography, individual personality, and Work-life balance of women academicians from both Public and Private universities of Pakistan, which may further provide insight to prospective researchers for further study.

This study will contribute to the body of knowledge about the prominent five personalities and work-life balance, but it will also facilitate the women academicians to ponder upon their personalities based on scientific evidence. Moreover, this will influence the policymakers to formulate more training sessions for women academicians to manage their work-life better. It is essential to support female employees in Pakistan, as the country is already way behind in gender equality.

Methods

The current research has the philosophy of positivism in its methodology (Antwi & Kasim, 2015; Rahi, 2017). This paradigm guided for a quantitative method to carry out this research. Since the relationship between the variables is hypothesized and variables exist in the previous studies and theories, the quantitative method was selected for empirical testing. Four hundred questionnaires with adopted and reliable instruments were distributed to female academicians, and 362 were in usable condition. Instruments were tested for their reliability and fitness indices in conformity factor analysis. For checking the impact of five personality types on work-life balance, the data were analyzed on IBM Amos, and model fitness was assured. The impact of marital status and family structure on the work-life balance of women academicians was analyzed with ANOVA on IBM SPSS.

The population for this study was women academicians of Pakistan, and the sample is drawn with a nonrandom technique due to the unavailability of a sampling frame. All respondents provided necessary information about the nature of the study, guidance on completing the questionnaire, and its benefit. The respondents selected in this study were based on their own will and not inhibiting questionnaires to them. The respondents were assured about their anonymity (Kumar & Chaturvedi, 2017).

The primary concerns of this research are work-life balance, and this variable is measured by fully adopted ten items on a Likert scale (Dex & Bond, 2005). The significant five personality types, in consideration, are extraversion, agreeableness, consciousness, neuroticism, and imagination, with fully adopted four items on each of these five types of personality dimensions (Donnellan et al., 2006).

Results and Discussion

The internal consistency of each construct was individually assessed, and it was found, shown in Table 1, to be well above criteria, 0.7 Cronbach Alpha ranges from 0 to 1. Value of Cronbach alpha equal to or greater than 0.9 depicts an excellent internal consistency, value greater than or equal to 0.8 displays good internal consistency, a value greater than or equal to 0.7 shows an acceptable, value greater than or equal to

0.6 indicates questionable and the value less than or equal to 0.5 depicts poor and unacceptable.

Table 1. Reliability Analysis

Construct	Cronbach Alpha
Extroversion	0.82
Agreeableness	0.84
Consciousness	0.80
Neuroticism	0.88
Imagination	0.77
Work-life Balance	0.90

The modification indices of all six individual constructs, depicted in Table 2, fit according to the different fitness criteria.

Table 2. CFA of Constructs

Categories	Absolute	Parsimonious		Incremental		Absolute
Fit Indices	χ^2/df	CFI	IFI	NFI	AGFI	GFI RMR
Criteria	< 5.0	> 9.0	> 0.95	> 0.90	> 0.90	> 0.90 < 0.08
Extroversion	5.16	0.98	0.98	0.98	0.92	0.98 0.042
Agreeableness	1.43	0.99	0.99	0.99	0.98	0.99 0.022
Consciousness	0.74	1.00	1.00	0.99	0.98	0.99 0.014
Neuroticism	3.51	0.99	0.99	0.99	0.95	0.99 0.027
Imagination	3.19	0.98	0.98	0.98	0.95	0.99 0.032
Work-Life Balance	1.05	0.99	0.99	0.97	0.96	0.98 0.036

The regression model is presented in Figure 3. Depicts five exogenous variables; Extroversion, Agreeableness, Consciousness, Neuroticism, and Imagination, all five items each. There is one endogenous variable, Work-Life Balance, with ten items.

Model fitness summary in Table 3, indicates that the model is fit in its indices. Absolute fitness criteria, the chi-square is 1.425, which is <5.0 (Wheaton et al., 1977), another absolute fit indices GFI and RMSEA are 0.90 and 0.034, respectively, and these are fit according to the prescribed standards (Browne & Cudeck, 1992). Parsimonious fitness indices, CFI and IFI, are 0.97 and 0.97, respectively, above their standards. Incremental fitness indices NFI and AGFI were found to be 0.908 and 0.892, respectively, from which NFI is well above standard (Bentler & Bonett, 1980) and AGFI is near to standard (Browne & Cudeck, 1992).

Figure 3. Regression Model
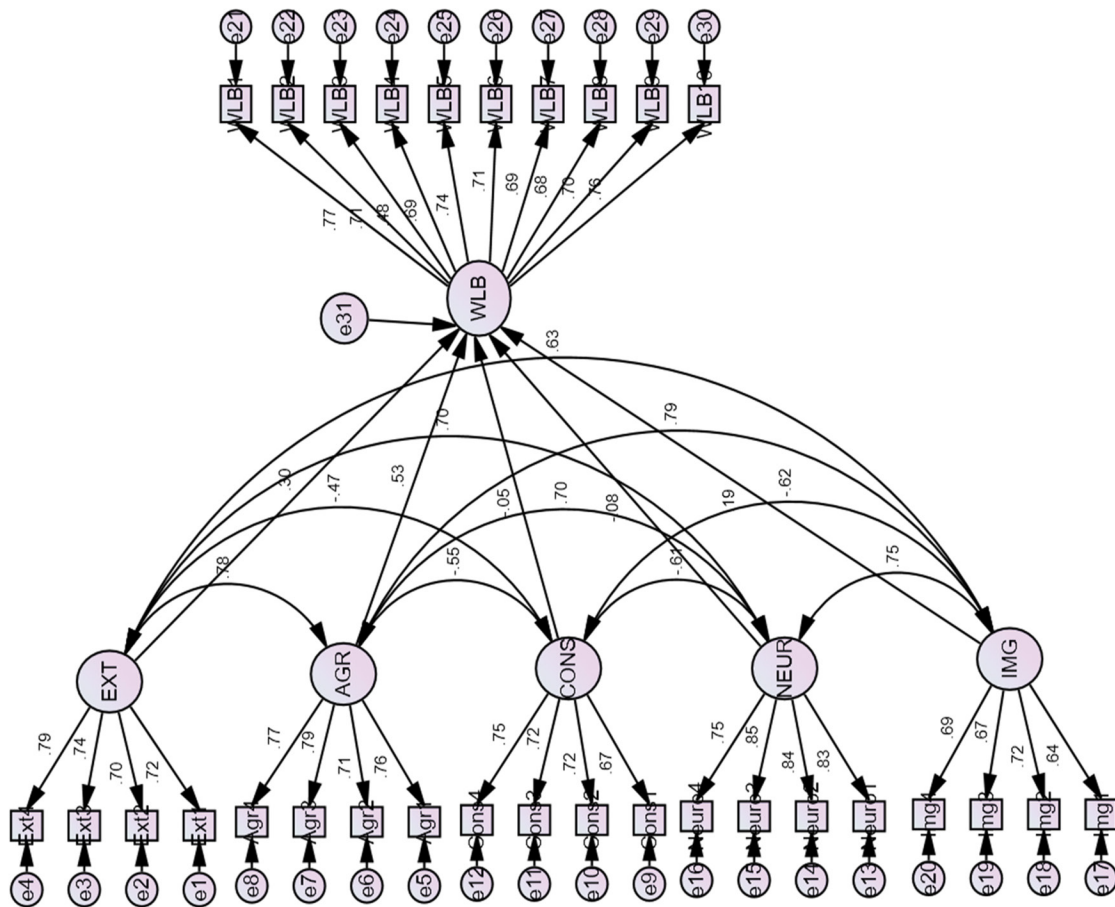
Table 3. Model Fit Indices

Categories	Absolute	Parsimonious		Incremental		Absolute
Fit Indices	$\chi2/df$	CFI	IFI	NFI	AGFI	GFI RMSEA
Criteria	< 5.0	> 9.0	> 0.95	> 0.90	> 0.90	> 0.90 < 0.08
		9.70	0.971	0.908	0.892	0.90 0.034

Results in Table 4 show a positive impact of extroversion on work-life balance, as when extroversion goes up by 1, work-life balance will also go up by 0.296, with a standard error of 0.79 and a CR value of 3.82. Agreeableness also positively affects work-life balance as the surge of 1 in it will cause a 0.525 increase in work-life balance. Consciousness and neuroticism seem to affect work-life balance negatively, but that effect is not statistically significant. However, imagination has a positive effect on work-life balance, but the effect is partially significant, and the effect size is 0.19 with a standard error of 0.11 and a CR value of 2.12.

Table 4. Hypothesized Relations: Structural Model Results

Path Coefficients			SRW*	SE	CR	P	Result
Extraversion	→	Work-Life Balance	0.296	0.79	3.82	***	Supported
Agreeableness	→	Work-Life Balance	0.525	0.91	5.22	***	Supported
Consciousness	→	Work-Life Balance	-0.55	0.67	-1.06	0.28	Not Supported
Neuroticism	→	Work-Life Balance	-0.81	0.60	-1.15	0.24	Not Supported
Imagination	→	Work-Life Balance	0.19	0.11	2.12	0.03	Partially supported

The other section of this study was to check whether the participants differed in their work-life balance based on their marital status and family structure. An independent t-test was conducted to check whether women academicians working with flexible hours differ in their work-life-work-life balance from those not having flexible hours facility.

Table 5. Descriptive Statistics

Descriptive Statistics				
Dependent Variable: Work-Life Balance				
Marital Status	**Type of Family**	**Mean**	**Std. Deviation**	**N**
Single	Nuclear	34.1463	9.42752	41
	Joint	34.9796	7.64441	49
	Extended	32.7167	9.16902	60
	Total	33.8467	8.77132	150
Married	Nuclear	26.6429	9.29442	28
	Joint	31.5750	9.52699	40
	Extended	31.7250	9.94855	40
	Total	30.3519	9.78872	108
Married with Children	Nuclear	28.8235	10.04979	34
	Joint	33.0000	9.89652	35
	Extended	32.8286	9.01791	35
	Total	31.5769	9.75993	104
Total	Nuclear	30.3495	10.03690	103
	Joint	33.3226	8.98739	124
	Extended	32.4519	9.31034	135
	Total	32.1519	9.46530	362

Table 5 provides the demographic details of the respondents involved in this study. The respondents in this study numbered up to 362, classified based on their marital status, type of family, age, and type of institution. However, this table is

focused on explaining marital status and type of family as these variables are given importance because they affect the work-life balance of women academicians. Out of 362, the single people totaled 150 divided into nuclear type of family with the figure of 41, 49 participants were single living in a joint family, and 60 were living in an extended family. The number of married women living in a nuclear family was 28, women living in a joint family were 40, and women living in an extended family structure 40, making a subtotal of 108 for all married women in a sample. Thirty-four were those women who were married and possessed with children and were also living in a nuclear type of family structure, women with children living in a joint family structure totaled about 35 and living in an extended family structure also numbered to be the same as for joint. The total sum of a nuclear family structure including all types of marital status becomes 103, 124 for joint and 135 for extended family structure, making the total 362.

One-way ANOVA was conducted, and Levene's Test of Equality of Error Variance was insignificant, with a P-value of 0.075. Thus, completing the prerequisites of the two-way ANOVA test. For work-life balance, the test between subjects revealed the statistically significant result for marital status with a P-value of 0.003, which shows there is an impact of marital status on the work-life balance of women academicians. Partial Eta square was found to be 0.032, implying that the effect size is 3.2%. Test between subjects for the factors, Family structure, showed a P-value of 0.024, which is also significant, implying that there is an effect of family structure on how the women academicians manage their work-life balance. Partial Eta square was found to be 0.021, which means the effect is 2.1%.

Table 6. Post Hoc Test for Marital Status

Factor	Compared with	Mean Difference	Std. Error	Sig. Level
Single	Married	3.494	1.172	0.009
Married	Married with Children	1.225	1.276	0.603

Multiple comparisons, as depicted in Table 6, for Marital Status shows that the mean difference between women academicians who are single and those who are married is 3.49 with a P-value of 0.009, implying a significant difference in how they manage their work-life balance. However, there appears to be no statistical difference between married women academicians and those married with children.

Table 7. Post Hoc Test for Family Structure

Factor	Compared with	Mean Difference	Std. Error	Sig. Level
Nuclear	Joint	2.973	1.238	0.044
Joint	Extended	0.870	1.155	0.732

Multiple comparisons, as depicted in table 7, for Family structure revealed that the mean difference between women academicians who live in a nuclear family and those who live in a joint family is 2.93 with a P-value of 0.044, which means there is a significant difference in their way of managing work-life balance. However, there is no difference in the extent of their work-life balance between women academicians who live in a joint family and those who live in an extended family.

This study commenced advancing the current understanding of the work-life balance local representative sample. We also intended to extend women academicians' work-life balance by considering the impact of the prominent five personalities, family structure, and marital status. It is clear from the results presented that work-life balance is a significant phenomenon for employees at different stages for possibly different reasons. The study is not longitudinal, and so the cross-sectional nature of the results allows some insight into potential differences that may exist for women academicians as they progress through their working lives (Darcy et al., 2012).

First, we examined the predictive impact of the big five personality traits on work-life balance where the results depict that there is a significant positive impact of extraversion, agreeableness, and openness to experience on work-life balance, which is consistent with the preceding study conducted by (Wayne et al., 2004). These findings support the notion that the cooperative, enthusiastic, and original nature of agreeable, extrovert, and open employees may reduce interpersonal stress at work, reducing the frequency of conflict between work and life simultaneously. In addition to these three traits, the results showed no impact of conscientiousness and neuroticism on work-life balance, which contradicts the results examined by (Kossek et al., 1999). They have revealed the negative impact of conscientiousness and neuroticism on work-life balance as the anxiety and insecurity characteristics of neuroticism lead individuals to focus more on negative aspects and have less time available to accomplish different tasks. On the other hand, the attribute of being hardworking and achievement orientation of conscientiousness may increase the experience of work-family conflict because individuals tend to have a high investment of time and energy in accomplishing one domain responsibility may incur conflict with others. Moreover, individual with conscientiousness personality trait commits to "do their best" in performance whatever the role is (Kossek et al., 1999).

Second, the analysis identified the impact of family structure and marital status on how female academic academicians manage their work-life balance. The findings portray significant differences between single and married women academicians in managing work-life balance but no statistical differences between married and married with children in managing work-life balance. These findings fit the proposition that the connubial influence of husband and childcare responsibilities is threatened throughout the women's professional life and accomplishment of different roles as researcher, teacher, mother, and service provider further leads to role conflicts between a job requirement and family responsibilities. However, single women tend to manage

their work-life balance differently because they are more self-dependent. Third, in analyzing the difference in the work-life balance of women academicians who live in a nuclear, joint, and extended family, findings indicated significant differences in the work-life balance of women academicians who live in a nuclear and joint family. However, no significant differences between women academicians who live in a joint and extended family were found as the women with children who have an extended and joint family confront family responsibilities that cause work-life conflict (Beigi et al., 2016). Beyond these findings, our results intimate that work-life balance must be given attention at the interface of different personality traits and internal or external surroundings mediation.

The findings identified above contribute to work-life balance literature in several ways. First, they align with several different studies indicating the positive impact of extroversion, agreeableness, and openness to experience on work-life balance (Kinnunen et al., 2003; Mudrack, 2004; Rantanen, 2008) that further depicts the individual with agreeableness have a positive mindset toward his or her work (Burke, 2009; Wickramaaratchi & Dr. Perera, 2018) while individuals who possess extroversion and imaginative personality are more committed and energetic in a particular situation (Kinnunen et al., 2003; Kossek et al., 1999; Mudrack, 2004; Wayne et al., 2004). However, the negative impact of neuroticism on work-life balance further specifies that the individual possession of thoroughness and defensiveness increases the degree of work-life conflict (Kossek et al., 1999). In contrast, our study did not find this impact statistically significant. Interestingly, the negative impact of conscientiousness on work-life balance partly contradicted the notion that individuals with conscientiousness traits adopt effective strategies and overcome conflict by organizing both domains in order (Wickramaaratchi & Dr. Perera, 2018). Our findings thus adding value that work-life balance is a crucial phenomenon that requires thorough research in the field of academia, which demands more working hours in managing student records, preparing for the following lectures, attending the functional meetings, providing updates and feedback to students while focusing on their research work, other activities for their carrier growth and fulfilling family responsibilities simultaneously. Consequently, our first contribution is that no study has taken the impact of the big five personality traits on the work-life balance of women academicians in Pakistan as a sample to conduct such research. Thus, the findings shed light on work-life balance and hold good.

Second, when considering the results, married and married with children, women academicians tend to have a low score on work-life balance compared to single women academicians who have a high score on work-life balance. This finding is similar to those examined by Achour et al. (2017), Butler & Skattebo (2004), Patel et al. (2006), Thriveni & Rama (2012), Umer and Zia-ur-rehman (2013). One of the reasons for these findings may be that Pakistan women's priority is to look after her children, take care of her dependents, and manage household affairs concurrently (Umer & Zia-ur-rehman, 2013). Furthermore, childcare and household are considered the primary

responsibility while the carrier is the second responsibility even though it contributes financially (Nishaat, 2017). Thus, our study differentiates between single, married, and married children in managing their work-life balance that has given limited attention in academia in Pakistan.

Third, we probed into differences in the work-life balance of women academicians possessing different family structures. Women academician reveals a different pattern in work-life balance. The findings showed the significant differences between women academicians who live in a nuclear and joint family in managing work and life, while no significant difference was found in women academicians who live in a joint and an extended family. These results correspond to those highlighted by Marafi (2016) that women have their parents or spousal contribution that encourage them to balance their work and life separately while, women with joint and extended families have an increasing number of dependents to focus on that further restrained women to manage work-life balance (Thriveni & Rama, 2012). Hence, our third contribution is that through analyzing the family structure and marital status, we could test other family structure variables, including traditional, modern, and egalitarian families with a similar model to be analyzed on as it may significantly impact work-life balance.

Conclusion

The implication of this article is notable since little research is conducted on the work-life balance of women academicians in public and private universities of Pakistan. The research study's findings will help organizational settings and educational institutions frame pertinent policies and practices, including family-friendly strategies, training, managerial support, flextime, childcare facilities, and telework. In addition, the factor of having a caring husband and family members may also help many working mothers to have balanced lives by offering good childcare services.

The study has few limitations as well. First, the data is collected only from the universities located in Karachi. However, future research may be conducted if the data is collected from various sources such as college and schoolteachers. Second, this study only considered women academicians as a sample from public and private universities. Future research may also consider the male academicians and the impact of the family structure consisting of a traditional and egalitarian family on their life. Third, the data was gathered from specific faculty members and teaching staff due to time limitations. Although, future research may also be conducted on women working in different sectors of the economy and different fields. Fourth, the study is only applicable to women academicians, thus not taking male academicians into account because the data is gathered only from women academicians. Fifth, the sample size of the current research study is also tiny compared to the numerous women academicians in Pakistan.

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The Impact of Tax and Social Expenditure Policies on Income Distribution: Evidence from South Asia

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Abstract
Tax and social expenditure policies have a crucial role in income distribution. This study explores the potential role of taxation and social expenditure policies in income redistribution in South Asia. For this purpose, empirical analysis is conducted by Fixed Effect (FE) and Instrumental Variable (IV) FE models. The analysis suggests that both taxation and social expenditures policies effectively reduce income inequality in South Asia. These findings indicate that social spending and taxation can be used as a policy tool to redistribute income in developing countries. The results also indicate that higher social spending, increased direct taxes, and more reliance on foreign debts can ameliorate the income distribution. Based on the results, it can be suggested that for this region, with the low level of taxes, direct taxes, a large informal economy, and other weak features of tax administration, more reliance on direct taxes and social expenditure policies should be the primary tool for income redistribution.

Keywords:
direct and indirect taxes, GDP per capita, social expenditure policies, gini coefficient

Introduction

Fiscal policy has a significant impact on income distribution and welfare. Through an appropriate mix of tax and social spending policies, wealth and income can be distributed fairly. During the last decade's income inequality has been rising almost in all countries due to an era of skepticism about claims that low-tax driven growth would eventually lead to everyone being well-off; an expectation that economists formalize in the Kuznets curve hypothesis (Agnello & Sousa, 2014; Piketty & Sáez, 2013). The global income inequality has slightly reduced due to catching up with China and India. However, from 1980 to 2016, the top 1% has captured twice as much total growth as the global bottom 50% (Alvaredo et al., 2018). The unequal income distribution is a significant cause of social injustice, political unrest, ethnic and regional violence. The high disparity in income and wealth persuade the poor to indulge in disruptive activities such as crimes, riots and thus, it retards economic growth (Bartels, 2018; Berg et al., 2018). Moreover, some empirical studies show that a more equal society enjoys a more significant life expectancy, fewer mortality rates, low school dropout, more minor mental illness, and drug abuse (Elgar & Aitken, 2011; Wilkinson & Pickett, 2009).

The developing countries have not yet succeeded in devising economically efficient and fairly distributive tax and transfer systems. The tax system of developing countries has multiple problems such as low tax to GDP ratio, high tax evasion and avoidance, weak tax institutions, high reliance on indirect taxation, which are likely regressive, affecting negatively the low-income households. Moreover, corruption, poor governance, and little attention to imposing taxes on the elites due to political reasons undermine the potential tax revenue (Auriol & Warlters, 2005; Besley & Persson, 2014; Fuest & Riedel, 2009). Regardless of that, in developing countries, redistribution and social expenditure programs are politically motivated, and certain political clouts, military elites, business tycoons, and real estate owners have effective control over the government programs and projects. Henceforth, most of these projects are carried out in urban areas rather than in rural areas where the majority of the poor and ultra-poor households reside (Alesina et al., 2002; Hemming et al., 2002). Due to low revenue generation capacity, it is a policy constraint for the developing countries to increase the domestic revenue to finance their high public and social expenditures. Moreover, it is also challenging for policymakers and economic planners to devise tax policies that are economically efficient and fairly distributive (Alavuotunki et al., 2017; Tanzi, 2000).

Market forces alone do not always bring a fair distribution of income. That is why government intervention is justified for redistributing income and correcting other market failures (Aikins, 2009; Wade, 2004). The government often uses tax and transfer policies to affect the income distribution, though significant redistribution through tax reforms is complex (Alesina & Angeletos, 2005; Berg et al., 2018). Tax and expenditures policies have a significant impact on income and wealth redistribution. Government spending might help ameliorate income disparity if tax revenues and transfer systems are redistributed in favor of the poor. A prudent and sound fiscal policy can reduce income inequality and poverty through tax and transfer systems (Cubero & Hollar,

2010; Milligan, 2013). In the case of developed countries, taxation is more effective in income redistribution and resource reallocation. The developed nations have adequate tax machinery, and they mostly rely on progressive income and corporate taxes. Therefore taxation is relatively effective in reducing income inequality (Bird, 2003; Lustig, 2017).

However, some strands of literature indicate that taxation is less effective in income distribution in developing countries due to large informal economy, excessive dependence on indirect taxes, and lack of adequate tax machinery, while the social expenditure policies have a relatively distributive effect (Bastagli, 2015; Bird & Zolt, 2005; Gemmell & Morrissey, 2005). In the case of developing (and transition) countries, due to low level of direct taxes, large shadow economy, and other weak features of tax administration, many have argued that social expenditures should be the primary tool for redistribution (Chu et al., 2000; Goñi et al., 2011; Tanzi, 2000). However, high reliance on indirect taxes may be rejected on equity standpoints as regressive, but it may be desirable on the equity ground as the resulting tax revenue is used for the social sector in rural areas (Inchauste & Lustig, 2017). Government spending on social sectors such as education, health, sanitation, and other necessities effectively reduces poverty and income inequality. Moreover, the expenditure policies such as primary education, essential health, and poverty reduction programs are believed to be progressive and can better target low-income households than taxes without much distortion of incentives (Bastagli, 2015; Bird & Zolt, 2005; Niehues, 2010).

Similarly, Martínez-Vázquez et al. (2012) study the impact of social expenditures such as social protection, education, health, and housing for a sample of developed and developing countries taking data from 1970-2009. The results show that all four categories of social expenditures effectively reduce income inequality. Causa and Hermansen (2017), using household-level microdata of Organization for Economic Co-operation and Development (OECD) countries, show that income inequality can be reduced by progressive taxes such as income and corporate taxes and increasing the expenditures on social security and transfer payments. According to Hoeller et al. (2012), a country with a relatively small tax base and transfer system can attain the same income redistribution level compared to a large tax base and transfer system if the former has a progressive tax system. In Pakistan, empirical studies also confirm that government transfer payment and social safety net programs such as Benazir Income Support Program (BISP) have significantly reduced the income disparity and poverty level (Farooq, 2014; Mumtaz & Whiteford, 2017; Iqbal et al., 2020; Nawaz & Iqbal, 2020). Similarly, Maboshe and Woolard's (2018) and Rossignolo's (2017) studies also indicate that social security contribution and personal income and wealth taxes reduce the income disparity in Argentina and South Africa.

Like other low-income countries, South Asia's tax and transfer payment systems have almost the same symptoms. Low tax to GDP ratio, complex tax system with a plethora of tax exemptions and privileges to various sectors and activities, narrow tax base, tax evasion, less compliance, and undocumented economy have undermined the potential tax revenue in the region (Kleven & Waseem, 2013; Padda, 2014; Gupta, 2015). Most countries' tax to GDP ratios is below the cross-country average, resulting from inadequate financial needs. Despite high growth in the last decades, mostly the regional countries

have under performed in the tax revenue collection especially larger countries such as Bangladesh, India and Pakistan, the tax to GDP ratio has either declined or stagnated. This underperformance in revenue mobilization extends to all kinds of tax instruments such as income tax, goods and services tax (GST), and property taxes (Gupta, 2015). Figure 1 indicates the tax composition of regional countries for the year 2018-19. In all regional countries except India, indirect taxes such as GST, excise, and customs duty significantly contribute to the total revenue. Empirical studies show that the incidence of indirect taxes likely falls on the poor segment of the society as the poor households tend to consume more of their income as tax than higher-income individuals (Inchauste & Lustig, 2017; Martinez-Vazquez et al., 2012).

Figure 1. Regional Comparison of Tax Revenue Composition
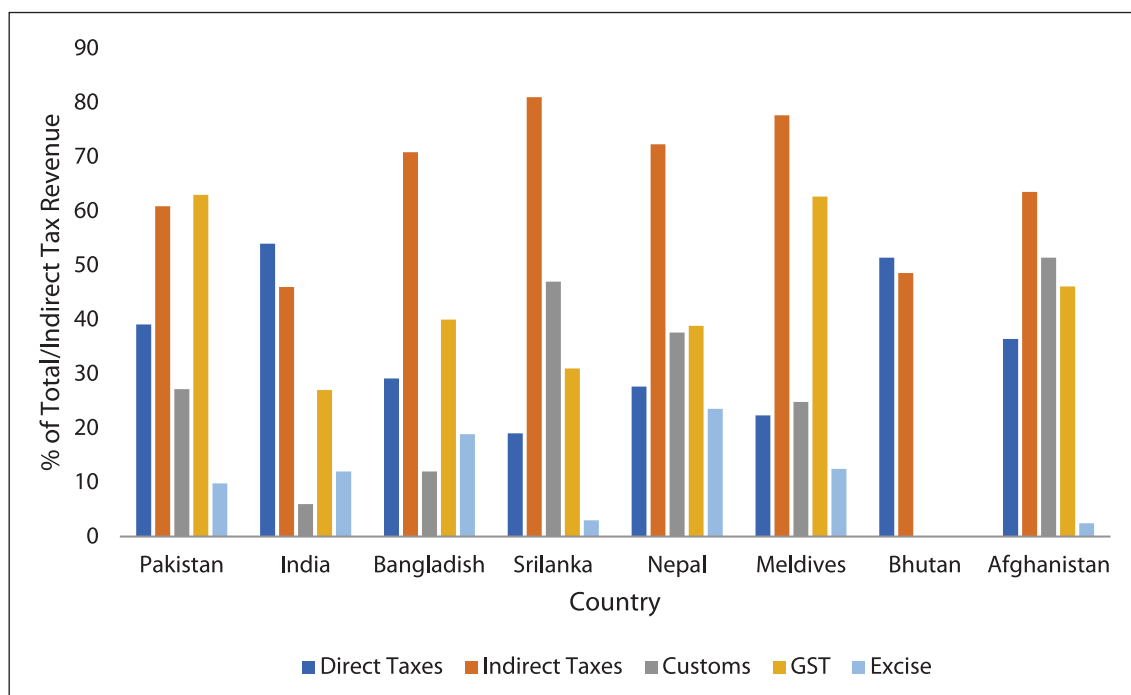
Source: Economic Surveys of the respective countries

In this study, we analyze the association between the distinguishing taxes -direct and indirect taxes and social expenditures- and the inequality in income distribution in South Asian countries during 2000- 2017. Governments in low and developing countries are particularly interested in assessing their fiscal policies to promote inclusive growth and reduce inequality and poverty. So this study has two main objectives. Firstly we assess whether taxation is effective in reducing income inequality in South Asia or not. In the case of developing (and transition) countries, due to the low level of direct taxes, large shadow economy, and other weak features of tax administration, many have argued that social expenditures policy will be effective in income distribution. Therefore, secondly, we examine the impact of social expenditures in reducing income disparities in the region. Recently there has been an acknowledgment of joint assessment of tax

and expenditures policies to find their impact on poverty and income inequality. There is scarce systematic research that has been undertaken regarding the joint assessment of tax and expenditures policies on income inequality for South Asia. Therefore, the current study is intended to explore it in a detailed manner. For empirical analysis, the impacts of direct taxes, indirect taxes, and social spending programs are explored using Fixed Effect (FE) and Instrumental Variable (IV) FE models. Our results show that taxation and social expenditures policies significantly reduce income inequality in South Asia.

Methods

We have taken the data from 2000 to 2017 of seven South Asian countries, including Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. The Gini coefficient, a well-known statistical measurement of income inequality in the economic literature, is the dependent variable in this study (Liang, 2006; Milligan, 2013). The data on the Gini coefficient is retrieved from Standardized World Income Inequality Database (SWIIB). The SWIIB (2020) uses after-tax and transfer income for the measurement of the Gini coefficient. The availability and reliability of Gini coefficients' data are significant, and there are specific missing numbers in time series data. However, SWIIB uses various imputation techniques to fill the missing values and standardizes the data for all the countries, taking the World Income Inequality Database (WIID) as the starting point (Solt, 2020).

The tax to GDP ratio is our primary independent variable. It is an aggregate of all tax revenues comprising direct taxes such as income tax, wealth tax, corporate tax, and withholding tax, while indirect tax revenues include GST, tariff, excise, and customs duty. The data on taxation are obtained from the 2017 edition of government revenue Dataset (GRD) and economic surveys of the respective countries. This GRD dataset provides disaggregated data on tax revenues that help analyze the effect of tax composition on the Gini coefficient. Moreover, we also disintegrated the total tax revenue into direct and indirect taxes. The direct taxes are expected to be more effective in equalizing the income by redistributing the income from rich to poor, while the indirect tax revenues are regressive and lead to income distribution more deteriorated (Martorano, 2018; Tsounta & Osueke, 2014). Our second primary independent variable is the social expenditure to GDP ratio. It includes the government spending on the social sector such as health, education, and other social safety net programs. It is expected that spending on social sectors has an income ameliorating effect (Bastagli, 2015; Niehues, 2010). So our baseline model will be;

$$Gini= F \ (TT, \ SE, \ Z)$$

Here Gini is the Gini Coefficient, statistical measurement of income inequality, TT is the total tax to GDP ratio, SE is the total social expenditures to GDP ratio, and finally, Z is composed of control variables included in the model to avoid omitted variable bias. These variables also affect income inequality. To ascertain the heterogeneous effects of direct and indirect taxes, the total taxes are replaced with direct taxes and indirect taxes, respectively. Besides taxes and social expenditures, several other variables are expected to have influences on the Gini coefficient. The choice of control variables

is based on the previous researches on the inequality determinants. The first included control variable in our model is GDP per capita. An increase in GDP per capita may increase the income disparity, but later it decreases. Increasing inequality is due to the shifting of some workers from agriculture to the industrial sector, as the industrial sector return is higher than agriculture. Therefore the per capita income of people involved in industry rises, leading to an increase in inequality. At later stages of development, more workers who entered the industrial sectors move up the ladder, reducing income disparity (Chan et al., 2014; Muinelo-Gallo & Roca-Sagalés, 2011; Naguib, 2017).

Trade openness is also included in the model as a proxy of globalization. International trade has become a significant factor in income inequality. However, economic literature has no consensus on trade openness on income inequality in developing countries. Trade can increase the demand of abundant unskilled workers in developing countries thus can have an income ameliorating effect (Grossman & Rossi-Hansberg, 2008; Mischi & Vivarelli, 2009). However, if trade increases the demand for scarce skilled workers, widening wage dispersion leads to income inequality (Lee & Virarelli, 2006; Jalil, 2012).

Foreign direct investment (FDI) is also included in our econometric model. It has an ambiguous impact on inequality. The reason is that FDI influx may increase the relative demand of high-skilled workers, increasing the wage and income compared to low-skilled labor, thus increasing the income disparity. However, it is also expected to equalize the income by increasing the demand for low and unskilled workers (Couto & Center, 2018; Figini & Gorg, 2011). Moreover, for the developing countries, capital inflow/outflow may create shocks, and it needs prudent and sound fiscal and monetary policies to manage the exchange rate and capital accounts (Ostry et al., 2011).

Table 1. Definition of Variables and Sources of Data

Variable descriptions	Unit of measurement	Sources
Gini coefficient, the dependent variable	0-1	World Income Inequality Database (WIID), 2015
Taxes excluding the social contribution	% of GDP	2018, Government Revenue Data Set
Direct taxes including resource revenue and excluding social Expenditures	% of GDP	2018, Government revenue Data Set
	% of GDP	
Indirect Taxes, excluding the social contribution	% of GDP	2018, Government revenue Data Set
Government spending on the social sector such as health, education, and other social safety nets	% of GDP	WDI (2020)
GDP per capita *(GDPC)*	constant (2010US$)	WDI (2020)
Trade openness; the sum of export and import	% of GDP	WDI (2020)
Foreign Direct Investment (FDI)	% of GDP	WDI (2020)
The stock of foreign Debt (SDE)	% of GDP/GNI	WDI, (2020)

Source: Authors' elaboration

Last but not least, the external debt to GDP ratio also has a significant impact on income inequality. The external debt increases the government's fiscal space and helps channel the resource towards the social sector, such as health, education, and other essential services to the poor, thus reducing the income disparity in the country (Akram & Hamid, 2016; Ngerebo, 2014). Moreover, external debt increases the foreign reserves, and it helps in the time of recession and sudden capital flight to stabilize the exchange rate and capital account (Adam et al., 2018). However, it is impossible to finance social spending by borrowing abroad indefinitely, as time will come when the debt will have to be repaid, with interest leading to fewer resources available for government expenditures.

This study takes panel data of seven South Asian countries from the period 2000 to 2017. As the data is the short panel in nature, there will not be an issue of stationarity, and conventional Fixed Effects (FE) and Random Effects (RE) models are suitable econometrics techniques for empirical analysis. A general panel regression is given below in equation 1.

$$Gini_{it} = \alpha_0 + a_1 TT_{it} + a_2 SE_{it} + a_3 Z_{it} + U_{it} \quad (1)$$
$$here\ U_{it} = U_i + V_{it} \quad (2)$$

Two main econometric techniques, i.e., Fixed Effects (FE) and Random Effects (RE) models, are used to analyze the micro panel data. FE model explores the relationship between the outcome/dependent variable and predictors/independent variables that vary over time within an entity (country, company person). Each entity has its characteristics that may or may not affect both the outcome and predictors. In the case of the FE model, we assume that the individual's time-invariant effects (U_i) may affect the predictors or outcome variables; therefore, we need to control for this. Here Ui shows the unobservable individual country's time-invariant effects, and Vit represents the remaining error terms. At the same time, there is no correlation between our included independent variables and V_{it} for all i and t. The advantage of the FE model is that it removes the effect of U_i from the independent variables and only captures the net effect of the independent variables. So the final equation for the FE model is given below.

$$Gini_{it} = \alpha_i + a_1 TT_{it} + a_2 SE_{it} + a_3 Z_{it} + V_{it} \quad (3)$$
$$Here\ \alpha_i = U_i + a_0 \quad (4)$$

Equation 3 accounts for the individuality of each cross-sectional unit by allowing the intercept to vary for each while assuming the slope coefficients constant across all the cross-sectional units. The subscript i on the intercept term shows that the intercepts of the cross-sectional units may vary. In the RE model, we assume no correlation between our included independent variables and U_{it}, i.e., the individual's time-invariant effects (U_i) and V_{it} are independent and identically distributed. It means that the variation across entities is random and uncorrelated with the independent variables in our model. So the RE model is given in equation 5.

$$Gini_{it} = a_0 + a_1 TT_{it} + a_2 SE_{it} + a_3 Z_{it} + U_{it} \quad (5)$$

Here U_{it} consists of two components, i.e., individual country's time-invariant specific error component (U_i), and V_{it} is the combined time-series and cross-sectional

error components. The decision between FE and RE models will be decided based on Hausman (1978) test. It measures whether the countries' specific time-invariant effects (U_i) are correlated with the included exogenous variables or not. The Null Hypothesis (Ho) of the Hausman Test is that countries' specific factors are not correlated with the exogenous variables, while the alternative hypothesis (H_1) is correlated with the exogenous variables. The rejection of Ho is the acceptance of the FE Model, and acceptance of Ho is in favor of the RE Model. Moreover, most economic variables are dynamic, i.e., the lag value of the dependent variable is correlated with the country-specific fixed effects. Due to endogeneity issue, i.e., the correlation between the exogenous variables and the error terms, the conventional FE and RE models give biased and inconsistent estimates of the parameters and also underestimate the variance (Ahn et al., 2001; Baltagi, 2008; 2000; Ebbs et al., 2004). To cope with this issue, Arellano and Bond (1991) and Blundel and Bond (1998) have developed a model for the short dynamic data that produces efficient and unbiased estimates. However, these methods are suitable for dynamic panel data with many panels and short periods. However, these methods provide relatively biased and inefficient estimates for a data set with small panels like ours (Judson & Owen, 1999). To tackle this issue, we employ the standard instrumental variable FE and RE models. Following Devereux et al. (2007), we take the first lag of the dependent variable and other additional independent variables as instruments.

Results and Discussion

Table 3 reports the results of the Hausman (1978) test and all four FE models. These results show that taxes can be used as a policy tool for redistributing income, contrary to many empirical studies in other developing countries that taxation is ineffective in redistributing income and wealth (Baihui, 2017; Lustig et al., 2013; Martorano, 2018). The results of the Hausman (1978) test favors the FE model. Therefore we provide the results of only FE models. The total tax to GDP ratio, direct tax to GDP ratio, and indirect tax to GDP ratio has a significantly negative impact on the Gini coefficient. The negative impact of taxes may reflect the progressive structure of the tax system of the analyzed countries. In a progressive tax system increase in the tax revenue through increasing the tax base or tax rate would yield a more significant redistributive effect, thus lower inequality (Martinez-Vazquez et al., 2012; Muinelo-Gallo & Roca-Sagalés, 2011).

Moreover, the expenditures on the social sector correlate negatively with the Gini coefficient, validating other empirical studies that social spending can ameliorate income inequality in the sample countries (Bastagli, 2015; Niehues, 2010). The results indicate that a 1% increase in social expenditure reduces the Gini coefficient by 0.005% on average. So these results are consistent with the previous literature arguing that expenditures on education, health, and other poverty reduction programs are more effective in redistributing income (Álvarez-Gálvez & Jaime-Castillo, 2018; Martinez-Vazquez et al., 2012; Shah et al., 2018). However, taking into account the low level of social expenditures, a great budgetary effort would be necessary to reduce the income inequality in South Asia.

The GDP per capita has a positive and significant impact on income inequality. The results show that the GDP per capita increases the Gini coefficient validating the conventional Kuznets hypothesis. As our sample consists of low-income countries, this result is in line with the Kuznets type relationship. Increasing inequality is due to the shifting of some workers from agriculture to the industrial sector, as the industrial sector return is higher than agriculture. Therefore the per capita income of people involved in industry rises, leading to increase income inequality (Chan et al., 2014; Naguib, 2017).

The trade has a positive and but insignificant effect on the Gini coefficient. This is likely attributed to the low level of share of world trade of South Asian countries. However, the positive sign of the trade openness indicates that international trade is expected to widen the wage dispersion between unskilled and skilled workers, resultantly increasing the income inequality in the region (Lee & Virarelli, 2006; Jalil, 2012). A possible justification could be that in South Asia, the significant exports sectors, i.e., agriculture and manufacturing, are dominated by the elites who extract rents and other tax exemptions, increasing income inequality (Zakariya & Fida, 2016). However, the FDI inflow has negative coefficients but is insignificant. Due to lack of inadequate infrastructure facilities, governance issues, and internal conflict, the South Asian countries still go a long way to attract FDI (Bhavan et al., 2011). However, if FDI inflow increases the demand for low-skilled labor, it is expected to equalize the income by increasing the wage of low-skilled and less-educated workers (Couto & Center, 2018; Figini & Gorg, 2011).

Table 2. Results of FE Fixed Models

Dependent Variables	(1)	(2)	(3)	(4)
Total taxes	-0.0406*** (0.0061)			0.0120 (0.0318)
Direct taxes		-0.0115** (0.0036)		-0.0079 (0.0085)
Indirect tax			-0.0352*** (0.0058)	-0.0377** (0.0142)
Social expenditures	-0.0054* (0.0027)	-0.0049* (0.0025)	-0.0057** (0 .0035)	-0.0058** (0.0031)
GDP per capita	0.0495** (0.0185)	0.0440 (0.0204)	0.0439** (0.0156)	0.0460** (0.0173)
Trade	0.0346 (0.0272)	0.0375 (0 .0300)	0.0321 (0.0255)	0.0344 (0.0273)
FDI	-0.0010 (0.0023)	-0.0005 (0.0025)	-0.0018 (0.0025)	-0.0012 (0.0020)
External debt stocks	-0.0161* (0.0070)	-0.0089 (0.0094)	-0.0103 (0.0061)	-0.0107 (0.0085)
Constant	3.3586*** (0.2343)	3.2711*** (0.3001)	3.3618*** (0.2135)	3.3184*** (0.2646)
R-Sq	0.5171	0.4491	0.5200	0.5344
No of observation	122	122	122	122
Hausman Test (P Value)	0.0000	0.0000	0.000	0.001

Note: Robust standard errors are in parenthesis. ***, **, and * indicate significant at 1%, 5% and 10% level respectively.

Lastly, the external debt also has a significantly negative impact on the Gini coefficient in model 1, showing that foreign debt accumulation decreases the income disparity in the country. Debt can affect the income distribution in different directions depending on how the debt is utilized as the external debt increases the fiscal space of the government and help to channel the resource towards social sector such as health, education, and other essential services to the poor thus reducing the income disparity in the region (Agnello & Sousa, 2012; Akram & Hamid, 2016). When spending is financed by borrowing abroad, the government is not taking from the poor, at least in the short run, which is why this combination is more effective for reducing inequality (Ngerebo, 2014). However, one particular aspect is the impossibility of financing social spending by borrowing abroad indefinitely, as time will come when the debt will have to be repaid with interest. If that finance is carried out from indirect taxes, as in the case of South Asia, then the inequality is expected to increase.

Table 3. Results of IV FE Model

Dependent Variables	(1)	(2)	(3)	(4)
lag of Gini coefficient	0.5506***	0.6550***	0.3392	0.5680***
	(0.1213)	(0.0913)	(0.5482)	(0.2437)
Total taxes	-0.0129**			0.0061
	(0.0062)			(0.0114)
Direct taxes		-0.0036***		-0.0044**
		(0.0010)		(0.0019)
Indirect taxes			-0.0184	-0.0104
			(0.0237)	(0.0129)
Social Expenditures	-0.0003	0.0001	-0.0013	-0.0003
	(0.0009)	(0.0006)	(0.0032)	(0.0017)
GDP per capita	0.0142***	0.0083*	0.0226	0.0129
	(0.0050)	(0.005)	(0.0219)	(0.0095)
Trade	0.0103*	(0.0073	0.0170*	(0.0102)
	(0.0060)	(0.0062)	(0.0094)	(0.0077)
FDI	0.0002	0.0005	-0.0003	0.0003
	.000939	(0.0007)	(0.0015)	(0.0009)
External debt Stocks	-0.0035	-0.0012	-.0028636	-0.00157
	(0.0031)	(0.0014)	.0061187	(0.0036)
Constant	1.5603***	1.1925***	2.2574	1.4772***
	(0.4568)	(0.3204)	(1.9127)	(0.8565)
R square	0.9561	0.9797	0.8117	0.9561
No of Observation	115	115	115	115

Note: Robust standard errors are in parenthesis. ***, **, and * indicate significant at 1%, 5% and 10% level respectively. All variables are in log form.

In order to check the robustness of our results, we use instrumental variables to examine the simultaneity between the fiscal variables and income inequality. Moreover, we take the first lag of both the dependent variable (Gini coefficient) and trade as instruments to tackle the issue of endogeneity. However, to check whether one particular country in our sample drives the results, we drop one county at a time from the regression

equation. The results are stable after repeating this process, indicating that no single country is driving our results. Table 3 reports the IV FE results of all four models. The expected signs and significance levels of both IV FE and conventional FE models are almost similar. The significant positive coefficients and high significance level of the previous year's Gini coefficient indicate the high persistence of inequality in income redistribution in the short run.

Moreover, the estimated coefficient value is between 0 and 1, indicating the convergence of income inequality in the region. The total tax to GDP ratio, direct/indirect taxes ratios has a significantly negative impact on the Gini coefficient. These results show that taxes can be used as a policy tool for redistributing income in the region, validating other empirical studies (Lustig et al., 2013; Martorano, 2018; Muinelo-Gallo & Roca-Sagalés, 2011). Similarly, the social expenditures harm the Gini coefficient, but they are not significant in either model. The GDP per capita has a positive and significant impact on income inequality again. The positive signs indicate a Kuznet relationship, i.e., in the early stages of development, an increase in GDP leads to an increase the income inequality in South Asia.

However, in IV FE, the trade has a positive and significant effect on the Gini coefficient. The positive sign of the trade openness indicates that international trade is expected to widen the wage dispersion between unskilled and skilled workers, resultantly increasing the income inequality in the region, validating other empirical studies (Lee & Virarelli, 2006; Jalil, 2012). Again FDI has no significant effect on the Gini coefficient of the south Asian countries in either model. Lastly, the external debt stock has a negative but insignificant effect on the Gini coefficient. However, the negative signs indicate that the external debt supplements the government's fiscal space and helps channel the resource towards social infrastructure and other essential services to the poor, thus expected to reduce the income disparity in the region. However, it is impossible to finance social spending by externally borrowing indefinitely, as time will come when the debts will have to be repaid, with interest leading to fewer resources available for government expenditures.

Conclusion

Income inequality has increased over the past three decades in developing (transition) countries. Our study examined how tax and expenditures policies affect income inequality. This study investigated the impact of government tax revenue, social expenditures, and other variables such as GDP per capita, trade openness, FDI, and external debt stocks on the income distribution of South Asia, taking the data from 2000-2017. Our empirical study suggests that in the case of South Asia, taxation policies, direct taxes are effective in income distribution. These results show that taxes can be used as a policy tool for redistributing income, contrary to the popular notion that taxation is ineffective in redistributing income and wealth in developing countries. The negative impact of taxes may reflect the progressive structure of the tax system in South Asia. In a progressive

tax system, increasing tax revenue by increasing the tax base or tax rate would yield a more significant redistributive effect.

Moreover, the expenditures on the social sector also ameliorate the income disparity in the region. This region has a relatively low tax to GDP ratio, sizeable informal economy, excessive dependence on indirect taxes, and lack of adequate tax machinery undermine the potential revenues and constraints governments' investment in the social sectors. Therefore, regional countries should mobilize the internal resources for inclusive growth by increasing direct taxes' tax base. The government's antipoverty programs are primarily constrained by limited tax revenue. Regional governments could benefit from expanding their tax base, raising the tax rate on top income, developing well-designed social benefits to target vulnerable people, and focusing on education and health sectors. So this study suggests that in the case of South Asia, due to low level of taxes (direct) taxes, large shadow economy, and other weak features of tax administration, the taxation and social expenditures policies should be the primary tool for income and wealth redistribution.

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The Impacts of Tourism and Governance on CO$_2$ Emissions in Selected South Asian Countries

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Abstract

Due to the increase in international connectivity and technological advancement, tourism has gained immense momentum in the recent past. Despite its favorable impacts, tourism has proved to be one of the significant contributors to increasing CO2 emissions. This study attempts to understand better the relationship between tourism, governance, and the CO2 emissions nexus in selected South Asian countries. The study obtained data from WDI and applied FMOLS, DOLS, and FEOLS methods from 1995-2019. It is observed that tourism has a significant and positive impact on CO2 emissions in the case of selected South Asian countries. Concerning the impact of governance on CO2 emissions, it is observed that governance effectiveness is negatively associated with CO2 emissions. It is evident from the empirical analysis that CO2 emissions can be mitigated with effective government policies. Furthermore, it is also suggested that the government aim at effective environmental policies, and attention should be given to sustainable tourism in the case of South Asian economies.

Keywords:
tourism, governance, South Asian countries

Introduction

The tourism sector plays a pivotal role in economic growth due to its multiplier effects on the economy. It tends to create a substantial increase in the gross domestic product (GDP) (Shahzad et al., 2017). At the same time, it helps to create new employment opportunities directly and indirectly and generate and increase revenues (Dogan & Aslan, 2017; Mathew & Sreejesh, 2017; Yaşar et al., 2019). According to the United Nations World Tourism Organization (UNWTO) 2019, the tourism sector accounts for ten percent of world GDP and also helps to create one in ten jobs in the developed and developing world. There is a strong association between tourism and sustainable development goals agenda 2030.

The tourism sector has immense potential to contribute to SDGs 8, 12, and 14 as it has also been included in the targets of the goals mentioned above (Siakwah et al., 2020; Ristić et al., 2019). It was estimated by UNWTO (2019) that the tourism sector grew at a rate of 4 percent in 2019. Almost all the regions in the world have seen an increase in tourism activities, such as the Middle East (8 percent), Asia and Pacific (5 percent), and Europe and Africa (4 percent), whereas America is lagging at the growth rate of 2 percent only. According to UNWTO's (2019) forecast, world tourism will grow at the rate of 3 to 4 percent in 2020.

International tourist arrivals increased from 770 million in 2005 to 1.2 billion in 2016 and are forecasted to reach 1.8 billion in 2030. Domestic tourist arrivals have doubled from 4 billion in 2005 to 8 billion in 2016 and are projected to reach 15.6 billion in 2030 (WTO 2011, WTO 2018). Affordable air travel, increased connectivity, new technological advances, new business models, and more excellent visa facilitation around the world have fostered the continuous growth of international and domestic tourism in the past decades (Anson & Avin, 2016; Dogan et al., 2017; Roudi et al., 2019). While this evolution offers vast opportunities, it also has significant responsibilities, notably concerning environmental impacts and climate change (Eyuboglu & Uzar, 2020). The negative impacts of tourism increasingly concern governments worldwide, and many are striving to reduce tourism's carbon footprint. Efficiency improvements have reduced emissions per passenger, but the number of tourists outweighs these improvements.

The decarbonization of the transport sector will have to be an essential part of the solution (Liu et al., 2019; Balli et al., 2019). In 2016, CO$_2$ emissions from transport, including passenger (car, rail, air) and freight (maritime, air, surface) transport, were estimated to total 7,230 million tonnes globally, representing 23% of all manufactured CO$_2$ emissions. Out of the total transport emissions, 64% or 4,650 million tonnes of CO$_2$ were produced by passenger transport. Emissions from passenger transport are calculated to have split almost equally between non-urban and urban transport. In terms of transport volumes, the estimates show that 44,000 billion PKM were traveled in 2016, 60% of which correspond to non-urban transport (IFT, 2019).

According to forecasts from ITF (2019) for 2030, despite expected increases in fuel efficiency and the emergence of cleaner and greener modes of transport, growth in

passenger and freight transport demand will lead to higher CO_2 emissions. By 2030, total passenger and freight transport-related CO_2 emissions are estimated to grow by 21% compared to 2016 and reach 8,772 million tonnes of CO_2, representing 23% of all manufactured CO_2 emissions. Passenger transport-related demand is projected to increase by 69% by 2030, reaching 75,000 billion PKM, two-thirds of which will be done in a non-urban setting. In the recent past, we have observed that institutional failure and poor governance lead to too many environmental problems, including increased CO_2 emissions (Lameira et al., 2016; Tarverdimamaghani, 2017; Jebli et al., 2019; Asongu & Odhiambo, 2020). Therefore countries with effective policies tend to manage their environment better. Generally, environmental policies depend on governmental policies. In turn, governmental policies are dependent on the structure and effectiveness of the government.

Previous literature also highlights that environmental degradation often stems from institutional failures. To measure governance effectiveness and quality, the Worldwide Governance Indicators (WGI) documented six different indicators such as voice and accountability, political stability and absence of violence (democracy), government effectiveness, and regulatory quality, rules of law, and control of corruption (Tarverdi, 2018). As a result of increasing threats of global warming and climate change, there is a particular need to discuss global environmental issues with a special focus on governance effectiveness. As we have mentioned that governance comprises six different indicators, the literature also noted that every governance index is differently connected with CO_2 emissions. It is observed that institutional quality is one of the significant determinants of environmental quality (Halkos & Tzeremes, 2013).

Meanwhile, corruption also impacts environmental quality in two ways, either directly or indirectly. As corruption affects institutional performance and creates rent-seeking behavior, it often creates obstacles to the effective implementation of environmental quality regulations. Therefore it is observed from different studies that control of corruption is mandatory for implementing environmental laws.

We found vast literature on the issue of tourism and CO_2 emissions for an individual country as well as for the group of countries, for example, Akan et al., 2008; Lee & Brahmasrene, 2013; Al-Mulali et al., 2015; Dogan & Aslan, 2017; Işik & Radulescu, 2017; Chen et al., 2018; Jebli et al., 2019 and Li et al., 2019. Most of these studies found a positive impact of tourism activities on CO_2 emissions. Also, the existing literature supports the negative impact of good governance on CO_2 emissions (Samimi et al.,2012; Gani, 2012; Halkos & Tzeremes, 2013; Halkos et al., 2015; Haseeb et al., 2018; Danish et al., 2019; Muhammad et al., 2019).

The basic idea of this study is to emphasize the issue of sustainable tourism by focusing on the role of governance in regulating the tourism sector emissions. The study's specific objectives are to evaluate the impact of tourism arrivals on CO_2 emissions in selected South Asian countries and analyze the impact of governance effectiveness on CO_2 emissions in selected South Asian countries. Also, the study attempt to assess the

combined effect of governance effectiveness and tourism sector activities on CO$_2$ emissions for the selected countries.

Most of the existing literature found the relationship between tourism and CO$_2$ emissions in developed countries and top tourist destinations. There are very few studies that incorporate the composite role of governance effective and tourism sector activities in mitigating the CO$_2$ emissions for the South Asian countries. The present study attempts to cover the literature gap by incorporating the interaction term of governance effectiveness and tourism arrivals, i.e., a proxy for the tourism sector activities in South Asian countries.

Moreover, the study contributes to the existing literature in various ways. It assesses the impact of tourism and governance on CO$_2$ emission for the panel of selected South Asian countries. Besides, in the existing literature in energy and environmental economics, the role of governance to curtail tourism sector emissions is not given much importance. Therefore, the present study also incorporates the combined effect of governance effectiveness and tourism sector activities to mitigate CO$_2$ emissions. The study also utilizes the latest econometrics techniques to assess the said relationship. Besides, the study provides suitable policies for South Asian countries, which may be generalized for a similar group of countries. The rest of the study is structured in the following manner. Section 2 presents methods. After that, we discuss results, and at the end, we conclude the study and proposed policies based on our empirical results.

Methods

In this study, we intend to analyze the impact of tourist arrivals as a proxy for the tourism sector activities and governance effectiveness and their composite impact on CO$_2$ emissions. The description of the variables is presented in Table 1. The period of the analysis is from 1996 to 2019. Our selected South Asian countries include Pakistan, India, Sri Lanka, and Bangladesh. We have extracted the data from World Development Indicators, the official data bank of the World Bank.

Table 1. Description of the selected variables

Variable	Symbol	Definition	Source
Corban emissions	CO$_2$	Carbon dioxide emissions (kilotons).	WDI
Tourism	Tur	The number of international tourist arrivals.	WDI
Governance effectiveness	GE	The quality of governance, including the quality of public services.	WGI
Energy consumption	EC	Kg of oil equivalent energy use.	WDI
Gross domestic product	GDP	Real GDP.	WDI

By following Katircioglu (2014) and Haseeb et al. (2018) the general form of the model is:

$$CO_2 = f\ (Tur,\ GE, EC,\ GDP) \tag{1}$$

By transforming it into natural logarithm the model will take the following form.

$$\ln CO_{2it} = \alpha_0 + \alpha_1 \ln Tur_{it} + \alpha_2\, GE_{it} + \alpha_3 \ln EC_{it} + \alpha_4 \ln GDP_{it} + \varepsilon_{it} \qquad (2)$$

$$\ln CO_{2it} = \alpha_0 + \alpha_1 lnTurGE_{it} + \alpha_2 \ln EC_{it} + \alpha_3 \ln GDP_{it} + \varepsilon_{it} \qquad (3)$$

In equation 1, we have the general form of the model to assess the impact of governance effectiveness and tourism on CO_2 emissions. In equation 2, we assess the impact of tourism and governance effectiveness on environmental quality indicated by CO_2 emissions for the selected panel of South Asian countries. In equation 3, we introduced an interaction term to see the collective impact of governance effectiveness and tourism arrivals on CO_2 emissions. Here we want to assess the role of governance effectiveness along with tourism to reduce CO_2 emissions.

After the model's specification, we will apply the panel unit root tests to find out the order of integration and the panel data stationarity. We can check the stationarity of data through LLC and IPS tests. LLC stands for Levin, Lin, and the Chu, and IPS stands for Im, Pesaran, and Shin. After checking the stationarity of the data, we concluded that all of the variables are integrated into order 1. To produce the long-run estimates, several econometrics techniques are available in the literature. However, the present study utilizes fully modified ordinary least square (OLS) and dynamic OLS. Pedroni used the fully modified ordinary least square (FMOLS) to solve the problem of endogeneity and the serial correlation between the regressors. Besides, the DOLS method was proposed by Stock & Watson (1993), and later on, it was extended by Kao (1999). The DOLS method is also helpful in correcting the problem of endogeneity. For the comparison of the empirical results, we used FEOLS.

Table 2. Panel Unit Root Tests

Variables		With Intercept		With Trend & Intercept	
		Statistic	P-Values	Statistic	P-Values
		First difference			
CO_2	LLC	-2.852	0.000	-5.102	0.0003
	IPS	-5.124	0.000	-2.985	0.002
Tur	LLC	-4.801	0.000	-2.921	0.053
	IPS	-5.255	0.000	-6.881	0.002
GE	LLC	-4.110	0.000	-6.211	0.000
	IPS	-8.555	0.000	-6.811	0.001
EC	LLC	-6.421	0.000	-3.401	0.000
	IPS	-5.962	0.000	-3.721	0.000
GDP	LLC	-3.990	0.000	-4.640	0.0001
	IPS	-2.002	0.000	-2.652	0.003

Results and Discussion

In this section, we will discuss the empirical results of the model. Table 3 presents the descriptive statistics of the selected variables. The mean value of CO_2 is 4.511, and the mean value of the variable tourism is 5.651. Moreover, the mean value of governance effectiveness is 0.616, the mean value of energy consumption is 2.851, and the mean value of GDP is 10.776. Since our variables are integrated of order I, we applied at least one cointegration test to confirm the existence of long-run relationships among the selected variables. The study used two panel cointegration tests: the Pedroni panel cointegration test (Pedroni, 1999; 2004) and the Kao panel cointegration test (Kao, 1999). The reported results in Table 4 confirmed the existence of cointegration among selected variables at 1 percent.

In Table 5, the estimation results express the value of each coefficient and its probability values. Here, the dependent variable is CO_2 emissions. In model 1, the coefficient value of tourism shows that if tourism increases by one percent, then the CO_2 emissions will increase by 0.21% for the selected countries in the South Asian block. The result is found consistent with other authors (Ozturk, 2016; Katircioglu, 2014; Shakouri et al., 2017; Paramati et al., 2018; Danish & Wang, 2018), and not consistent with Dogan & Aslan (2017), as these authors conclude that tourism tends to mitigate CO_2 emissions. The coefficients of governance effectiveness show a negative relationship with CO_2 emissions. Therefore we can conclude that governance effectiveness is negatively associated with CO_2 emission in the selected South Asia countries.

Table 3. Descriptive Statistics

Variables	CO_2	Tur	GE	EC	GDP
Mean	4.511	5.651	0.616	2.851	10.776
Median	4.712	5.565	0.624	2.703	10.721
Maximum	6.021	7.091	1.283	2.163	12.441
Minimum	3.412	5.001	0.088	2.096	9.551
Std. Dev.	0.699	0.466	0.321	0.851	0.708

Our results are supported by various studies from the literature on governance and CO_2 nexus for different countries around the globe (Halkos & Tzeremes, 2013; Halkos et al., 2013; Yang et al., 2018; Haseeb et al., 2018; Asongu & Odhiambo, 2020). The coefficient of the log of energy consumption shows that if energy consumption increases by one percent, then CO_2 emissions will increase by 0.41%.

The result is similar to Lee & Brahmasrene, 2013; Khobai & Le Roux, 2017; Dogan & Aslan, 2017; Wang & Fang, 2018; Muhammad, 2019; Mensah et al., 2019; Munir et al., 2020. The coefficient of the GDP shows that if GDP increases by one percent, then CO_2 emissions will increase by 1.10%. Our results are supported by the

previous and recent literature; for example, Magazzino, 2016; Bekhet & Othman, 2018; Magazzino & Cerulli, 2019; Balli et al., 2019; Beşe & Kalayci, 2021; Munir et al., 2020. The coefficient of the interaction term of governance and tourism shows that governance effectiveness and tourism will help to decrease CO_2 emissions by 0.16%. Almost similar results are found for the other two models, i.e., DOLS and FEOLS. It also concludes that policymakers should emphasize the support of low carbon tourism development. Significantly more attention should be given to energy intensity reduction from tourism. The empirical results also support this notion that effective governance policies concerning tourism development also helps to reduce CO_2 emissions in selected South Asia countries.

Table 4. Pedroni Cointegration Test

Common AR coefs. within dimension				
	Stat.	Prob.	Weight Stat.	Prob.
V-statistics	10.25	0.00	6.23	0.314
Rho-statistics	3.22	0.210	3.11	0.307
PP-statistics	-3.11	0.001	-3.11	0.001
ADF-statistics	-7.13	0.001	6.00	0.001
Individual AR coefs. between-dimension				
Rho-statistics	4.99	0.560		
PP-statistics	2.19	0.000		
ADF-statistics	-9.11	0.001		
Kao's cointegration test				
	t-statsitics	Probability		
ADF	-3.660	0.000		

Table 5. Panel Long Run estimators

Variables	FMOLS		DOLS		FE OLS	
Tur	0.21** (0.02)	-	0.02*** (0.00)	-	0.01*** (0.00)	-
GE	-0.18***	-	-0.15**	-	-0.18**	-
TurGE	-	-0.17*** (0.00)	-	-0.16*** (0.00)	-	-0.19*** (0.00)
EC	0.41*** (0.00)	0.19*** (0.00)	0.05*** (0.00)	0.34*** (0.00)	0.29*** (0.05)	0.14*** (0.00)
GDP	1.10*** (0.00)	1.02** (0.03)	0.21*** (0.00)	0.10*** (0.00)	0.68*** (0.00)	0.41** (0.03)

***, **, * represent 1, 5 & 10 percent level of significance. In parenthesis ( ) are probabilities.

Conclusions

As for the empirical results of selected South Asia countries, the present study illustrates the role of governance in controlling the environmental degradation originating from tourism sector activities in selected South Asian countries. This study contributes

to increasing our understanding of tourism-governance and CO_2 nexus in South Asian countries. Following the results, we found that tourism significantly impacts CO_2 emissions, whereas governance quality is negatively associated with CO_2 emissions. We also included an interaction term where we assessed the joint association of tourism and governance effectiveness with CO_2 emissions in the selected countries, and as expected, it is negatively associated with CO_2 emissions. Moreover, CO_2 emissions are also significantly associated with GDP. CO_2 emissions tend to increase as a result of higher energy usage.

It is essential to give more attention to effective government policies that control environmental degradation originating from tourism sector activities in these countries. The government should restrict the amount of carbon that polluters are permitted to emit from the tourism sector. Moreover, attention should be given to sustainable tourism. Sustainable tourism is an industry dedicated to making a low impact on the environment and local culture while helping to generate future employment for local people. The main aim of sustainable tourism is to maximize benefits while safeguarding cultural heritage and minimizing the negative environmental impact of tourism. Sustainable tourism is firmly positioned in the 2030 Agenda. However, achieving this agenda requires a clear implementation framework, adequate financing, and investment in technology, infrastructure, and human resources.

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The Reviews on Sustainable and Responsible Investment (SRIs) Practices According to *Maqasid Shariah* and *Maslahah* Perspectives

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JEL Classification:
G2
G4
I13
N2

Received: 04 November 2020

Revised: 25 June 2021

Accepted: 12 July 2021

Abstract

The present study aims to explore SRIs practices based on *Maqasid Shariah* and *Maslahah's* points of view. A qualitative method via content analysis document was advocated to address the link between all concepts. The analysis revealed that SRIs, *Maqasid Shariah* and *Maslahah* share similar aims and goals to promote better environmental, social and governance practices. Thus, the paper concludes that the concept of SRIs does not contradict *Maqasid Shariah* and *Maslahah* in Islamic perspectives. However, a few criteria in the Environmental, Social and Governance (ESG) concept that govern the SRIs practices like promoting human rights, freedom of expression, and censorship need further clarification to align with Shariah principles. The paper can enlighten the reader, especially in terms of the capabilities of SRIs practices (which is from West philosophy) to suit *Maqasid Shariah* and *Maslahah* in Islamic perspectives.

Keywords:
SRIs practices, ESGs concept, *maqasid shariah*

Introduction

At present, Sustainable and Responsible Investment (SRIs) has been attracting considerable interest and continuously promoted in the last decade around the globe. Generally, it is essential to understand that the SRIs concept promotes any investment activities that integrate Environmental, Social and Governance (ESG) issues into investment portfolios. Specifically, this integration commonly occurs through several approaches such as investment decision-making, transparency, collaboration, active ownership, and the achievement of broader support for these practices from the entire financial services industry (OECD, 2007). Marwan & Rabiah (2015) pointed out that the movement can be observed from the increasing number of investors and assets under this concept.

ESGs concept integrates several factors into the fundamental investment analysis, which act as the indicators in evaluating investment and company performance (Lauren et al., 2013). Moreover, Laura et al. (2015) state that ESGs investing is not only for financial motivation but also to promote corporate responsibilities towards society. Thus, the Responsible Investment Association Australia (RIAA) defines ESGs concept as follows:

> *"[…] the systematic and explicit inclusion by investment managers of environmental, social, and governance factors into traditional financial analysis and investment decision making based on an acceptance that these factors represent a core driver of both value and risk in companies and assets."* (RIAA, 2013).

In particular, investors and stakeholders tend to decide their investment portfolios by paying more attention to the ESGs factors. Accordingly, this allows them to know where the money is invested and how the business is conducted. For example, in the environmental scope, investors and stakeholders are more aware of the importance of protecting the natural environment due to climate change and their impact on the environment based on the business operation decisions.

Therefore, in driving the ESGs concept, SRIs have to be used as instruments or approaches to fulfill the ESG's objectives. Regarding this matter, SRIs can be defined with several acronyms, including Social Responsible Investment, Sustainable, Responsible, and Impactful Investments; Socially Responsible Investments; and others. Nevertheless, SRIs reflect the same fundamental aims and goals regardless of the various terms used. According to Moghul & Safar-Aly (2014), "SRIs" is a generic terminology that involves any investment process, which occurs through the combination of the concerns toward the issues of ESGs and investors' financial objectives. There are many investment products have been launched to support the SRIs. Figure 1 presents a precise diagram that illustrates the structure of SRIs and ESGs.

Previously, SRIs were known as 'ethical investment.' The West first developed the instrument, and the practices can be traced since the 18th century when the members of "Quakers or Friends of Church" (name of a religious society) decided to select investment activities based on their values and ethics. However, the practices only started to show significant development and growth in the 20th century or during the last two decades. As a result, this has led many Methodism scholars to highlight these issues in

a straightforward way which then turns the philosophy and ideology into a trend that has been widely applied until today (Salina & Adam, 2017).

Figure 1. Relationship between SRIs and ESGs
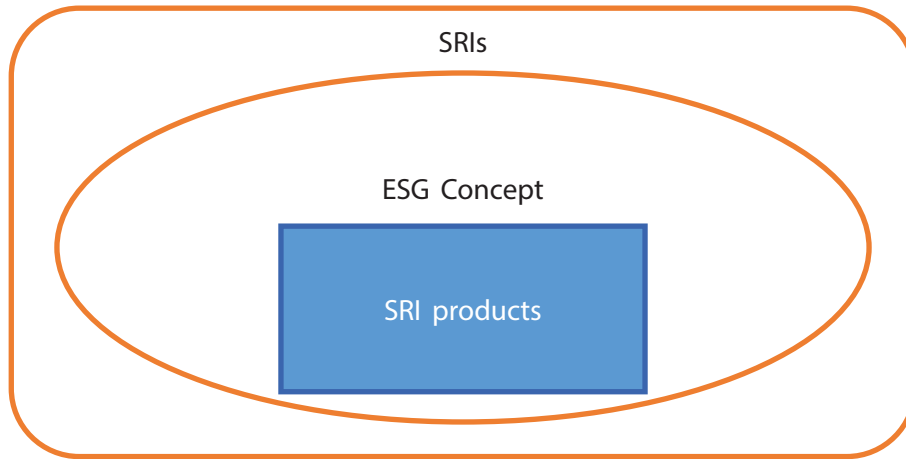
Source: self-constructed

On another side, Islam is a religion that promotes a comprehensive and balanced development of the economy with a strong emphasis on social welfare (Mohamad et al., 2016). Regarding the Islamic institution's practices, *Maqasid Shariah* and *Maslahah* as the primary objective that needs to be achieved, while the operation and services are described as the manifestation of the objective. More importantly, Islamic products and services will lose their intrinsic values and become unacceptable in the global market due to ignoring *Maqasid Shariah* and *Maslahah*. The application of the SRIs concept has been practiced directly and indirectly by Islamic institutions through several names and products offered since its establishment. As stated in Dangulbi's (2012) study, one of the main objectives of Islamic institutions' services is to provide justice and social welfare to society and human life. In addition, Vejzagic & Smolo (2011) pointed out that profit maximization is not the sole concern of Islamic institutions because responsibility, justice, and fair play must occur together at all levels of human interaction *(Mu'amalah)*.

Generally, the philosophies established by West and Islamic might be different in specific aspects, although some share the same aims and goals. Therefore, by considering the SRIs and ESGs concepts are originated from the western philosophical point of view, it is of great significance to investigate both concepts from the Islamic perspectives by adopting *Maqasid Shariah* and *Maslahah* approaches as a core fundamental. In order to develop a comprehensive Islamic institution, they should make a proper decision before deciding whether to be involved actively in these concepts, although global practices highly encourage SRIs instruments in investment portfolios.

Hence, it is crucial for Islamic institutions to consider the most crucial issue: whether the practices of SRIs and ESGs concepts will fulfill the Shariah requirement or otherwise. This concern is in line with the views of Mohamad et al. (2016), Marwan & Rabiah

(2016), and Wahab & Naim (2021), which mentioned that Islamic institutions require careful identification and investigation regarding the desired social outcome. Overall, further work is needed to answer the issues considering that the SRIs instrument cannot be adopted because it may raise the Shariah issue that will affect product offerings. Thus, to cater to the Shariah-compliant issue and to protect the image of the Islamic financial industry, a study on SRIs and ESGs that linked to the Islamic perspectives by adopting *Maqasid Shariah* and *Maslahah* approaches is needed. In the context of Malaysia, the study is essential to strengthening Malaysia's position as the world's Islamic banking hub (New Straits Times, 2017). Moreover, this study might be helpful to other countries as a reference to develop their own Islamic SRI framework.

A search of the literature discovered that most past research only focused on the one-to-one dimension of study; for example, SRIs towards investment performance (see Ferrero-Ferrero et al., 2016; Syed, 2017; Buallay, 2019) while other studies (e.g., Hebb et al., 2014; Junkus & Berry, 2015; Hernaus, 2019) focused only on SRIs instrument itself. Other than that, several existing research (e.g., Laldin & Furqani, 2013; Shinkafi & Ali, 2017; Hudaefi & Noordin, 2019) explored *Maqasid Shariah*, followed by published studies by Cebeci (2012) and Ishak (2019) that focused on the concept of Maslahah in Islam. Thus, this paper has offered a comprehensive interlinked analysis that combines the concept from West and Islamic philosophies: SRIs, ESGs, *Maqasid Shariah*, and *Maslahah*. Thus, the paper can serve the readers about the capabilities of all concepts to suit each other's although it has come from different philosophies.

This paper also aims to strengthen the current literature by providing empirical findings that can further expand existing literature on ESGs and SRIs globally and from Malaysia's perspective. Meanwhile, pertinent findings on the current practices of SRIs linked with Islamic points of view will significantly influence the industry, particularly in the effort to manage the products in a better way. Therefore, the present study will significantly impact the readers, especially the Islamic financial institutions, investors, and academicians. Overall, this study's findings will help them better understand the concepts and applications of ESGs, SRIs, *Maqasid Shariah,* and *Maslahah*.

The rest of the current paper has been structured into four sections, including the introduction in Section 1. Next, Section 2 presents a discussion on methodology, followed by Section 3 that consists of the findings and discussions part of the current research results. Finally, Section 4 concludes the whole research and presents the limitations of the study.

Method

The research methodology is a systematic way to solve a problem. In other words, it is a science of studying how research should be carried out. Essentially, the procedures whereby researchers carry out their work of describing, explaining, and predicting

phenomena are called research methods. Apart from that, it is also defined as the study of methods to develop the research work plan.

Subsequently, the qualitative field study was employed in the present study. According to Creswell (2013), qualitative research explains everyday, difficult moments and meaning in individual lives through empirical materials such as case studies, personal experience, interviews, observational, visual text. Meanwhile, it is essential to note that all data sources can be manuscripts, newspapers, diaries, pictures, official and personal letters, and artifacts. Moreover, it can also describe people using the interview method, then analyzed using ethnography (Aspers & Corte, 2019). Therefore, this paper applied the qualitative research method via document content analysis approach to progressively answer the current paper's objectives.

This approach allows the present study to collect data from appropriate books, journals, reports, and other publications. In addition, data were also collected from recognized websites that discuss several issues related to the research objectives: among other things, ESGs, and SRIs concepts which are associated with the Islamic teaching, links between the objectives and principles of ESGs, SRIs, *Maqasid Shariah*, and *Maslahah*; and the opportunities for product innovations in Islamic financial products and services. The researchers were also engaged in seminars, forums, and various industry talks to further understand the present study's subjects.

The current research adopted this methodology to integrate the information obtained from papers, which simultaneously address ESGs, SRIs, *Maqasid Shariah*, and *Maslahah*. Subsequently, the present study managed to identify a limited number of published studies on the relationship between those concepts after analyzing the set of papers and coding relevant information.

Figure 2. The Area in Which The Identified Papers Are Located

Source: self-constructed
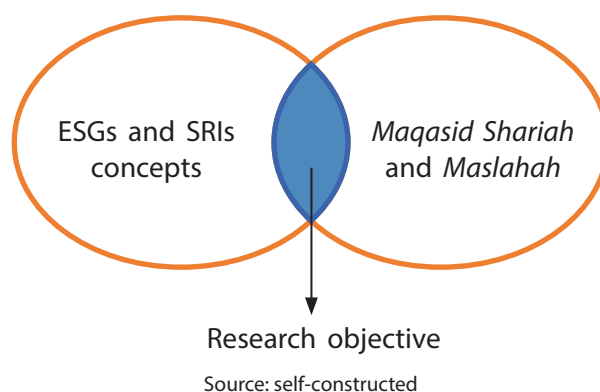
Therefore, the objectives of the present study are located at the intersection area between the ESGs, SRIs, *Maqasid Shariah*, and *Maslahah* concepts. Table 1 shows the simplified research methodology that the researcher has used to analyze the data.

Table 1. the simplified research methodology

Research objective	Method	Analysis
To reviews on Sustainable and Responsible Investment (SRIs) Practices according to *Maqasid Shariah* and *Maslahah* perspectives	Document	Content analysis

Source: self-constructed

"Besides, this research also applied the "big data" strategy. Nowadays, big data is a popular term commonly used to describe the vast and available data from digital sources inside and outside the organization (Sekaran & Bougie, 2016). It is undeniable that searching for information and knowledge using the Internet has become more accessible and saves time. Thus, the researcher has obtained information regarding all concepts discussed in this paper through related websites. For example, the UN-PRI website is helpful for information on the criteria, resolutions, and data statistics regarding the SRIs and ESGs concepts. Besides, the researcher has also used library research as a medium for data collection. This research method requires gathering information from materials, including previous literature, papers, journals, and books related to the topic. Hence, data from primary and secondary sources are integrated carefully to reach the best conclusion for this research.

Result and Discussion

This section discusses three sub-topics: *Maqasid Shariah* and *Maslahah* in Islam, SRIs practices based on *Maqasid Shariah* and *Maslahah*, and SRIs dimensions based on *Maqasid Shariah* and *Maslahah*.

### *Maqasid Shariah* and *Maslahah* in Islam

Maqasid (plural) is an Arabic word from the root word "maqsad," which means purpose, objective, principle, intent, goal, and end (Oladapo & Rahman, 2016). Moreover, Laldin & Furqani (2013) listed the features of *Maqasid Shariah* which include justice and balance *(al-'adl)*, straightness of a path *(istiqamat al-Tariq)*, and a directive destination *(al-i'timad)*. In addition, Al-Shatibi, who was among the early scholars who discussed the maqasid concept in his well-known book of Al-Muwafaqat, proclaimed that maqasid could be observed in two situations which are the objective of Shariah (the law) and the objective of Mukallaf (the performer) (Rauf, 2015).

On the other hand, Maslahah is defined as public interest. Regarding this matter, Aris et al. (2013) define Maslahah as 'benefit' or 'interest,' 'welfare,' or 'advantage.' Meanwhile, Maslahah can also be considered a juristic approach applied in Islamic legal theory that focuses on welfare, interest, or benefit to the societies and repelling harm (jalb al-masalih wa dar'u al-mafasid). Most Islamic scholars (e.g., Abu Hamid al- Ghazali, d.505H; Fakhr al-Din al-Razi, d.606 H; Saif al-Din al-Amidi, d.631 H; Najm al-Din al-Tufi, d.716 H) used the term maqasid and Maslahah interchangeably in their early discussion of these theories. For example, al-Juwaini, one of the earliest contributors to

the maqasid theory, used both terms interchangeably while Al-Qarafi linked both terms as a fundamental rule that needs to be achieved (Afridi, 2016). Moreover, he added that 'a maqasid is not valid unless it leads to the fulfillment of some good *(Maslahah)* or the avoidance of some mischief *(mafsadah)*.' Therefore, maqasid and Maslahah can be defined as a set of principles or objectives in Islamic law to secure the interest of humanity.

The traditional classifications of maqasid can be divided into three 'levels of necessity,' namely necessities *(dhururiyyat)*, needs *(hajiyyat)*, and luxuries *(tahsiniyyat)*. Specifically, necessities can be further classified into five dimensions *(Al-Dharuriyyat al-Khams)* which are protections of religion *(Al-Deen)*, life *(Al-Hayah)*, progeny *(Al-Nasl)*, mind/intellect *(Al-'Aql)*, and protection of wealth *(Al-Mal)*. More importantly, it is crucial to understand that these necessities can be considered essential for human life. Nevertheless, it should be noted that the arrangement of these levels is not to show preference in protecting them but rather to demonstrate that any negligence or inability in acquiring and protecting one of the elements will harm the humanity of humans (Naim, 2011; Isa et al., 2015). Figure 3 shows a clear illustration of the level of necessity in Islamic law.

Figure 3. Levels of Necessity in Islamic Law
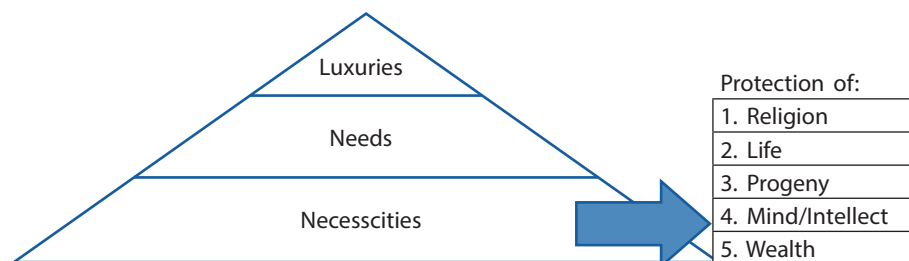
Source: Adopted from Al-Ghazali Framework

As stated by Rane (2012), Ibn Tamiyyah later expanded the *maqasid* theory developed by Al-Ghazali by including other matters such as fulfilling contracts, preserving ties of kinship, fulfilling the right of neighbors, respect the right to love the God, sincerity, trustworthiness, and moral purity as a part of the *Maqasid Shariah*. Apart from that, a study by Mohammad & Shahwan (2013) stated that Abu Zaharah in his book "Usul al-Fiqh" also broadened the scope of *maqasid* with the inclusion of education, justice, and public interest *(Maslahah)* as part of the objectives in Shariah. He further explained that a sound education system is an essential criterion for Muslims in building a great society which includes the advancement of knowledge, introduction to new skills, and promotion of awareness. Additionally, it was argued that the concept of justice in Islam should be seen broadly by incorporating judicial justice, social justice, and economic justice (Amin et al., 2013), which are concerned with fair dealings among individuals and employees community.

On the other hand, "Shariah" can be translated as a set of norms, values, and laws that govern every single aspect of life. In other words, Shariah can be described

as a source of knowledge in Islamic teaching that emphasizes various principles which cover numerous aspects, including belief, social, politics, economics, morality, ethics, and others (Laldin & Furqani, 2013; Syahiza et al., 2015). More importantly, the integrated principle is a complete code of life that each Muslim should obey. According to Ibn Qayyim al-Jawziyyah (d. 1356), Shariah aims to safeguard people's interest in this world and the hereafter.

Meanwhile, Mergaliyev et al. (2021) stated that Ibn Ashur in his book "Treatise on *Maqasid al-Shari'ah*" further explained another main objective of Shariah which is to create a stable and robust society or community. Besides that, Shariah is responsible for promoting an orderly function of its affairs by attaining comprehensive welfare and preventing evil. Therefore, this implies that the objectives of Shariah can be fulfilled by anything that operates towards establishing a better society, creating an environment for social welfare, and removing societal harm.

Therefore, *maqasid* can be defined as purpose or objectives, while Shariah can be understood as a set of ethics and values covering all aspects of life, including personal, social, economic, and others. Overall, *Maqasid Shariah* can be defined as the 'highest objectives of Islamic jurisprudence,' which acts as a guideline to achieve success and happiness in the world and hereafter according to the Quran and Sunnah.

SRIs Practices Based on *Maqasid Shariah* and *Maslahah*

Fundamentally, the objectives of Shariah are to encourage people to do every deed and action with high morality and ethics based on various proofs from Al-Quran that mentioned this matter. For example, Allah Subhanahu Wa Taala (SWT) said in Surah al-Nahl, verse 30:

"And it will be said to those who feared Allah, "What did your Lord send down?" They will say, "[That which is] good." For those who do good in this world is good, and the home of the hereafter is better. And how excellent is the home of the righteous." (Al-Nahl 16:30)

Apart from that, Allah SWT also mentioned in surah al-Nahl verse 97 and Surah Yunus, verse 26:

"Whoever does righteousness, whether male or female, while he is a believer - We will surely cause him to live a good life, and We will surely give them their reward [in the Hereafter] according to the best of what they used to do." (Al-Nahl 16:97)

"For them who have done good is the best [reward] and extra. No darkness will cover their faces, nor humiliation. Those are companions of Paradise; they will abide therein eternally." (Yunus 10:26)

Hence, it can be clearly understood from the above verses that Islam highly encourages its *ummat* to perform good deeds in their everyday life. On the other hand, Islam prohibits people from immoral actions; therefore, those who commit them will be punished accordingly. Islam is a divine revelation that embraces the whole aspect of human life, including economic and financial aspects. As previously discussed, Islam also

encourages its believers to promote comprehensive and balanced economic development by emphasizing social welfare (Mohamad et al., 2016). This concept is in line with *Maqasid Shariah* (objective of Shariah) which is to preserve the public good (*maslahah)* and promote the well-being of all mankind. At the same time, it is equally vital to omit evils or mischief (*mafsadah*) either from an individual or society because the *maqasid* will not be considered valid unless it brings good and eliminates evils.

On another note, SRIs is a moral investment initiative based on a belief system that states that an institution must observe the ESGs issues despite the financial consequences. In this case, certain funds will be used to solve the societal problem, which is hoped to positively impact the environment in particular and society at large, such as pollution control, alleviation of poverty, and better infrastructures prevention of corruption.

In general, the objectives of ESGs and SRIs have been clearly illustrated as a socially responsible financial tool that is in line with the Islamic concepts of *Maqasid Shariah* and *Maslahah* (Laldin & Furqani, 2013). Regarding this matter, issues such as the preservation of life, improvement of life quality, and preservation and promotion of mind/intellect of youth are directly related to the *Dharruriyat* (necessities) of *Maqasid Shariah*. Apart from that, the SRIs concept also denotes the principles that promote socio-economic justice, repulsion of harm, and encouragement of ethics and morality in financial practice, which aligns with Islamic principles (Wahab & Naim, 2020).

SRIs Dimensions based on *Maqasid Shariah* and *Maslahah*

As discussed earlier, the main aim of the SRIs instrument is to overcome the issues related to the environment, society, and governance. Therefore, the current research has conducted an analysis based on the mentioned dimensions.

Environment

The first initiative of the SRIs instrument, which is to protect the environment, is undeniably in line with the objectives of Shariah. In *maqasid al-Shariah*, the protection of the environment falls under the protection of human life and progeny. In other words, people are encouraged to protect the environment from any destruction to ensure that humans can live healthy and safe life. On the other hand, Islam also forbids wilful destruction to all creations of God including animals, trees, and others because humans should act as a trustee on this earth (Salina & Adam, 2017). Allah SWT mentioned this matter in surah al-Baqarah, verse 205:

> *"And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption"* (al-Baqarah: 205)

According to legal maxims (*qawa'id al-fiqhiyyah*) from the *maqasid* perspective, one general maxim mentions *La Darara wa la Dirar*, which means "Harm shall not be inflicted nor reciprocated." Specifically, this maxim indicates the importance of removing all kinds of harm inflicted on the environment, such as pollution, open burning, and

unrestricted forest destruction. Accordingly, several initiatives can help protect the environment, including pollution control, recycling, and stricter policy.

Furthermore, it should be understood that protecting the environment also helps secure the future progeny life most healthily. In Islamic teaching, man is only considered the vicegerent entrusted to manage the environment in the best possible way. Hence, any destruction and defect on the earth will damage the stability and well-being of future generations. Therefore, every human being needs to be highly aware of this matter by transforming them into actions to ensure that the environment is inherited in good condition to the next generation.

Social

In terms of social protection, Islam indicates that personnel's life needs to be protected first, and only then can a good society be developed. Social protection is described as ensuring necessities for humans to live, such as food, clothes, and residence, are sufficient for everyone. More importantly, these necessities are in line with one of the *Maqasid Shariah,* which protects life. Simultaneously, reducing the unemployment rate among the public to ensure their survival is also part of the protection.

Furthermore, the protection of society also falls under the protection of mind/intellect. Allah SWT has appointed mankind as his vicegerent (*Khalifah*) in this world to manage the resources on this earth. Hence, an excellent intellectual mind allows a human to make a good decisions. The accuracy of decision-making is crucial to humans because it can influence their daily activities and directly affect the harmony of social life. For example, Allah SWT affirms that humans are prohibited from being involved in useless things because it will destroy the human's mind, as stated in Surah al-Maidah, verse 90.

> *"O you who have believed, indeed, intoxicants, gambling, [sacrificing on] stone alters [to other than Allah], and divining arrows are but defilement from the work of Satan, so avoid it that you may be successful."* (al-Maidah: 90)

In another aspect of social protection, Islam also bans adultery among believers. The affirmation on protecting the lineage is stated in the Quran as found in Surah Al-Isra' verse 32:

> *"And do not approach unlawful sexual intercourse. Indeed, it is ever an immorality and is evil as a way."* (al-Isra: 32)

Islam strongly emphasizes on its adherents to care for the offspring from any elements that are damaging. A possible explanation for this matter may be that the development of better societies in this world can be established from the descendant. Regarding another aspect of social protection, the preservation and protection of *al-'aql* (intellect) and *al-nasl* (progeny) can be achieved by developing good educational infrastructures such as schools and universities. These infrastructures can be developed in Islamic practices by utilizing Islamic financial instruments such as the zakat, *sadaqat, waqf,* and *Sukuk* model. More importantly, these approaches can open the golden gate for society, enabling them to seek knowledge, eventually eliminating social issues. Apart

from that, other social issues such as eliminating abuse towards women and children and prostitution can also be tackled through an excellent educational and employment system. Therefore, the *Maqasid Shariah*, which refers to protecting life, progeny, and intellect, can fall under social protection in the ESG dimensions.

Governance

Regarding the governance issues, Islam emphasizes the concept that human as a vicegerent that has been sent to the mankind to this earth to govern in a way that complies with the commandment of Allah Almighty as mentioned in surah Az-Zariyat, verse 56:

> *"And I did not create the jinn and mankind except to worship Me."* (Az-Zariyat: 56)

The preservation of religion is a method that can serve good governance as accountability which is closely related to the belief system or, in other words, religion. Hence, Islam promotes good governance practices in every action that believers should observe. In Islamic teaching, humans are responsible for themselves and the *ummah* as a whole. As a *Khalifah*, a human is responsible for upholding good governance in conducting relationships between man and the creator, man and fellow man, man and other elements of creatures of the universe. In other words, Muslims are responsible for whatever deeds they perform regarding the resources provided by Allah.

One concept in Islam that Muslims must always obey in ensuring good governance practices is trustworthiness (*Amanah*). The concept of trustworthiness in Islam can be divided into the trustee of Allah's resources and trustee between people (e.g., an owner and a manager). Allah SWT mentions this matter in Surah An-Nisa' verse 58:

> *"Indeed, Allah commands you to render trusts to whom they are due and when you judge between people to judge with justice. Excellent is that which Allah instructs you. Indeed, Allah is ever Hearing and Seeing."* (an-Nisa: 58)

Incorporate governance, man is the central element that effectively enables a system to progress on the right track. In this case, it can be manifested that man plays a paramount role in managing because it can lead to achieving its vision and mission. Specifically, a man will act as a shareholder, creditor, auditor, regulator, manager, and director. Hence, each party in the organization should perform their professional duties to fulfill Allah's wills and satisfy the needs of the shareholders.

The misleading understanding and implementation of good governance practices will lead to a big problem for the organizations. In other words, the responsibility to perform good governance practices does not fall under one party or one individual, but it is considered the responsibility of all parties involved. Therefore, a poor governance system may lead to corporate failure, which will affect the wealth of the shareholders and the welfare of other stakeholders.

Overall, the basic fundamental of governance is to ensure the success of businesses and organizations. Therefore, the aim of ESGs and SRIs concept, which is to overcome

governance issues, including immorality practice, corruption, board accountability, and transparency, are closely related to the *Maqasid Shariah,* especially in protecting life and wealth. Furthermore, it is crucial to understand that Islam promotes accountability, transparency, and trustworthiness in practicing good governance. Table 2 shows the link between SRIs objectives based on the ESGs concept, the objective of Shariah, and the sources, which are al-Quran and Sunnah.

Generally, the aims and fundamentals of ESGs and SRIs concepts do not contradict the Shariah principles. Moreover, the concepts tend to encourage people to do good actions that can provide several benefits and improvements to the daily life of humans. Apart from that, in Islam, people who perform good actions or encourage others to do good deeds will be rewarded by Allah SWT as mentioned in Surah az-Zalzalah verses 7-8 and Surah al-Baqarah, verse 286. Besides, SRIs investing also aims to improve investment performance, outcomes, and the benefits to the environment, society as well as governance via varieties of programmed such as to overcome the issue of poverty, unemployment, homeless, healthcare, criminal offending, pollution control, providing necessary infrastructures, among others school and hospital, avoiding corruption and so on and so force. In terms of scope, SRIs also avoid the investment that gives terrible effects to society, such as being involved in drugs, alcohol, and gambling investments, all of which result in addiction and negatively affect society's health. At that point, the practices have most similar with investment guidelines in Islam teaching that prohibited that kinds of investment to be practices.

Table 2. The link between SRIs objectives based on ESGs concept, the objective of Shariah, and the source from al-Quran and Sunnah.

Objective of SRIs	Objective of Shariah	Examples sources of Evidence
Environment: To concern about the issues related to climate change, natural resources, pollution, energy efficiency, toxic and waste treatment, and environmental opportunities.	Protection of: 1. Life, 2. progeny	*"And when he goes away, he strives throughout the land to cause corruption therein and destroy crops and animals. And Allah does not like corruption"* (al-Baqarah: 205). *"And do not mischief on the earth, after it has been set in order, but call on Him with fear and aspiration. Indeed the mercy of Allah (SWT) is near to the doers of good.* (Qur'an 7:56)
Social: To overcome the issues related to high poverty rates, child labor issues, discrimination, and; health and safety.	Protection of: 1. Life, 2. Progeny, 3. mind/intellect	*"Indeed, we offered the Trust to the heavens and the earth and the mountains, and they declined to bear it and feared it; but man [undertook to] bear it. Indeed, he was unjust and ignorant."* (Quran 33: 72)
Governance: To focus on the issues related to corporate governance and behavior, immoral practices, corruption, and transparency issue.	Protection of: 1. Religion, 2. Life, 3. Wealth	The Prophet said in a Hadith Qudsi, "Allah said, "I will oppose three types of people on the Day of Resurrection and among these, He mentioned 'one who employs a laborer, has the whole job completed by him, but does not pay him for his labor" "I have made oppression unlawful for Me and you, so do not commit oppression against one another" (Sahih Muslim, Vol. 3 Hadith No.6254)

Source: Self-constructed

Thus, the objectives of SRIs can be concluded in line with Maqasid Shariah and Maslahah in Islamic principles. Issues such as the preservation of life, improvement of life quality, and preservation and promotion of the mind/intellect of youth are directly related to the Dharruriyat (necessities) of Maqasid Shariah. Besides, the SRIs concept also denotes the principles that promote socio-economic justice, repulsion of harm and encourage the practice of ethics and morality in financial practice that is in line with Islamic principles. As a whole, the current research paper only touched on Maqasid Shariah that is directly related to the protection of ESG issues, but at the same time did not deny other essential matters in Maqasid Shariah that may be indirectly related to those issues.

Conclusions

The present study has investigated the SRIs and ESGs practices according to Maqasid Shariah and Maslahah. The current research results revealed similarities between the Maqasid Shariah, Maslahah, ESGs concept, and SRIs instrument in the enhancement of wellness, welfare, and well-being of social life. In other words, those concepts are inclined towards preserving nature, people, and wealth. The preservation and protection of Maqasid Shariah majorly emphasize five essential matters (religion, life, progeny, intellect, and wealth) that are important for the alleviation of mischief or evil (mafsadah) in the society as well as preserving the interests or good (maslahah) among the public. Therefore, it is essential to apply any social responsibility-based activities such as the ESGs concept and its instruments because it will positively influence the protection of Maqasid Shariah and Maslahah.

However, this paper also does not deny that a few criteria of ESGs need to be further clarified with Shariah principles. The criteria such as promoting freedom of human rights, freedom of expression, freedom of censorship, and freedom of association need to be carefully explained. In this context, more comprehensive studies should be conducted before the Islamic financial institutions actively decide to involve those criteria. It is to ensure that the Shariah principle becomes the priority in the decision-making process of Islamic institutions. Besides, this paper also proves that although particular concepts originated from the West philosophy like SRIs and ESGs, it does not mean that Islam does not emphasize or even reject those issues in total. Islam seems comprehensive and consistent to handle the ESG issues since the revelation of this religion, as Allah SWT mentions in surah al-Baqarah verse 205 that Islam forbids its believers from making any wilful destruction to all creations, including animals, trees, and others.

About the whole research, some limitations of the present study need to be acknowledged. First, this paper is conceptual; hence, the analysis was purely obtained from secondary data sources. Hence, it cannot be denied that the filters used to identify the critical papers may have led to the exclusion of others who might also be essential papers. Second, the systematic literature review adopted in the current research was utterly dependent on available and accessible research studies and the criteria set by the

researchers. Therefore, selecting specific criteria for inclusion and exclusion of the papers may have been exposed to publication bias, which should be considered an intrinsic limitation to the systematic literature reviews.

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The Role of Technology Usage in Mediating Intellectual Capital on SMEs Performance During the Covid-19 Era

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JEL Classification:	**Abstract**
O2	This study examines technology in mediating human capital, customer capital, and organizational capital on SMEs' performance during Covid-19. To test the hypothesis, the PLS-SEM method was applied. Data collection was conducted by sharing questionnaires to 150 owners of small industrial clusters in East Java, Indonesia. The empirical results show that human capital and technology usage directly affect significantly on SMEs' performance. Furthermore, technology usage has a significant influence in mediating human capital on firms' performance. We provide implications for using technology for practice and using a socio-technical approach by SMEs to face challenges related to their work organization in response to COVID-19 while maintaining their activities. We hope that our reflection will be a source of thought for scholars and practitioners to explore further using technology for SMEs to secure business continuity during COVID-19.
O34	
M21	
Received: 16 January 2021	
Revised: 08 May 2021	
Accepted: 30 May 2021	

Introduction

In the case of COVID-19, academics and practitioners discussed a new threat, namely the shock of the global society. If someone compares the current crisis to the 2008 crisis, they will see that the problem is related to challenges related to the supply of capital and the chain of supply and, in particular, disruptions to upstream and downstream flows from that. This is evident in China, where factories are shutting down product supply is reduced, especially auto parts and clothing components. At the same time, worldwide lockdowns and the closure of industries such as travel, hospitality, and retail allowed significant worldwide business closings and further disruptions, including an increase significantly in unemployment, to occur in the months ahead.

Meanwhile, governments worldwide, including Indonesia, are issuing policies and implementing action plans including restrictions (i.e., lockdowns of countries, temporary closure of physical business operations) to prevent the spread of the Covid-19 epidemic. These restrictions impact sustainable business operations, including reducing business activities, human resource issues related to staff disruptions, supply chain, and other activities. These restrictions have a more severe impact on small and medium enterprises (SMEs) than on large and global companies (Saturwa et al., 2021; Beglaryan & Shakhmuradyan, 2020; Sahoo & Ashwani, 2020). Due to SMEs' lack of resources, external crises such as the COVID-19 outbreak threaten the SME market. They are hit with great force and worsen the situation (Eggers, 2020). SMEs face various problems such as declining demand, supply chain disruptions, cancellation of export orders, shortage of raw materials, and transportation disruptions, among others (Shafi et al., 2020).

SMEs are particularly vulnerable because they tend to have lower reserve capital, fewer assets, and lower productivity levels than large firms (OECD, 2020). In addition, small organizations and their leaders face challenges in crisis times (Shane, 2011). Passingly, they explore new opportunities because of their size and flexibility (Davidsson, 2015) and develop emerging strategies for the sustainability of business operations. In the UK, SME businesses account for 99.3% of all private sector business, 47.8 percent of private-sector employment, and 33.2 percent of private sector turnover. Thus, SMEs have implications for the broader economy. So far, limited research has focused on SMEs' experience and how organizational actors interact during the crisis (Cucculelli & Peruzzi, 2020; Doern et al., 2019; Mayr et al., 2017; Ogawa & Tanaka, 2013). More specifically, previous research has neglected identifying appropriate actions and strategies taken by leaders in times of crisis and the effectiveness of these strategies based on the company's capabilities (Bundy et al., 2016; Kunc & Bandahari, 2011), especially in terms of SME context (Appelbaum et al., 2012; Randall, 2018).

Some researchers agree that intellectual capital components such as organizational capital, social capital, and human capital can add value to a company's goals (Khalique et al., 2013b; Absah et al., 2018; Nhon et al., 2018). Human capital, for example, with a level of education, experience, knowledge, social skills, innovation, and attitude in carrying out its work, will create value to achieve goals. As a result, the creation of added value

by human capital in the performance of their duties and work will provide a company with a sustainable income in the future (Nhon et al., 2018; Absah et al., 2018).

A slew of intellectual capital studies has looked into the direct effects model on business performance within the context of SMEs (McDowell et al., 2018; Williams et al., 2019; Bakhru, 2019). These studies emphasized the evaluation of the intellectual capital parameters of a business school. They considered that intellectual capital parameters can be used by academic administrators and also as a means for compensation of a business school teacher. It finds that the intellectual capital will improve the quality of teaching and help the business school achieve a higher ranking and repute (Bakhru, 2019). The current studies have highlighted the inconsistency of previous research in which an indirect effects model, particularly the use of technology as a significant mediating variable in enhancing the sustainability of SMEs, was overlooked (Jämsä et al, 2011; Kim & Orazem, 2017; Zhong et al., 2020; Adam, 2021). There was also an inconsistency between intellectual capital and SMEs' performance (Absah et al., 2018; Maharani & Fuad, 2020; Ahmed et al., 2020; Mubarik et al., 2020). As a result, through technology, the intellectual capital component indirectly influences SMEs' sustainability. Limited prior empirical research has emphasized the significance of addressing the mediating effect of technology use on the relationship between intellectual capital components and SME performance.

To take on the consequences of extreme events and due to COVID-19, SMEs can use, among other things, technology usage. These include, for example, mobile and internet technology with next-generation telecommunications networks (e.g., 5G), big data analytics, artificial intelligence (AI) using deep learning, and blockchain technology. Technology usage digitizes and crosslinks the value creation process. Firms that use the technology are more important than what they use it for—investment and commitment to the Internet influence successful implementation. Moreover, firms with an existing export sales capability fare better using VECs (virtual export channels). There is evidence in the literature that appropriate strategic adoption of technology can lead to increased competitiveness, productivity, and performance (Bruque & Moyano, 2007; Chan et al, 2018; Kleis et al., 2012). At the same time, companies must have the appropriate capabilities, culture, and talent within the organization to experiment and conceptualize how technology usage (TU) will affect current and future business processes and models (Kane et al., 2015). The internet can provide good external enterprise development conditions, mainly displays two relevant mechanisms (enterprise characteristics and external environment) (Reuber & Fischer, 2011; Terziu et al., 2020), and they can be grouped into six channels (enterprise innovation, enterprise business model, enterprise performance, enterprise productivity, enterprise import and export trade, and enterprise location selection) (Zhong et al., 2020).

This study aims to provide valuable recommendations to business people in designing and managing intellectual capital components and technology usage in the business sector because the use of technology is a newly discovered issue (Terziu et al., 2020; Zhong et

al., 2020; Adam, 2021). The use of technology may enhance the competence of social capital in company productivity, such as in the fields of marketing, production, and service (Kim & Orazem, 2017; Terziu et al., 2020). Additionally, technology can decrease the cost of communication and information processing, changes business processes and work practices, and create new products and values through e-commerce (Jämsä et al., 2011; Jovanovic et al., 2020).

According to the findings of the current studies, other specific aspects of the sustainability of SMEs must consider the use of technology to improve business performance (Zhong et al., 2020; Jovanovic et al., 2020). Firms that adopted technology earlier saw faster productivity gains than similar firms that did not (Fernandes et al., 2019; Ghasemaghaei & Calic, 2019). Companies with higher Internet connection speeds via broadband increase company productivity compared to companies without connections or companies that only have access through dial-up services (Kim & Orazem, 2017). This condition will make it easier for SMEs to improve their performance, such as in the roles of their resources in production, marketing, and sales. Although the relationship between intellectual capital, technology use, and SME performance has been extensively researched, the effects and properties of using technology as a mediating variable in the context of this study have not been adequately discussed (Jovanovic et al., 2020; Zhong et al., 2020). Many researchers argue that a variety of factors could cause this situation. First, many previous studies have extensively described the direct effect of intellectual capital on firm performance (Zuhir, Surin, & Rahim, 2019; Maharani & Fuad, 2020; Ahmed et al., 2020). Second, several previous studies used a structured review approach to the existing literature on the relationship between internet use and corporate development (Zhong et al., 2020), Third, Using the OLS approach, This research paradigm has typically used simple descriptive and association methods to achieve short-term goals and solve immediate problems (Bartelsman et al., 2018; Fernandes et al., 2019). As a result, the study's findings are only recommendations, and they may not be of much assistance to practitioners and academics in understanding the complexities of using technology to sustain SMEs in a globalized and volatile economy.

However, the role of technology as a moderating variable has not been studied. As a result, it is critical to investigate the nature of this relationship. This circumstance motivates the researchers to broaden the literature by investigating the role of technology as a moderator in the relationship between intellectual capital and business performance. Therefore, the objectives of this research are 1) to examine the impact of components of intellectual capital on the performance of SMEs; 2) whether the relationship between components of intellectual capital and the performance of SMEs is mediated by technology usage; 3) whether there is a significant relationship between technology usage and the performance of the firms in terms of growth in sales, satisfaction among customers, financial perspective and internal business process.

This study confirms the role of technology usage, which the company can apply to improve the performance of SMEs. This research's first contribution is to raise awareness among SMEs about the components of intellectual capital and the benefits of technology

use. Second, this study adds to the existing literature's theory by demonstrating that the relationship between intellectual capital and the sustainability of SMEs can be developed by reflecting on technology usage.

Method

This research is a study that examines the role of technology as a mediator of the variables of human capital, customer capital, and organizational capital in improving company performance. This study was conducted in small and medium industries (SMEs) in East Java, Indonesia. Data collection was carried out by distributing questionnaires to 150 owners of small industrial clusters in East Java, Indonesia, and 99 surveys were collected. The questionnaires consist of 20 indicators of the Likert scale with responses 1 (strongly disagree) to 5 (strongly agree). Data collection was carried out by distributing questionnaires to clusters in East Java which consisted of two parts, namely questions related to the characteristics of respondents and the main variables. These characteristics can be seen in Table 1.

Table 1. The demographic profiles of respondents

Location	Cluster	N=99	Category	Frequency	%
Madura	Handicraft of Batik	= 16	**Gender**		
Mojokerto	Shoes of leather	= 16	Male	= 65	65.66
Sidoarjo	Bags of leather	= 20	Female	= 34	34.34
Pasuruan	Furniture	= 15	*Periode of SMEs*		
Malang	Processing Food	= 17	1981-1990	= 12	12.12
	Processing Ceramic	= 15	1991-2000	= 28	28.28
			2001-2010	= 35	35.35
			2011-2020	= 24	24.24
			Number of employees		
			1-4 (micro enterprises)	= 39	39.39
			5-19 (small enterprises)	= 45	45.45
			20-99 (medium enterprises)	= 15	15.15

Table 1 displays that the firms are distributed in shoes, furniture, batik handicraft, leather bags, food processing, and ceramic clusters located in selected regions of Madura, Mojokerto, Sidoarjo Pasuruan, and Malang cities. The data showed that male entrepreneurs (65.66%) dominate the business than female entrepreneurs (34.34% for females). Around 84.85% of the entrepreneurs operate micro and small enterprises (MSEs), whereas 15.15% manage medium enterprises. By using 5-Likert's scale, the respondents can choose 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree for replying the questions presented in Table 2.

This research tests the mediating role of technology usage on the relationship between intellectual capital and SMEs performance, including human capital, customer capital, and organizational capital together, and the relationship between intellectual capital on SMEs performance. This research consists of three exogenous constructs (human capital (HC), customer capital (CC), organizational capital (OC), and two endogenous constructs (technology usage (TU), SM Enterprise Performance (EP)). All these constructs were measured based on observed variables.

Table 2. Items of Indicators

Human Capital(HC)		*Technology Usage (TU)*	
HC01	– items related to skills	TU01	– items related to the new model for selling
HC02	– items related to intellectual ability		
HC03	– items related to knowledge and expertise	TU02	– items related to the development of technology
HC04	– items related to attitude	TU03	– items related to internet usage in working
Customer Capital (CC)		TU04	– items related to technology knowledge
CC01	– items related to loyalty		
CC02	– items related to customer satisfaction	*SMEs Enterprises Performance (EP)*	
CC03	– items related to customers' complaints	EP01	– items related to financial perspectives
CC04	– items related to networking	EP02	– items related to internal business process
Organizational Capital		EP03	– items related to growth in sales
OC01	– items related to infrastructure & system	EP04	– items related to satisfaction among customers
OC02	– items related to policies and procedures		
OC03	– items related to exchange & relationship		
OC04	– items related to culture		

Partial Least Square structural equation modeling (PLS-SEM) was applied in this research because it is widely applied by researchers in management, economics, and other fields to test the causal association and effect between unobservable variables (Mourad & Valette-Florence, 2016; Faisol, 2017). For many reasons, PLS-SEM has been adopted in many research areas, such as management information systems, accounting, and management in operation. Firstly, it is suitable for studies with small sample sizes, multiple dependent variables, and a large set of independent variables. Second, it is suitable if the research is at the initial stage of theoretical development (Ribau et al., 2017). Third, PLS-SEM provides researchers to examine the measurement model concurrently with the structural model and presents scholars to apply more complicated research models with both mediating associations (Lee et al., 2011). In this paper, we used SMART-PLS 3.0 software. This research performs the bootstrapping of the PLS-SEM method to examine the significance of relationships and the mediating effect of technology usage on the relationship between intellectual capital and SMEs performance.

Result and Discussion

The evaluation of the measurement model applied in this study are the validity test and reliability test. Validity tests include convergent validity that shows the values of loading factor (λ) and average variance extracted (AVE) and discriminant validity that

shows the value of fornel larcker criterion and cross-loading. Then, the reliability test shows composite reliability (CR) and Cronbach's alpha (α). Table 3 presents the result of the measurement model.

Table 3. Result of the measurement model

Constructs	Convergent Validity			Reliability	
	λ	significance	AVE	β	CR
Human Capital(HC)					
HC01	0.777	***			
HC02	deleted		0.630	0.706	0.836
HC03	0.836	***			
HC04	0.770	***			
Customer Capital (CC)					
CC01	0.932	***			
CC02	0.906	***	0.822	0.892	0.933
CC03	deleted				
CC04	0.881	***			
Organizational Capital (OC)					
OC01	0.803	***			
OC02	.0851	***	0.679	0.766	0.864
OC03	0.818	***			
OC04	deleted				
Technology Usage (TU)					
TU01	deleted				
TU02	0.916		0.801	0.753	0.889
TU03	0.874	***			
TY04	deleted	***			
SMEs Performance (EP)					
EP01	0.905				
EP02	0.820	***	0.695	0.791	0.872
EP03	0.770	***			
EP04	deleted	***			

Source: processed, 2021

Construct convergent validity was assessed using factor loading and AVE values (Azlis-sani & Dawal, 2013). All factor loadings for all items in each construct (HC, CC, OC, TU, and EP) were higher than 0.5 (Anderson & Gerbing, 1991) and statistically significantly confirmed construct convergent validity using factor loadings criterion achieved. Average variance extracted (AVE) values were found to be higher than 0.5. This value is under suggested by (Chin, 2010).

Construct discriminant validity was assessed through Fornell larcker criterion and cross-loading. Fornell Larcker is the correlation value between variables with the variable itself and variables with other variables. The assessment is that this value cannot be smaller than the other values (or we can say that the correlation value with the variable itself must be greater than the correlation value of other variables). Cross loading is the correlation value between indicators and variables. Indicators that should affect the variable, the correlation value must be greater than the correlation value with other variables. Table 4 presents the values of the discriminant validity summary.

Table 4. Construct discriminant validity assessment summary

|	CC	HC	OC	EP	TU
CC	0.907				
HC	-0.004	0.794			
OC	0.209	0.376	0.824		
EP	0.142	0.511	0.257	0.834	
TU	0.040	0.565	0.383	0.461	0.895

Source: processed, 2021

Table 4 presents discriminant validity among constructs. The correlation value with the variable itself was found more significant than the correlation value of other variables. This indicates adequate discriminant validity. Therefore, the measurement model demonstrated adequate convergent validity and discriminant validity. The construct measures in the measurement model are confirmed as reliable and valid, and the next step is to assess the structural model results. For assessing the structural model, criteria checked are R-Square, T-statistic value, Path coefficient (β value), Predictive Relevance, and Model Fit. In the PLS model, the squared correlation values of 0.68, 0,32, and 0.19 are considered substantial, moderate, and weak, respectively (Chin, 2010). The R^2 value of each latent endogenous construct shown in figure 2 is more significant than 0.3 and is considered substantial.

Table 5 shows the path coefficient value along with the T-statistics (bootstrap) values. The relationship between human capital and SMEs performance is significant with β = 0.375 and p-value = 3.903 (Table value is 1.96 at 5% level of significance) has a direct positive significant influence on SMEs performance. This indicates that a 100 point change in human capital will bring about 37.5 point change in SMEs' performance effects relationship between technology usage and SMEs performance is significant with β = 0.014 and p-value = 0.024 effects on SMEs' performance. This indicates that a 100 point change in technology usage will bring out 14 points change the sustainability of SMEs' performance.

The quality of the PLS path model is evaluated by calculating Q2 statistics. The model can predict by repeating the observed values through blindfolding procedures (Tenenhaus et al. 2005). In the structural equation model, Q^2 greater than zero means the model has predictive relevance, and less than zero means the model lacks predictive relevance (Chin, 2010). As a relative measure of predictive relevance, values of 0.02, 0.15, and 0.35 indicate that an exogenous has a small, medium, or enormous predictive relevance for a selected endogenous construct. By using blindfolding procedures, two types of Q^2 statistics can be estimated – cross-validated communality and Cross validated redundancy. In the path model, the predictive relevance of Technology usage has a value of 0.245, which indicates that the construct of human capital, customer capital, and organizational capital have considerable predictive relevance on technology usage. Then, the predictive relevance of SMEs performance (EP) has a value of 0.197, which indicates that all of the exogenous (HC, CC, OC, TU) has medium predictive relevance on SMEs performance.

Figure 2. The measurement model
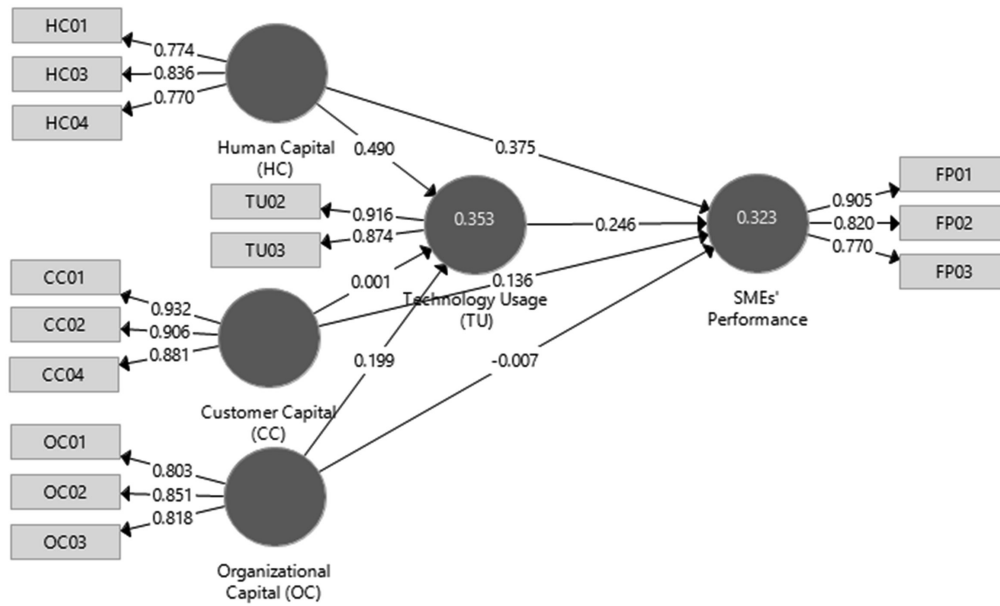
Model fit or Goodness of Fit (GOF) is used as an index for the model's overall fit to validate the PLS path model globally (Tenenhaus *et al.,* 2005). GOF is the geometric mean of the average commonality and the average *R*2. For the global validation of the PLS path model, the cut-off values lie between 0 and 1, resulting in GOF small= 0.1, GOF medium = 0.25, GOF large =0.36 (Akter et al. 2011). In this model, the global fir index ism0.684, which indicates that empirical data fits the model very well.

By removing some irrelevant indicators, the constructs satisfy the values of α, CR, AVE, and λ. They recommended that the scores of , AVE, and CR be more significant than 0.6, whereas the score for should be greater than 0.5. The measurement of indicators is depicted in Figure 2. Figure 2 displays that technology usage mediates the performance of SMEs' human capital, customer capital, and organizational capital.

This study hypothesized that human capital (HC), customer capital (CC), and organizational capital (OC) have a positive and significant influence on SMEs' performance (EP). Through technology usage, human capital, customer capital, and organizational capital have a positive and significant effect on SMEs' performance, and technology usage has a positive and significant effect on SMEs' performance. Table 5 shows the finding of this research.

Finding revealed that human capital directly has a positive and significant influence on SMEs' performance (β = 0.375; p-value = 0.000), customer capital does not significantly influence on SMEs' performance (β = 0.136; p-value = 0.167), organizational capital directly does not significantly influence on SMEs' performance (β = -0.007; p-value = 0.945), technology usage has a positive and significant influence on SMEs' performance (β = 0.246; p-value = 0.025). These findings confirm that hypothesis H_{1a}, H_4 are supported by the collected data, while hypothesis H_{2a}, H_{3a} are not supported by the collected data.

Table 5. Hypothesis testing

Category	β	Mean	SD	T statistics	P-Values	H-Results
HC = > EP	0.375	0.385	0.096	3.903	0.000	Accepted
CC = > EP	0.136	0.154	0.098	1.385	0.167	Rejected
OC = > EP	-0.007	-0.005	0.103	0.068	0.945	Rejected
TU = > EP	0.246	0.241	0.099	2.479	0.014	Accepted
HC = > TU = > EP	0.120	0.121	0.053	2.265	0.024	Accepted
CC = > TU = > EP	0.000	-0.003	0.031	0.007	0.994	Rejected
OC = > TU = > EP	0.049	0.052	0.035	1.409	0.164	Rejected

The study also hypothesized that technology usage, human capital, customer capital, and organizational capital influence SMEs' performance. Findings from this study informed that human capital mediated by technology usage has a positive and significant influence on SMEs' performance (β = 0.120' p-value 0.024. However, customer capital dan organizational through technology usage does not significantly influence on SMEs' performance (β = 0.000; p-value 0.994); (β = 0.049; p-value = 0.164). Hence, hypothesis H_{1b} is accepted. As such, hypotheses H_{2b} and H_{3b} are not supported.

The primary purpose of this study is to apply the component based on the structural equation modeling technique to make sure the technology used as a mediator for intellectual capability included human capital, customer capital, and organizational capital to build the sustainability of SMEs' performance. According to Intellectual Capital Theory (Becker, 1962; Khalique & Shaari, 2013a), the primary function of intellectual capital is to create value-added products and services through proactive management of intangible resources like technology usage, which positively influence organizational performance (Tronconi & Marzetti, 2011; Khalique et al., 2013c; Hashim et al., 2015; Xu & Li, 2019).

The analysis results show that human capital directly has a significant positive effect on the sustainability of SME performance. Statistically, this result is evidenced by the p-value = 0.000 and β = 0.375. This result means that if there is an increase in human capital, it will encourage the sustainability of SMEs. This illustrates that in the Covid 19 era, human capital owned by SMEs was still able to increase their capacity, for example, related to skills, knowledge, expertise, and intellectual agility. This increase has resulted in increased business process activities and has stimulated the performance of SMEs to be better. This finding supports that of investigated human capital and small and medium enterprises (Mubarik et al., 2020; Ahmed et al., 2020).

These results indicate that when SME actors increase their capacity in the fields of skills, knowledge, expertise, and attitude in business, it will be easier to utilize knowledge on the use of technology in their business, thereby creating and producing added value in production, which means that the performance of SMEs will be positive. The results also inform that technology can mediate the relationship between human capital and SMEs' performance, which statistically equates to a p-value = 0.024 and b = 0.120. This

result is in line with the intellectual capital theory, which states that human capital is one of the main components of intellectual capital is to create value-added products and services through proactive management of intangible resources which positively influence organizational performance. This finding also supports the previous studies such as Farace & Mazzotta (2015), Suroso et al. (2017), and Muda & Rahman (2016) stated the contribution of human resources to business performance, followed by the role of human capital in various stages of the SME life cycle.

Furthermore, customer capital and organizational capital are components of intellectual capital. It is generally believed that customer capital consists of brand value, a strong network with customers, customer loyalty, and customer satisfaction. It has a positive relationship to organizational performance (Tai-ning et al., 2011; Khalique et al., 2013c). Then, organizational capital is firms' intangible resources to achieve sustained competitive advantage (Tronconi & Marzetti, 2011). In general, it can also be believed that organizational capital is a collective, firm-specific and idiosyncratic factor, is one of the main determinants of firm performance. However, the results are not under what is explained in theory, that the findings of this study also show that directly customer capital and organizational capital do not affect the sustainability of SMEs. These findings illustrate that the field of customer capital and organizational capital owned by MSMEs has not been able to utilize their capacity to encourage the performance of SMEs. These results describe in Covid 19era, SMEs operated in small industry clusters providing empirical results demonstrating that customer capital and organizational capital directly have no significant effect on firm performance. The data also reveal that technology usage cannot mediate the relationship between customer capital, organizational capital, and firm performance. By taking various clusters in East Java, this research provides different points of view to understand the dynamics of the SME cluster. Understanding these dynamics makes it known that customer and organizational capital do not directly affect SMEs' performance. It is contrarily with a standard view on this effect, SMEs operating in clusters probably cannot utilize something related to customer capital and organizational capital like loyalty and relationship between firms. Consequently, this condition does not stimulate firm performance. This finding indicates the tendency of the covid 19 Era can be one of the possibilities that hamper to utilize the relationship, networking, taking the policy, procedure on firm performance (Liu et al., 2020; Sheth, 2020; Shafi et al., 2020).

Conclusion

This research aimed to convince the role of technology as a mediating aspect for intellectual capital such as; human capital, customer capital, and organizational capital on the sustainability of small and medium enterprises operating in small industrial clusters in the Covid 19 era. In particular, attention is given to examining the role of using technology in mediating this interaction. The results reveal that human capital and technology usage directly affect SMEs' performance. Furthermore, the results showed a significant relationship between human capital and firms' performance mediated by technology. According to the literature review, the intellectual capital involved in human

capital, customer capital, and organizations significantly influences firm performance. Further, many literature reviews showed that technology is a driver for intellectual capital to sustainable SMEs. Also, the choice of technology could be related to SME's existing equipment, and essential digital competencies can be used in the business activities like communication channels with customers. They recommended that the business model that can be applied to SMEs is a business that is supported by digital transformation. Digital transformation exists when digital skills emerge, and digital tools are adopted.

This study indicates that supporting the development of human capital orientation is the main factor influencing creativity, organizational innovation ability, and outstanding company performance where SMEs companies accelerate recovery, and executives can apply information to benefit the development of human resources in companies. The company encourages employees to think of joint initiatives and create something new that is ready to face organizational changes related to innovation and new information technology to lead the organization to survive and gain a competitive advantage.

The result of this research should be very beneficial to both academics and practitioners. Academics in the policy and management areas would be very interested in how technology usage mediated the relationship between intangible assets toward the performance of firms. This study has shown a significant positive relationship between the intellectual component and firms' performance mediated by the use of technology. Future research may show that this link can be generalized to other regions and virtually all industries. This study provides implications for using technology for practice and using a socio-technical approach by SMEs to face challenges related to their work organization in response to COVID-19 to maintain their activities. We hope that this reflection will be a source of thought for scholars and practitioners to explore further using technology for SMEs to secure business continuity during COVID-19.

Acknowledgment

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How Did The Financial Markets Respond to The COVID-19 Pandemic? Empirical Evidence from BRICS Countries

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Abstract
The paper aims to evaluate the reaction of stock markets in BRICS countries (Brazil, Russia, India, China, and South Africa) to the outbreak of the COVID-19 pandemic. The study uses ARCH and GARCH models that use daily stock prices from January 1, 2020, to September 2, 2020. The financial market response was analyzed in two phases. The first phase analyses the financial markets' response within 30 to 60 days from the first day of confirmed cases of COVID-19. The second phase analyses the financial market response post 30 to 60 days of initial confirmed cases. The study results conclude that the share prices decreased, but in the second phase, the markets responded positively. Our results conclude that governmental support played an important role in mitigating the repercussions of the COVID-19 outbreak on stock markets in BRICS countries.

Keywords:
BRICS countries, stock market, volatility, Covid-19

Introduction

The first case of the COVID-19 outbreak was reported in Wuhan, China, in January 2020. It has caught global attention within one month because of the severity of the spread to around 109 countries (Ramelli & Wagner, 2020; Ozili & Arun, 2020). It has a global impact in social distancing, travel restrictions, quarantine and lockdown of countries, government restrictions on commercial activities resulting in a market shutdown. This heightened global uncertainty has resulted in the contraction in economic activity and volatility in the stock markets. The pandemic has made such a massive impact on the global stock markets like no other infectious disease in the past (Baker et al., 2020). The global stock markets have collapsed by 20% in the first quarter of 2020 (Al-Awadhi et al., 2020). The freely available information about the number of cases and mortality rates through media coverage and its dissemination has significantly influenced the stock markets and the investor's sentiments. (Engelberg & Parsons, 2011). This condition resulted in investor pessimism and overreaction in the short-run (Barber & Odean, 2008).

BRICS constitute five countries, namely Brazil, Russia, India, China, and South Africa. These are emerging economies that have an understanding of trade and investment to enhance economic growth. The BRICS countries are considered the fastest-growing economies globally, which constitute about one-third of the global economy. In addition, they play an essential role in influencing the global economy by exporting essential commodities, goods, services, and raw materials. Therefore, it is crucial to study the impact of the spread of pandemics on the economies of these countries. According to the World Health Organization (WHO), as of May 2020, Brazil is the epicenter of Latin America and is responsible for 40.2% of COVID-19 cases and 65% of deaths. Russia and India have the highest number of active cases, with 34.3% and 12% of cases dead. The first COVID-19 case was on February 26, 2020, in Brazil. As of May 2020, Brazil is in the second position in total COVID cases worldwide and the first position in daily-confirmed active cases. The first COVID-19 case in Russia was reported on January 31, 2020. The first COVID-19 case in India is on January 30, 2020. The pandemic affected India on two significant fronts firstly, migrant and unorganized workers, and secondly, many citizens lost jobs as production came to a standstill because of the pandemic. The measures taken by the government are providing relief packages, strict lockdown, and mass testing of COVID-19 cases, working on rolling out the vaccine. China was initially in the pandemic's epicenter, but the government went in for strict lockdown measures to avoid the spread of the virus and controlled the daily number of cases. South Africa reported the first COVID-19 case on March 5, 2020. The cases in South Africa were relatively high, and some of the measures taken are banning travelers from high-risk countries, creating awareness among citizens, increased controls and lockdown, and mass testing of the population.

There are studies done across the globe on the impact of the COVID-19 pandemic on stock markets and returns (Zhang et al., 2020; Pavlyshenko, 2020; Sharif et al., 2020; Topcu & Gulal, 2020; Albulescu, 2020; Mubarok & Al Arif, 2021), the effect of the pandemic on the economy (Ayittey et al., 2020; Estrada et al., 2020; Luo &

Tsang, 2020), COVID-19 and financial markets (Baig et al., 2020; Gormsen & Koijen, 2020; He et al., 2020; Singh et al., 2020; Zaremba et al., 2020; Zeren & Hizarci, 2020). It is observed that stock markets are interdependent in various countries as the stock markets more or less behaved the same (Amar et al., 2020; Cepoi, 2020; Okorie & Lin, 2021). The stock markets had a decline of around 30%, but there has been a difference across countries. This is because of the differences in investors' risk tolerance in different countries (Anderson et al., 2011) and how investors interpret and respond to information (Dou et al., 2016). The negative emotions and pessimism affected investors' investment in the stock market and thereby had an impact on the stock market returns. During the pandemic, there was panic, and people were more concerned about their livelihood and less about wealth and returns. There is a correlation between the increase in the confirmed cases and deaths with the decline in market liquidity, because of the pandemic (Peress, 2014; Donadelli, 2015). Baig et al. (2020) reiterate that lockdown reduces liquidity and stability of markets. Bash (2020) used event study methodology to study the effect of COVID-19 on the returns from stock using event study analysis for 30 countries. The findings show that the COVID-19 caused a downward trend in the stock market returns and significant negative returns.

Tetlock (2007) and Kaplanski & Levy (2010) argued that investor sentiments during economic uncertainty cause volatility. On investigating the stock market's reaction to the increase in COVID-19 cases, the markets overreact because of the availability of information. The people take some time to understand the implications, and after some time, the market corrects itself (Phan & Narayan, 2020). The Asian financial markets were investigated by Uddin et al. (2020) during the pandemic and found that the uncertainty and volatility in the stock markets reduce the risk tolerance in investors. The investors exhibit herd behaviour in the stock market with the fear to act and do differently (Lin & Lin, 2014). This fact explains the significant volatility in the stock markets.

Research is done to investigate the government's role in reducing the consequences of the pandemic on stock markets. One such research is to examine if the Government policies like the travel ban, lockdowns, and stimulus packages would reduce the negative consequences of the pandemic. Research is done to examine the impact of these measures on the revival of the stock market. Some timely interventions and announcements by the government in the form of restrictions affect the stock market returns negatively, whereas the policies of testing of people of COVID-19 and policy about quarantine and economic support packages resulted in positive market returns.

Zaremba et al. (2020) found that stringent policy responses taken by various countries resulted in increased volatility in global stock markets during the pandemic. Research by Caggiano et al. (2020) reiterated that timely government response in the form of restrictions on commercial activities and social distancing restore confidence in the investors that the crisis is under control. It is argued that some policy responses by the government during pandemics created uncertainties in global financial markets (Pástor & Veronesi 2012). The study of Narayan et al. (2020) found that measures initiated by the government like lockdown, travel bans, and economic support positively affects

stock markets. When we dwell on the literature, it is understood that the stock markets reacted differently in different countries.

Though there are few studies done globally, the impact of the COVID-19 pandemic on the stock market performance of BRICS countries has attracted less research attention. Against this backdrop, this paper aims to evaluate the reaction of stock markets in BRICS countries (Brazil, Russia, India, China, and South Africa) to the outbreak of the COVID-19 pandemic from January 2020 – September 2020.

Methods

This paper examines the impact of the COVID-19 outbreak on stock markets in BRICS countries (Brazil, Russia, India, China, and South Africa). The paper uses daily closing stock price data for the major indexes of stock markets in BRICS countries. The stock market indexes include IBOVESPA Index (Brazil), Nifty 50 Index (India), MOEX Russia Index (Russia), SSE Composite Index (China), Top 40 index JTOPI (South Africa). The series are converted into natural logarithmic series. The data for the indexes are taken from respective websites of stock markets. The data for the COVID-19 in each country is taken from the World Health Organization (WHO) website. The data relating to COVID-19 cases measured as a cumulative number of the confirmed cases of COVID-19 in each country is taken from Wealth Health Organization for January 1, 2020, and September 2, 2020.

This research uses the ARCH and GARCH models to examine the impact of the COVID-19 pandemic on the stock markets of BRICS countries. The goal of using the ARCH models' family is to overcome autocorrelation and heteroscedasticity problems, which lead to biased results. These models use proper lagged values of independent variables to overcome autocorrelation problems and allow variances of errors to vary over time by conditional heteroscedasticity. The conditional heteroscedasticity allows variances to be dependent on time, and error terms have zero mean.

Engle (1982) introduce the Autoregressive Conditional Heteroskedastic Model (q) ARCH (q). In this model, the variances of return are changed with the squared lagged values of the error terms. Bollerslev (1986) introduced GARCH (p, q), which is generalized ARCH (q) and enables the conditional variance h_t to be dependent to h_{t-1} and ε_{t-1}^2. This model is considered as a symmetric model and is not able to measure asymmetry effect "leverage effect", which exits in the stock market prices. To overcome on asymmetry effect of the stock market prices, the threshold ARCH or TARCH (advanced by Zakoian, 1994) and the Exponential GARCH or EGARCH (proposed by Nelson, 1991) models are utilized.

This paper uses the following general model to examine the impact of the COVID-19 outbreak on stock markets, which is presented in equations 1.

$$P_t = \varphi_1 + \varphi_2 COVID_t + \theta P_{t-1} + \varepsilon_t \qquad\qquad (1)$$

Where: P is the logarithm of the closing price of the market index at t, and COVID is the cumulative confirmed cases of COVID-19 in each country.

Conditional Variance Equation GARCH:

$$h_t = \omega + a\varepsilon_{t-1}^2 + \beta h_{t-1} \qquad (2)$$

In this GARCH model, the conditional variance is expressed as dependent on past shocks and past variances. From the equation of the GARCH model, we can notice that this model responds in a symmetrically way to the past shocks. This means that good news of corporations has the same effect as bad news on financial markets. The shocks on the short-run persistence are expressed by the term α, while the term β expresses the effects of shocks on the long-run persistence.

Result and Discussion

Table 1 presents descriptive statistics for the closing price index and confirmed COVID-19 cases for the BRICS countries from January 1, 2020, to September 2, 2020. It is observed from Table 1 that the average daily closing price for IBOVESPA Index in Brazil is 96016.08 with a standard deviation of 14945.56, and maximum and minimum values are 119528 and 63570, respectively. The average cumulative confirmed cases of COVID-19 in Brazil are 858658.1. In Russia, the average daily closing price for MOEX Russia Index is 2814.039 with a standard deviation of 240.1887, and maximum and minimum values are 7674.56 and 4993.89, respectively. The average cumulative confirmed case of COVID-19 is 329621.8. In India, the average daily closing price for the Nifty 50 Index is 10567.1with a standard deviation of 1245.664, and maximum and minimum values are 12362.3 and 7610.25respectively. The average cumulative confirmed case of COVID-19 in India is 574532.2.

Table 1. Descriptive statistics of the variables used in the analysis

Country	Variable	Mean	Median	Maximum	Minimum	Std. Dev.
Brazil	IBOVESPA Index	96016.08	98817	119528	63570	14945.56
	CUMULATIVE_CASES	858658.1	111247.5	3908272	0	1196475
Russia	MOEX Russia Index	2814.039	2794.32	3219.92	2112.64	240.1887
	CUMULATIVE_CASES	329621.8	150319	1005000	0	364438
India	Nifty 50 Index	10567.1	10768.05	12362.3	7610.25	1245.664
	CUMULATIVE_CASES	574532.2	52952	3769523	0	959569.4
China	SSE Composite Index	3026.931	2967.63	3451.09	2660.17	217.8914
	CUMULATIVE_CASES	73244.33	84415	90422	0	27177.74
South Africa	Top 40 Index (JTOPI)	48398.3	49920.09	53350.88	34239.3	4320.17
	CUMULATIVE_CASES	130365.7	7220	628259	0	208808.5

In China, the average daily closing price for the SSE Composite Index is 3026.931, with a standard deviation of 217.8914. The maximum and minimum values are 3451.09 and 2660.17, respectively. The cumulative confirmed case of COVID-19 in China is

73244.33. In South Africa, the average daily closing price for the Top 40 index (JTOPI) is 48398.3 with a standard deviation of 4320.17, and the maximum and minimum values are 53350.88 34239.3, respectively. The average daily-confirmed case of COVID-19 is 130365.7.

Table 2. Parameter estimates for the ARCH and GARCH models of the impact of COVID-19 on stock markets in Brazil

	ARCH	GARCH	ARCH	GARCH
Mean equation				
27-02-2020 to 27-03-2020			**28-03-2020 to 02-09-2020**	
Coefficient	Value	Value	Value	Value
COVID-19	-0.090122***	-0.091751***	0.054819***	0.057933***
Constant	11.70848***	11.71858***	10.70789***	10.65961***
variance equation				
ω	0.003203**	-0.000308	0.000311***	0.0000829
α	0.749213	-0.252091	0.723598**	0.483184*
β	--------	1.543127		0.438101*
R-squared	0.686368	0.679820	0.890083	0.894389

*,**,&*** *** represent significant level at 10%, 5% & 1% respectively.

Table 2 presents the results of the ARCH and GARCH models of the impact of COVID-19 on stock markets in Brazil during two phases. The first phase extends from the first day of confirmed cases of COVID-19 in Brazil on February 27, 2020, and for 30 days until March 27, 2020, while the second phase extends from March 28, 2020, to September 2, 2020. The results of the first phase analysis show that the coefficients of ARCH and GARCH models of the effect of total COVID-19 cases on the Brazilian stock market are negative and statistically significant at a 1 percent level. On the other hand, the coefficient value is positive and significant during the second phase analysis of the impact of the COVID -19 outbreak on the Brazilian stock markets. This result indicates the fading of the direct impact of the COVID-19 on the stock markets. It is also noted that the value of the R-square is high in all models, which indicates that the COVID-19 outbreak played a significant role in stock prices movement in the Brazilian stock markets.

It is noticeable through the first and second phases that the financial markets in Brazil have responded quickly to the news of the initial confirmed cases with COVID-19. The response was strong and negative, which led to a decline in stock prices in the Brazilian markets during the first month of the COVID-19 epidemic. Emerging countries, such as Brazil, recorded more than 40% (Ashraf, 2020). However, the negative impact of the increasing number of COVID-19 cases on the markets' financial markets is rebounding. This condition can be explained by the solid economic support provided

by the government to mitigate the effects of the COVID-19 outbreak on the economy (Hale et al., 2020).

Table 3 presents the results of the ARCH and GARCH models of the impact of COVID-19 on stock markets in Russia during two phases. The first phase extended from the first day of confirmed cases of COCID-19 Russia on January 31, 2020, and for 30 days until March 1, 2020, while the second phase extended from March 2, 2020, to September 2, 2020. The results of the first phase analysis that the coefficients of ARCH and GARCH models of the effect of total COVID-19 cases on the Russian stock market are negative and statistically significant at a 1 percent level. On the other hand, the value of the coefficients in the second phase is statistically positive but small, reflecting the receding of the negative impact of the spread of COVID-19 on the Russian stock markets. The value of the R-square is high in all models, confirming the critical impact of the spread of COVID-19 on price movements in the Russian stock markets.

Table 3. Parameter estimates for the ARCH and GARCH models of the impact of COVID-19 on stock markets in Russia

	ARCH	GARCH	ARCH	GARCH
Mean equation				
31-01-2020 to 1-03-2020			**02-03-2020 to 02-09-2020**	
Coefficient	Value	Value	Value	Value
COVID-19	-0.641901**	-0.595321***	0.019858***	0.019816***
Constant	9.184337***	9.103328***	7.665184***	7.665342***
variance equation				
ɯ	0.0000409	-0.0000235	0.0000863	0.0000498
α	1.676640	0.450634	1.121570***	0.813688
β	--------	1.272544*		0.216268
R-squared	0.476813	0.880478	0.493678	0.492248

*,**,&*** *** represent significant level at 10%,5%&1% respectively

It is observed through the results of the first and second phases that the financial markets in Russia have responded quickly to the news of the initial confirmed cases with COVID-19. The response was solid and negative on Russian stock markets and led to a sharp decline in the stock prices during the first month of the COVID-19 outbreak in Russia. After that, the government began to provide economically solid support packages to mitigate the repercussions of the spread of COVID-19 on the economy. This policy led to a decline and disappearance of the negative impact of COVID-19 on the financial markets.

Table 4. Parameter estimates for the ARCH and GARCH models of the impact of COVID-19 on stock markets in India

	ARCH	GARCH	ARCH	GARCH
	Mean equation			
	30-01-2020 to 30-03-2020		24-03-2020 to 02-09-2020	
Coefficient	Value	Value	Value	Value
COVID-19	-0.071626***	-0.071308***	0.045126***	0.045274***
Constant	9.537209***	9.534381***	8.666409***	8.664180***
	variance equation			
ᴡ	0.000114	0.0000414	0.0000785***	0.0000708*
α	1.736168***	1.312038**	1.094770***	1.027879**
β	--------	0.154632		0.045783
R-squared	0.877589	0.880478	0.887822	0.888549

*,**,&*** *** represent significant level at 10%,5%&1% respectively

Table 4 presents the results of the ARCH and GARCH models of the impact of COVID-19 on stock markets in India during two phases. The first phase extended from the first day of cases of COVID-19 in India on January 30, 2020, and for a period of 60 days until March 30, 2020, while the second phase extended from April 1, 2020, to September 2, 2020. The first phase analysis shows that the coefficients of ARCH and GARCH models for the total COVID-19 cases effect on the Indian stock market are negative. On the other side, the value of the coefficients in the second phase is statistically positive, reflecting the disappearance of the negative impact of the spread of COVID-19 on the Indian stock markets. It can be seen that the value of the R-square is too high in all models, confirming that the stock price movements during the crisis were affected by the spread of COVID-19 in the Indian stock markets.

It is evident through the results of the first and second phases that the financial markets in India have responded quickly to the news of the initial confirmed cases with COVID-19. The response was solid and negative on Indian stock markets, and it lasted for two months. The negative abnormal returns are observed more in Asian countries than in other countries (Liu et al., 2020). Haldar & Sethi (2021) show significant effects of COVID-19 related media coverage on the stock market.

The developed countries' stock markets influence the developing countries' stock markets, indicating enormous interdependence. In India, the COVID-19 outbreak is considered the most crucial factor that led to a decline in stock prices in the Indian stock markets during the first two months. However, after that, the negative impact of the increasing number of COVID-19 on the financial markets started to diminish and disappear with the start of government economic packages to unorganized labour sector workers as they are the worst hit and rapid controls by the government to mitigate the repercussions of the COVID-19 outbreak on stock markets. This result is in line with

the study of Avery & Zemsky (1998) and Bouri et al. (2021) that government response and support can reduce uncertainty in investors.

Table 5. Parameter estimates for the ARCH and GARCH models of the impact of COVID-19 on stock markets in China

	ARCH	GARCH	ARCH	GARCH
Mean equation				
06-01-2020 to 06-02-2020			**07-02-2020 to 02-09-2020**	
Coefficient	Value	Value	Value	Value
COVID-19	-0.009405***	-0.009391***	2.339700***	0.001887
Constant	8.058792***	8.058710***	-18.56758***	7.960181***
variance equation				
ⱳ	0.000350**	0.000321	0.0000448***	0.0000663
α	0.077409	0.080857	0.978737***	1.026211***
β	--------	0.071505		0.060531
R-squared	0.761350	0.761290	0.08169035	0.181880

*,**,&*** *** represent significant level at 10%,5%&1% respectively

Table 5 presents the results of the ARCH and GARCH models of the impact of COVID-19 on stock markets in China during the two phases. The first phase extended from the first day of confirmed cases of COVID-19 China on January 6, 2020, and for 30 days until February 6, 2020, while the second phase extended from February 7, 2020, to September 2, 2020. It is observed from the first phase analysis that the coefficients of ARCH and GARCH models of the effect of total COVID-19 cases on the Chinese stock market are negative and statistically significant at a 1 percent level. On the contrary, the value of the coefficients in the second phase is statistically positive, showing the disappearance of the negative impact of the spread of COVID-19 on the Chinese stock markets. The values of the R-square for the first phase analysis models are high, while they are considered low in the second-phase analysis models. This result indicates that the Chinese markets were severely affected during the first phase of the spread of COVID-19, and then the impact on prices became limited during the second phase.

It can be noticed through the results of the first and second phases that the financial markets in China responded quickly to the news of the initial confirmed cases with COVID-19. The response was negative on Chinese stock markets and led to a fall in the stock prices during the first month of the COVID-19 outbreak in China. The results of the second phase confirm that there was no negative impact on stock markets in China. This result can be attributed to the rapid procedures taken by the Chinese government to limit the negative impact of the COVID-19 pandemic on the economy. Countries that imposed strict restrictive measures to curtail the spread during pandemics like China have positively influenced financial markets.

Table 6. Parameter estimates for the ARCH and GARCH models of the impact of COVID-19 on stock markets in South Africa

	ARCH	GARCH	ARCH	GARCH
Mean equation				
05-02-2020 to 05-04-2020			06-04-2020 to 02-09-2020	
Coefficient	Value	Value	Value	Value
COVID-19	-0.034555***	-0.033027***	0.030047***	0.029840***
Constant	10.84749***	10.84539***	10.46744***	10.47041***
variance equation				
ɯ	0.000292*	0.0000975	0.000190***	0.00000813
α	1.145170**	0.950139	0.150123	0.144218
β	--------	0.224200		0.812058***
R-squared	0.520421	0.501070	0.937321	0.937214

*,**,&*** *** represent significant level at 10%,5%&1% respectively

Table 6 presents the results of the ARCH and GARCH models of the impact of COVID-19 on stock markets in South Africa during two phases. The first confirmed case of COVID-19 in South Africa was on March 5, 2020. However, the negative impact on financial markets began a month earlier in South Africa, affected by the outbreak of the COVID-19 around the world. This phase begins from February 5, 2020, to April 5, 2020, while the second phase extends from April 6, 2020, to September 2, 2020.

It is evident through the results of the first and second phases that the financial markets in South Africa responded quickly to the news of the outbreak of COVID-19. The response was significantly negative on stock markets, and it lasted for two months. During the pandemic, investors in the first quarter of 2020 are affected by emotions of uncertainty and fear and make irrational decisions. This condition led to the sell-off of shares resulting in market volatility. The developing countries, such as South Africa, recorded more than 40% losses at the beginning of 2020 compared to China, which had losses of 10% (Phan & Narayan, 2020). The COVID-19 outbreak was the main factor driving the financial markets during this period. However, the negative impact on the financial markets faded. In the times of the pandemic, the government policy support in the form of relief packages revived the stock markets (Zaremba, 2021).

Conclusion

This paper aims to evaluate the reactions of stock markets in BRICS countries (China, Russia, India, and Brazil, and South Africa) to the pandemic of the COVID-19 outbreak. The paper uses ARCH, GARCH models using daily data from January 1, 2020 – to September 2, 2020. The financial market response was analyzed during two phases. The first phase included analyzing the financial markets' response within 30 to 60 days from the first days of confirmed cases of COVID-19. The second phase analyzes the

financial market response after 30 to 60 days of initial confirmed cases. The results of the first phase analysis show that the negative impact of the spread of the COVID-19 on the financial markets in the BRICS countries lasted for about 30 days in Brazil, Russia and China, while it lasted for about 60 days in India and South Africa. On the other hand, the results of the second phase analysis indicate the disappearance of the negative impact on financial markets that resulted from government interventions in the economy to limit the economic repercussions of the spread of the COVID-19.

The empirical results confirm that the response of stock markets in BRICS countries to confirmed COVID-19 cases was negative and strong during 30 to 60 days of the initial confirmed cases. After that, the negative response of the financial markets faded over time. Governments responded with numerous policies related to travel bans, lockdowns, and stimulus packages to minimize the effects of the pandemic. The results conclude that governmental support played an important role in mitigating the repercussions of the COVID-19 outbreak on stock markets in BRICS countries. The study's results cannot be generalized to other markets and countries or during a different period that is a limitation of the study. The study is helpful to the policymakers to take the required precautions and policy measures to stabilize the stock markets to reduce volatility and losses in markets.

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INDEXING AND ABSTRACTING

Etikonomi: Jurnal Ekonomi accredited "Sinta S2" by Ministry of Research, Technology and Higher Education Republic of Indonesia No. 30/E/KPT/2018 amendment of No. 036a/KPT/2016 since May 23, 2016 (valid until December 2022)

Etikonomi: Jurnal Ekonomi has been covered (indexed and abstracted) by following indexing services:

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- Journal Index

AUTHORS INDEX

Raja Fawad Zafar

Ravil Gabdullaevich Akhmadeev

Ruslan Lavrov

Roni Bhowmik

Rozita Baba

Salima Shahin

Saira Ahmed

Sana Baqai

Sampson Agyapong Atuahene

Sheza Zeb

Sigit Puji Winarko

Suhrah Khan

Shujaa Waqar

Syed Ahsan Jamil

Taslima Jannat

Umer Ilyas

Syeh Shah Alam

Vasyl Kuybida

Xuezhou Wen

Yusheng Kong

Zahid Asghar

Zehra Alam Siddiqui

Zubair A Shah

Zubaria Andlib

Zulkefly Abdul Karim

SUBJECT INDEX

ARTICLES & AUTHORS

Vol. 20(1), 2021

No	Name	Title	Note
1	Benjamin Korankye, Xuezhou Wen, Michael Appiah, Louisa Antwi	The Nexus Between Financial Development, Economic Growth and Poverty Alleviation: PMG-ARDL Estimation	Lecturer and researcher from School of Management, School of Business, and Southwestern University of Finance and Economics, China
2	Md. Qaiser Alam, Md. Shabbir Alam	Financial Development, Economic Growth and Poverty Reduction in India	Researcher and Lecturer from Aligarh Muslim University, India, and Dhofar University, Oman.
3	Easmond Baah Nketia, Yusheng Kong	Deciphering African Financial Development Interaction with Institutional Quality and Economic Growth Nexus	Lecturer and Researcher from Jiangshu University, China
4	Sampson Agyapong Atuahene, Kong Yusheng, Geoffrey Bentum-Micah, Abigail Konadu Aboagye	Impact of Capital Adequacy on Banks' Performance: Considering the Basel International Regulatory Framework for Banks	Lecturer and researcher from Jiangshu University, China
5	Kumar Debasis Dutta, Mallika Saha	Nonlinearity of Competition-Stability Nexus: Evidence from Bangladesh	Lecture and researcher from University of Economics and Law, China; Patuakhali Science and Technology University, Bangladesh, and University of Barishal, Bangladesh.
6	Umer Ilyas, Matti Ullah, Muhammad Gulzar	Exploring Philosophy of Co-Movements Between Stocks and Macroeconomic Variables	Lecturer and researcher from National College of Business Administration and Economics, Pakistan; University of Management & Technology, Pakistan.
7	Andi Irawan, Halim Alamsyah	The Covid-19's Economic Crisis and Its Solutions: A Literature Review	Lecturer and researcher from Universitas Bengkulu and Lembaga Penjaminan Simpanan, Indonesia.

No	Name	Title	Note
8	Abderahman Rejeb, Karim Rejeb, John G. Keogh	Cryptocurrencies in Modern Finance: A Literature Review	Lecturer and researcher from Szechenyi Istvan University, Hungary; Higher Institute of Computer Science of El Manar, Tunisia; University of Readings, United Kingdom.
9	Nur Izzaty Mohamad, Azman Ismail, Azmawaty Mohamad Nor	Relationship Between Managers' Support and Training Application with Motivation to Learn as Mediator	Lecturer and researcher from National University of Malaysia and University of Malaya, Malaysia.
10	Muhammad Nawaz Baloch, Asif Hussain Samo, Azeem Akhtar Bhatti, Moomal Baig Bhughio, Sheza Zeb	Position and Prejudice: Exploring the Stereotypical Transformation of Female Identity at Workplace	Lecturer and researcher from University of Sindh and Sindh Madressatul Islam University, Pakistan.
11	Taslima Jannat, Nor Asiah Omar, Syeh Shah Alam	Is Deception an Antecedent for Employees' Cognitive Appraisal Processes and Unethical Behavior?	Lecturer and researcher from Universiti Kebangsaan Malaysia and University Malaysia.
12	Rozita Baba, Zulkefly Abdul Karim, Mariani Abdul Majid, Noorasiah Sulaiman	The Determinants of the Technical Efficiency of Secondary Schools in Malaysia: Panel Evidence	Lecturer and researcher from University College of Islam Melaka and National University of Malaysia
13	Doddy Setiawan, Muhammad Agung Prabowo, Irwan Trinugroho, Bany Ariffin Amin Noordin	Board of Commissioners' Structure, Ownership Retention, and IPO Underpricing: Evidence from Indonesia	Lecturer and researcher from Universitas Sebelas Maret, Indonesia; Universiti Putra Malaysia
14	Muhammad AsadUllah, Masood Hassan, Zehra Alam Siddiqui	Comparison of Takaful and Non-Takaful Insurance Companies Pakistan: Under Pre, During, and Post Economic Crisis 2008	Lecturer and researcher from Institute of Business Management (IoBM), Pakistan

Vol. 20 (2), 2021

No	Name	Title	Note
1	Muhammad Nawaz Tunio, Lenny Yusrini, Zubair A. Shah, Naveeda Katper, Mushtaque Ali Jariko	How Hotel Industry Copes Up with the COVID-19: An SME Perspective	Lecturer and researcher from Greenwich University, Pakistan; Alpen Adria University, Austria; Akademis Pariwisata Indonesia, Indonesia; Salim Habib University, Pakistan; University of Sindh, Pakistan
2	Noreen Khalid, Raja Fawad Zafar, Qasim Raza Syed, Roni Bhowmik, Muhammad Jamil	The Heterogeneous Effects of COVID-19 Outbreak on Stock Market Returns and Volatility: Evidence from Panel Quantile Regression Model	Lecturer and researcher from Quad-i-Azzam University, Pakistan; Sukkur IBA University, Pakistan; Ministry of Commerce, Pakistan; Guangdong University of Foreign Studies, China; University of Azad Jammu and Kashmir, Pakistan.
3	Normala S Govindarajo, Dileep Kumar M, Erum Shaikh, Mukesh Kumar, Pramod Kumar	Industry 4.0 and Business Policy Development: Strategic Imperatives for SME Performance	Lecturer and researcher from Xiamen University Malaysia, Malaysia; Gopal Narayan Singh University, India; University of Modern Science, Tando Muhammad Khan, Sindh, Pakistan.
4	Shujaa Waqar, Iftikhar Badshah, Marium Sara Minhas Bandeali, Saira Ahmed	The Impact of Special Economic Zones (SEZs) on Economic Growth: Where the Absorption Capacity of Domestic Labor Stands?	Lecturer and researcher from Forman Christian College, Pakistan; International Islamic University, Pakistan; Government of Sindh, Pakistan; and Capital University of Science and Technology, Pakistan
5	Olha Sliusarchuk, Ruslan Lavrov, Vasyl Kuybida, Maksym Slatvinskyi, Andrii Zelenskyi	Fiscal Policy of Economic Development: Comparative Characteristics of Ukraine and Poland.	Lecturer and researcher from Taras Shevchenko National University of Kyiv, Ukraine; European University, Ukraine; National Academy for Public Administration, Ukraine; Pavlo Tychyna Uman State Pedagogical University, Ukraine; and Podillya State Agrarian and Engineering University, Ukraine.

No	Name	Title	Note
6	Lyudmila I. Petrova, Nadezda Y. Glubokova, Ravil G. Akhmadeev, Olga A. Bykanova, Elena I. Artemova, Ramzil B. Gabdulkhakov	The Inductiveness of Agricultural Village-Type Cluster Creation in Developing Countries	Lecturer and researcher from Altai State University, Russia; Plekhanov Russian University of Economics, Russia; Kuban State Agrarian University, Russia; and Ufa State Petroleum Technological University, Russia
7	Anna M. Kulik, Elena A. Lavrinenko, Julia V. Lyshchikova, Elena A. Strybkova	Smart-Specialization of The Agro-Industrial Complex in The Context of Digital Transformation of Regional Economic System	Lecturer and researcher from Belgorod State University, Russia.
8	Sana Baqai, Jawaid Ahmed Qureshi, Ejindu Iwelu MacDonald Morah	The Relationship Between ES-QUAL Model and Online Purchase Intention in the Context of Rising Global Marketplace of E-Commerce	Lecturer and researcher from Shaheed Zulfikar Ali Bhutto Institute of Science and Technology, Pakistan; and University of Westminster, United Kingdom.
9	Amna Noor, Zahid Asghar, Haroon Sarwar, M. Irfanullah Arfeen	Role of The ICT in Women Empowerment and Achieving SDGs: A Case Study of Women Labor Force in Developing Countries	Lecturer and researcher from Quaid-i-Azam University, Pakistan; and Federal Ministry of Planning, Development and Reforms, Pakistan.
10	Salima Shahin, Muhammad Nawaz Baloch, Najia Shaikh, Iqra Ibrahim, Ahsan Ali Abbassi	Women in the Whirpool: Traversing the Tie-up of Personality and Work-Life Balance of Pakistani Academicians	Lecturer and researcher from Karakoram International University, Pakistan; University of Sindh, Pakistan; and Sindh Madressatul Islam University, Pakistan.
11	Suhrab Khan, Ihtsam Ul Haq Padda	The Impact of Tax and Social Expenditure Policies on Income Distribution: Evidence from South Asia	Lecturer and researcher from Federal Urdu University of Arts, Science and Technology, Pakistan.
12	Zubaria Andlib, Julio Salcedo-Castro	The Impact of Tourism and Governance on CO_2 Emission in Selected South Asian Countries	Lecturer and researcher from Federal Urdu University of Arts, Science and Technology, Pakistan; and School of Science, UNSW Canberra, Australia

No	Name	Title	Note
13	Muhammad Zarunnaim Haji Wahab, Asmadi Mohamed Naim	The Review on Sustainable and Responsible Investment (SRIs) Practices According to Maqasid Shariah and Maslahah Perspectives	Lecturer and researcher from Univesiti Utara Malaysia and Universiti Islam Antarbangsa Sultan Abdul Halim Mu'adzam Shah, Malaysia
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15	Kavita Chavali, Hazem Al Samman, Syed Ahsan Jamil	How Did The Financial Markets Respond to The Covid-19 Pandemic? Empirical Evidence from BRICS Countries	Lecturer and researcher from College of Commerce and Business Administration, Dhofar University, Sultanate of Oman.

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	2012	2013	2014	2015	2016	2017
Fundraising	52.271	76.036	115.415	147.512	174.018	186.608
Financing	46.886	68.181	102.655	147.505	179.284	187.886
Asset	66.090	97.519	145.467	195.018	229.557	244.197

Source: Islamic banking statistics, Bank of Indonesia

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