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Abstract

The outbreak of COVID-19, labeled as a black swan event, causes significant damage globally due to its fatality. The COVID-19 pandemic has expanded across the world by creating shocks in almost all the industries due to the restrictions, curfews, stay-home and work-from-home policies, and quarantines. As a result of the health and economic crisis with the COVID-19 pandemic, the tourism sector got severely affected. The UNWTO has estimated a loss of approximately 1.1 billion international tourist arrivals, with a loss of US\$ 910 to 1.1 trillion export revenues and 100-120 million jobs due to the wider spread of the novel coronavirus. Therefore, this paper aims to determine the impact of the COVID-19 outbreak on the tourism industry in the world and in the Kingdom of Saudi Arabia. This article adopts the financial data of listed companies in Saudi Arabia and uses the synthetic index compilation method to compile an accounting index that captures the period before and during the Covid-19 outbreak and measures the impact of the Covid-19 on the tourism sector. From this article, we recommend the appropriate policies to re-launch some tourism activities within the after Covid-19 period. It will be crucial to restore all types of travel, and domestic and international flights, improve direct and indirect employment and the recovery of many related business as travel agencies, hotels, and airline companies, which allow for economic and social benefits.

JEL Classification: I3, L8

Keywords: Covid-19 Pandemic; Tourism Sector; Accountancy Approach, KSA.

ملخص

أدى تفشي- جائحة فيروس كورونا كوفيد-19، والمسمى بالبجعة السوداء، إلى التسبب في وقوع أضرار جسيمة على مستوى العالم نتيجة لتسببه في عدد كبير من الوفيات. وقد انتشرت جائحة كوفيد-19 في جميع أنحاء العالم من خلال إحداث صدمات في كل الصناعات تقريبا بسبب القيود وحظر التجوال وسياسات البقاء في المنزل والعمل من المنزل والحجر الصحي. ونتيجة للأزمة الصحية والاقتصادية لكوفيد-19، تأثر قطاع السياحة بشدة. وقدرت منظمة السياحة العالمية الخسارة بما يقرب من 1.1 مليار سائح دولي وافد، وخسارة تتراوح بين 910 و1.1 تريليون دولار أمريكي في عائدات التصدير و100-120 مليون وظيفة بسبب الانتشار الأوسع لفيروس كورونا المستجد. لذلك، تهدف هذه الورقة إلى تحديد تأثير تفشي- جائحة كوفيد-19 على صناعة السياحة في العالم وفي المملكة العربية السعودية. تستخدم هذه المقالة البيانات المالية للشركات المدرجة في المملكة العربية السعودية وتستخدم طريقة تجميع المؤشرات الاصطناعية لجمع مؤشر محاسبي يسجل الفترة قبل وأثناء تفشي- جائحة كوفيد-19 ويقيس تأثيرها على قطاع السياحة. وبناء على هذه المقالة، نوصي بالسياسات المناسبة لإعادة إطلاق بعض الأنشطة السياحية خلال فترة ما بعد جائحة كوفيد-19. وسيكون من الحيوي استعادة كل أنواع السفر، والرحلات الداخلية والدولية، وتحسين العمالة المباشرة وغير المباشرة واستعادة العديد من الأعمال ذات الصلة مثل وكالات السفر والفنادق وشركات الطيران، والتي تتيح تحقيق الفوائد الاقتصادية والاجتماعية.

1. Introduction

The Covid-19 (declared as a pandemic by WHO, 12 March 2020) of significantly impacts the global economic, political, socio-cultural systems. Health communication strategies and measures (e.g. social distancing, travel and mobility bans, community lockdowns, stay at home campaigns, self- or mandatory-quarantine, curbs on crowding) have halted global travel, tourism and leisure. Being a highly vulnerable industry to numerous environmental, political, socio-economic risks, tourism is used to and has become resilient in bouncing back (Novelli, Gussing Burgess, Jones, & Ritchie, 2018) from various crises and outbreaks (e.g. terrorism, earthquakes, Ebola, SARS, Zika). However, the nature, the unprecedented circumstances and impacts of the Covid-19, demonstrate signs that this crisis is not only different, but it can have profound and long-term structural and transformational changes to tourism as socio-economic activity and industry. Indeed, the global and huge scale, the multidimensional and interconnected impacts challenging current values and systems and leading to a worldwide recession and depression are the most distinctive characteristics of this pandemic.

Covid-19 tourism impacts will be uneven in space and time, and apart from the human tool, estimates show an enormous and international economic impact: international tourist arrivals are estimated to drop to 78% causing a loss of US\$ 1.2 trillion in export revenues from tourism and 120 million direct tourism job cuts representing seven times the impact of September 11, and the largest decline in the history (UNWTO, 2020). Being one of the most important global employers (1 in 10 jobs are directly related to tourism, UNWTO, 2020) and the major GDP contributor for several countries, tourism and Covid-19 are the epicenter of all international discussions and economies. Within the burgeoning industry discussions and research about tourism and Covid-19, there is an unanimous call to see and use the pandemic as a transformative opportunity (Mair, 2020). Industry should not only recover but also reimagine and reform the next normal and economic order (McKinsey, 2020), while researchers should not solely use Covid-19 as another context to replicate existing knowledge for measuring and predicting tourism impacts (Gössling, Scott, & Hall, 2020; Hall, Scott, & Gössling, 2020).

Although such studies are important for managing the pandemic, they do not advance knowledge and/or guide the industry to a step beyond. Moreover, because of the interlinked socio-cultural, economic, psychological and political impacts of Covid-19 of this magnitude, unforeseen trajectories instead of historical trends are expected and the predictive power of 'old' explanatory models may not work. Moreover, there is enough evidence to claim that both the tourism industry and research have matured to a good extent providing sufficient knowledge about how to study and effectively: (1) design and implement crisis recovery and response strategies (e.g., McKercher & Chon, 2004); (2) build resilience to address future crises (Hall, Prayag, & Amore, 2017). What is still lacking is knowledge about how crisis can foster industry change, how companies can convert this crisis disruption into transformative innovation and how to conduct research that can enable, inform and shape the rethinking and resetting of a next normal.

The near worldwide lockdown imposed to prevent the spread of Covid-19 has affected tourism in the Kingdom of Saudi Arabia and across the world. A gradual return to some sort of normal life will require structural transformation conducting to the implementation of a wider range of new tourism policies, including ways to rebuild consumer confidence, change consumer patterns, allow rapid testing and vaccines, increase the quality of tourism services and use of technology, and develop sustainable tourism. This article adopts the financial data of listed companies in Saudi Arabia and uses the synthetic index compilation method to compile an accounting index that captures the period before and during the Covid-19 outbreak and measures the impact of the Covid-19 on the tourism sector. This index is based on big data portrait analysis. Moreover, with the discovery of vaccines against Covid-19, it is appropriate to think the factors responsible for the tourism sector recovery after the Covid-19 pandemic. This study also examines the level of influence of these factors on the tourism sector in Saudi Arabia. From this article, we recommend the appropriate policies to re-launch some tourism activities within the after Covid-19 period. It will be crucial to restore all types of travel, and domestic and international flights, improve direct and indirect employment and the recovery of many related business as travel agencies, hotels, and airline companies, which allow for economic and social benefits.

1. This study aims to measure the impact of the Covid-19 on the KSA tourism sector. It adopts the financial data of listed companies in Saudi Arabia and uses the synthetic index compilation method to compile an accounting index that captures the period before and after the Covid-19 outbreak.
2. Explores the factors responsible for the tourism sector recovery after the Covid-19 pandemic.
3. Assesses the level of influence of these factors on the tourism sector in Saudi Arabia.

It is expected that from an accounting approach, we are the first to use the synthetic index compilation method to compile tourism sector wide accounting indexes that capture the period before and after the Covid-19 outbreak. These indexes are able to measure the impact of the pandemic on the Saudi Arabia economy at the sector level. Moreover, the contribution of this study consists in determining the factors responsible for the tourism sector recovery after the Covid-19 pandemic and the level of influence of these factors on the tourism sector in Saudi Arabia.

In addition, this study shall provide an estimate of society's benefits from the government policies to boost the tourism sector activities. This would set the stage for the authorities to introduce corrective measures in some concerned re-launch programs in order to boost entrepreneurship in the tourism and enhance the level of domestic employment.

The work plan of the study starts firstly by an introduction that briefs the current progress of the literature review of the economic and social impacts of the Covid-19 on the tourism industry worldwide. Subsequently, we develop the model to be executed using an accountancy approach.

We use the synthetic index compilation method to compile an accounting index that captures the period before and after the Covid-19 outbreak and measures the impact of the Covid-19 on the tourism sector. To do so, we adopt the financial data of listed companies in Saudi Arabia and this index is based on big data portrait analysis. Thirdly, we document the factors associated to impact the tourism sector during the Covid-19 pandemic and we assess the level of influence of these factors on the tourism sector in Saudi Arabia. Primary data will be collected online from tourism business and consumers using a questionnaire developed by the researchers. Smart PLS3 software was used to analyze the data. Further, a brief discussion will be included related to the significance of these factors. It includes (1) Rebuilding consumer confidence, (2) Intensive and efficient use of technology and the need to invest in Tourism 4.0 and (3) increasing the quality and sustainability of the tourism sector.

2. Tourism worldwide trends before and during Covid-19 pandemic: some stylized facts

Several distinct factors determine the impact of an epidemic outbreak on tourism demand. Geographical distance to ground zero (infection epicenter) and infectious power are two of the most distinct. Other modern determinants are media attention (Internet revolution) and associated hysteria. Present worldwide socioeconomic conditions and terrorism, together with conditions of world conflict, impact tourism demand. Oil prices and environmental conditions also exhibit a substantial effect on the number of international tourists travelers. Furthermore, episodes of epidemic outbreaks have coincided with economic turmoil, both nationally and internationally. Because of tourism's seasonality character and vulnerability to exogenous factors, measuring the impact of an individual factor is a complicated task. Several virus outbreaks globally affected worldwide tourism trends and the world economy after World War II (WWII). Table 1 shows the infections and deaths of significant virus outbreaks in the last 53 years.

Table 1. Infections and deaths of significant virus outbreaks in the last 53 years

Outbreaks	Infections	Deaths
Marberg (1967)	466	373
Ebola* (1976)	33,577	13,562
Hendra (1994)	7	4
H5N1 bird flu (1997)	861	455
Nipah (1998)	513	398
SARS (2002)	8096	774
H1N1** (2009)	762,630,000	284,500
MERS*** (2012)	2494	858
H7N9 bird flu (2013)	1568	616
COVID-19 **** (2020)	1,930,979	120,074

Note: *as of January 2020

** between 2009 and 2010

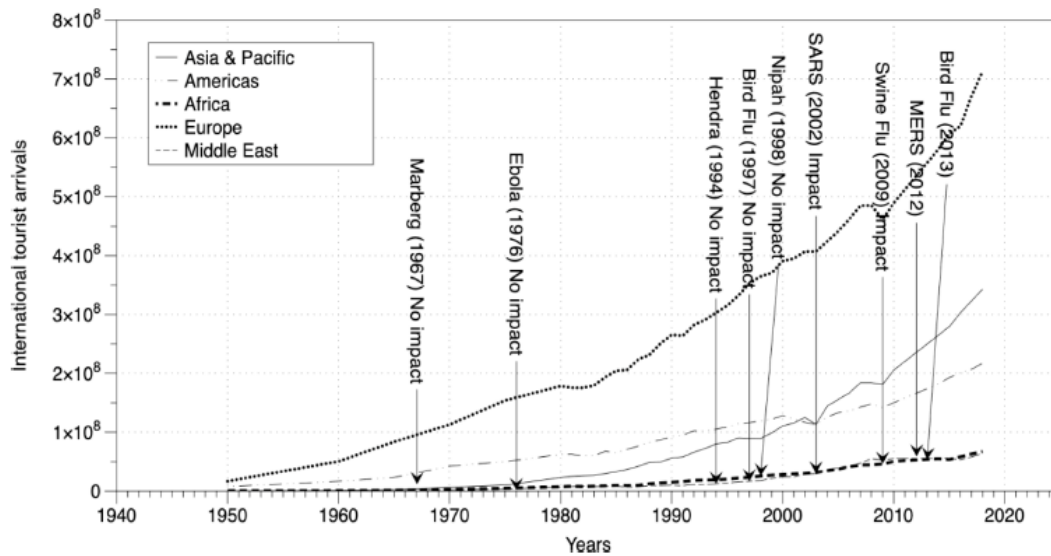
***as of November 2019

**** as of April 2020

Source: Science Alert (2020)

In the past 50 years, the world has experienced several virus outbreaks with different levels of infections and mortality rates. Fig. 1 plots the virus outbreak episodes to the total number of tourist arrivals by world regions from 1950 to 2018. As expected, the impact varies by world regions depending on the source and distance to the virus outbreak source (ground zero countries). Fig. 1 shows that different epidemic outbreaks produce different worldwide impacts. Virus epidemic diseases, like SARS (2002) and H1N1(2009), have a large and significant impact on worldwide tourism trends and economic opportunity costs. Epidemic outbreaks with less infectious power ($R_0 < 1$) have a lower impact on tourism trends and associated economic losses. Fig. 1 illustrates that the drop in tourist arrivals due to epidemic outbreaks varies across world regions. According to Skare et al. (2021), data displays registered (direct) drops in the number of tourist arrivals by world regions according to data from the United Nations World Tourism Organization (UNWTO)—a United Nations specialized agency—database. Skare et al. (2021) show that the total lost tourist arrivals worldwide from 1980 to 2019 amounted to 57 million (M) during the epidemic outbreaks. Lost tourism spending worldwide in times of epidemic outbreaks during this same period reached 95 US\$ billion (bn). In relative terms, total lost tourism spending in a time of epidemic crisis was 0.23% of the world GDP (to the average world GDP value from 1980 to 2018). Epidemic outbreaks vary significantly between the type of disease outbreak and across world regions. Africa did not experience a significant impact on the tourism demand during the epidemic crisis; total losses were 2 bn US \$ in tourism spent from 1980 to 2019. The SARS epidemic crisis of 2002 and H1N1 (2009) caused a striking drop in tourist arrivals by 10 million in the Americas region; in tourism spending, the loss was 21 bn US\$ in the that region. The Asiatic and Pacific regions experienced a significant drop in tourist arrivals during the bird flu epidemic (1997), SARS (2002), and H1N1(2009). Lost arrivals during the bird flu crisis in that region was 1 million, and lost spending amounted to 2 bn US\$. The decline in the tourist arrivals in the region at the time of the SARS (2002) outbreaks was 12 million with a related 2 bn US\$ in lost revenue. During the H1N1 (2009) crisis, the region experienced 3 million tourist arrivals decline and 6 bn US \$ lost tourism spending. The European region was not significantly hit by most of the outbreaks and epidemics from 1980 to 2019 (for the distance to the virus originating region). However, in the H1N1 epidemics (2009), there was a decline of 26 million tourist arrivals and a 61 bn US\$ total tourism spending loss (amounting to 0.5% of the Europe GDP at the time). In H1N1 epidemic episode, however, Europe was affected strikingly with a total decline in tourist arrivals and spending loss that surpassed the economic impact for all other world regions over the 1980–2019 period.

Figure 1. International Tourist Arrivals by world regions 1950-2018



Source: Skare et al. (2021).

The Middle East region suffered travel disruptions during the H1N1 (2009) epidemic crisis, causing a 3 million decline in tourist arrivals. Tourist spending, however, did not register a decline due to a rise in the receipts per arrival. The bird flu (2013) crisis faced a 2 million decline in tourist arrivals and 1 bn US\$ in international visitor spending. Skare et al. (2021), associate epidemic outbreaks with significant opportunity costs in tourism demand. Although epidemic outbreaks significantly shape and influence the tourism industry, multiple causality issues (e.g., outbreaks followed by environmental and security issues or political and economic crises) arise when it comes to measuring the opportunity costs of epidemic outbreaks.

3. Review of the literature

3.1. Theoretical explanations

Research investigating, measuring and predicting the Covid -19 tourism impacts is important in order to eliminate ‘casualties’, draft, monitor and improve response strategies (i.e. you cannot manage what you cannot measure). However, research focusing on the features and impacts of crises instead of their structural roots tends to conceal and stabilize the conditions and corollary social structures through which crises are produced (Barrios, 2017). Investigating the real roots of Covid -19 may go beyond the boundaries and scope of tourism research. Yet, the latter needs to look into and challenge the tourism ‘circumstances’ and structures that have enabled and sometimes accelerated the global spread and impact of Covid -19. Unfortunately, the economists downplay the pandemic as a purely natural event originating and operating outside of the economic system (Nowlin, 2017). But, treating Covid -19 as an exogenous shock and phenomenon that has nothing to do with socio-economic structures and values, can perpetuate and strengthen the pandemic roots during the post Covid -era as well as constrain change and transformational processes.

Covid -19 is a crisis of the economized societies rooted in the growth-paradigm (Ötsch, 2020). Covid -19 is also a result of the intersection of broader processes of urbanisation, globalisation, environmental change, agribusiness and contemporary capitalism. The nature of tourism (requiring traveling) and its evolution and growth paradigms are a significant contributor to such circumstances and the current socio-economic system accelerating the spread and impact of this contagious and infectious virus. Tourism is a result but also responsible for: our highly interconnected and global world; pollution, waste and climate change; global, national and regional economic development and growth; superiority of capitalism values in people's and business decision-making but also policy and politics formulations.

As climate change increases the frequency of pandemics and outbreaks, pandemics are expected to become more common in the future (World Economic Forum (2019) which in turn highlights the interwoven nature and vicious circle forces between the biological, physical and socio-economic systems. Moreover, the economic system and mindset contributing to the Covid -19 has also been guiding and shaping the Covid -19 response and recovery strategies of governments, institutions, businesses and people alike. This can significantly perpetuate and repeat crises as we are treating their symptoms and not their roots. For example, economic priorities for maintaining business continuity and jobs, resume and recovering to the old 'economic success growth', have been driving governments' policies and practices such as: economic support (e.g., subsidies, tax reliefs) to tourism businesses and employees; debates for relaxation of restrictions for re-opening and re-starting economies at the expense of a second way and human lives. Similarly, people have engaged in panic buying and (over)-consumption of online experiences (e.g., virtual entertainment, dining, drinking, traveling) during lockdowns, that demonstrate their persistence, preference and fear of losing to their 'consumerism' traditional lifestyles deemed essential for their success and happiness. Early Covid -19 tourism research also reinforces a similar mindset, e.g., many studies trying to measure the economic impacts of Covid -19 trading them off to socio-cultural and biological impacts, studies aiming to predict and measure when tourists will start traveling again and when we can reach the old tourism targets.

As governments race to minimise economic losses, and be the first to reopen borders and (tourism) businesses, and financial markets, investors, cash liquidity and financial survival are equally pressing multinational and small tourism enterprises, they are all also looking for tourism research that can 'feed' and 'reconfirm' their mindset and help them resume operations based on the old paradigms and business models they are founded.

3.2. Empirical Literature

The Covid-19 pandemic is the first and foremost a humanitarian crisis affecting people lives and has triggered a global economy crisis. This has very global tangible impacts for the tourism sector, which is critical for many people, places and businesses, with the impact particularly felt in countries, cities and regions where tourism is an important industry of the economy.

According to OECD (2020)⁴ revised estimates point to 60% decline in international tourism in 2020, rising to 80% if recovery is delayed to december 2020. From the Middle East and North Africa (MENA) region, tourism is an important pillar of the economies accounting for about 5.3% of GDP growth and 6.7 million jobs across the region. The unknown duration and scope of the pandemic and the worldwide panic accompanying it have caused a tourism crisis (Ben Youssef et al, 2020)⁵. Despite the current pandemic, the Kingdom of Saudi Arabia plans to increase household spending on cultural and entertainment activities inside the Kingdom from the current level of 2.9 per cent to six percent. The 2030 vision anticipates an increase of tourism's contribution to the country's GDP by 10 percent by 2030⁶.

The study of Foo et al. (2020)⁷ would inspire our article. The authors prove that the pandemic highly impacts the airlines and hotel business in Malaysia. In order to ensure sustainability of the tourism industry, the authors discuss the stimulus packages offered by the Malaysian government. Moreover, we consider the document of Mulder (2020)⁸ published by the Economic Commission for Latin America and the Caribbean (ECLAC). Mulder (2020) concludes towards the different measures to mitigate the impact of the crisis and accelerate recovery. While the results provided by Păvăluc et al. (2020)⁹ underline that, in all countries, the coronavirus pandemic has affected the tourism sector, but the intensity to which has done it is different, the UNTWO (2020)¹⁰ reports that quarantine measures, flight cancellations, bans and border closures are expected to reduce international tourist arrivals by 20% to 30% by 2020. Some lessons are learned from Gil-Alana & Poza (2020)¹¹ who examined the impact of Covid-19 on the Spanish tourism sector by using a strong dependence model.

These references support our interest to assess the impact of the Covid-19 pandemic on the Saudi Arabia tourism industry related to the few scientific articles dealing with this issue. Following He et al. (2020)¹² we are able to apply an accountancy index to assess the impact of the Covid-19 pandemic on the Saudi Arabia tourism industry.

⁴ OECD (2020), Tourism policy responses to coronavirus (Covid-19)

⁵ Ben Youssef, A., Zeqir A. & Belaid, F. (2020), [The impact of Covid-19 on the tourism sector in MENA](#), ERF Forum.

⁶ AlDawood A, (2019), Arabian Travel and Tourism Industry. Understanding inbound, outbound, and domestic travel trends. Seera Group.Riyadh, Saudi Arabia

⁷ Foo, Lee-Pang., Chin, Mui-Yui., Tan, Kim-Leng & Phuah, Kit-Teng. (2020), The impact of COVID-19 on tourism industry in Malaysia. *Current Issues in Tourism*, <https://doi.org/10.1080/13683500.2020.1777951>.

⁸ Mulder, N (2020). "The impact of the COVID-19 pandemic on the tourism sector in Latin America and the Caribbean, and options for a sustainable and resilient recovery", *International Trade series*, No. 157 (LC/TS.2020/147), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC).

⁹ Cristiana Păvăluc, C., Brînză, G., **, Alexandru Anichiti, A & Butnaru, G.I. (2020). COVID-19 pandemic and its effects on the tourism sector. *CES Working Papers – Volume XII, Issue 2*.

¹⁰ UNWTO (2020), Impact assessment of the COVID-19 outbreak on international tourism, (retrieved from <https://www.unwto.org/impact-assessment-of-the-Covid-19-outbreak-on-internationaltourism>).

¹¹ Gil-Alana & Poza (2020), The impact of COVID-19 on the Spanish tourism sector, *Tourism Economics*, Forthcoming.

¹² He, P., Niu, H., Sun, Z & , Tao L (2020), Accounting Index of COVID-19 Impact on Chinese Industries: A Case Study Using Big Data Portrait Analysis. *Emerging Markets Finance and Trade*, Vol. 56, No. 10, pp.2332–2349

This section focuses on the empirical findings of the Covid -19 outbreak and the global tourism industry. The tourism industry has been identified as of key economic sector that faced more challenges due to the Covid -19. The study argues that the tourism sector plays a prominent role in the economic growth of a country, and further illustrated that the Covid -19 pandemic affected the tourism sector, ultimately leading to risks in the economic growth of a nation.

The tourism sector is a major source of employment globally, which is a labor-intensive industry. The supporting industries of tourism are accommodation, transportation, food and beverages, retail and culture, hospitality, and sports (WTTC, 2017). The tourism sector of a country provides benefits and opportunities for its people. The tourism industry belongs to the service sector of the economy, which has its unique characteristics (Haq et al., 2014; Gamage et al., 2017). A significant number of previous scholars have considered the considerable task of the tourism industry in economic development (Gamage et al., 2020). According to the World Tourism Organization (WTO), tourism is considered one of the driving forces for economic development. The benefits of tourism to economic growth are creating the highest foreign exchange, employment opportunities, and revenue for a country (Steiner, 2006). Faiza et al. (2019) and Gamage et al., (2020) reveal that tourism is the fastest growing industry in developed and developing economies, and tourism is considered the largest source of employment opportunities with the highest revenue creator in an economy. The Covid -19 pandemic situation badly hit on the economic development of almost all countries in the world. It caused the largest downfall of the economy in history. More advanced economies like the USA, UK, Japan, and Europe are also experiencing the downfall of their economies due to the spread of Covid -19. The World Trade Organization estimates that trade activities may drop by 32% in 2020. The poor economic performance occurs due to the weak demand, supply chain disruptions, travel restrictions, and the Lockdown policy, which are preventive actions for further spread of the virus. Those restrictions may pose pressure on the economic growth of the world. The International Labor Organization (ILO) estimates the impact of the Covid-19 pandemic to increase global unemployment between 5.3 million to 24.7 million (ILO, 2020). This leads to the loss of economic activities with loss of jobs. The Covid 19 outbreak impacts all sectors of the economy, such as manufacturing, tourism, financial, service, trade, transport, and people in every field in every country with more significant economic shocks. Due to the uncertainty and fear of the pandemic, most firms are more likely to have low profits as people are advised to stay at home, with travel bans and cancellation of events, and the prohibition of mass gatherings (Horowitz, 2020; Elliot, 2020). The travel and tourism sector are more likely to get influenced by the Covid -19 pandemic (Shretta, 2020). The global tourism sector accounts for more than 10% of the global GDP and 30% of the world's export services (World Bank, 2017). Among all segments in the economy, Tourism is one of the main sectors which impact the economy as many governments impose travel restrictions, travel bans, shutting down airports, and mass passenger cancellations. Thus, the tourism industry cost with a loss of over US\$ 820 billion in revenue globally due to the Covid -19 pandemic (Ozili & Arun, 2020). Besides, the hospitality industry has been mainly affected due to the policies of stay at home and social distancing imposed by most governments and by cancellations of bookings, which may cost about US\$ 150 billion worldwide. Ahikul et al. (2020) revealed that coronavirus

significantly affects the Chinese tourism industry. The hospitality and tourism industry in China usually earns huge profits, but the Covid-19 pandemic resulted in postponing most tourist visits to China, heavily affecting the tourism industry in China (Aljazeera, 2020). Furthermore, the positive impact on online traveling agencies, hotels, bars, restaurants, and other traveling agencies was revealed.

As the Covid -19 epidemic spread globally, international tourist arrivals are forecasted to decline in 2020 by up to 30%, with a loss of worldwide tourism revenue of US\$ 450 billion (UNWTO, 2020a). This is ten times more than the global financial impact of the SARS epidemic (Shretta, 2020). Thus, it can be concluded that the Covid -19 outbreak is expected to critically impact international tourism compared to the previous pandemics and outbreaks in the world. The tourism industry's decline may severely impact employment and supply chain income. Countries that heavily depend on the tourism sector may experience massive recessions in the labor market and the GDP of the country. The main sub-sectors involved with the tourism sector are health, financial, constructions, trade, air transport, accommodations, food and beverages, transportation, and communication. Thus, all such sub-sectors are negatively influenced by the decline of the tourism sector (UNCTD, 2020). As per the WTTC (2020), the tourism industry is more likely to recover slower than the other sectors in the economy, as the previous pandemics have taken more than 19 months to recover. International tourism faced the most vulnerable situation with the pandemic due to travel restrictions, social distancing, and quarantine policies, a common feature of major governments. In this regard, the tourism sector could be pinpointed as the sector, which is most severely and negatively affected by the unpredicted economic shocks in countries. Thus, this study addresses the impact of Covid -19 pandemic in the tourism industry to determine growth strategies that address the challenges of economies and tolerate the tourism sector amidst the epidemic.

4. The Methodology

4.1. The model

The basic idea of compiling the industry accounting index is as follows. First, determine the calculation method for the industry accounting index and the required accounting subjects. Second, calculate the quarterly accounting index $ai(t)$ of each company in the industry, and obtain the accounting index $Ai(t)$ for each industry i and quarter t by weighting the equity and weighted average. Finally, use the synthetic index compilation method to form an optimized industry accounting index $Yi(t)$.

The industry accounting index has four dimensions, namely value creation, cost, leverage, and inventory indexes. The value creation index represents how stakeholders create value to the enterprise. The value creation index is the sum of net profit, financial expenses, taxes, and remuneration. The larger the index, the more value the stakeholders create and the better it is for the industry.

The cost index reflects the quarterly operating costs of the industry. The cost index is sum of operating costs, taxes and surcharges, sales expenses, and management expenses. The leverage index reflects the industry's quarterly debt pressure and is measured by financial expenses. The inventory index reflects the industry's quarterly inventory backlog. The cost, leverage, and inventory indexes are all negative indexes. Thus, a reduction in these indexes is conducive to the development of the industry.

The final industry accounting index is obtained after passing $A_i(t)$ through the synthetic index compilation method and standardization. The steps involved in the composite index compilation method are as follows.

Step 1: In order to reduce the influence of seasonal changes and irregular factors on the index calculation, we use the $A_i(t)$ the current period and the previous period as the base to find the symmetric change rate – so that whether the index rises or falls, the change is equal/symmetric. The calculation of the symmetric change rate is:

$$C_i(t) = \begin{cases} \frac{A_i(t) - A_i(t-1)}{A_i(t) + A_i(t-1)} * 200, & A_i(t) > 0 \\ A_i(t) - A_i(t-1), & A_i(t) \leq 0 \end{cases}$$

where $C_i(t)$ is a symmetric change rate, $A_i(t)$ is an unoptimized industry accounting index, i represents industry, and t represents the quarter.

Step 2: In order to reduce the impact of excessive change in the index, we standardized the symmetric change rate. First, we obtained the standardization factor $U_i(t)$:

$$U_i(t) = \frac{\sum_{t=2}^n |C_i(t)|}{n-1}$$

In order to more clearly see the effect of Covid-19 on various industry indexes, the rate of change is amplified, while ensuring the stable change of the index (the leverage index changes are relatively obvious, so a relatively small amplification process is adopted relative to other indexes). The standardized rate of change $S_i(t)$ is obtained:

$$S_i(t) = \frac{U_i(t)}{A_i} * 10000$$

Step 3: Taking January 1, 2011 as the base period, let $Y_i(1) = 100$, and calculate the composite index of each subsequent quarter, which is the final industry accounting index $Y_i(t)$:

$$Y_i(t) = Y_i(t - 1) * \frac{200 + S_i(t)}{200 - S_i(t)}$$

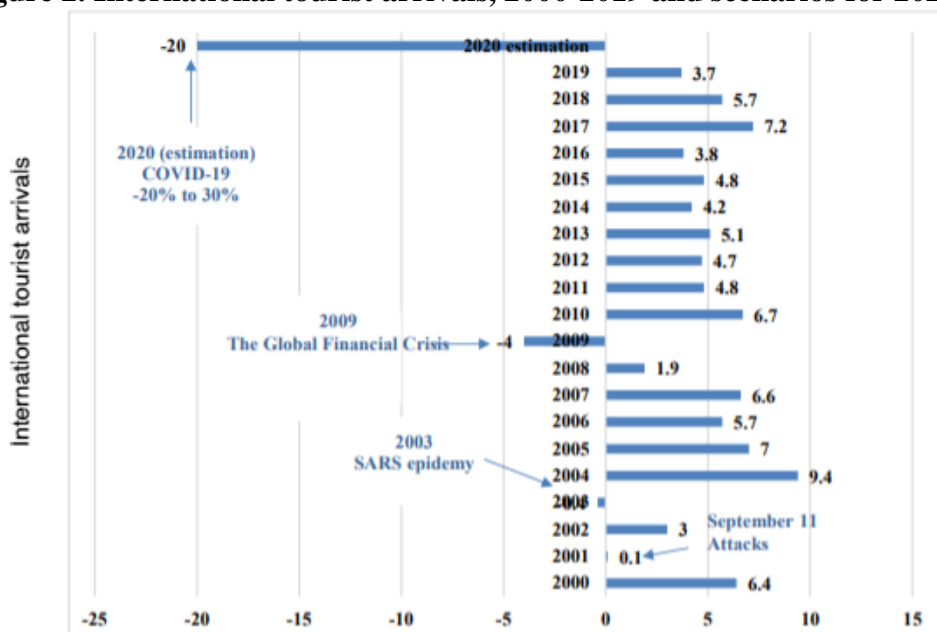
4.2. Data

From the financial data of listed companies in Saudi Arabia we use the synthetic index compilation method to compile an accounting index that captures the period before and during the Covid-19 outbreak and measures the impact of the Covid-19 on the tourism sector.

5. Results

The Covid-19 pandemic affects the health, social and economic sectors globally. Tourism is the most affected sector of activity due to closed airports, suspension of activities in the hotel industry, travel restrictions. This year's outlook has declined sharply and shows a high degree of uncertainty for the near future (UNTWO, 2020). As a result, hospitality and tourism operations in many countries have been virtually closed, and international travel (and, in some countries, domestic travel too) has ceased (Baum and Hai, 2020). UNWTO estimates that the Covid -19 pandemic will have serious consequences for the global economic system and cause damage to the tourism sector, revising the forecast for international arrivals in 2020 (UNWTO, 2020). It is also shown that this event has the greatest negative impact on the development of the tourism sector in recent decades and occurred when the tourism sector played a major role in the global economic system, being one of the most important sectors in terms of contribution in global GDP. The forecast for the global tourism sector in 2020 is declining, a situation caused by the restrictions imposed by the coronavirus pandemic. The current pandemic crisis can be compared to previous crises, namely the global economic crisis of 2009, the crisis caused by the SARS epidemic in 2003, or the terrorist attacks that took place on September 11th, 2001 in the USA (see Fig.2).

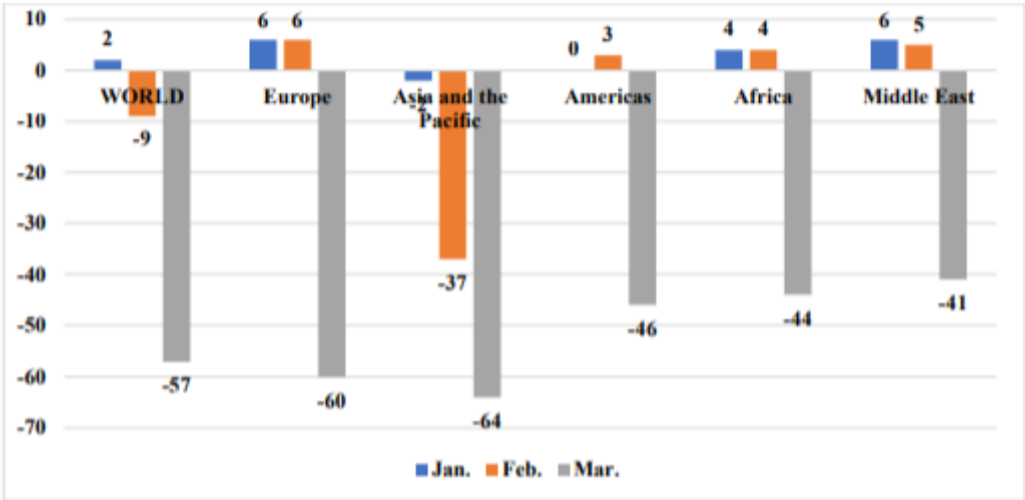
Figure 2. International tourist arrivals, 2000-2019 and scenarios for 2020 (% change)



Source: UNWTO (2020)

The Covid - 19 pandemic will cause a 20% to 30% decrease of international arrivals in 2020 as compared to average of 2000-2019, given that a 3% increase was expected for the same period, so that in March it was a critical point of -57%. Asia and the Pacific recorded the highest level of decline: -2% in January, -37% in February and -64% in March. Europe is in 2nd place in terms of losses due to the decrease in the number of tourists, reaching -60% in March. The area least affected by the Covid -19 pandemic in terms of the number of tourists is the Middle East, where there was a decrease of -41% in March (UNTWO, 2020). Quarantine measures, travel restrictions and the closure of airports and national borders have led to this unexpected decrease (Ministry of Foreign Affairs, 2020). The current crisis generated by the Covid -19 pandemic has caused the largest losses in the tourism sector since 2000. The 2003 SARS epidemics caused the loss of the number of tourist arrivals worldwide by only 0.4%, the attacks of September 11th, 2001 in the USA caused losses, but they managed to limit the number of tourist arrivals to +0.1 %, while the global economic crisis of 2009 had a stronger impact on tourist arrivals by -4% (UNTWO, 2020). Large declines in the number of tourists show that, if the Covid -19 pandemic remains a concern for a longer period, this will continue to have a significant negative impact on tourism sector, that will probably also shape the habits, especially tourists' habits through domestic trips, explore the areas close to where they live, buy cheaper holidays, use promotions to book holidays, take less trips, for many years to come (Statista, 2020). Fig.3 shows the negative effect on the number of tourists globally during the onset of the pandemic.

Figure 3. Number of tourists -first quarter of 2020

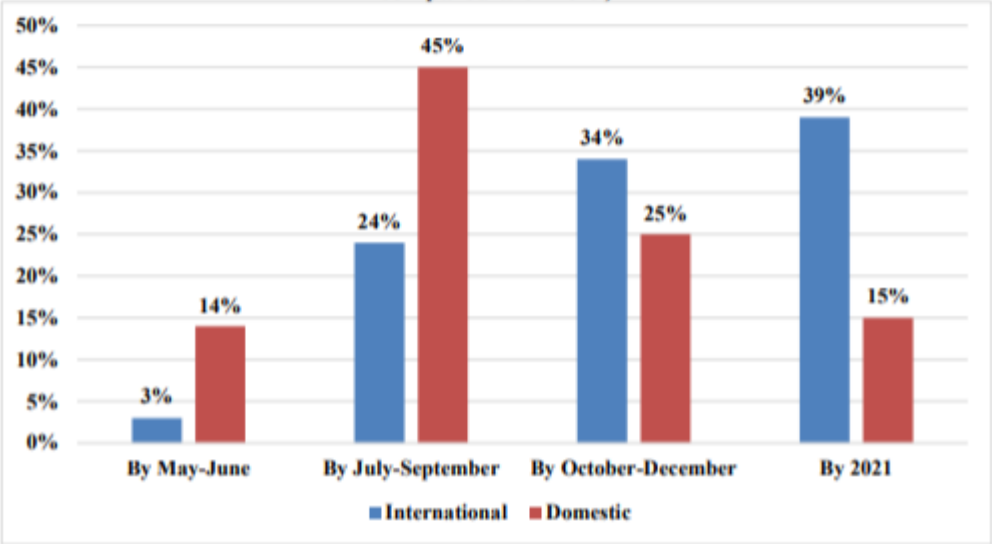


Source: UNWTO (2020).

International demand for tourism products is expected to recover in the fourth quarter of 2020 and mainly during 2021, according to a UNTWO study (2020) conducted with the support of respondents - regular consumers of tourism products. Thus, fig.3 shows the information regarding the quarterly forecasts regarding the recovery of the tourist demand for the next period, three quarters from 2020, respectively the first quarter from 2021. The recovery of the demand for tourist products is expected to enter an upward trend starting with May-June 2020, an increase of 3% internationally and 14% domestically. Internationally, with the opening of airports and borders, an increase in tourist demand of 24% is expected from July to September,

reaching 34% between October and December, the highest forecast level of demand. At the domestic level, during 2020, the forecast of tourist demand is higher compared to the international demand. In May-June the demand is expected to rise to 14% in the summer, for the period July-September the demand is expected to record the highest level, 45%, and in the last quarter of the year the tourist demand is estimated to keep on an upward trend, reaching a level of demand of 25% (see Fig.4).

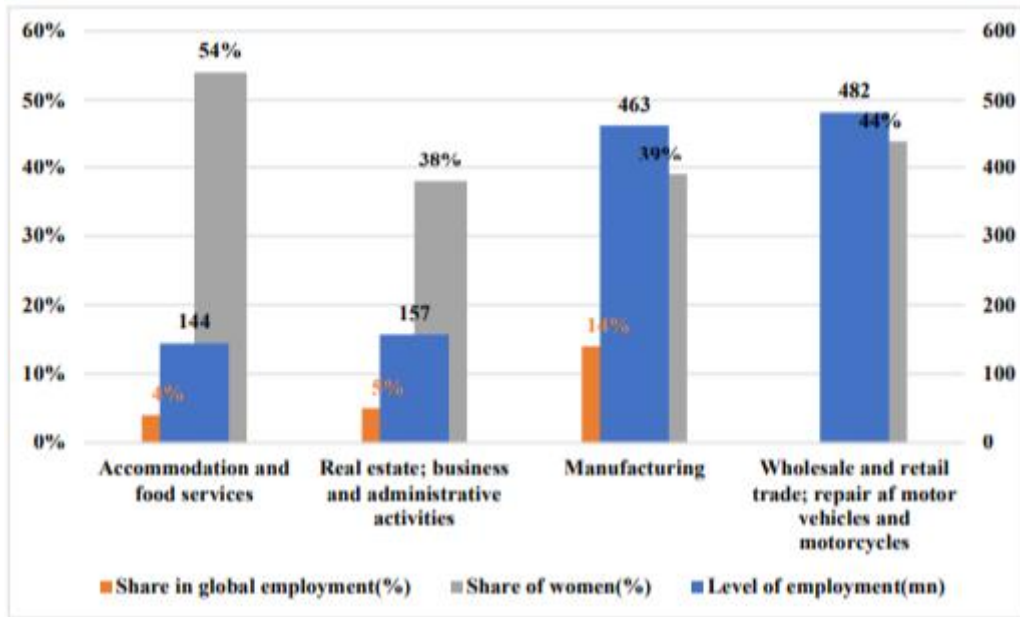
Figure 4. Forecasts regarding the recovery of tourist demand (2020-2021), estimate as compared with 2019



Source: UNWTO (2020)

In 2021, an increase in international tourist demand is expected, compared to the forecasts made for the current year. International tourism demand is likely to reach 39%, while domestic demand will be only 15% (UNWTO, 2020). The situation of the personnel in the field of tourism was also deeply affected, Fig.5 shows the situation of the workers by activity sectors is presented.

Figure 5. Workers at risk-the most affected sectors (2020)



Source: ILO (2020).

The pandemic caused by the Covid -19 virus has led to job losses in the tourism sector. Based on real economic and financial data, International Labour Organization (2020) claims that key economic sectors have suffered dramatic declines. The most affected economic sectors can be seen in Fig.6. UNTWO announces that 144 million employees in accommodation and food companies are at risk because hotels were forced to suspend operations. The only possibility for the restaurants to remain active was to deliver to the customers' homes (UNTWO, 2020; Ministry of Internal Affairs, 2020). The global percentage of employment in 2020 in the field of tourism is 4%, but we can see in the figure above that the manufacturing sector was affected the most by the quarantine, which blocked the activity in this sector.

6. Conclusion

The outbreak of COVID-19, labeled as a black swan event, causes significant damage globally due to its fatality. The COVID-19 pandemic has expanded across the world by creating shocks in almost all the industries due to the restrictions, curfews, stay-home and work-from-home policies, and quarantines. As a result of the health and economic crisis with the COVID-19 pandemic, the tourism sector got severely affected. The UNWTO has estimated a loss of approximately 1.1 billion international tourist arrivals, with a loss of US\$ 910 to 1.1 trillion export revenues and 100-120 million jobs due to the wider spread of the novel coronavirus. Therefore, this paper aims to determine the impact of the COVID-19 outbreak on the tourism industry in the world and in the Kingdom of Saudi Arabia. This article adopts the financial data of listed companies in Saudi Arabia and uses the synthetic index compilation method to compile an accounting index that captures the period before and during the Covid-19 outbreak and measures the impact of the Covid-19 on the tourism sector. From this article, we recommend the appropriate policies to re-launch some tourism activities within the after Covid-19 period. It will be crucial to restore all types of travel, and domestic and international flights, improve

direct and indirect employment and the recovery of many related business as travel agencies, hotels, and airline companies, which allow for economic and social benefits.

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