

# Economic Resilience: Fiscal Policy, Tourism, and ICT in COVID-19

Conceição Castro<sup>1</sup> and Teresa Dieguez<sup>2</sup>

<sup>1</sup>CEOS.PP, ISCAP, Polytechnic of Porto, Rua Jaime Lopes Amorim, s/n 4465-004 S. Mamede de Infesta Portugal Portugal

<sup>2</sup>CITUR, Polytechnic University of Cávado and Ave, Barcelos, Portugal

[mariacastro@iscap.ipp.pt](mailto:mariacastro@iscap.ipp.pt)

[tdieguez@ipca.pt](mailto:tdieguez@ipca.pt)

**Abstract:** The COVID-19 pandemic crisis has brought about unprecedented economic and social consequences worldwide. The implementation of isolation measures, including national and international travel restrictions, significantly affected contact-intensive sectors such as tourism. Information and Communication Technology (ICT) was crucial during this lockdown period in maintaining connectivity and enabling remote activities. Governments worldwide implemented discretionary measures to mitigate the crisis's adverse effects on economic activity. This paper aims to analyse whether the level of ICT adoption and the importance of tourism influence the fiscal policy efforts pursued by governments. Based on the results of a linear regression analysis for 154 countries, the findings suggest that governments had to promote higher fiscal stimulus in countries with higher international tourism receipts. At the same time, ICT development diminished the efforts of the fiscal policy response to the crisis since it facilitated economic resilience. The findings of this study can contribute to understanding how governments responded to the pandemic crisis and the factors that influenced their fiscal policy decisions.

**Keywords:** Fiscal Stimulus, Tourism, ICT

## 1. Introduction

COVID-19 highly impacted the world's society and economy. In 2020, according to the World Development Indicators (WDI) database, GDP decreased by 4%, and imports and exports by 8.8% and 8.7%, respectively. Imposed isolation measures impacted especially high-contact activities, such as hospitality and tourism, recreation and personal services. In 2019, the Travel and Tourism sector, representing 10.4% of global GDP and 7% of global trade (WTTC, 2021) saw its contribution to GDP fall by 49.1% in 2020 due to the pandemic (UNWTO, 2023; WTTC, 2021). However, this impact was almost null in other activities "that facilitate non-contact activities, like ICT support or delivery of services" (European Commission, 2021, p. 1).

Many response policies have been implemented by the authorities, to address the impact of the crisis and alleviate it, namely fiscal, monetary and financial measures, specially oriented through the healthcare, business and household sectors (Elgin, Basbug and Yalaman, 2020). To assist families, workers and businesses, fiscal policies such as tax cuts, direct cash transfers, and subsidies were implemented by governments (Haroutunian, Osterloh and Sławińska, 2021; International Monetary Fund (IMF), 2023).

Some authors argue that the policy response to the COVID-19 crisis can be influenced by specific characteristics of the country, such as the dimension of intensive contact sectors like tourism, the level of ICT adoption that had an essential role during the pandemic crisis, the healthcare policy, and pandemic-related variables (Elgin, Basbug and Yalaman, 2020; Khalid, Okafor and Burzynska, 2021; Shafiullah, Khalid and Chaudhry, 2021; Okafor, Khalid and Burzynska, 2022; Okafor, Khalid and Gama, 2022). Although during the COVID-19 pandemic, many governments worldwide increased their focus on ICT to address challenges posed by the pandemic, recognizing the importance of technology in healthcare, education, remote work, and communication during lockdowns and social distancing measures, economies with higher ICT development may not need higher fiscal policy efforts to reinforce its vital role in enhancing economic resilience. These factors can play a crucial role in shaping the strategies and approaches adopted by governments worldwide, but very few studies analyse the determinants of the fiscal policy response. This paper aims to analyse whether the adoption of ICT and tourism levels influence fiscal policies' response to the economic pandemic crises. While several studies have explored the influence of ICT and tourism on fiscal policies, there remains limited comprehensive analysis assessing their combined impact across a diverse set of countries. Additionally, the study fills a gap in the limited research on the determinants of fiscal policy responses during the pandemic, advancing understanding in this critical area.

## 2. Literature Review

The COVID-19 was first identified in the city of Wuhan, China, in December 2019. In early 2020 it spread all over the world and in March was considered a pandemic demanding international Public Health Emergency measures, namely by restricting interaction among people and mobility of individuals. These constraints led to

a big negative impact on the economy, reduced demand and interrupted supply chain, obliged funding, and a decline in business and consumer confidence (IMF, 2020). Authorities have implemented various policies to mitigate economic effects, including fiscal policies. These fiscal policies aimed to align output with potential production, reducing the output gap, and for income redistribution. And several policy objectives were concerning the pandemic. In addition to automatic stabilizers that reduce the size of the output gap, governments have implemented various discretionary measures to slow down the spread of the disease, help businesses, support families, and sustain jobs (IMF, 2020; OECD, 2020), and according to OECD (2020), the readiness to act helped to boost confidence. “At the global level, spending and revenue measures amount to \$3.3 trillion, and loans, equity injections, and guarantees total \$4.5 trillion” (FMI, 2020, p. 1).

Intensive-contact industries such as travel, tourism, and hospitality were hit the hardest by the pandemic (Rather, 2021; Chen et al., 2023). Conversely, industries that support non-contact activities, such as ICT, have experienced a surge in global demand (Sharma et al., 2021). In 2020, ICT service exports as a percentage of total service exports increased by about 3.7 percentage points, and ICT goods exports as a percentage of total goods exports increased by 1.5 percentage points (World Bank, 2023).

The pandemic has brought about profound changes in social organisation and ICT has been key to fostering social stability in an adverse environment (Yang et al., 2020; Mishna et al., 2022). ICTs were already presented in daily life, but the pandemic triggered it globally (Sharma et al., 2021; Mishna et al., 2022; Kim et al., 2023). Management decisions were supported by data in real-time, combining collection with analysis, tracking and dissemination (Alghamdi and Alghamdi, 2022; Kim et al., 2023). The use of digital technology was identified as a strategic method to reduce the transmission of the pandemic (Watts, 2020; Whitelaw et al., 2022). Instead of traditional in-person consultations, remote appointments were utilized. This allowed for effective real-time communication and consequently led to more efficient and responsive governance (Alghamdi and Alghamdi, 2022).

During the time when schools closed, ICT offered solutions for learning, such as online methods, virtual classrooms, online resources, and interactive platforms (König, Jäger-Biela and Glutsch, 2020; Yang et al., 2020; Sevillano-Monje, Martín-Gutiérrez and Hervás-Gómez, 2022; Kim et al., 2023).

In the business world, there was a greater reliance on remote work due to mobility restrictions, which led to the need to sustain business (Eurostat, 2022). The ability to facilitate remote access to an enterprise's resources, such as email and other ICT systems, enabled employees to maintain their tasks, ensuring the continuity of business activities. Additionally, the use of video conferencing, collaborative platforms, and cloud-based technologies enabled continuous internal communication within enterprises and interactions with external entities (Eurostat, 2022; Rachmawati et al., 2021). This not only preserved economic activities but also demonstrated the adaptability of ICTs to ensure business continuity. In 2020, many enterprises in the European Union (EU) experienced changes in their remote work practices. About 33% increased staff access to company e-mail or other ICT systems, and 91% of those enhancing e-mail access attributed it partly to the impact of COVID-19. Similarly, 94% of enterprises increasing remote access to broader ICT systems cited COVID-19 as a contributing factor. Additionally, half of EU enterprises increased remote meetings, with 97% of these changes linked, at least in part, to the effects of the COVID-19 pandemic (Eurostat, 2022).

Despite the evident benefits, the advancement of digital transformation faces obstacles due to limited resources. In some countries, a significant proportion of the population still lacks ICT tools. Consequently, during the pandemic, governments are inclined to invest in enhancing digital technologies (Okafor, Khalid and Gama, 2022). Okafor, Khalid and Gama (2022) analysed the effect of the level of digitalization on the economic response by governments and found a negative impact when interacting with the level of income. According to the authors, governmental responses through assertive fiscal or monetary policy interventions may be attenuated when most households and businesses possess adequate technological infrastructure to conduct their daily operations in an online base seamlessly. Enhanced digital capabilities and resources dispersed among the population in select developing nations could facilitate the uninterrupted continuation of routine activities.

Tourism, a global industry, is very vulnerable to crises, either health or economic. In the last years several health crises (such as Severe Acute Respiratory Syndrome (SARS-CoV), the H1N1 influenza virus, the Ebola virus or the Zika virus) emerged as a disruptor with large consequences on the tourism industry. The vulnerability to health crisis results on the reliance on the mobility of people, and travel restrictions, the closure of borders and other rigorous health and safety measures implemented by governments, as had happened during the COVID-19 pandemic, contributed to a profound negative impact on tourism. In the short term, cancellations of bookings,

a significant decline in tourist arrivals, and economic losses for tourism businesses in the travel and hospitality sector were expected.

To address the emergency, many regions have implemented policies (WNWTO, 2020). A study published by the UNWTO (2020) in June indicates that "undeniably tourism" is "one of the most directly affected" sectors of the 220 countries analyzed (p. 6). According to this report, fiscal stimulus measures primarily involved actions such as waiving or delaying Value Added Tax (VAT) and corporate income tax, establishing emergency economic funds, providing financial assistance to support small and medium enterprises and self-employed individuals, and implementing investment programs designed to alleviate the immediate impacts of the pandemic.

Okafor, Khalid and Gama (2022) conducted a comprehensive investigation involving 118 countries, wherein they observed a positive correlation between the magnitude of the travel and tourism industry and the level of economic policy endeavours undertaken to address the adverse repercussions of the COVID-19 pandemic. The study revealed that as the scale of the travel and tourism sector increased, there was a concurrent increase in the intensity of economic policy measures implemented to mitigate the deleterious effects of the pandemic. The empirical results derived from the investigation by Khalid, Okafor and Burzynska (2021) also indicated a positive correlation between the importance of the tourism sector within a destination country and the implementation of an economic stimulus package designed to alleviate the adverse repercussions of the COVID-19 pandemic. More expansive economic stimulus measures were adopted when nations rely more on the tourism industry.

Chen et al. (2023) simulated the impact of tax reduction and financial subsidies to mitigate the effects of COVID-19 in Macau, a region reliant on gambling and working to diversify its economy. Their findings indicated that more than these measures were needed for a rapid post-pandemic economic recovery. They suggested that these fiscal interventions should be complemented with supply-side policies, including measures to support employment and the capital chain to accelerate economic recovery.

### 3. Methodology

To study the influence of the level of tourism activity and the degree of ICT adoption on the dimension of the fiscal policy response to the crisis, it was estimated the following model, where  $i$  represents the country:

$$\text{Fiscal Stimulus } i = \beta_0 + \beta_1 \text{ Tourism } i + \beta_2 \text{ ICT } i + \beta_3 \text{ Health expenditures } i + \beta_4 \text{ Ageing population } i + \beta_5 \text{ Mortality rate COVID-19 } i + \varepsilon_i \quad (1)$$

Fiscal Stimulus is the fiscal policy response to the pandemic to stimulate economic activity and was proxied by the measures "above the line" using the Fiscal Monitor database developed by IMF (IMF, 2021). These measures include additional spending, capital grants and targeted transfers, tax measures, and tax deferrals (IMF, 2020, p.20; IMF, 2021). The choice of this variable was motivated by its relevance in capturing direct government interventions that aim to mitigate the economic impact of the pandemic.

Tourism was proxied by the international tourism receipts in 2019 in constant 2010 US\$ (log-transformed) and calculated by deflating current prices. The international tourism receipts series at current prices and the Price Index were gathered from the World Development Indicators (WDI) database of the World Bank.

The number of individuals using the Internet as a percentage of the population in 2019 (WDI) was used to measure ICT adoption. The rationale behind including this variable is that a higher degree of ICT adoption could facilitate remote work, e-commerce, and digital services, potentially mitigating the negative economic impacts of the pandemic.

The remaining variables included in the model correspond to control variables selected according to the literature review. The health care policy was measured by the level of current health expenditure expressed as a percentage of GDP. The health expenditure includes healthcare goods and services (but "does not include capital health expenditures such as buildings, machinery, IT and stocks of vaccines for emergency or outbreaks", World Bank, 2023). Data refers to 2019 and were gathered from the WDI database. Population ageing was assessed by the share of the population aged 65 or older in the total population in 2019 and obtained from the WDI. For the variables related to COVID-19, it was used the mortality rate by COVID-19, calculated by the ratio between the cumulative deaths and the cumulative cases. Data was obtained from the World Health Organization.

The sample consists of 154 countries for which the necessary information was available.

## 4. Results

### 4.1 Sample Descriptive Analysis

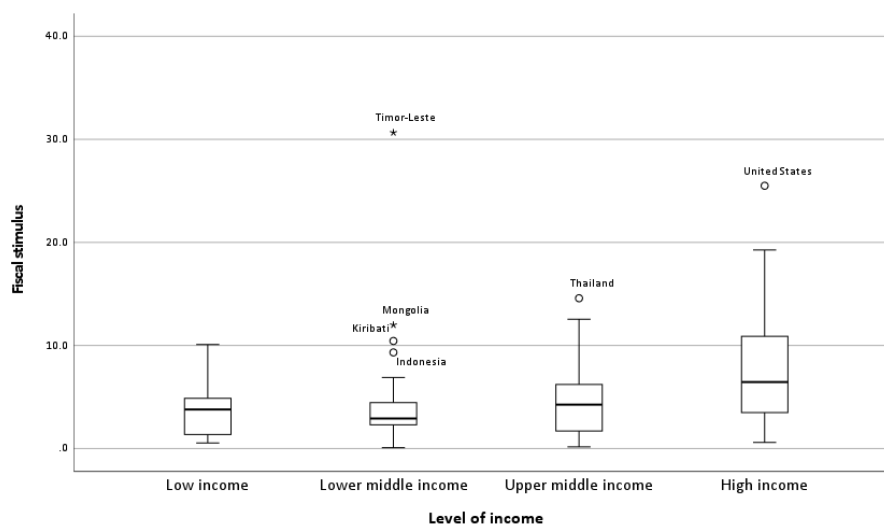
Table 1 reports the descriptive statistics of the variables under examination. The fiscal stimulus exhibits considerable variation across the sampled countries, ranging from a minimum of 0.09% of GDP in LAO People's Democratic Republic to a maximum of 30.66% in Timor-Leste. This country adopted a strong package to mitigate the impact of COVID-19, and according to Francis et al. (2023), Timor-Leste exemplified the impact of effective leadership and pragmatic policy decision-making during the COVID-19 pandemic. While high-income countries implemented fiscal policy measures in response to the pandemic crisis, amounting to approximately 8.17% of GDP, low-income countries allocated less than half (3.63%) (Figure 1). The Kruskal-Wallis test results suggest statistically significant differences in the fiscal stimulus countries implement according to their income level ( $\chi^2_{df=3}=22.905$ ,  $p<0.001$ ). Pairwise comparisons indicate significant statistical differences between high-income countries and low-income ( $p^*=0.006$ ), upper middle income ( $p^*=0.036$ ), and with lower middle income ( $p^*=0.000$ ), where  $p^*$  is the level of significance adjusted by Bonferroni correction. Some outliers are observed, particularly in low-middle-income countries, such as Timor-Leste (the country with the highest fiscal stimulus value in the sample), Mongolia, Kiribati, and Indonesia. Also, the United States is an outlier in the observed fiscal stimulus distribution in high-income countries.

International tourism receipts have the lowest value in South Sudan and the maximum in the United States. The average value is 7,192.8 million US\$ with a standard deviation of 19,485.0 million US\$.

Regarding internet usage, the sample indicates an average of 60.43% of the population accessing the internet. More than 99% of the population in Bahrain, Qatar, Kuwait, and the United Arab Emirates use the internet. At the same time, Burundi, South Sudan, Uganda, Congo Republic, and Burkina Faso have less than 10% internet access.

**Table 1: Descriptive statistics**

|                                                               | Mean   | Median | SD      | Min  | Max      |
|---------------------------------------------------------------|--------|--------|---------|------|----------|
| Fiscal Stimulus (% of GDP)                                    | 5.54   | 4.12   | 4.91    | 0.09 | 30.66    |
| International tourism receipts (constant 2010 US\$, millions) | 7192.8 | 1122.4 | 19485.0 | 0.1  | 204229.3 |
| Individuals using the Internet (% of the population)          | 60.43  | 67.95  | 27.24   | 2.73 | 99.70    |
| Health expenditure (% of GDP)                                 | 6.45   | 6.15   | 2.95    | 1.80 | 23.96    |
| Population ages 65 and above (% of total population)          | 8.99   | 6.53   | 6.48    | 1.17 | 29.28    |
| Mortality rate by COVID-19                                    | 1.86   | 1.60   | 1.49    | 0.00 | 9.44     |



**Figure 1: Fiscal stimulus by level of income**

Current health expenditure as a percentage of GDP ranges from 1.8% of GDP in Djibouti (a lower middle-income country) to 23.96% in Tuvalu, an upper-middle income, with an average value in the sample of 6.45%. Although high-income countries spend more on healthcare as a percentage of GDP (7.78%), followed by upper-middle-income countries (7.04%), low-income countries spend more (5.72%) than lower-middle-income countries (4.79%).

While there are countries with ageing population problems, such as Japan, Italy, Finland, Portugal, Bulgaria, Greece, Germany, Croatia, France, and Serbia (more than 20% of the population is 65 years old or above), among others, in Qatar, United Arab Emirates, and Uganda less than 2% falls into the 65 years and above category.

The mortality rate attributed to COVID-19 was between 5% and 10% in México, Peru, Sudan and Egypt. By geographical area, Latin America and the Caribbean recorded an average of 2.74% deaths of total cases, followed by Sub-Saharan Africa (2.06%), Europe Central Asia (1.94%), North America (1.82%), Middle East North Africa (1.62%), South Asia (1.34%), and East Asia & Pacific (0.82%). The mortality rate by COVID-19 does not exhibit significant differences between low-income countries (2.25%), upper middle income (2.09%), lower middle income (1.74%) and high-income (1.63%) ( $\chi^2_{df=3}=1.046$ ,  $p=0.79$ ) (Figure 2).

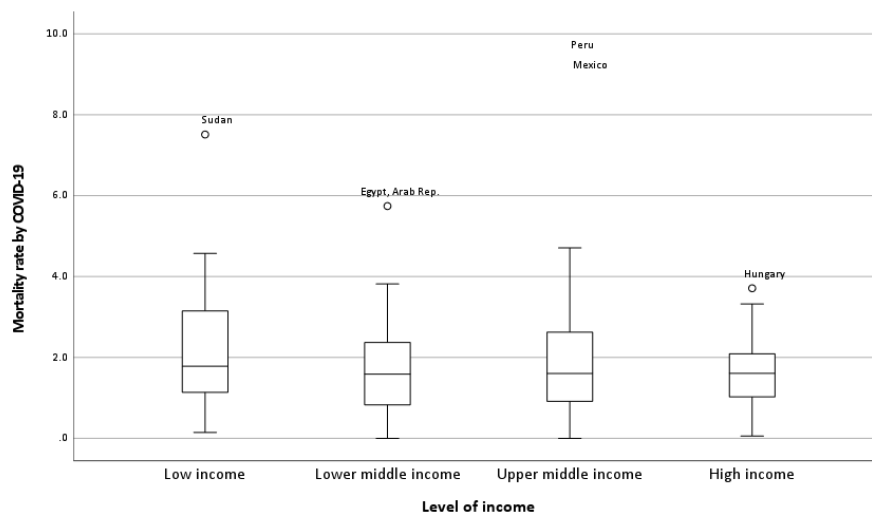


Figure 2: Mortality rate by COVID-19 by level of income

#### 4.2 Regression Analysis: Results and Discussion

The model was estimated using the Ordinary Least Squared method. Table 2 reports the correlation coefficients among the variables, all below 0.75. The Variance Inflation Factors (VIF) values were analysed, revealing values consistently below 10, indicating no evidence of multicollinearity. The Breusch-Pagan test ( $\chi^2_{df=5}=24.52$ ,  $p=0.0002$ ) concludes that heteroskedasticity is present in the regression model. Heteroskedasticity-robust standard errors were used to address this problem. The results are presented in Table 3.

Table 2: Correlation matrix

|                                    | (1)     | (2)     | (3)     | (4)     | (5)   | (6) |
|------------------------------------|---------|---------|---------|---------|-------|-----|
| (1) Fiscal Stimulus                | 1       |         |         |         |       |     |
| (2) International tourism receipts | 0.320** | 1       |         |         |       |     |
| (3) Individuals using the Internet | 0.281** | 0.685** | 1       |         |       |     |
| (4) Current health expenditure     | 0.485** | 0.158   | 0.287** | 1       |       |     |
| (5) Population ages 65 and above   | 0.466** | 0.581** | 0.639** | 0.494** | 1     |     |
| (6) Mortality rate by COVID-19     | -0.096  | 0.100   | -0.091  | 0.001   | 0.071 | 1   |

\*\*. The correlation is significant at the 1% level.

The model is statistically significant ( $F=13.38$ ;  $p<0.001$ ), and the variables included explain 32.2% (Adjusted R-squared) of the variance in fiscal stimulus. All the variables included are significant in explaining the variance in fiscal stimulus at levels of significance of 1%, 5%, and 10%.

**Table 3: Estimated results**

Dependent variable: *Fiscal stimulus*

|                                   | Coefficient | 95% Conf. interval    | Std. Error         | t-ratio | p-value  | VIF   |
|-----------------------------------|-------------|-----------------------|--------------------|---------|----------|-------|
| Constant                          | -7.2255     | [-14.4750, 0.0240]    | 3.6683             | -1.970  | 0.0508   |       |
| In International tourism receipts | 0.4695      | [0.1113, 0.8277]      | 0.1813             | 2.59    | 0.0106   | 2.136 |
| Use of Internet                   | -0.0296     | [-0.0593, 9.361e-005] | 0.015              | -1.970  | 0.0507   | 2.392 |
| Health expenditures               | 0.6269      | [0.3108, 0.9429]      | 0.1599             | 3.92    | 0.0001   | 1.388 |
| Mortality rate COVID-19           | -0.5184     | [-1.0711, 0.0343]     | 0.2797             | -1.854  | 0.0658   | 1.072 |
| Ageing Population                 | 0.1966      | [0.0631, 0.3301]      | 0.0675             | 2.911   | 0.0042   | 2.332 |
| Mean dependent var                | 5.525473    |                       | S.D. dependent var |         | 4.920535 |       |
| Sum squared resid                 | 2412.039    |                       | S.E. of regression |         | 4.050732 |       |
| R-squared                         | 0.344585    |                       | Adjusted R-squared |         | 0.322292 |       |
| F(5, 147)                         | 13.37609    |                       | P-value(F)         |         | 9.52e-11 |       |
| Log-likelihood                    | -428.0685   |                       | Akaike criterion   |         | 868.1371 |       |
| Schwarz criterion                 | 886.3197    |                       | Hannan-Quinn       |         | 875.5231 |       |

The estimated coefficient for In international tourism receipts stands at 0.4695 with a t-statistic=2.59, indicating a positive relationship between international tourism receipts and the fiscal effort undertaken by governments. In other words, the higher the international tourism receipts, the greater the fiscal effort made by governments. Given that the tourism industry has experienced one of the most significant declines in demand, governments have introduced a set of fiscal policy measures, and these incentives have played a key role in overcoming the short-term shocks faced by enterprises and workers (Sengel, 2022). These findings align with previous studies in the literature, which have also found a positive correlation between tourism and the level of economic stimulus by authorities (Khalid, Okafor and Burzynska, 2021; Okafor, Khalid and Burzynska, 2022).

By contrast, the fiscal stimulus required is less in countries where internet use is more widespread. An increase of 1 percentage point in internet use decreases the fiscal stimulus by 0.0296 percentage points. To Yang et al. (2020), ICTs were the "best chance to maintain social order during a pandemic" (p. 1). In Okafor, Khalid and Gama's (2022) investigation, although internet use negatively impacts the economic response to COVID-19, the coefficient is insignificant. However, when the authors estimate the interaction between internet use and income level, its effect becomes negative and statistically significant. Policymakers may need to leverage digital technologies for effective crisis management.

The estimate of the coefficient of the mortality rate by COVID-19 is negative but statistically significant only at a 10% significance level. This may be explained by the fact that countries with higher mortality rates may have faced significant challenges in managing the spread of the virus, limiting the resources available for fiscal stimulus.

Countries that spend more on health adopted broader fiscal policy packages. This may be related to the greater financial capacity of these countries (Khalid, Okafor and Burzynska, 2021; Okafor, Khalid and Burzynska, 2022).

Furthermore, the results also suggest a positive and statistically significant association (at a 1% level of statistical significance) between the ageing population and fiscal stimulus. This result is in line with the research of Elgin,

Basbug and Yalaman (2020), concluding that the median age positively influences economic stimulus, meaning that countries with higher levels of elderly populations implemented broader economic stimulus packages.

## 5. Conclusions

The COVID-19 pandemic brought big challenges worldwide. It impacted, among others, health, economy, education, supply chain, and social structures. Globally, governments responded with fiscal policies to mitigate the profound crisis generated in public health and economy. On the economic level, the more affected industries were the ones related to contact-intensive, as a way to prevent the spread of the disease, namely tourism and hospitality. However, this global pandemic can also be viewed as a sudden disturbance stimulating digital development, making digital technology a vital force in people's lives and workplaces.

This research aimed to analyse whether the level of effort in fiscal policy was influenced by the level of digital development and the size of the tourism industry. The results reveal that countries exhibiting higher levels of internet penetration tended to adopt comparatively lower fiscal policy measures. This inverse association suggests that countries with more significant digital development would be better prepared to face the challenges arising from the pandemic, which would lead to less financial effort by governments. The findings also suggest a positive correlation between fiscal policy efforts and the importance of the tourism industry within a nation. Countries that rely more on tourism demonstrated a propensity for strengthening fiscal policy interventions. This aligns with the economic vulnerability of the tourism sector, necessitating more substantial government support to offset the severe impact of travel restrictions and reduced tourism activities.

The COVID-19 pandemic brought big changes in human life, challenges and way of being. The role of the digital during the pandemic has emphasised the centrality of technology in the post-pandemic era. Governments contemplating fiscal interventions should recognise the interconnection between digital development, economic dependencies, and the nature of the industries affected.

This research suggests that nations with less robust digital development need to prioritize fiscal policies that not only stimulate immediate economic recovery but also promote long-term investments in digital technologies. Governments could consider directing stimulus funds towards expanding broadband access, enhancing digital literacy, and supporting tech startups. Countries such as Estonia and South Korea successfully used strong digital infrastructures during the pandemic to sustain economic activity, showing how integrating digital strategies into fiscal policies can enhance resilience for future crises. Conversely, countries heavily reliant on tourism may find merit in implementing more substantial fiscal measures to leverage a sector crucial to their economic fabric.

This research thus contributes to the debate on effective policy responses for sustainable recovery during unprecedented global crisis, emphasizing the importance of context-specific strategies that consider both digital and industry compositions.

The investigation is limited by the use of proxy variables that may not fully capture the underlying concepts. For example, international tourism receipts may not fully reflect the total economic impact of tourism, and the percentage of internet users may not encompass the quality or accessibility of ICT infrastructure in each country. Additionally, unobserved factors like political stability and governance quality could influence fiscal policy responses, potentially introducing bias into the results. Future research should focus on sector-specific impacts of fiscal policies, particularly beyond tourism, to better understand effective measures. Investigating governance quality and its influence on fiscal responses could provide key insights. Longitudinal studies on the long-term effects of pandemic-era policies and the benefits of digital investments and diversification are also needed. Additionally, examining the social impacts of fiscal policies, particularly on inequality, could help design more equitable and inclusive future strategies.

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