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# Evaluation of the Impact of Covid-19 on SMEs: Cross-Country Comparison

Nihan Öksüz Narinç[1]

| **Covid-19'un KOBİ'ler Üzerindeki Etkisinin Değerlendirilmesi: Ülkeler Arası Karşılaştırma** | **Evaluation of the Impact of Covid-19 on SMEs: Cross-Country Comparison** |
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| **Öz** | **Abstract** |
| Covid-19, belirsiz ekonomik sonuçları olan bir dış krizdir. Bununla birlikte, pandeminin doğası gereği, birçok ülkenin işletmesinin karantinalardan ciddi şekilde zarar gördüğü iyi bilinmektedir. Bu çalışma, Covid-19'un çeşitli demografik değişkenlerle küçük ve orta ölçekli işletmelerin istihdamını nasıl değiştirdiğini açıklamaya çalışmıştır. Ayrıca iş sürekliliği ve dijitalleşme de incelenmiştir. Çalışmanın verileri Dünya Bankası, OECD ve Facebook tarafından yürütülen Data for God projesinden elde edilmiştir. Araştırma sonucunda COVID-19 nedeniyle işten çıkarılan işçilerin yarısından fazlası yaklaşık iki yıl süreyle yeniden işe alınmadığı ve iş sürekliliği açısından, işletmelerin yalnızca yüzde 46,2'si faaliyetlerini bir yıl veya daha fazla sürdürebileceklerdir. Ayrıca bu süreçte bazı Avrupa ülkelerinin dijital satışlarında azalma yaşanmıştır. | Covid-19 is an external crisis with unclear economic consequences. However, it is well known that due to the nature of the pandemic, several countries' businesses have been severely harmed by lockdowns. This study attempted to explain how Covid-19 has changed the employment of small and medium businesses with various demographic variables for this purpose. Furthermore, business continuity and digitization were investigated. The study's data was collected from the Data for God project, which was run by the World Bank, the OECD, and Facebook. As a result of the research, more than half of the workers laid off due to COVID-19 could not be rehired for about two years. In terms of business continuity, only 46.2 percent of businesses believe they can continue operations for a year or more. In addition, digital sales decreased in some European countries during this period. |
| **Anahtar Kelimeler:** KOBİ, Ülkelerarası Karşılaştırma, Covid-19, İstihdam, Dijitalleşme, İş Sürekliliği | **Keywords:** SMEs, Cross-Country, Covid-19, Employment, Digitalization, Business Continuity |
| **JEL Kodları:** M21**,** I15, J69 | **JEL Codes:** M21**,** I15, J69 |

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| **Araştırma ve Yayın Etiği Beyanı** | Bu çalışma bilimsel araştırma ve yayın etiği kurallarına uygun olarak hazırlanmıştır. |
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## 1. Introduction

Small and medium-sized enterprises constitute 50% of all enterprises around the world, as well as 50% of existing employment. Small and medium-sized enterprises (SMEs) constitute approximately 40% of the national income in developing countries and account for 7 out of 10 jobs in the market. Access to financing is one of the most pressing concerns for SMEs in the face of these enormous figures. Due to limits on using bank loans in comparison to large enterprises, they may have access to funding through re-sorting to internal funds or applying to spouses, friends, and family. When looking at the financial deficit in SMEs by countries, Asian and Pacific countries have the highest financial deficits, at 46 percent, while European and Central Asian countries have a rate of 15 percent. COVID-19 Restrictions on economic activity generated major supply and demand problems in the early stages of the crisis. One-third of employed people in developing countries' economies lost their jobs between March 2019 and July 2020, while the rest worked with wage decreases (World Bank, 2021).

It is known that the current crisis differs significantly from the previous ones. For example, it is predicted that the United States' real GDP will fall by 11 to 20% in the fourth quarter of 2020 (Baker et al., 2020). In the USA, 13 million paid workers lost their jobs in a very short time. Unemployed people who lost their jobs while working were reemployed faster than those who were previously unemployed (Cajner et al., 2020). In the US, a large shift has been observed among small businesses employing 50% of workers weeks after the onset of the pandemic. It was found that the median firm with monthly expenses of over $10,000 only had enough cash for 2 weeks, and in the retail sector, nearly half of the businesses were closed, and employment fell by 40%. Among these low-wage service companies, unhealthy ones are more likely to close and less likely to reopen, while disadvantaged workers are less likely to be laid off and returned (Bartik et al., 2020). A more recent study estimated that only 3 percent of businesses would reopen, and that those reopened businesses would rehire about 35 percent of their laid-off workers within four weeks. In other words, the longer the closure period, the more difficult it is for businesses to reopen and re-employ the dismissed (Dam et al., 2021). In a study in which the effects of lock-in on output, employment, and firm dynamics were estimated, it was concluded that the effect would not be permanent under certain conditions. Employment subsidies to firms by the government are thought to reduce volatility before dismissed workers move into the frictional labor market (Buera et al., 2021). This situation also means that this epidemic is quite different from previous epidemics, and it is not possible to determine the real economic effects of the current crisis with the traditional economics approach. In terms of economic impact, interest rates are quite high and there is a large imbalance between commodity supply and demand (Fernandes, 2020). In addition, the countries affected by the pandemic are not only low- or middle-income countries, but countries that have an important share in the production and global supply chain. It is thought that the global supply chain will not be the same after COVID-19. There are findings showing how dependent many developed countries are on China in terms of supply during the crisis. Because the pandemic has revealed the weaknesses of systems that should work properly. It is predicted that the trust of businesses in China in the supply chain before COVID-19 will result in the diversification of supplier countries and businesses after the epidemic (Javorcik, 2020). While there are differences in short-term and long-term impacts, for example, European countries have experienced serious demand disruptions and logistical difficulties. It is argued that the dominant sector should be considered, and a paradigm shift is needed in policy interventions that consider innovation and a strong supply chain with

differentiated support instead of a uniform bailout package (Juergensen et al., 2020). Based on the difficulties faced by SMEs in China, three ways to get out of the crisis have been described. These are access to external financing by reducing SME costs, incentives to work and production as soon as possible, and finally, incentives to consume by creating domestic demand (Guo et al., 2020). The Canadian review indicates the potential to support outdated industries with multiple financing options, emergency wage subsidies, and loan programs. It is argued that support, the costs, and benefits of which vary greatly according to the sectors, is generally concentrated in the sectors where the government wants to maintain the status quo, and it is not possible to move from the crisis period to recovery without giving importance to automation (Blit, 2020).

Although countries have different bankruptcy and financial regulations, especially in the European Union and the USA, it is claimed that the implementation of some general economic recovery rules will revive demand in the economic recovery period. Temporary wage subsidies and restructuring of debts of SMEs that are unsustainable due to their debts and review of bankruptcy procedures are advocated, especially to support firms affected by negative demand and productivity shocks (Blanchard et al., 2020). For example, it has been shown that in Germany, the fiscal policy response to COVID-19 triggered backlog bankruptcies, which was particularly evident among financially weak small firms (Dörr et al., 2021). On the other hand, some studies suggest that business failures will result from the decrease in loans to the corporate sector (Gourinchas et al., 2021). In the analysis made for some Asian countries, it has been concluded that although there is an increase in the number of SMEs benefiting from government support, the support has not reached the most vulnerable and affected by COVID-19. In addition, a nonlinear relationship was found between digitalization intensity and sales and employment. (Dam et al., 2021). In a study on SMEs based on Turkey and some Middle Eastern countries, it has been seen that self-employed SMEs do not bear an additional cost because they do not have employees, and they cope with the impact of COVID-19 more easily than others. In addition, female SME owners are less likely to dismiss their employees (Hoorens et al., 2020). In addition, in a study examining the effects of the pandemic on various sectors and employment in Turkey, a possible negative standard error shock in the industrial production index, which represents economic growth, is compared to the retail trade and service sector, manufacturing industry sector, construction sector, and employment rate. It has reached the conclusion that it responds faster than the import and export sectors. The sector with the lowest response was found to be construction. They say that jobs should be made more available in industries that can quickly adapt to digitalization (Koyuncu and Mecik, 2020).

There are studies emphasizing that the use of digital technologies, especially social media, is important in overcoming the crisis. It is argued that using Google trend searches, strengthening ties with the entrepreneurial ecosystem, and establishing a transparent and accountable relationship with employees can help SMEs turn disadvantages into advantages during the crisis (Liguori and Pittz, 2020). However, there are also studies that conclude that developing business models and increasing digitalization are important for SMEs to get out of the crisis (Fitriasari, 2020). The findings for the UK show that the entrepreneurs most affected by the crisis are start-ups with the highest levels of ambiguity. In addition, it is emphasized that the winners could be in highly technical and digitally enabled sectors such as life sciences, medical equipment, online delivery-based organizations, software organizations, and application-based organizations. So this means that the government should invest more

in technology due to the heavy dependence of SMEs on technology and telecommunications (Brown et al.,2020). In addition to the studies that see the importance of digitalization as a catalyst for recovery from the crisis, there are some studies suggesting that it is still based on analog and nostalgic elements. It is claimed that digital offices spread corporate 'tattleware', especially in the reflections of the digitalization of businesses on employment. When it comes to small companies, it can be said that those with cash-based business traditions do not catch up with digitalization. In a sense, governments have an important role to play in the fact that productivity depends on surveillance and inequality in digitalization survives the crisis (Faraj et al., 2021; Amankwah-Amoah et al., 2021). Another problem is the impact of digitalization on corporate life during the COVID-19 period. In terms of efficiency and production aspects, we can say that the entire digitization of countries and the digitization of SMEs in the COVID-19 era have different results (Katz et al., 2022). Although digitalization can act as a catalyst, it is important to look at the advantages and disadvantages of both developed and developing countries (Amankwah-Amoah, 2021). There are also different approaches in the literature that conclude that an Artificial Intelligence and NLP-based Islamic FinTech Model that combines Zakat and Qardh-Al Hasan in terms of financing SMEs and digitalization will reduce the impact of COVID-19 in Malaysia (Syed et al., 2020).

In this study, the effect of the epidemic on businesses will be investigated according to various characteristics based on the behavior of SMEs to rehire the workers they dismissed, especially during the COVID-19 period. In addition, the effects of the epidemic on business continuity and digitalization will be examined. An analysis of SMEs in Europe, Asia, Africa, Latin America, the USA, and Australia will be carried out with the data obtained within the scope of the Data for Good project, carried out in cooperation with Facebook, the World Bank, and the OECD. This section will be followed by the material method section, and finally, the findings will be reported. The paper will conclude with a discussion and a conclusion section.

## 2. Materials and Methods

Since 2016, the World Bank, the OECD, and Facebook have collaborated on the Future of Business Survey. The target population for this study, which used the September 2021 questionnaire, was 50 countries; the questionnaires were applied to Facebook Page administrators, who are business owners and managers (Data for Good, 2021). Because creating advertisements or content for a Facebook audience is nearly a necessity for a business, the page admins group is likely to comprise almost every business on the network. According to the survey methodological guide, only individuals who are managers of a firm, those who own a firm, and those who are both owners and managers of a business were included in this study. First, because this is an online survey, it has been noticed that the rate of non-answers or incomplete responses is high in general. As a result, while the original raw data included 181.509 individuals, NA observations in variables utilized in the first stage of the analysis, such as age, gender, and education, were omitted from the analysis in this study. The final sample size was 24.172 people. Table 1 shows descriptive tables for the variables used in Multiple Correspondence Analysis (MCA), which is the initial method for evaluating businesses. Egypt, Israel, Niger, and South Africa are African countries; Indonesia, the Philippines, India, Pakistan, Vietnam, Taiwan, Turkey, and Russia are Asian countries; Belgium, Germany, Spain, France, the United Kingdom, Ireland, Italy, and Poland are European countries; and Argentina, Brazil, Colombia, and Mexico are Latin American countries.

Table 1. Descriptive statistics for Multiple Correspondence Analysis variables

| Variables | Categories | Africa | Asia | Australia | Europa | Latin America | USA | Total |
|---|---|---|---|---|---|---|---|---|
| Rehire | No | 53.5% | 54.6% | 56.6% | 63.0% | 69.1% | 47.3% | 52.9% |
| | Same | 24.9% | 23.1% | 35.9% | 29.0% | 18.8% | 43.3% | 34.9% |
| | Yes | 21.7% | 22.3% | 7.6% | 8.0% | 12.1% | 9.3% | 12.2% |
| Education | More than secondary and etc. | 16.1% | 17.3% | 31.5% | 27.5% | 21.7% | 20.8% | 21.2% |
| | No formal schooling completed | 1.2% | 2.0% | 1.2% | 2.1% | 0.7% | 3.6% | 2.7% |
| | Primary | 1.5% | 3.5% | 1.5% | 2.7% | 2.7% | 4.8% | 3.9% |
| | Secondary | 24.7% | 17.2% | 18.7% | 24.3% | 20.5% | 8.9% | 14.5% |
| | University or college | 56.5% | 60.0% | 47.1% | 43.4% | 54.3% | 61.8% | 57.7% |
| Age | Less than 20 | 9.4% | 7.2% | 0.3% | 1.0% | 3.8% | 0.4% | 2.4% |
| | 30 to 39 | 31.0% | 32.7% | 27.6% | 30.4% | 35.1% | 22.1% | 26.6% |
| | 40 to 49 | 14.7% | 20.5% | 25.9% | 31.0% | 22.5% | 28.8% | 26.3% |
| | 50 to 59 | 6.9% | 7.9% | 24.6% | 20.2% | 10.7% | 26.2% | 20.0% |
| | 60 to 69 | 2.2% | 1.7% | 10.6% | 5.4% | 3.0% | 13.2% | 8.8% |
| | 70 or older | 0.5% | 0.4% | 1.7% | 1.0% | 0.9% | 3.6% | 2.3% |
| Gender | Female | 28.3% | 25.1% | 49.7% | 42.6% | 39.0% | 54.8% | 45.4% |
| | Male | 71.7% | 74.9% | 50.3% | 57.4% | 61.0% | 45.2% | 54.6% |
| Mainemp | Both own and manage a business | 44.8% | 46.2% | 55.7% | 50.6% | 44.4% | 52.0% | 49.9% |
| | Manage a business | 16.0% | 19.6% | 10.9% | 13.0% | 10.8% | 12.0% | 13.5% |
| | Own a business | 39.2% | 34.2% | 33.3% | 36.4% | 44.9% | 36.1% | 36.6% |
| Opengn | 2012 or earlier | 25.6% | 30.4% | 44.9% | 44.3% | 32.6% | 48.2% | 42.1% |
| | 2013 | 3.8% | 3.7% | 3.0% | 2.9% | 3.3% | 3.5% | 3.5% |
| | 2014 | 4.2% | 3.8% | 4.7% | 3.6% | 4.2% | 3.7% | 3.8% |
| | 2015 | 6.4% | 6.3% | 5.9% | 4.8% | 6.0% | 4.8% | 5.3% |
| | 2016 | 6.5% | 5.7% | 5.6% | 5.6% | 6.8% | 5.3% | 5.6% |
| | 2017 | 7.0% | 6.7% | 6.7% | 5.7% | 7.2% | 5.9% | 6.2% |
| | 2018 | 10.2% | 8.8% | 4.9% | 7.7% | 9.9% | 7.0% | 7.8% |
| | 2019 | 12.9% | 11.4% | 7.1% | 8.9% | 11.8% | 8.4% | 9.5% |
| | 2020 | 16.9% | 16.9% | 15.7% | 13.0% | 15.6% | 11.1% | 13.1% |
| | 2021 | 6.4% | 6.2% | 1.5% | 3.5% | 2.6% | 2.1% | 3.3% |
| Wrkrnmbr | 0 (Just me) | 24.2% | 21.1% | 38.9% | 40.0% | 25.9% | 32.7% | 30.9% |
| | 1 | 12.2% | 10.8% | 10.6% | 13.2% | 15.6% | 11.9% | 12.2% |
| | 10 to 49 | 10.4% | 12.5% | 11.4% | 8.3% | 7.7% | 11.5% | 10.8% |
| | 100 to 250 | 2.4% | 2.3% | 1.0% | 0.9% | 0.7% | 1.5% | 1.5% |
| | 2 to 4 | 28.2% | 29.2% | 22.1% | 23.1% | 33.7% | 25.7% | 26.6% |
| | 5 to 9 | 16.4% | 16.4% | 12.5% | 11.2% | 13.6% | 12.6% | 13.3% |
| | 50 to 99 | 2.7% | 3.4% | 0.7% | 1.2% | 1.2% | 1.8% | 2.0% |
| | More than 250 | 3.6% | 4.3% | 2.9% | 2.1% | 1.6% | 2.4% | 2.7% |
| Subsector | Agriculture, forestry, fishing and mining | 6.0% | 6.0% | 5.2% | 3.9% | 1.9% | 3.6% | 4.1% |
| | Construction | 7.5% | 6.6% | 7.7% | 8.1% | 5.6% | 7.4% | 7.3% |
| | Hotels, cafes and restaurants | 7.1% | 8.6% | 6.7% | 8.3% | 10.6% | 6.2% | 7.3% |
| | Information and communication | 9.9% | 9.1% | 9.4% | 8.6% | 10.4% | 9.2% | 9.3% |
| | Manufacturing, energy, water supply and waste management | 3.2% | 4.5% | 2.9% | 2.2% | 1.3% | 1.9% | 2.4% |
| | Other services | 40.5% | 34.6% | 45.8% | 47.5% | 42.8% | 50.0% | 46.0% |
| | Transportation and storage | 2.9% | 3.0% | 3.0% | 2.5% | 2.7% | 2.8% | 2.8% |
| | Wholesale and retail trade | 22.8% | 27.6% | 19.2% | 18.9% | 24.7% | 18.8% | 20.9% |

The rehire variable is a categorical variable that consists of answers to the question of whether this business has rehired workers who have been on leave or laid off since March 13, 2020, in the previous three months. In all of the African countries studied, 21.7% of the layoffs were rehired. This is the highest rate of all country groups. Australia has the lowest rate of rehired workers. When all countries are evaluated, it is discovered that more than half of those who are laid-off are not rehired. There are no country comparisons in any of the tables, but some key figures can be provided. Pakistan has the highest percentage of rehired workers at 10.8 percent, while Belgium has the lowest rate at 0.7 percent. Most of the people in the sample have a university or college education. Indonesia, France, and India have the highest rates of people without a formal education, with 14.8 percent, 14.2 percent, and 11.5 percent, respectively, among all countries. In terms of gender, Australia, Brazil, and Poland have the largest percentages of women who own, manage, or both manage and own firms, with 7.7%, 6.6 percent, and 6.0 percent, respectively. Individuals under the age of 20 who work for or own a small business account for 12.2 percent of the Nigerian population, 11.5 percent in the Philippines, and 11.3 percent in Indonesia. Australia (12%), Israel (10.8%), and Brazil (10.8%) have the greatest percentage of SME owners or managers aged 70 or older (9.6%).

The status of business digital sales, COVID-19 challenges, and business continuity were examined in the second section of the analysis. These three questions were asked separately in the same dataset, and individuals who didn't respond to any of them were excluded from the analysis. As in the prior analysis, the disparities across countries were re-examined. However, due to the huge number of observations, the United States was omitted from the study based on this data. Table 2 shows the details of the variables for examining business continuity and digitization.

Table 2. Business Continuity and Digitization Analysis Variables

| | | | |
|---|---|---|---|
| Business continuity | How much longer could this business continue to operate under current conditions? | 1-<br>2-<br>3-<br>4-<br>5-<br>6-<br>7- | 12 months or more<br>At least 9 months but less than 12 months<br>At least 6 months but less than 9 months<br>At least 3 months but less than 6 months<br>At least 2 months but less than 3 months<br>At least 1 month but less than 2 months<br>Less than 1 month |
| Digital sales | In the past 30 days, what percentage of your business sales were made digitally (for example, orders and payments made online)?<br><br>This time last year, before the corona virus (COVID-19) pandemic, what percent of this business's sales were made digitally (for example, orders and payments made online)? | 1-<br>2-<br>3-<br>4-<br>5-<br>6- | All 100%<br>Between 75 and 100%<br>Between 50 and 75%<br>Between 25 and 50%<br>Between 0 and 25%<br>None |

Business continuity is determined by the answers given to the question of how long they can work under current conditions. Digital sales in the last 30 days and before the coronavirus outbreak were looked at as part of a question on how to make things more digital.

### 2.1. Multiple Correspondence Analysis (MCA)

The first approach used in this study is an extension of correspondence analysis, which entails performing multiple correspondence analyses (MCA) to examine relationships between categorical dependent variables. As a result, a generalization of principal component analysis may be seen in the fact that the variables to be analyzed are categorical rather than quantitative. Because all of the variables in the data set used in this study are categorical, MCA analysis was used. MCA analysis is a method for determining the distinction between variables and individuals in big data sets. STATA v.15 and SPSS v.26 were used to analyze the data.

The goal of this method is to demonstrate the spatial coexistence of rows, columns, and categories in a huge multidimensional data set as geometric elements. If two categories are close in distance, it indicates that they have a close association, and if one of the categories travels away from the origin, it indicates that the category is moving away from the average profile. A group of people with a similar profile to the responses given in a questionnaire consisting of categorical responses and their relationships to variables, for example. Variables with similar characteristics are grouped together when the findings are displayed graphically. On the graph, negatively and positively associated categories are on opposite sides of the origin. The gap between category scores and origin indicates the variable category's quality (Abdi and Valentin, 2007; Kassambra, 2017).

Divide the column totals by the grand total to find the average row profiles. Divide the column totals by the grand total to find the average column profiles. The origin of the primary axes is where this point, also known as the geometric center (centroid), is located. The way a detected profile value is positioned on the axis is determined by the difference between it and the average profile value. All points must have the same profile value to be at the origin. When computing this distance, the chi-square distance is used for average profiles. If are considered as the elements of the line profile and are considered as the elements of the center line profile, as seen in the formula to be calculated, the chi-square distance is the weighted Euclidean Distance (Clausen, 1997; Greenacre, 2007).

$$d(i,i') = \sqrt{\sum_j \frac{(a_{ij} - a_{i'j})}{a_j}}$$

After this step, inertia $(\Lambda^2)$ is measured for variance. If $d_i$ represents the chi-square distance of point i to the geometric center and r_irepresents the weight of point i, inertia is calculated as follows:

$$\Lambda^2 = \sum_i r_i d_i^2$$

The sample size is divided by the chi-square value determined to calculate inertia. To put it another way, it can be written in the next step, the eigenvalues are determined. Using the Singular Value Decomposition technique, this is the process of breaking down total inertia. The obtained eigenvalues represent the relative relevance of the dimensions, or how much of

the overall inertia they can explain If is the square of the coordinate of point $i$ in dimension $k$ and $r_i$ is the weight of point $i$, then the eigenvalue computation for dimension $k$ is as follows:

$$\lambda_k^2 = \sum_i r_i f_{ik}^2$$

An indicator matrix is created in the Multiple Correspondence Analysis, with raw data coded as individuals in the row and categorical variables coded as 1-0 in the columns. If the data matrix has as many categorical variables as Q, then the indicator matrix is called Z;

$$Z = \begin{bmatrix} Z_1 & Z_2 & Z_3 \dots \dots . Z_Q \end{bmatrix}$$

The $Z_Q$ term refers to the $Q_{th}$ category's indicator matrix. Inside a variable's own category, the total of the rows equals 1/n, and the number of variables within all categories equals the number of variables in the Z indicator matrix. By multiplying this indicator from the left with the matrix cycle, the Burt matrix is obtained. If the Burt Matrix (R) is shown for Q variables as a block;

$$R = Z'Z = \begin{bmatrix} Z_1'Z & Z_1'Z_2 & Z_1'Z_2 & \dots & Z_1'Z_2 \\ Z_2'Z & Z_2'Z_2 & Z_2'Z_2 & \dots & Z_2'Z_2 \\ Z_3'Z & Z_3'Z_2 & Z_3'Z_2 & \dots & Z_3'Z_2 \\ \vdots & \vdots & \vdots & \dots & \vdots \\ Z_Q'Z & Z_Q'Z_2 & Z_Q'Z_2 & \dots & Z_Q'Z_Q \end{bmatrix}$$

Multiple Correspondence Analysis is generated when the Simple Correspondence Analysis technique is applied to the Burt matrix, and the procedure is the same. MCA can be defined as a comprehensive examination of all binary cross tabulations (Abdi and Valentin, 2007; Gifi, 1990).

**2.2. Chi-Square Analysis**

The second approach used in this study is chi-square analysis. It is assumed that the cell probabilities in a two-way probability table are equal to certain constant values $\pi_{ij}$ , in chi-square analysis. Considering n samples with cell numbers $n_{ij}$ and mean $\mu_{ij}$, values of $\mu_{ij} = n\pi_{ij}$ are called expected frequencies. To test $H_0$, $n_{ij}$ is compared with $n_{ij}$ . In the chi-square test for $H_0$ :

$$\chi^2 = \sum \frac{(n_{ij} - \mu_{ij})^2}{\mu_{ij}}$$

If is $H_0$ true, $n_{ij}$ will be close to $\mu_{ij}$ in each cell. Chi-square test, which can be the most appropriate analysis to test the hypotheses, was determined as the analysis method (Agresti,2019). In addition, Post Hoc procedure was applied, and z tests were performed for column ratios for each row with Bonferroni correction.

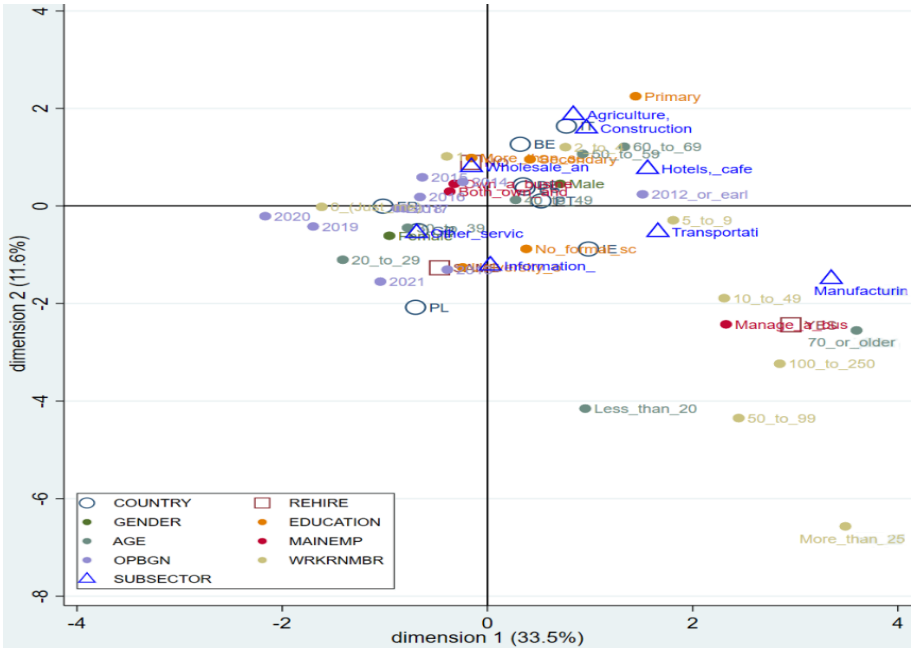
**3. Results**

The variables in this study are entirely categorical. There are just a few options for dealing with such variables. As a result, MCA analysis was chosen first in this investigation, followed by chi-square analysis**.**

## 4. MCA Analysis Results

Figure 1 shows the findings of the MCA analysis for European countries. The first-dimension accounts for 33.5 percent of overall inertia while the second-dimension accounts for 11.6 percent. People who are over 70 years old have the most positive value, while businesses that were started in 2020 have the most negative value.

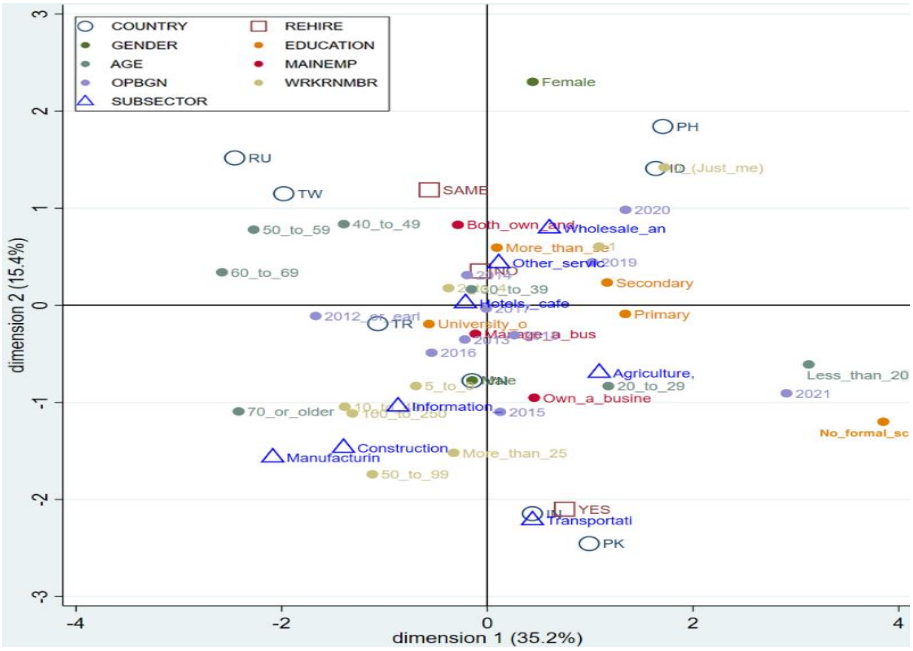
Figure 1. European Countries MCA Analysis Results




Only their own employees, organizations founded before 2012, and businesses that rehire individuals who were laid off due to COVID-19 are the three biggest contributors to inertia in the first dimension, respectively. In the second dimension, people under the age of 20 have the largest negative value, while those with only a primary education have the highest positive value. Businesses with more than 250 employees, firm managers, and individuals with a university education are the three categories that contribute the most to the second dimension. Workers laid off because of COVID-19 were rehired in manufacturing businesses managed by people over 70 years old, employing 10–49 and 100–250 workers. Workers who received secondary or higher training and were laid-off because of COVID-19 were not rehired by wholesale or re-tail firms. Established in 2013, businesses in the IT activity sector did not lay off workers or hire new personnel. Italian firms dominate the agriculture and construction sectors.

According to the statistics shown in Figure 2, the first dimension explains 35.2 percent of the overall inertia in Asia, and the second dimension explains 15.4 percent. Those with the highest negative values in the first dimension are between 60 and 69 years old, while those with the highest positive values are under 20 years old. Pakistanis have the largest negative value in the second dimension, while women have the highest positive score.

Figure 2. Asian Countries MCA Analysis Results




Businesses in the transportation sector in India and Pakistan have been rehired. Managers or owners of SMEs with 2 to 4 employees that were established in 2014 in other service industries were found to not rehire workers laid off because of COVID-19. In Vietnam, men predominate, whereas in Turkey, managers or owners of businesses founded before 2012 are university graduates. There is evidence that managers or owners in the technology and communication sectors employ between 100 and 250 individuals. Construction SMEs have more than 25 employees, and manufacturing SMEs have more than 50.

The conclusions of the investigation are depicted in Figure 3 for a few African countries. According to the findings, the first-dimension accounts for 25.4 percent of overall inactivity, while the second accounts for 15.9 percent. Over 70 years old has the largest negative value in the first dimension, whereas businesses with more than 250 employees have the highest positive value. In the second dimension, the highest negative value is under 20 years old, while the highest positive value is over 70 years old. Operating since 2013, Egyptian businesses, which employ 5–49 people in the construction, manufacturing, and agriculture sectors, have rehired workers laid off due to COVID-19. It is a small business that works in both the wholesale and retail sectors. It was started in 2018 by both the manager and the owner.

Figure 3. African Countries MCA Analysis Results

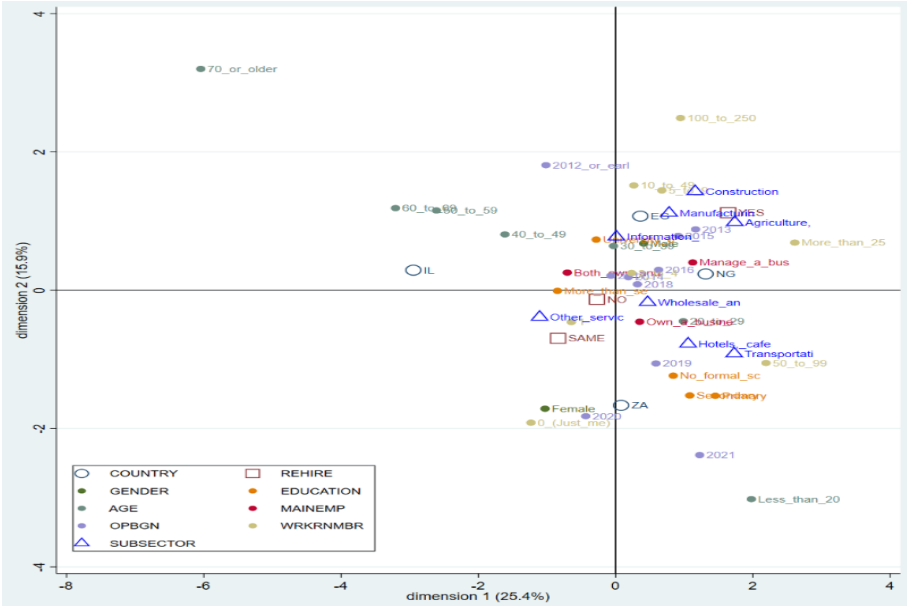



Figure 4 illustrates the outcomes for Latin American countries. The first dimension is accountable for 27.8 percent of overall inactivity, while the second is accountable for 16.5 percent. Other service-related businesses that started up in 2014 did not rehire their laid-off workers. Argentina and Brazil are SMEs that began operations in 2014 and have managers and owners between the ages of 40 and 49, despite the fact that production businesses employ people between the ages of 10 and 49. Colombian business owners and managers are well-educated people.

Figure 5 displays the study's findings for Australia. The disclosure rate for the first dimension is 33.4 percent, while the disclosure rate for the second dimension is 8.9 percent. Employers in Australia have rehired workers in hotels, cafes, and other businesses that employ 10 to 49 people. The number of employees in businesses founded in 2019 whose managers or owners did not have formal training has stayed constant. The 50–59-year-old owners and managers of SMEs in operation since 2013 did not rehire their employees in wholesale or retail firms.

Figure 4. Latin American Countries MCA Analysis

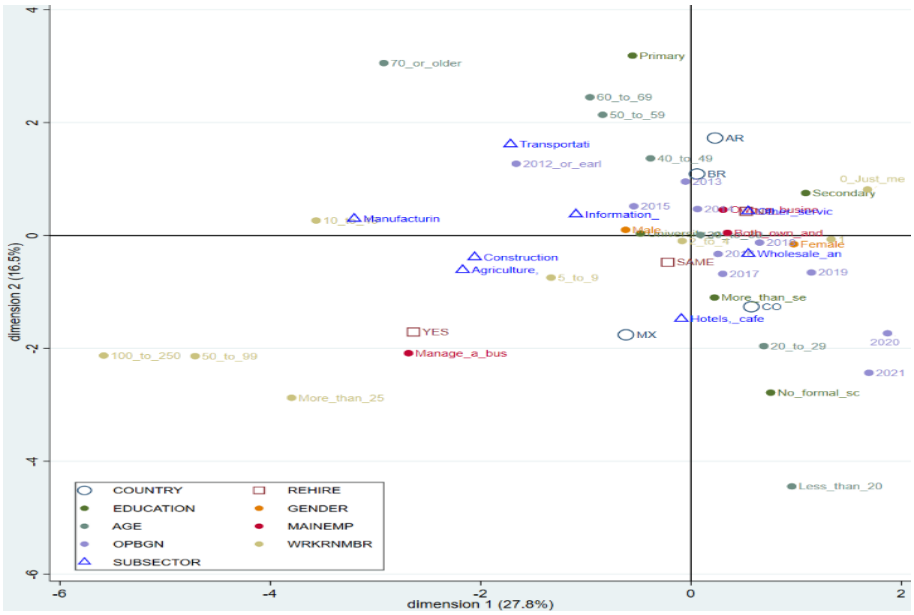
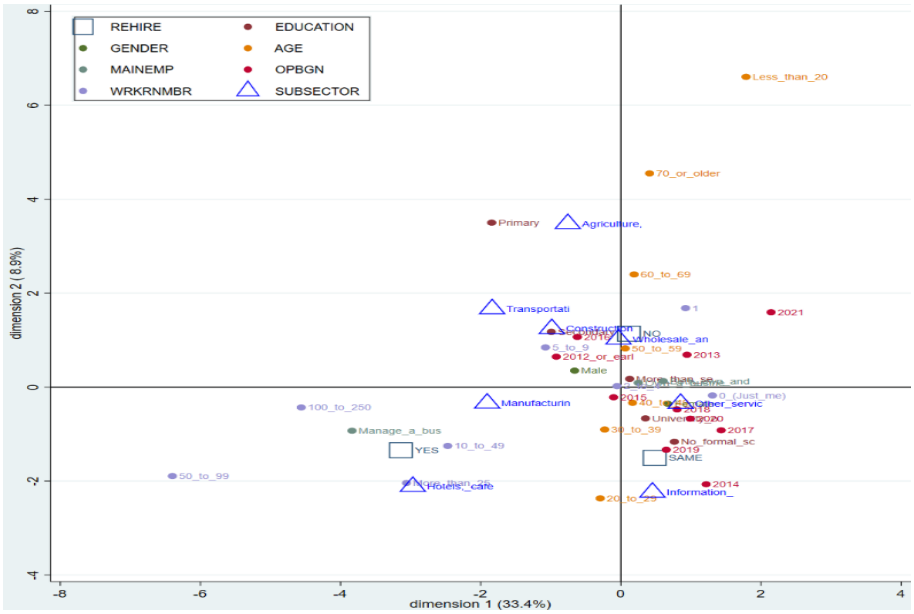


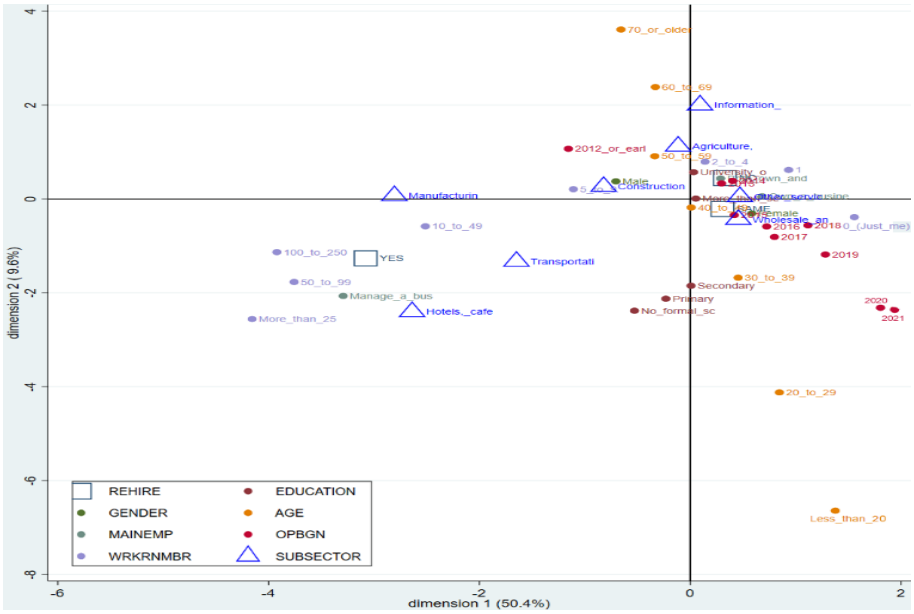

Figure 5. Australia MCA Analysis Results




The findings of the MCA analysis for the United States are depicted in Figure 6. Managers in the cafe and hotel industry, which employs between 50 and 250 people in the United States, have rehired employees who were laid-off. Workers were not re-hired by SMEs with their own businesses that had much fewer employees in 2013 and 2014. Businesses that began

operations in the wholesale and retail sectors with female managers or owners in 2016, 2017, or 2018 did not lay off or hire additional employees as a result of COVID-19.

Figure 6. The USA MCA Analysis Results




### 3.2. Results of Business Continuity and Digitization Analysis

Table 3 shows the comparison results in terms of businesses' ability to continue operations in various countries. Among those who believe they can continue their operations for a year or more due to the present COVID-19 conditions, 42.5 percent of African businesses differ significantly from 69.1 percent of Australian businesses. Compared to 6.8 percent of SMEs in Latin American countries, 2.5 percent of Australian SMEs expect to be able to continue operations for at least 6 months but less than 9 months. An evaluation has also been conducted inside the countries, and the findings that are not shown here in the form of any table can be assessed. While Israel (54.6%) is among those who believe that their businesses will continue to operate for 12 months or more, it differs statistically significantly from Egyptian (32.6%) and Nigerian (41.4%) firms, and it does not differ from South African (42.5%) firms.

For those who are unsure, Indonesia (35.2%), India (35.1%), and Pakistan (31%), from Asian countries, believe they can continue operations for at least a year; this is a statistically significant difference from business in the Philippines (48.7%), Russia (48.1%), Turkey (48.1%), Taiwan (64.4%), and Vietnam (54.5%). Turkey and Taiwan differ statistically significantly. For individuals who are unsure, there is no difference in Asian countries. In terms of businesses that believe they can function for a year or more, Portugal (36.8%) differs significantly from Germany (55.8%) and the United Kingdom (54.2%). Spain (42.4%) and Italy (40.1%) are significantly different from Germany. In terms of those who are unsure, Ireland (18.9 %) differs from Portugal (36.1 %). There is no statistically significant difference (mean 42.8 percent) between Latin American firms that expect to be in business for at least a year.

Argentina (37.2%) out-performs Brazil (24.3%) and Mexico (25.3%) among those who are unsure ($p<0.05$).

Table 3. Comparison of Business Continuity Across Country Groups

| | | Africa | Asia | Australia | Europa | Latin America | Total |
|---|---|---|---|---|---|---|---|
| 12 months or more | Count | $485_a$ | $1170_a$ | $304_b$ | $1118_a$ | $607_a$ | 3684 |
| | C % | 13.20% | 31.80% | 8.30% | 30.30% | 16.50% | 100.00% |
| | R % | 42.50% | 45.50% | 69.10% | 46.50% | 42.80% | 46.20% |
| | z | -2.7 | -0.9 | 9.9 | 0.4 | -2.8 | |
| At least 1 month but less than 2 months | Count | $54_a$ | $88_a$ | $9_a$ | $71_a$ | $41_a$ | 263 |
| | C % | 20.50% | 33.50% | 3.40% | 27.00% | 15.60% | 100.00% |
| | R % | 4.70% | 3.40% | 2.00% | 3.00% | 2.90% | 3.30% |
| | z | 2.9 | 0.4 | -1.5 | -1.1 | -0.9 | |
| At least 2 months but less than 3 months | Count | $53_a$ | $95_a$ | $8_a$ | $90_a$ | $64_a$ | 310 |
| | C % | 17.10% | 30.60% | 2.60% | 29.00% | 20.60% | 100.00% |
| | R % | 4.60% | 3.70% | 1.80% | 3.70% | 4.50% | 3.90% |
| | z | 1.4 | -0.6 | -2.3 | -0.4 | 1.3 | |
| At least 3 months but less than 6 months | Count | $69_a$ | $192_a$ | $22_a$ | $208_a$ | $105_a$ | 596 |
| | C % | 11.60% | 32.20% | 3.70% | 34.90% | 17.60% | 100.00% |
| | R % | 6.00% | 7.50% | 5.00% | 8.70% | 7.40% | 7.50% |
| | z | -2 | 0 | -2 | 2.6 | -0.1 | |
| At least 6 months but less than 9 months | Count | $49_{a.\ b}$ | $128_{a.\ b}$ | $11_b$ | $133_{a.\ b}$ | $97_a$ | 418 |
| | C % | 11.70% | 30.60% | 2.60% | 31.80% | 23.20% | 100.00% |
| | R % | 4.30% | 5.00% | 2.50% | 5.50% | 6.80% | 5.20% |
| | z | -1.5 | -0.7 | -2.7 | 0.8 | 3 | |
| At least 9 months but less than 12 months | Count | $60_a$ | $146_a$ | $18_a$ | $104_a$ | $80_a$ | 408 |
| | C % | 14.70% | 35.80% | 4.40% | 25.50% | 19.60% | 100.00% |
| | R % | 5.30% | 5.70% | 4.10% | 4.30% | 5.60% | 5.10% |
| | z | 0.2 | 1.6 | -1 | -2.1 | 1 | |
| Less than 1 month | Count | $48_a$ | $83_{a.\ b}$ | $5_b$ | $51_b$ | $25_b$ | 212 |
| | C % | 22.60% | 39.20% | 2.40% | 24.10% | 11.80% | 100.00% |
| | R % | 4.20% | 3.20% | 1.10% | 2.10% | 1.80% | 2.70% |
| | z | 3.5 | 2.2 | -2 | -2 | -2.3 | |
| Not sure | Count | $323_a$ | $672_a$ | $63_b$ | $629_a$ | $399_a$ | 2086 |
| | C % | 15.50% | 32.20% | 3.00% | 30.20% | 19.10% | 100.00% |
| | R % | 28.30% | 26.10% | 14.30% | 26.20% | 28.10% | 26.20% |
| | z | 1.8 | -0.1 | -5.8 | 0 | 1.9 | |
| Total | Count | 1141 | 2574 | 440 | 2404 | 1418 | 7977 |
| | C % | 14.30% | 32.30% | 5.50% | 30.10% | 17.80% | 100.00% |
| | R % | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Each subscript letter denotes a subset of Country categories whose column proportions do not differ significantly from each other at the .05 level.

Table 4 shows the results of a comparison of various countries' digital activity in the last 30 days. It is statistically different from Australia (21.2%) and all other countries among those who do all their sales digitally. Africa (9.9%) and Asia (8.6%) are different from Europe (13.5%). There is a significant difference between Asia (8.6%) and Latin America (12.3%). There is no significant difference between Africa, Asia, and Austria. At any level, Latin America has the highest amount of digital activity, whereas Europe has the lowest ($\chi^2$ (20.9381) =343.673 p=0.000).

Table 4. Comparison of Digital Sales Across Country Groups (After Covid-19)

| Categories | | Africa | Asia | Australia | Europa | Latin America | Total |
|---|---|---|---|---|---|---|---|
| All | Count | 138$_{a, b}$ | 270$_{b}$ | 109$_{c}$ | 371$_{d}$ | 195$_{a, d}$ | 1083 |
| | C % | 12.70% | 24.90% | 10.10% | 34.30% | 18.00% | 100.00% |
| | R % | 9.90% | 8.60% | 21.20% | 13.50% | 12.30% | 11.50% |
| | Z | -2.1 | -6.3 | 7.1 | 3.8 | 1 | |
| Between 0 and 25% | Count | 305$_{a. b. c. d}$ | 768$_{c. d}$ | 103$_{b. d}$ | 586$_{b}$ | 416$_{a. c}$ | 2178 |
| | C % | 14.00% | 35.30% | 4.70% | 26.90% | 19.10% | 100.00% |
| | R % | 21.80% | 24.50% | 20.00% | 21.30% | 26.20% | 23.20% |
| | Z | -1.3 | 2.1 | -1.8 | -2.8 | 3.1 | |
| Between 25 and 50% | Count | 243$_{a}$ | 533$_{a}$ | 53$_{b}$ | 274$_{b}$ | 267$_{a}$ | 1370 |
| | C % | 17.70% | 38.90% | 3.90% | 20.00% | 19.50% | 100.00% |
| | R % | 17.40% | 17.00% | 10.30% | 10.00% | 16.80% | 14.60% |
| | Z | 3.2 | 4.7 | -2.8 | -8.2 | 2.7 | |
| Between 50 and 75% | Count | 161$_{a}$ | 352$_{a}$ | 35$_{b}$ | 191$_{b}$ | 180$_{a}$ | 919 |
| | C % | 17.50% | 38.30% | 3.80% | 20.80% | 19.60% | 100.00% |
| | R % | 11.50% | 11.20% | 6.80% | 7.00% | 11.30% | 9.80% |
| | Z | 2.3 | 3.3 | -2.3 | -6 | 2.3 | |
| Between 75 and 100% | Count | 127$_{a}$ | 295$_{a}$ | 62$_{a. b}$ | 247$_{a}$ | 199$_{b}$ | 930 |
| | C % | 13.70% | 31.70% | 6.70% | 26.60% | 21.40% | 100.00% |
| | R % | 9.10% | 9.40% | 12.10% | 9.00% | 12.50% | 9.90% |
| | Z | -1.1 | -1.1 | 1.7 | -1.9 | 3.8 | |
| None | Count | 424$_{a}$ | 916$_{a}$ | 152$_{a}$ | 1079$_{b}$ | 330$_{c}$ | 2901 |
| | C % | 14.60% | 31.60% | 5.20% | 37.20% | 11.40% | 100.00% |
| | R % | 30.30% | 29.20% | 29.60% | 39.30% | 20.80% | 30.90% |
| | Z | -0.5 | -2.5 | -0.7 | 11.3 | -9.6 | |
| Total | Count | 1398 | 3134 | 514 | 2748 | 1587 | 9381 |
| | C % | 14.90% | 33.40% | 5.50% | 29.30% | 16.90% | 100.00% |
| | R % | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |

Each subscript letter denotes a subset of Country categories whose column proportions do not differ significantly from each other at the .05 level.

There are no comparison tables in which country groups are examined; only the findings are provided. Israel (17.8%) makes all of its sales digitally; it differs significantly from Egypt (5.2%) and Nigeria (7.8%). In this regard, South African (23.8%) businesses differ significantly from Egyptian (35.8%) and Israeli (38.7%) firms in this regard. In South Africa, 76.2% have done at least 1% of their sales digitally.

Only 4.1 percent of Indonesian businesses conduct all of their sales digitally, according to the Asia analysis. This figure is statistically significant when compared to the Philippines (12.4%), Russia (11.8%), and Pakistan (11.3%). The differences are insignificant when compared to India (8.6 percent), Turkey (7.6 percent), Taiwan (7.9 percent), and Vietnam (9.3 percent). Russia has the greatest percentage of those who have not made any digital sales in the last 30 days, at 39%. In Indonesia, 88% of businesses made at least 1% of their sales digitally.

There is no statistically significant difference between Belgium (9.6%), Germany (13.8%), Spain (10.1%), France (11.4%), and Italy (6.6%), which have made all of their sales digitally in the last 30 days. However, there is a statistically significant difference between Belgium

(9.6%), Poland (11%), and Portugal (9.2%). Except for Ireland (24.4%), the UK (31.3%) has a statistically significant difference from the European countries. The United Kingdom and Ireland have the highest rates, with at least 1% of their sales activities performed digitally. 77.7% of Argentine SMEs, 81.9 percent of Brazilian SMEs, 78.8% of Colombian SMEs, and 77% of Mexican SMEs execute at least 1% of their sales operations digitally. The difference in Chi-square test findings, however, is not statistically significant, (χ^2 (15.1587) =20.473,p=0.155).

Table 5 compares the outcomes of digital sales before and after COVID-19 across countries. Australia (13.9%) outperforms the rest in terms of making all sales digitally before COVID-19. In terms of businesses that had never made digital sales before COVID-19, there are significant differences between Australia (35.5%), Europe (42.1%), and Latin America (24.8%).

Table 5. Comparison of Digital Sales Country Groups (Before Covid-19)

| Categories | | Africa | Asia | Australia | Europa | Latin America | Total |
|---|---|---|---|---|---|---|---|
| All | Count | $130_{a}$ | $270_{a}$ | $73_{b}$ | $231_{a}$ | $119_{a}$ | 823 |
| | C % | 15.80% | 32.80% | 8.90% | 28.10% | 14.50% | 100.00 % |
| | R % | 8.90% | 8.20% | 13.90% | 8.20% | 7.20% | 8.50% |
| | Z | 0.6 | -0.6 | 4.6 | -0.6 | -1.9 | |
| Between 0 and 25% | Count | $251_{a}$ | $737_{b}$ | $108_{a.\,b}$ | $656_{b}$ | $415_{b}$ | 2167 |
| | C % | 11.60% | 34.00% | 5.00% | 30.30% | 19.20% | 100.00 % |
| | R % | 17.10% | 22.50% | 20.60% | 23.20% | 25.20% | 22.30% |
| | Z | -5.1 | 0.4 | -0.9 | 1.5 | 3.2 | |
| Between 25 and 50% | Count | $264_{a}$ | $506_{a}$ | $40_{b}$ | $264_{b}$ | $272_{a}$ | 1346 |
| | C % | 19.60% | 37.60% | 3.00% | 19.60% | 20.20% | 100.00 % |
| | R % | 18.00% | 15.40% | 7.60% | 9.40% | 16.50% | 13.80% |
| | Z | 5 | 3.3 | -4.2 | -8.2 | 3.5 | |
| Between 50 and 75% | Count | $214_{a}$ | $508_{a}$ | $43_{b}$ | $223_{b}$ | $237_{a}$ | 1225 |
| | C % | 17.50% | 41.50% | 3.50% | 18.20% | 19.30% | 100.00 % |
| | R % | 14.60% | 15.50% | 8.20% | 7.90% | 14.40% | 12.60% |
| | Z | 2.5 | 6.2 | -3.1 | -8.9 | 2.5 | |
| Between 75 and 100% | Count | $169_{a.\,b}$ | $330_{a.\,b}$ | $74_{b}$ | $260_{a}$ | $193_{a.\,b}$ | 1026 |
| | C % | 16.50% | 32.20% | 7.20% | 25.30% | 18.80% | 100.00 % |
| | R % | 11.50% | 10.10% | 14.10% | 9.20% | 11.70% | 10.50% |
| | Z | 1.3 | -1.1 | 2.7 | -2.7 | 1.7 | |
| None | Count | $437_{a.\,b}$ | $927_{b.\,c}$ | $186_{a}$ | $1189_{d}$ | $408_{c}$ | 3147 |
| | C % | 13.90% | 29.50% | 5.90% | 37.80% | 13.00% | 100.00 % |
| | R % | 29.80% | 28.30% | 35.50% | 42.10% | 24.80% | 32.30% |
| | Z | -2.2 | -6.1 | 1.6 | 13.2 | -7.1 | |
| Total | Count | 1465 | 3278 | 524 | 2823 | 1644 | 9734 |
| | C % | 15.10% | 33.70% | 5.40% | 29.00% | 16.90% | 100.00 % |
| | R % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |

Each subscript letter denotes a subset of Country categories whose column proportions do not differ significantly from each other at the .05 level.

For values where results are not tabulated here, Israel (16.1%) differs statistically from Nigeria (6.7%) and Egypt (5%) among countries where all sales were digitally before Covid-19. This is statistically different from Israel (38.2%), Nigeria (27.9%) and South Africa (25.3%), where there were no digital sales before COVID-19.

South Africa is the highest-scoring country, with 74.7% of businesses making more than 1% of their sales digital. The difference between the UK (15.5%) and Italy (4.2%) is statistically significant for businesses that do all their pre-Covid-19 sales digitally. With the exception of France and Belgium, the highest percentage of those who do not make any of their sales digitally is 58 percent. There is a statistically significant difference between Pakistan (12.2%), Turkey (6%), and Indonesia (6.5%), which made all of their sales digital before COVID-19. In terms of businesses that don't make any of their sales digitally, it differs significantly from Turkey (34.7%), Vietnam (23%), and Indonesia (20 percent). Indonesia had the highest percentage of businesses that at least 1% of their pre-Covid sales digitally, at 80%. Pre-Covid-19 Latin American countries make at least 1% of their sales digitally, with the average being 74.8 percent. In terms of digital sales in Latin American countries, there is no significant difference between countries ($\chi^2$ (20.9734) =374.326 p=0.000).

**4. Discussion**

In this study, numerous variables were used to try to understand how COVID-19 influences employment, business continuity, and digitalization in small and medium-sized firms. Multiple Correspondence Analysis initially evaluates the dimensions being described; hence, it may be stated that additional dimensions and thus information are required to explain the inactivity. In general, it has been found that the age, education, and experience of the managers or firm owners are significant for the future of the business. COVID-19 causes disparities in employment outcomes even among countries with similar socioeconomic conditions. It has been decided that special attention should be paid to the manufacturing and retail sectors, as well as medium-sized businesses, in order to keep small-scale jobs around for a long time.

Those who were laid off in COVID-19 have been rehired in European countries in the manufacturing, energy, water supply, and waste management industries. Rehiring appears to be a priority for medium and large enterprises with 10 to 250 employees. This could be because, as was the case during the Great Depression, the same industries are being considered in job creation schemes across the European Union, particularly in Germany and the United Kingdom (Drahokoupil and Müller, 2021). It is consistent with studies emphasizing the necessity of new research and innovation, private investment, and financing for SMEs at the EU level to boost European manufacturing (Juergensen et al., 2020). The years of a company's establishment do not have a distinct situation in terms of rehiring. While the finding that businesses established between 2018-2021 did not rehire the workers, they laid off is compatible with Brown et al., 2020, it differs from the finding of the effect of the age of the companies and their founders on SME performance after the 2008 crisis (Cowling et al., 2017). This could be because the 2008 crisis was on the internal, while the COVID-19 issue was on the external.

It is clear that the transportation and storage sectors are centered in India and Pakistan, where workers who were laid-off due to COVID-19 in Asian countries are being rehired. Especially in pre-Covid-19 India, it is known that increasing supply chain efficiency and various policies to increase this efficiency are advocated. In India, despite the disruptions caused by

COVID-19, the market share of businesses in the transportation and storage sectors continues to increase (Sudan and Taggar, 2021). Consistent with the findings of this study, there may be a significant variation in rehiring in relation to market share gain as a result of policy influence.

In this study, it was concluded that Vietnam is an Asian country where those who were laid-off during the COVID-19 period were not rehired. This result can be associated with the fact that Vietnam, which has been in a troubled period in terms of unemployment in recent years, announced the largest unemployment figures in the last ten years (Nguyen et al.,2020). It has been observed that firms working in the production and agriculture sectors in Egypt, one of Africa's countries, rehire the workers they laid-off. This result is consistent with data suggesting that Egypt's situation will be offset by product and market changes in the event of a shock, as well as market flexibility for agri-food SMEs during the COVID-19 era (Hatab et al., 2020).

According to the analysis of the United States, the workers who were rehired in COVID-19 are largely from the cafe and restaurant sector. It is widely acknowledged that independent restaurants are critical, with approximately 11 million people employed in this industry in the United States. Despite the fact that COVID-19 is experiencing a severe bottleneck, the Restaurant Stability Fund is projected to have a substantial impact. This study's findings could be connected to this impact (Amel et al.,2020).

Of course, the findings that emphasize the idea of zombification of SMEs in the pre-and post-crisis periods (Dörr et al.,2021) as well as the contrary findings that forecast that business failures will arise from a reduction in loans to the corporate sector (Gourinchas et al., 2021). can be considered. The fact that the rate of businesses who are pessimistic about continuing their situation is so high may be a subjective evaluation, according to the findings of this study. However, when comparing countries, less than half of all businesses, apart from Australia, believe that they can maintain their activities for more than a year. This outcome is like the ITC's analysis of 132 nations (ITC, 2020). In other words, given the heterogeneity in businesses' predictions to continue operations, the concentration of rehired in some sectors, and the lack of a significant increase in digital sales, it is possible to predict that the crisis is caused by factors other than the internal dynamics of SMEs. There haven't been many studies on the effects of COVID-19 on business continuity and its measures for guaranteeing continuity in the literature. More information and research are needed to understand the disparities between countries on this subject.

When businesses that did not make any digital sales in the pre- and post-Covid periods are excluded, there is a 0.50% decrease in African countries and a 0.90% decrease in Asian countries. On the other hand, there was an increase of 5.90% in Australia, 2.8% in Europe and 4% in Latin American countries. In terms of countries, digital sales at all levels before and after COVID-19 showed an increase of 1.5% in South Africa, 8% in Indonesia, 8.8% in the United Kingdom, and 5.6% in Brazil. Germany, one of the European countries, decreased by 1.1% in digital sales in terms of the sum of all levels. The OECD report that Germany is at a low level in terms of digital transformation among industrialized countries (OECD, 2020) supports this finding. In terms of digitalization, no statistically significant effects were discovered in Latin American countries. According to a Cisco study, Latin American countries are lagging in terms of digitalization (Cisco, 2020). Prior to and during the crisis, there was a relative fall in digital sales, particularly in African and Asian countries. This finding is consistent

with research that predicts disparities in digitization between countries and industries, as well as variances in Industry 4.0 reflections among countries and regions (Gregurec et al., 2021). According to the conclusions of this study, Australia is well ahead of the rest of the world in terms of digital sales before and after COVID-19. This conclusion gives support to research that concludes that business owners adapt to emergency situations and adopt new business models in order to capitalize on marketing opportunities (Alam et al., 2022).

Another critical question here is whether increased business digitization would be sufficient to end the crisis without boosting demand. We do not currently have adequate knowledge to address this issue because the literature on this subject is very fresh. If we must offer a broad judgment, while digitalization has evolved into an opportunity in countries with comparatively better socioeconomic situations due to the effect of COVID-19, the predicted performance has not been realized in countries with relatively poor socioeconomic conditions.

## 5. Conclusion

The pandemic of the coronavirus has jeopardized not just broad macroeconomic values but also business life dynamics and social life that are inextricably linked to these values. It is critical to analyze employment, working conditions, and SMEs in depth in order to uncover flaws and soften the fragilities of this period, the end of which we cannot predict. The influence of COVID-19 on employment, digitalization, and continuity in various countries was examined using secondary data in this study. The rehire status of those laid-off under the COVID-19 process varies by country. The United States, Australia, and European countries lead the way in rehiring people who have been laid off. During this period, the sectors that are focused on being rehired by countries are the areas in which countries are already superior, as expected. In terms of business continuity, it's worth noting that only 46.2 percent of all countries in the study expected their operations to last a year or longer. This supports the assumption that the number of SMEs that close or go bankrupt will rise in the future. In terms of the gap in digital sales between the pre-and post-COVID-19 periods, Indonesia and the United Kingdom appear to have come a long way in comparison to other countries. The micro survey data used in this study was collected through Facebook. The lack of some countries and the inability of cross-sectional data to adequately represent temporal dynamics are important limitations of the study. However, in this period when we cannot properly analyze the long-term economic reflections of the COVID-19 problem, it is important in terms of being the first descriptive results made with Facebook micro surveys and can be a comparative guide for future studies.

## References


Abdi, H. and Valentin, D. (2007), Multiple Correspondence Analysis. *Encyclopedia of Measurement and Statistics*, *2*, 651-657. *https://personal.utdallas.edu/~herve/Abdi-MCA2007-pretty.pdf* , (Accessed:05.10.2020).

Agresti, A. (2019), An introduction to categorical data analysis*,* Hoboken, Nj: Wiley.

Alam, K.;Ali, M. A.; Erdiaw-Kwasie, M. O.; Murray, P. A. and Wiesner, R. (2022), "Digital Transformation among SMEs: Does Gender Matter?", *Sustainability*, *Vol.14, No.1:*535. doi:10.3390/su14010535

Alboukadel Kassambara. (2017), Practical guide to principal component methods in R, United States}: *http://Stdha.com* (Accessed:05.10.2020).

Amankwah-Amoah, J.; Khan, Z.; Wood, G. and Knight, G. (2021), "COVID-19 and digitalization: The great acceleration", *Journal of Business Research*, Vol.136:602-611. doi:10.1016/j.jbusres.2021.08.011

Amel, E.; Lee, D. and Singer, E. (2020), "*Independent restaurants are a nexus of small businesses in the United States and drive billions of dollars of economic activity that is at risk of being lost due to the Covıd-19 pandemic"*, https://blumenauer.house.gov/sites/blumenauer.house.gov/files/CL%20Economic%20Impact%20Report_RESTAURANTS%20Act.pdf, (Accessed:12.03.2021).

Baker, S.; Bloom, N.; Davis, S. and Terry, S. (2020), "COVID-Induced Economic Uncertainty", *NBER Working Papers*. doi:10.3386/w26983

Bartik, A. W.; Bertrand, M.; Cullen, Z.; Glaeser, E. L.; Luca, M. and Stanton, C. (2020), "The Impact of COVID-19 on Small Business Outcomes and Expectations", *Proceedings of the National Academy of Sciences*, Vol.117, No. 30*,* doi:10.1073/pnas.2006991117

Blanchard, O.; Philippon, T. and Pisani-Ferry, J. (2020), "A new policy toolkit is needed as countries exit COVID-19 lockdowns", *JSTOR*. https://www.jstor.org/stable/resrep28503 (Accessed: 15.04.2022)

Blit, J. (2020), "Could Increased Productivity Be COVID-19's Silver Lining?", *Canadian Public Policy*, COVID-19(S2), doi:10.3138/cpp.2020-065

Brown, R.; Rocha, A. and Cowling, M. (2020), "Financing entrepreneurship in times of crisis: Exploring the impact of COVID-19 on the market for entrepreneurial finance in the United Kingdom", *International Small Business Journal: Researching Entrepreneurship*, Vol.38, No.5:026624262093746. doi:10.1177/0266242620937464

Buera, F.; Fattal-Jaef, R.; Hopenhayn, H.; Andres, P. and Shin, N. (2021), *The Economic Ripple Effects of Covid-19*. https://www.nber.org/system/files/working_papers/w28704/w28704.pdf (Accessed:12.05.2022)

Cajner, T.; Crane, L. D.; Decker, R., Grigsby; J., Hamins-Puertolas, A.; Hurst, E., and Yildirmaz, A. (2020), "The U.S. Labor Market During the Beginning of the Pandemic Recession", *SSRN Electronic Journal*. doi:10.2139/ssrn.3595452

Cisco, (2020), *A Snapshot of Eight of the World's Leading Markets*. https://www.cisco.com/c/dam/en_us/solutions/small-business/resource-center/small-business-digital-transformation.pdf

Clausen, S. E. (1998), *Applied correspondence analysis: An introduction (Vol. 121)*, Sage.

Cowling, M.; Liu, W. and Zhang, N. (2017), "Did firm age, experience, and access to finance count? SME performance after the global financial crisis", *Journal of Evolutionary Economics*, Vol.28, No.1: 77-100. doi:10.1007/s00191-017-0502-z

Dam, D., Heise, S., Melcangi, D. and Schirmer, W. (2021), "*Many Small Businesses in the Services Sector Are Unlikely to Reopen"*, *https://libertystreeteconomics.newyorkfed.org/2021/05/many-small-businesses-in-the-services-sector-are-unlikely-to-reopen.html*. Federal Reserve Bank of New York Liberty

Street Economics, (Accessed: 20.04.2022).

Data for Good, (2021), Data for Good. https://dataforgood.fb.com/.

Dörr, J. O.; Murmann, S. and Licht, G. (2021), "The COVID-19 Insolvency Gap: First-Round Effects of Policy Responses on SMEs", *SSRN Electronic Journal*. doi:10.2139/ssrn.3783768

Drahokoupil, J. and Müller, T. (2021), "Job retention schemes in Europe: a lifeline during the Covid-19 pandemic", *SSRN Electronic Journal*. doi:10.2139/ssrn.3931230

Faraj, S.; Renno, W. and Bhardwaj, A. (2021), "Unto the breach: What the COVID-19 pandemic exposes about digitalization", *Information and Organization*, Vol.31, No.1, 100337. doi:10.1016/j.infoandorg.2021.100337

Fernandes, N. (2020), "Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy", *SSRN Electronic Journal*, Vol.2, No.1*2*, doi:10.2139/ssrn.3557504

Fitriasari, F. (2020). "How do Small and Medium-sized Enterprises (SME) survive the COVID-19 outbreak?", *Jurnal Inovasi Ekonomi*, Vol.*5, No.3*, doi:10.22219/jiko.v5i3.11838

Gifi, A. (1990), *Nonlinear multivariate analysis*, Chichester; New York: Wiley.

Gourinchas, P.O.; Kalemli-Özcan, Ş.; Penciakova, V. and Sander, N. (2021), "COVID-19 and SMEs: A 2021 "Time Bomb"?", *NBER Working Paper*, No.28418, doi:10.3386/w28418

Greenacre, M. J. (2007), *Correspondence analysis in practice*, Boca Raton: Chapman & Hall

Gregurec, I.; Tomičić Furjan, M. and Tomičić-Pupek, K. (2021), "The Impact of COVID-19 on Sustainable Business Models in SMEs", *Sustainability*, Vol.13, No.3, doi:10.3390/su13031098

Guo, H.; Yang, Z.; Huang, R. ve Guo, A. (2020), "The digitalization and public crisis responses of small and medium enterprises: Implications from a COVID-19 survey", *Frontiers of Business Research in China*, *Vol.14, No.1,* doi:10.1186/s11782-020-00087-1

Hatab, A. A.; Lagerkvist, C. and Esmat, A. (2020), "Risk perception and determinants in small & medium-sized agri-food enterprises amidst the COVID-19 pandemic: Evidence from Egypt", *Agribusiness*, doi:10.1002/agr.21676

Hoorens, S.; Hocking, L. and Fays, C. (2020), "*How small businesses are coping with the impact of COVID-19: Results from a survey in Turkey and the Middle East",* Santa Monica, CA: RAND Corporation, https://www.rand.org/pubs/research_reports/RRA607-1.html.

ITC (2020), *COVID-19: The Great Lockdown and its Impact on Small Business, International Trade Center*. https://www.intracen.org/uploadedFiles/intracenorg/Content/Publications/ITC_SMECO-2020ExSummary_EN_web.pdf

Javorcik, B. (2020), Global supply chains will not be the same in the post-COVID-19 world. R. E. Baldwin and S. J. Evenett (Ed.), in *COVID-19 and Trade Policy: Why Turning Inward Won't Work*. London: CEPR Press. https://voxeu.org/system/files/epublication/Covid-19_and_Trade_Policy.pdf

Juergensen, J.; Guimón, J. and Narula, R. (2020), "European SMEs amidst the COVID-19 crisis: assessing impact and policy responses", *Journal of Industrial and Business Economics*, Vol.*47*, doi:10.1007/s40812-020-00169-4

Katz, R. L.; Callorda, F. M. and a Jung, J. (2020), "Can Digitization Mitigate COVID-19 Damages? Evidence from Developing Countries", *papers.ssrn.com*, Rochester, NY. Retrieved March 8, 2022, from https://ssrn.com/abstract=3600829.

Koyuncu, T. and Meçik, O. (2020), "Covid-19 Pandemisinin Türkiye'de Ekonomik Büyümeye Sektör-Spesifik Etkileri: VAR Analizi", *Yönetim ve Ekonomi Araştırmaları Dergisi*, Vol.18, No.4, doi:10.11611/yead.793257

Liguori, E. W. and Pittz, T. G. (2020), "Strategies for small business: Surviving and thriving in the era of COVID-19", *Journal of the International Council for Small Business*, Vol 1. No.2:1-5, doi:10.1080/26437015.2020.1779538

Markovic, S.; Koporcic, N.; Arslanagic-Kalajdzic, M.; Kadic-Maglajlic, S.; Bagherzadeh, M. and Islam, N. (2021), "Business-to-business open innovation: COVID-19 lessons for small and medium-sized enterprises from emerging markets", *Technological Forecasting and Social Change*, No.*170*: 120883. doi:10.1016/j.techfore.2021.120883

Nguyen, H. T. T.; Nguyen, T. T.; Dam, V. A. T.; Nguyen, L. H.; Vu, G. T.; Nguyen, H. L. T. and Le, H. T. (2020), "COVID-19 Employment Crisis in Vietnam: Global Issue, National Solutions", *Frontiers in Public Health*, No.*8*, doi:10.3389/fpubh.2020.590074

OECD (2020), Germany: Invest More in infrastructure, Digital Economy and Energy Transition for a Strong and Greener Recovery from COVID-19 Crisis, https://www.oecd.org/newsroom/germany-invest-more-in-infrastructure-digital-economy-and-energy-transition-for-a-strong-and-greener-recovery-from-covid-19-crisis.htm

Sudan, T. and Taggar, R. (2021), "Recovering Supply Chain Disruptions in Post-COVID-19 Pandemic Through Transport Intelligence and Logistics Systems: India's Experiences and Policy Options", *Frontiers in Future Transportation*, No.*2*, doi:10.3389/ffutr.2021.660116

Syed, M. H.; Shahnawaz, K.; Rabbani, M. R. and Thalassinos, Y. E. (2020), "An Artificial Intelligence and NLP based Islamic FinTech Model Combining Zakat and Qardh-Al-Hasan for Countering the Adverse Impact of COVID 19 on SMEs and Individuals", *International Journal of Economics and Business Administration*, Vol.*VIII, No.2*:351-364. doi:10.35808/ijeba/466

World Bank. (2021). https://www.worldbank.org/en/topic/jobsanddevelopment/overview#1 (Accessed: 25.12.2021).