Journal of
Risk and Financial Management

MDPI

Article

Employee Compensation, Training and Financial Performance during the COVID-19 Pandemic

Rabie Mahssouni [1], Mohamed Noureddine Touijer [2,*] and Mohamed Makhroute [1]

[1] Laboratory of Researches in Finance, Accounting, Management and Systems Decision Support Information at The National School of Business and Management, Hassan I[er] University, Settat 26000, Morocco
[2] Laboratory of Interdisciplinary Studies of Research and Study in Management and Business Law (LIRE-MD), Faculty of Law, Economics and Social Sciences (FSJES), Cadi Ayyad University, Marrakech 40000, Morocco
* Correspondence: mohamednoureddine.touijer@ced.uca.ma

Abstract: The purpose of this paper is multi-faceted: first, to analyze the impact of employee compensation and training on firms' financial performance and the moderating effect of the COVID-19 pandemic on the relationship between employee compensation and financial performance, as well as the relationship between training and financial performance; and second, to analyze the decision-making process pertaining to these two aspects of human resources both prior to and during the COVID-19 pandemic. This study utilizes a sample of 103 Belgian pharmaceutical firms whose financial statements were published in the Bureau Van Djik database between 2012 and 2021. The estimation approach employed was panel data analysis, and the Generalized Method of Moments was used to evaluate the robustness of the system. Whether or not a crisis exists greatly alters the parameters that influence a pharmaceutical company's business performance. Specifically, the results reveal that the COVID-19 pandemic had a substantial and negative impact on financial performance. Human resource factors, which include employee compensation and training, more accurately explain the company's performance. The key contribution of such an approach is to illustrate that human resource-related factors have an impact on performance indicators during various types of crises, thereby assisting HR managers in making the best decision during times of crisis. It provides basic guidelines for policymakers to adhere to in order to have a better knowledge of how human capital characteristics might be utilized to improve the performance of their businesses during times of crisis. In addition, this research demonstrates that the firm's unique characteristics may affect the success of Belgian businesses.

Keywords: human resources; performance; pharmaceutical industry; Belgium; panel data

Citation: Mahssouni, Rabie, Mohamed Noureddine Touijer, and Mohamed Makhroute. 2022. Employee Compensation, Training and Financial Performance during the COVID-19 Pandemic. *Journal of Risk and Financial Management* 15: 559. https://doi.org/10.3390/jrfm15120559

Academic Editor: Sabri Boubaker

Received: 30 October 2022
Accepted: 22 November 2022
Published: 28 November 2022

1. Introduction

Pharmaceuticals have historically contributed significantly to human progress by enhancing the quality of life and decreasing hospital stays. Because of the creative pharmaceutical industry, almost all epidemics and chronic illnesses may now be treated. The pharmaceutical sector is of strategic significance to the development of a healthy and productive country because of its direct connection to human health. In addition to generating medical advancement via the research, development, and marketing of new medications that improve the health and quality of life for people throughout the globe, the pharmaceutical business is a crucial component of the global economy. The sector has gross margins of over 70% (Pignarre 2004), whereas other industries are satisfied with 15%. The substitution of older, less costly pharmaceuticals with newer, more expensive ones, the aging of the population, and the growth of developing markets all contribute to the expansion of the industry.

Belgium is one of the leading pharmaceutical manufacturers in Europe and an important export hub (Bogaert et al. 2015). The tiny nation contributed 13% of EU pharmaceutical

exports and 10% of pharmaceutical R&D spending in 2019 (i.e., before the spread of the COVID-19 epidemic). Belgium has become a prominent manufacturer of COVID-19 vaccines, leading to an 83% rise in pharmaceutical manufacturing in 2021, with pharmaceutical exports accounting for 15% of overall Belgian exports.

In order to remain competitive with its European competitors, Belgian pharmaceutical manufacturers must continue to invest extensively in research and development, i.e., by introducing new patented drugs. On the domestic market, wholesalers and distributors of pharmaceuticals face increasing margin pressure as competition intensifies. As it raises the need for prescription pharmaceuticals, vaccinations, and medical equipment, COVID-19 might be called the opportunity of the century for the pharmaceutical business (Ayati et al. 2020).

The pharmaceutical sector is currently experiencing enormous change as well as a variety of other issues. It has been noted that organizations have been pushed to be inventive in the process of devising ways to retain their priceless personnel as a result of a shortage of skilled, talented, and capable workforce members. As a result, it is critical to sustain the pharmaceutical industry in areas such as technological innovation, team building, employee communication skills, improved customer service, interpersonal relationships, job satisfaction and morale among employees, and so on. As a result, continual expansion and development of new and existing goods, research and development, scientific productivity, and other areas are required in order for the pharmaceutical business to keep up with the changing preferences of consumers. Developing the skilled workers who are already an integral part of the pharmaceutical industry is necessary for the industry's further expansion. In order for the pharmaceutical sector to rise to the challenges that lie ahead, the workforce within the company must also be educated.

Financial compensation is paid to employees in exchange for their services to an organization (Gao et al. 2019). Furthermore, it is clear that the organization is solely focused on the overall compensation opportunity in order to achieve remuneration (Garcia-Zamor 2014). It indicates that these employees fail to understand that their salary is favorable. (Umer and Salman 2018) indicate that job happiness is directly related to the organization's cooperation, involvement, and motivation. Additionally, an individual's work ethic is enhanced through a company's reward management system. On the other hand, the value of motivation and the workplace environment cannot in any way be overlooked. According to Esthi (2021), motivation is always a crucial factor that boosts an individual's working credibility. It is also emphasized that people are the company's most precious resource, having a direct impact on its performance and competitive advantage. Moreover, according to Alqahtani et al. (2021), a successful compensation system always achieves a healthy balance between work and income. This later became one of the organization's motivations. Further evidence suggests that motivated employees will always have a higher level of job satisfaction and will always work harder to achieve more goals. The primary cause for concern, however, is that the byproduct related to pay is insufficiently controlled, negatively impacting time performance. Therefore, this paper seeks to explore the effect of employee compensation and training in the workplace on organizational performance by examining the function of COVID-19 as a mediator during the crisis period. The purpose of this study is to identify and assess the compensation policy and training within periods of crisis.

2. Literature Review and Theoretical Framework

In this section, we will be discussing the contextual review of compensation, the theory, the construction of hypotheses, the examination of empirical data, and the conceptual framework.

Human capital may be traced back to the founding of classical economics in 1776 and the subsequent development of scientific theory. After the concept was formalized as a theory, Schultz (1961) argued that HC was one of the most important factors in the development of modern national economies (Dae-Bong 2009). Schultz's (1993) ideas stem from macroeconomic development theory. This topic was presented in the famous book

"Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education" by Becker ([1964] 1993). Education, computer training, and healthcare spending are examples of capital, according to Marimuthu et al. (2009). According to this theory, formal education has an impact on an individual's earning ability. The notion of HC stems from the assumption that education fosters particular traits in individuals, and that these traits encourage economic productivity and development (Deneulin and Shahani 2009). Within the framework of neoclassical economics, Becker's landmark book *Human Capital* (1964) introduced the notion of HC. He made the argument that investing in people is similar to investing in other production facilities such as mines or factories. A second economist, Theodore Schultz, built on Becker's work by attempting to determine how the return on education might be calculated in nations with various wealth levels and attitudes of foregoing profit in order to provide HC (Deneulin and Shahani 2009). Human capital theory assumes that the core competencies, skills, knowledge and capabilities of the workforce contribute to the firm's competitive advantage. It deals with resource allocation, human resource development, and compensation techniques and processes. According to human capital theory, training is an investment as it has the potential to yield private and social returns (Odhon'g and Omolo 2015). Human capital theory, according to Armstrong (2012) and referring to Odhong and Were (2013), helps determine the influence of employees on the firm and their contribution to shareholder value. It demonstrates the human resource approach to value creation, for example, return on investment. According to Dae-Bong (2009), education and earning capacity are associated, which means that the better educated a person is, the more money he or she may make, and that education offers skills, information, and talents that can be translated to the productivity element of the job. HC represents the knowledge, skills, and abilities that a person gains via education and training (Odhon'g and Omolo 2015).

Firms may increase their HC by strengthening the knowledge and skills of their existing workforce and hiring persons with high levels of knowledge and skills from the external labor market. Firms can thus seek to produce and acquire HC. HC increases in two ways: when organizations use more of their employees' knowledge, and when employees gain further awareness of their organization's needs (Choudhury and Mishra 2010). As the main theory of HC research, HC theory underpins the factors of knowledge management, education, training, and skills development. It provides short- and long-term benefits in terms of knowledge and skill development of individuals and groups.

2.1. Impact of COVID-19 on Firm's Performance

Despite the fact that it is a health crisis with all of the negative effects on people's health all over the world, the COVID-19 pandemic continues to spur the work of researchers. Furthermore, COVID-19 has recently demonstrated the weaknesses and strengths of policies in various sectors. In fact, the rapid spread of the pandemic has served as a timely reminder to take a step back and initiate some open-ended discussions regarding work routines on all levels, from the individual to the small- and medium-sized business to the major corporation (Boubaker et al. 2022; Hewa-Wellalage et al. 2022; Ichsan et al. 2021; Rababah et al. 2020).

The pharmaceutical industry plays a significant role in the dissemination of products and services that can save lives for the benefit of the general population. However, the pharmaceutical industry is plagued by a variety of problems, some of which have been brought to its leaders' attention. These problems include the difficulty of supplying the demand for diagnostic testing facilities and protective clothing. As a result of China's monopoly over the world's active ingredients, pharmaceutical companies that are responsible for the development of new medications are almost entirely reliant on chemicals that are mostly produced in China and India. The COVID-19 issue has had a direct negative impact on transportation and lodging due to lockdown limitations (Batool et al. 2021) particularly in China, which is the country that produces the majority of medicinal goods. China is also

the country where the majority of COVID-19-affected factories are located. Because of this, the global economy has been in jeopardy.

Due to regulations designed to prevent the spread of the outbreak, the capacity to procure raw ingredients, and manufacture and transport medications, has been constrained. The reliance on imports makes it difficult for these nations to negotiate the cost of treatment alternatives for individuals in need (Guo et al. 2022). Prioritizing the manufacturing of COVID-19-specific medications and equipment reduces the production of treatments for other chronic illnesses (Kretchy et al. 2021). Inadequate medicine supply, lack of vaccination therapy alternatives, insufficient hospital treatment capacity, and absence of quarantine facilities have contributed to an increase in mortality as a result of the epidemic's impact on the health system (Sarkees et al. 2021). According to Devi et al. (2020), the economic crisis caused by the COVID-19 epidemic has had a substantial influence on the profitability of businesses. When a company's profit declines due to a drop in sales, this would undoubtedly have an effect on its performance. The drop in sales may have an effect on the fall in profits if the firm is unable to minimize its operating expenses and other costs that impact on its overall profitability.

Based on the above, we formulate our first hypothesis as follows:

Hypothesis 1 (H1). *The COVID-19 crisis has a negative impact on the financial performance of pharmaceutical companies.*

2.2. Impact of Employee Compensation on Firm's Performance

It is common practice to place an emphasis on the significance of salary as a component in determining total job satisfaction. If the morale of the workforce has improved, and employees are in a position to deliver their best efforts when they are working, then the firm's reputation will be enhanced as a result, and it will be in a better position to satisfy the short-term and long-term needs of the organization. Girdwichai and Sriviboon (2020) drew attention to the fact that the working environment is another factor that has a positive impact on the overall productivity of workers. It has an impact on workers' wellbeing in terms of their safety, health, comfort, and morale. Specifically, these are the areas that are impacted when the working environment is negative. In addition to this, having a working environment that is not only undesirable but also inappropriate will always and predictably boost the level of stress that is experienced by workers. According to the results of another study that Hung et al. (2018a) carried out, the various characteristics of the physical environment tend to have an influence on the levels of output, perception, and behavior that workers display. On this basis, the literature makes clear that compensation systems that are consistent and equal are best suited to serve the interests of workers. If workers are not compensated appropriately, they will not put in the necessary effort or perform to the required standard. This has a detrimental effect on the performance of the company. In addition, Niu et al. (2018) found that the compensation system has to be in accordance with three elements of equality, which are individual equality, internal equality, and external equality. It is assured that the pay structure is fair and in line with the nature of the task when there is internal equality. The idea of external equality ensures that the pay scale is fair for all workers who are working in the same environment, through comparison of their salaries to those of others in similar jobs elsewhere. For the purpose of individual equality, people who work for the same firm need to have a salary structure that is comparable to that of their colleagues. This is one of the most significant insights that we gained from our study.

According to Safuan and Kurnia (2021), COVID-19 caused a significant amount of havoc to the pay systems of various organizations. The subsequent study effort was based on an examination of the context, and significant findings have made it clear that the compensation system became unsustainable during the lockdown. A literature review investigation was carried out, and the results of that study led to these discoveries: The availability of monetary payments almost always acts as a stimulant in the operation of

organizations. It makes the business more inductive and coercive for the healthy growth and development of the personnel, which in turn has a dominant impact on the performance of the firm. The findings also indicate that low compensation structures have a negative influence on firms' performance.

The impact that compensation has on how well an organization performs is of the utmost importance because of the role that it plays in motivating workers. It is essential to conduct an investigation into the relevance of the salary in order to build the trust of the workers. Even Hung et al. (2018b) concede that having motivated employees always results in strong organizational performance that is both efficient and robust. The employee will receive remuneration from the employer in the form of a number of different financial transactions in exchange for the services that they supply to the company in the capacity of their role as an employee. It is the job of the management of human resources to offer the workers incentives that will improve both their physical and mental health in order to raise their levels of productivity. This is carried out with the aim of increasing the workers' overall output. It is crucial for the organization to provide incentives because if they want the quality of the output that the organization produces to be high, then it is necessary that the quality of the input that the organization receives from its members should also be high (Ahmad et al. 2012).

The following hypothesis can be deduced from the results of this literature review:

Hypothesis 2 (H2). *The amount of money a company is able to pay its workers has a substantial bearing on the level of success achieved in the working environment. In other words, the higher the wage a company pays its workers, the more likely it is to achieve higher levels of success. COVID-19 moderates the relationship between employee compensation and financial performance.*

2.3. Impact of Training on Firm's Performance

Training has an impact on the execution of work within the organization because it leads to high levels of commercial success. The link between training and organizational performance is crucial. This is one reason for the significance of this relationship. Training is a key component that contributes to the organization by helping to enhance the credibility of the company's performance in business. According to Kurnia et al. (2019), businesses that do not put a considerable priority on the training of their employees have significant challenges in their capacity to handle the day-to-day operations of the firm in a way that is both efficient and rational. Research has proven that adequate training is necessary for any future organizational development to be successful. Without it, growth would be impossible. The completion of training programs requires not only a significant financial investment but also a significant time commitment on the part of the individual.

A further point to be mentioned is a technique, validated by scientific study, to measure the effectiveness of training. This approach is used to assess the usefulness of training programs that have been created by an organization. In order to evaluate the efficacy of training, it is essential to determine not only what and why training should be conducted, but also who should be responsible for conducting the training.

Training is the major method used by organizations to develop a sense of purpose in their staff, which, in turn, enhances morale and makes staff members more productive in their responsibilities within the firm (Shokohifard et al. 2017). The following hypothesis can be deduced from the results of this review:

Hypothesis 3 (H3). *The fact that training has such a major overall effect on how well an organization works demonstrates its importance. COVID-19 moderates the relationship between training and financial performance.*

2.4. Compensation and Training Decisions in Crisis and Non-Crisis

The fourth hypothesis (H4) stipulates that in times of crisis, management decision-making in the pharmaceutical industry differs from times of non-crisis, which leads to changes in financial performance. This in turn leads us to develop the following sub-hypotheses:

Hypothesis 4a (H4a). *In times of crisis, employee compensation has an impact on financial performance.*

Hypothesis 4b (H4b). *In times of crisis, training has an impact on financial performance.*

Hypothesis 4c (H4c). *In times of non-crisis, employee compensation has an impact on financial performance.*

Hypothesis 4d (H4d). *In times of non-crisis, training has an impact on financial performance.*

3. Materials and Methods

3.1. Research Design and Methods

Based on a review of existing research models in the literature, we observe that the bulk of studies have investigated the influence of employee compensation and training on the financial performance of organizations. Seven factors serve as independent variables in the study model shown below (Table 1), which uses ROA and ROE as a measure of business financial performance. This is consistent with previous academic research (Anghel et al. 2018; López-Toro et al. 2021; Zhang et al. 2021). We may construct our equation using the suggested research model, which is as follows:

$$\begin{aligned} ROA_{i,t} = \beta_0 &+ \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} \\ &+ \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \beta_8 Crisis_t \\ &+ \beta_9 Crisis\#\#EPR_{i,t} + \beta_{10} Crisis\#\#TraiCos_{i,t} + i.year + \varepsilon_{i,t} \end{aligned} \quad (1)$$

$$\begin{aligned} ROE_{i,t} = \beta_0 &+ \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} \\ &+ \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \beta_8 Crisis_{i,t} \\ &+ \beta_9 Crisis\#\#EPR_{i,t} + \beta_{10} Crisis\#\#TraiCos_{i,t} + i.year + \varepsilon_{i,t} \end{aligned} \quad (2)$$

where:

- $ROA_{i,t}$: "Return On Asset of the company i period t";
- $ROE_{i,t}$: "Return On Equity of the company i period t";
- $EPR_{i,t}$: "Employee Performance Ratio for company i period t. The ratio is proposed by Bel-First Finance. The formula is "Personnel costs/Sales";
- $TraiCos_{i,t}$: "Training cost invested in employees of the company i period t. In other words, it represents the net training costs";
- $LnFsize_{i,t}$: "Logarithm of sales of company i period t";
- $Fage_{i,t}$: "Firm age of the company i in the period t";
- $Liquid_{i,t}$: "Ratio of liquidity of the company i period t";
- $Tang_{i,t}$: "Logarithm of total fixed assets of the company i in period t";
- $Risk_{i,t}$: "Ratio of risk of the company i in period t". The formula is "Total Debt/Total Assets";
- $Crisis$: "Dummy variable catching the crisis period (1 = if crisis, 0 = if no crisis)";
- $Crisis\#\#EPR_{i,t}$: "Interaction term indicating how EPR effects on financial performance vary as crisis starts";
- $Crisis\#\#TraiCos_{i,t}$: "Interaction term indicating how TraiCos effects on financial performance vary as crisis starts";
- $i.year$: "We suppose that every year has an effect on the results so we can control the unobserved heteroscedasticity of years".

Table 1. Descriptive statistics of financial performance measure and independent variables.

Variables	Mean	SD	Min	Max
Dependent Variables (Firm financial performance)				
ROA	0.1178417	0.4329095	−6.5231	2.5542
ROE	0.081288	0.5555353	−7.0433	4.4872
Independent Variables				
EPR	21.34254	19.19048	0143989	196.58
TraiCos	7.547887	5.394577	0	17.10051
Firm-specific variables				
LnFsize	10.66506	2.782853	1.09861	22.31696
Fage	35.60798	22.88881	4	108
Liquid	3.782146	10.38811	−48.49	99.23
Tang	9.137034	3.429679	0.31991	23.18394
Risk	1.773397	1.033673	0.0001337	15.29443
Dummy Variable				
	Phase	**Observations**	**%**	
Crisis	Pre Crisis	721	70%	
	During Crisis	309	30%	

Source: Authors, using Stata/MP version 14.0 for Mac.

3.2. Data Source and Sample

As mentioned earlier, the purpose of this study is to examine the impact of employee compensation and training on financial performance. Therefore, we collected the financial statements of companies from Bureau Van Djik. We found this data source to be very reliable as it covers two million companies in Belgium and Luxembourg. The data provided by Bureau Van Djik are mainly from the balance sheets and income statements of the companies. In order to overcome the shortcomings of previous studies, we chose three periods for our analysis (complete period—2012 to 2021, pre-crisis period—2012 to 2018, crisis period—2019 to 2021). Using our criteria to extract the database from Bel-First Finance, we extracted data of more than 1700 companies. We checked the data after estimating the variables and discovered that numerous companies did not report several of the factors. These businesses were excluded from our research sample. In the end, only 103 organizations were chosen for our research study. According to Van Voorhis and Morgan (2007), an absolute minimum of ten participants per predictor variable is recommended for regression equations with six or more predictors. However, if circumstances permit, it is easier for the researcher to determine a small effect size with about 30 participants per variable. Hence, the study sample is considered sufficient for statistical testing or regression, and the findings can be applied to the entire population (see Table 1 for descriptive statistics). The descriptive statistics (Table 1) for all variables utilized in the primary analysis are included in Table 1, including mean, standard deviation, minimum and maximum. The overall financial performance of the selected pharmaceutical companies is 11.78% ROA and 8.12% ROE.

3.3. Estimation Methods

We employed appropriate strategies to deal with the aggregated data as these were what we were working with. Stage-by-stage applications of various statistical and economic methodologies and approaches began with a description of the data's minimum and maximum values, mean, and standard deviations. This gave some broad company characteristics. Additionally, statistical summaries highlighted variations between companies for each factor in the study model. The link between the independent and dependent variables was then investigated using correlation tests. The research model may have a multicollinearity issue if the two independent variables have strong correlations (close to 1.0), in which case one of the independent variables should be eliminated. There is no

association between the independent and dependent variables if the correlation coefficient is near to zero. As a result, the research model could not use this independent variable.

In addition, the multicollinearity issue was put to the test. In a multivariate regression equation, multicollinearity happens when one independent variable has a significant correlation with one or more other independent variables. Since it reduces the independent variable's statistical significance, multicollinearity is an issue. As suggested by Hoang and Chu (2013), it is advisable to compute the VIF value for estimate. If the VIF is higher than 10, there is likely a multicollinearity issue.

Using the Breusch–Pagan and White heteroscedasticity tests, we may assess whether or not the residuals of a regression exhibit shifting variance. In addition, the heteroscedasticity test is used to explain situations in which the variance of the model's errors is not uniform over all data. Typically, one of the essential assumptions in modeling is that the variances and model errors are homogenous and uniformly distributed. This assumption is violated when the heteroscedasticity test returns a positive result. According to Breusch and Pagan (1979) and Koenker (1981) the Breusch–Pagan and White heteroscedasticity tests can be used to determine if the residuals of a regression have a changing variance and to identify cases of heteroscedasticity, both of which render the classical estimators of the parameters of the linear regression unreliable. Breusch–Pagan and White heteroscedasticity tests may also be used to determine if the residuals of a regression have changed over time.

Because serial correlation in linear panel-data models leads to biased standard errors and inefficient outcomes, we needed to discover serial correlation in the panel model's idiosyncratic error component. This was important because serial correlation results in biased standard errors. The Wooldridge (2002) test for serial correlation in panel-data models was extremely attractive owing to the fact that it involved a limited number of assumptions and was straightforward to implement. Despite the fact that several tests for serial correlation in panel-data models have been presented, this one was particularly advantageous. In this inquiry, we constructed the first-order serial correlation test recommended by Wooldridge (2002) for panel data using the method given by Drukker (2003). The data were subjected to this test. This test is regarded as robust because it requires fewer assumptions about the behavior of diverse individual effects in order to perform.

In addition, endogeneity issues may arise when working with panel data. This emerged as a possible supplementary difficulty. The values of endogenous variables are determined by the values of the other variables inside the equation. If a model has endogenous regressors, then ordinary least squares estimators will not function correctly, as one of the assumptions of OLS is that there is no connection between a predictor variable and the error term. When endogenous regressors are present in a model, this assumption can no longer be satisfied. Estimators that account for instrumental variables are an additional alternative accessible in this circumstance. Before selecting the proper approach for regression, it was necessary for us to identify whether or not the variables acting as predictors were endogenous. Davidson and MacKinnon (1993) devised an enhanced regression test, referred to as the Durbin–Wu–Hausman test. This test may be readily stated by integrating the residuals of each endogenous right-hand-side variable as a function of all exogenous variables into a regression of the original model.

Furthermore, the F-test was mobilized to identify the ideal model from the Fixed Effect Model (FEM) and Ordinary Least Squares (OLS) models. If FEM was selected, a Hausman test would be run to determine if FEM or Random Effect Model (REM) should be used. Finally, the model's independent variables' beta factors were looked at. This enabled us to establish which factors, at a certain level of statistical significance, had the most influence on company performance and whether this influence was positive or negative.

After everything had been completed, the system GMM method to check for robustness was enabled. In order to validate the results of the regression, a system-GMM-based dynamic panel model was applied. In contrast to the static and OLS models, the system GMM method avoids endogeneity, and can be used to tackle the issue of endogeneity that exists in performance studies. When carrying out endogenous testing, we employed the

two-step GMM technique proposed by Arellano and Bover (1995) and Blundell and Bond (2000). The STATA package "xabond2" was utilized for this purpose (Roodman 2009). The module produces a double equation for the initial difference of all series and employs GMM to test the model using the lag values of the variables. The test results are displayed in the output of the module. Through the application of first-order differentiation, unobserved heterogeneity and variable bias were eliminated. Three tests were utilized in the examination of the outcome: AR1, AR2, and Hansen.

The next section presents the test results under the assumptions of linearity.

4. Results

Table 2 displays the Pearson correlation coefficients between the various factors. The correlation between the variables Tangibility and Company Size was the greatest and most significant (r = 0.76) of all the correlations between the variables. Table 2 reveals that all correlation coefficients were less than 0.95; hence, the collinearity issue between the variables did not appear to be a concern, as Gujarati and Porter stated. As seen in Table 2, there were a number of significant relationships between the variables. Numerous factors, including EPR, TraiCos, LnFsize, Tang, and Risk, exhibited a statistically significant relationship with the ROA ($p < 0.1$), indicating that this relationship was significant. Additionally, the Return on Equity showed a substantial ($p < 0.1$) association with EPR, TraiCos, LnFsize, and Fage. Furthermore, similar results regarding the absence of collinearity were seen both before and during the COVID-19 crisis. Having compared data from different time periods, we can suggest that there was no collinearity between the variables.

Table 2. Correlation matrix.

	ROA	ROE	EPR	TraiCos	LnFsize	Fage	Liquid	Tang	Risk
Panel 1: Full period (2012–2021)									
ROA	1.0000								
ROE	0.8050 ***	1.0000							
EPR	−0.1948 ***	−0.2296 ***	1.0000						
TraiCos	0.0621 *	0.0862 *	−0.0392	1.0000					
LnFsize	0.0856 ***	0.1205 *	−0.4956 ***	0.5285 ***	1.0000				
Fage	0.0500	0.0645 **	−0.1190 ***	0.4147 ***	0.3656 ***	1.0000			
Liquid	−0.0204	0.0023	−0.0956 ***	−0.0503	0.0747 **	−0.0887 *	1.0000		
Tang	−0.1035 ***	−0.0158	−0.1644 ***	0.4747 ***	0.6782 ***	0.2639 ***	0.1365 ***	1.0000	
Risk	0.0645 **	0.0413	−0.0094	−0.1118 ***	−0.2328 ***	−0.0390	−0.1436 ***	−0.4915 ***	1.0000
Panel 2: Pre-crisis period (2012–2018)									
ROA	1.0000								
ROE	0.8239 ***	1.0000							
EPR	−0.2112 ***	−0.2356 ***	1.0000						
TraiCos	0.0680 *	0.0681 *	−0.0030	1.0000					
LnFsize	0.1511 ***	0.1414 ***	−0.4031 ***	0.5840 ***	1.0000				
Fage	0.0366	0.0537	−0.1050 ***	0.4171 ***	0.4637 ***	1.0000			
Liquid	0.0001	0.0253	−0.0680 *	−0.0677 *	−0.0311	−0.0571	1.0000		
Tang	−0.0903 **	−0.0266 **	0.0071	0.4504 ***	0.5339 ***	0.3067 ***	0.0445	1.0000	
Risk	0.0463	0.0445	−0.1324 ***	−0.0771 **	−0.0072	−0.0488	−0.0528	−0.3908 ***	1.0000
Panel 3: During crisis period (2019–2021)									
ROA	1.0000								
ROE	0.6981 ***	1.0000							
EPR	−0.1644 ***	−0.2084 *	1.0000						
TraiCos	0.0402	0.1618 **	−0.1328 **	1.0000					
LnFsize	−0.0054	0.1078 *	−0.6582 ***	0.5347 ***	1.0000				
Fage	0.1198 **	0.0971	−0.1056 *	0.4130 ***	0.2329 ***	1.0000			
Liquid	−0.0664	−0.0369	−0.1259 **	−0.0375	0.0950	−0.1701 ***	1.0000		
Tang	−0.1866 ***	−0.0228	−0.4133 ***	0.5649 ***	0.7603 ***	0.1616 ***	0.1662 ***	1.0000	
Risk	0.1542 **	0.0609	0.2690 ***	−0.2028 ***	−0.4886 ***	0.0430	−0.2229 ***	−0.6315 ***	1.0000

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors, using Stata/MP version 14.0 for Mac.

The variance inflation factor (VIF) was also calculated for all regressions to test for multicollinearity (Table 3). The highest VIF values were 6.58, 4.81, and 2.65 for the Crisis, LnFsize, and Tang, respectively, well below the generally accepted value of 10 (Salama and Putnam 2013). Similarly, the lowest tolerance value in Liquid was 1.03, well above the generally accepted value of 0.1. Therefore, there was no multicollinearity between the independent variables.

Table 3. Variance inflation factors.

	VIF
EPR	1.63
TraiCos	1.82
LnFsize	4.81
Fage	1.31
Liquid	1.03
Tang	2.65
Risk	1.42
Crisis	6.58

Source: Authors, using Stata/MP version 14.0 for Mac.

The Breusch–Pagan and Cook–Weisberg diagnostic tests were utilized in order to examine our data in order to determine whether or not they had heteroscedasticity (Table 4). When the assumption of homoscedasticity is invalidated, heteroscedasticity will appear in the data. We came to the conclusion that all three of our models suffered from heteroscedasticity since p was less than 0.05. The use of "robust" standard errors was implemented so that this problem may be solved. A method for obtaining unbiased standard errors of OLS coefficients in the presence of heteroscedasticity is referred to as this. Simply by adding "robust" to the regression command we already had in STATA, we were able to acquire robust standard errors.

Table 4. Diagnostic Tests.

	Full Period		Pre Crisis		During Crisis	
	ROA	**ROE**	**ROA**	**ROE**	**ROA**	**ROE**
Wooldridge test	0.126 (0.7229)	0.860 (0.3561)	2.054 (0.1549)	1.160 (0.2841)	18.463 (0.0000) ***	1.896 (0.1724)
Breusch–Pagan/Cook–Weisberg test	431.83 (0.0000) ***	595.29 (0.0000) ***	351.54 (0.0000) ***	507.50 (0.0000) ***	76.36 (0.0000) ***	42.92 (0.0000) ***
Durbin (score)	4.20633 (0.6488)	10.382 (0.1095)	4.4979 (0.6096)	4.80738 (0.5687)	8.09637 (0.2311)	10.0691 (0.1218)
Wu–Hausman F	0.684955 (0.6619)	1.70404 (0.1172)	0.73015 (0.6255)	0.780749 (0.5853)	1.29834 (0.2595)	1.63009 (0.1404)

***: Significant at 1% level. Source: Authors, using Stata/MP version 14.0 for Mac.

In this analysis, we employed a technique known as the serial correlation test to determine the relationship between observations of the same variable gathered across many time periods. If the serial correlation of a variable was measured to be zero, it showed that there was no relationship and that each observation could be seen as independent of the others. In contrast, if the serial correlation of a variable trended towards 1.0, it indicated that the observations were serially linked and that future observations would be influenced by past values (Drukker 2003). A variable is serially correlated if it displays a pattern and does not exhibit random variation. Except for the model ROA from the crisis era, the Wooldridge test (xtserial) indicated that none of the models from any of the three time periods exhibited a serial correlate. When doing our analysis, we took use of the lag of the ROA variable to sidestep this issue. This suggests that ROA at times of crisis is influenced by values from previous years.

Moreover, to test for endogeneity of independent variables, we used the module IVREGRESS 2SLS. We then calculated the Durbin–Wu–Hausman test to check for existence of endogeneity. The results (Table 4) showed that in all our models, all of the independent variables were exogenous.

In summary, we can conclude that the viability of our models was assessed and that each one met the standard requirements. For those that did not meet the prerequi-

sites, we produced a solution for serial correlation by adding the lag and a solution for heteroscedasticity by introducing the "robust" criterion.

Table 5 displays the outcomes of testing hypotheses. For the OLS regression, Table 5 demonstrates that the total R2 for all variables (ROA, ROE) is rather small (0.0983, 0.0858), indicating that there are more elements influencing financial performance that were not accounted for in the analysis. Moreover, the F-test for both variables is significant, indicating that the selected parameters are effective performance estimators. After analyzing both models with fixed effects, we found that the fixed effect model had a F value that was not statistically significant, hence robust regression is the optimal model for this analysis. After adding the interaction term (using the variable Crisis) for both compensation and employee training, we determined that it had no significant influence on financial performance ($p > 0.10$). After estimating the coefficients using fixed effect models, we concluded that OLS is more appropriate for the analysis.

Table 5. Regression analysis of model (1) and (2).

	ROA (1)		ROE (2)	
Variables	**Panel A: OLS, R**	**Panel D: GMM-System**	**Panel A: OLS, R**	**Panel D: GMM-System**
EPR	−0.0052466 (0.009) ***	−0.0163452 (0.004) ***	−0.0091694 (0.001) ***	−0.0139051 (0.423)
TraiCos	0.0080907 (0.087) *	0.0289216 (0.078) *	0.0125835 (0.062) *	0.0448429 (0.638)
LnFsize	0.0374874 (0.003) ***	−0.0320136 (0.513)	0.0113492 (0.451)	−0.1033844 (0.566)
Fage	−0.000294 (0.685)	−0.0020274 (0.236)	−0.0000117 (0.991)	0.0010442 (0.854)
Liquid	−0.0000503 (0.958)	−0.0016095 (0.746)	0.0004432 (0.753)	0.00903 (0.456)
Tang	−0.0374449 (0.000) ***	−0.010978 (0.696)	−0.0209608 (0.004) ***	−0.0151339 (0.829)
Risk	−0.0297015 (0.041) **	−0.0687874 (0.409)	−0.0082882 (0.562)	0.4355622 (0.249)
Crisis	−0.2926674 (0.001) ***	- -	−0.166536 (0.165)	- -
2013	−0.0445308 (0.479)	0.0361919 (0.254)	−0.0961158 (0.218)	−0.0808059 (0.555)
2014	−0.088343 (0.281)	−0.01566 (0.704)	−0.1276441 (0.165)	0.0045794 (0.911)
2015	−0.0850615 (0.191)	0.0604835 (0.038) **	−0.1195551 (0.134)	0.0661649 (0.287)
2016	−0.0331188 (0.420)	0.0463762 (0.232)	−0.0144971 (0.819)	0.0185482 (0.852)
2017	−0.0226452 (0.698)	0.0402428 (0.297)	−0.0901036 (0.332)	0.0740855 (0.566)
2018	−0.0130244 (0.765)	0.0584528 (0.108)	−0.0317535 (0.706)	0.0524693 (0.709)
2019	0.2754644 (0.002) ***	0.0648145 (0.036) **	0.1246327 (0.278)	0.100557 (0.315)
2020	0.2846765 (0.001) ***	−0.2349633 (0.511)	0.173814 (0.138)	1.109025 (0.377)
Constant	0.2238004 (0.078) *	0.7698721 (0.193)	0.3269235 (0.048) **	0.3112513 (0.890)
R^2	0.0983	-	0.0858	-
F-statistic	6.59 (0.000) ***	- -	3.23 (0.000) ***	- -
Wald Test	- -	115.79 (0.000) ***	- -	58.86 (0.000) ***
Hansen	- -	74.11 (0.075) *	- -	45.33 (0.623)
AR1	- -	−2.08 (0.038) **	- -	−1.66 (0.097) *
AR2	- -	0.56 (0.576)	- -	0.90 (0.368)

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors, using Stata/MP version 14.0 for Mac.

In addition, Table 5 displays the results of testing hypotheses based on the system-GMM computation of ROA and ROE. Table 5 diagnostics tests suggest that the model is

well fitted since AR(1) and AR(2) satisfy the criteria that there is first-order autocorrelation but not second-order autocorrelation. This is consistent with what the literature indicates (Roodman 2009). According to Table 5, both the ROA and ROE models have statistically significant test statistics for the Wald test that provide good fits. This indicates that the instruments used in the GMM estimate for the two measures (ROA and ROE) are reliable (p = 0.00 and 0.00). Moreover, the Hansen test did not uncover sufficient evidence to reject the null hypothesis that the two measurements have correct specifications (p(ROA) = 0.075, p(ROE) = 0.623).

First, it was discovered (Table 5) that employee compensation (EPR), which is statistically significant at the 1% level, has a detrimental effect on both return on asset and return on equity. This finding suggests that a rise in pay rates causes a slight fall in performance. This outcome is consistent with Yan and Sloan (2016), who found a negative relationship between employee compensation and return on equity. The capacity of companies with higher remuneration to invest more resources in further development, which lowers profitability, can be used to explain this pattern. Secondly, training costs have a statistical significance of 10% and a favorable impact on financial performance. This implies that investing in existing resources has a favorable impact on the success of the organization.

The second estimate we developed is based on data from firms that operated during non-crisis periods. Due to time limitations, we limited our time series to the years 2012 to 2018. We constructed the following model based on the assumption that linearity would hold true in order to analyze the impact of employee training and compensation during non-crisis periods:

$$ROA_{i,t} = \beta_0 + \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} + \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \varepsilon_{i,t} \quad (3)$$

$$ROE_{i,t} = \beta_0 + \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} + \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \varepsilon_{i,t} \quad (4)$$

where i: 2012, . . . , 2018.

It is evident from examining Table 4 that the model utilized in this study has serial correlation difficulties. We resorted to robust regression to overcome this problem. Table 6 displays the results of the regression analysis as contrasted to the fixed effect model. After comparing the F-test results of the OLS and FE models, we decided that the FE model was more appropriate. Following the selection of the Fixed Effects (FE) model, we conducted the Hausman test to distinguish between FE and the Random Effects (RE) model (Green and Vavreck 2008). It was established based on the data that FE models were appropriate in terms of both ROA and ROE.

Table 6 shows that employee compensation and training have a significant impact on both ROA and ROE. In other words, at the 1% level of significance, EPR has a negative impact on ROA and ROE. Second, at the 5% level of significance, TraiCos has a favorable effect on ROA and ROE. Similar to the findings in the preceding analysis, the findings indicate that businesses' investments in training have a favorable effect on their financial success. Third, among the control factors, only fixed assets and risk have statistically distinct impacts on ROA, indicating that investing in fixed assets has a negative impact on performance. However, unexpectedly, company risk significantly affects ROA, highlighting the significance of pre-crisis risk aversion. Fourth, the R-squared value for the regression findings, which is 0.1282 for ROA and 0.0663 for ROE, indicates that the independent variables in the model account for 12.8% and 6.63% of the variance in the dependent variable.

Table 6. Regression analysis of model (3) and (4).

	ROA (3)		ROE (4)	
Variables	**Panel A: OLS, R**	**Panel B: OLS-FE**	**Panel A: OLS, R**	**Panel B: OLS-FE**
EPR	−0.005257 (0.015) **	−0.0057235 (0.000) ***	−0.0094616 (0.003) ***	−0.0091784 (0.001) ***
TraiCos	0.0081721 (0.163)	0.0122363 (0.002) ***	0.0112198 (0.188)	0.0169126 (0.011) **
LnFsize	0.0456427 (0.011) **	0.0501001 (0.056)	0.0164372 (0.438)	0.0073406 (0.870)
Fage	−0.00058 (0.524)	−0.0028629 (0.625)	-0.00000135 (0.999)	−0.0043064 (0.670)
Liquid	0.0004921 (0.786)	0.001227 (0.578)	0.0019066 (0.378)	0.0019703 (0.604)
Tang	−0.0415513 (0.000) ***	−0.0802822 (0.000) ***	−0.0217587 (0.022)	−0.0774659 (0.008)
Risk	−0.0283629 (0.060) *	−0.0385693 (0.025) **	−0.0074933 (0.626)	−0.0234393 (0.429)
Constant	0.1824338 (0.270)	0.5201771 (0.135)	0.2939271 (0.161)	0.9631556 (0.107)
R^2	0.0908	-	0.0808	-
Within R^2	-	0.1282	-	0.0663
F-statistic	5.38 (0.000) ***	6.84 (0.000) ***	3.02 (0.000) ***	3.29 (0.000) ***
Hausman	- -	0.30 (0.9999)	- -	4.03 (0.7768)

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors, using Stata/MP version 14.0 for Mac.

Furthermore, the third model that we created relies on data collected from companies that were in business throughout the financial crisis. It has come to our attention that SARS-COV-2 was discovered for the first time in 2019 in Wuhan (Zhu et al. 2020). The companies immediately began reviewing their choices and making preparations for the newly discovered virus. A number of measures were enacted, and the actions that were taken varied depending on the activity sector. While the majority of businesses were closing their doors and embracing new methods of work (e.g., remote working), pharmaceutical corporations increased their investments in their laboratories in an effort to better understand the virus and develop medicines for it. Our empirical model, which analyzes the influence of employee compensation and training on financial performance, was created as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} + \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \varepsilon_{i,t} \quad (5)$$

$$ROE_{i,t} = \beta_0 + \beta_1 EPR_{i,t} + \beta_2 TraiCos_{i,t} + \beta_3 LnFsize_{i,t} + \beta_4 Fage_{i,t} + \beta_5 Liquid_{i,t} + \beta_6 Tang_{i,t} + \beta_7 Risk_{i,t} + \varepsilon_{i,t} \quad (6)$$

where i: 2019, . . . , 2021.

Table 7 displays the results of regression analysis for the ROA and ROE model during the period of crisis.

As we see in the fourth column of Table 7, we used the Random Effects model to analyze the impact of EPR and TraiCos on ROE. This was due to the fact that robust regression displayed an insignificant value of F so we had to choose between FE and RE. The results of the Hausman test (Table 7) concluded that the RE model was more appropriate.

As seen in Table 7, the relationship between employee compensation and the financial performance indicator (ROE) during periods of crisis was substantially inverse at the 1% level. This was the case throughout the duration of the study. Similarly, during times of

crisis, TraiCos was shown to have a positive link with ROE at the 10% level. Consequently, the results indicate that pharmaceutical companies were able to maintain their performance as a result of investment in the development of their personnel. The results provide validity to Molloy and Barney (2015) who found that human capital investments contribute to enhanced corporate success.

Table 7. Regression analysis of model (5) and (6).

	ROA (5)		ROE (6)	
Variables	**Panel A: L.OLS ROB**	**Panel B: OLS-FE**	**Panel A: OLS, R**	**Panel B: OLS-RE**
EPR	−0.0046212 (0.309)	0.001212 (0.516)	−0.0075085 (0.129)	−0.0088164 (0.000) ***
TraiCos	0.0002916 (0.957)	0.0023366 (0.696)	0.0167772 (0.052) *	0.0143066 (0.074) *
LnFsize	0.0342939 (0.080) *	−0.0366278 (0.648)	0.0068405 (0.769)	−0.0101262 (0.570)
Fage	0.0001141 (0.900)	0.1819009 (0.512)	−0.0001442 (0.905)	0.0010882 (0.567)
Liquid	0.0016024 (0.153)	0.001338 (0.198)	−0.0007446 (0.684)	−0.001711 (0.379)
Tang	−0.0237342 (0.038) **	−0.0108203 (0.581)	−0.0235252 (0.048) **	−0.0239359 (0.132)
Risk	0.0108887 (0.665)	0.0157822 (0.665)	−0.0177857 (0.622)	−0.0100497 (0.837)
Constant	0.0748673 (0.664)	−6.96549 (0.511)	0.309769 (0.150)	0.5089586 (0.043) **
R^2	0.1756	-	0.1189	-
Within R^2	-	0.0137	-	-
Overall R^2	-	-	-	0.1061
F-statistic	4.86 (0.000) ***	0.53 (0.830)	1.61 (0.115)	- -
Wald test	- -	- -	- -	21.43 (0.0032) ***
Hausman	- -	- -	18.29 (0.0107)	- -

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors, using STATA MP 14.0.

5. Discussion

We can see in Table 8 that the financial performance of companies that operate in the pharmaceutical industry is significantly impacted in a negative and positive way, respectively, by the employee compensation and training that these companies provide for their workers. Given that the health of millions of people is directly impacted by the pharmaceutical industry, it is, in fact, one of the most dangerous and, at the same time, one of the most closely monitored and strictly controlled industries in the world.

Table 8. Summary of hypothesis verification of model (1) and (2).

Variables	Variable's Effect (1)	ROA (1)	Variable's Effect (2)	ROE (2)	Final Decision
Independent variables					
EPR	–	Supported ***	–	Supported ***	Supported
TraiCos	+	Supported *	+	Supported *	Supported
Crisis	–	Supported ***	–	Not Supported	Supported
EPR##Crisis	+	Not Supported	+	Not Supported	Not Supported
TraiCos##Crisis	–	Not Supported	+	Not Supported	Not Supported
Firm specific variables					
LnFsize	+	Supported ***	+	Not Supported	Supported
Fage	–	Not supported	–	Not Supported	Not Supported
Liquid	–	Not Supported	–	Not Supported	Not Supported
Tang	–	Supported ***	–	Supported ***	Supported
Risk	–	Supported **	–	Not Supported	Supported

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors.

In this sense, the success of a pharmaceutical company depends on the corporation's ability to strike a balance between the human role it plays and the financial goal it seeks to achieve. In order to achieve this goal, pharmaceutical businesses make consistent investments not just in research and the training of their workforce but also in compensation. According to Kurnia et al. (2019), businesses that do not place a considerable priority on staff training are significantly disadvantaged in their ability to efficiently and logically handle day-to-day business operations. It has been shown that an organization cannot reach its full potential without training. Our research provides empirical evidence that supports the hypothesis that the pharmaceutical industry is one of the types of businesses that is more likely to suffer losses during times of crisis, particularly health crises. In fact, the COVID-19 pandemic caused disruption to the pharmaceutical industry on several fronts: first and foremost, the staff that continued to be at high risk of exposure to the virus; second, the lockdowns; third, the feeling of panic and uncertainty that spread throughout the world, etc. As a result of these problems, the decline in the profits of businesses in the pharmaceutical industry accelerated, especially in 2020 before the vaccine and other ways to mitigate the virus were found.

The results displayed in Table 9 are similar to those in Table 8. In other words, in normal times, remuneration and training plans remain essential elements in the financial performance of pharmaceutical companies. However, in reality, this sector depends heavily on scientific research, which is why there is a need to invest in personnel both financially, through multiple forms of remuneration, especially variable, and in training plans. Khan et al. (2011) say that a company needs to plan its training programs carefully to make sure they produce the results the company wants. The latter not only allows a company to achieve positive financial results, but also allows the company to guarantee its continued existence. Manju and Suresh (2011) say that training is a type of intervention that improves the overall quality of a company's products and services to help the business do better in the market. In this sense, the two factors of remuneration and training are not dependent on periods of crisis; rather, they constitute the backbone of the pharmaceutical industry.

Table 9. Summary of hypothesis verification of model (3) and (4).

Variables	Variable's Effect (3)	ROA (3)	Variable's Effect (4)	ROE (4)	Final Decision
Independent variables					
EPR	–	Supported ***	–	Supported ***	Supported
TraiCos	+	Supported ***	+	Supported **	Supported
Firm-specific variables					
LnFsize	+	Not supported	+	Not Supported	Not Supported
Fage	–	Not supported	–	Not Supported	Not Supported
Liquid	+	Not Supported	+	Not Supported	Not Supported
Tang	–	Supported ***	–	Not supported	Supported
Risk	–	Supported **	–	Not Supported	Supported

***: Significant at 1% level. **: Significant at 5% level. Source: Authors.

During times of crisis (Table 10), such as COVID-19, all companies, no matter what industry they operate in, have been affected. However, the health crisis continues to have the biggest effect on the pharmaceutical industry. Because of the rise in demand for prescription medications, vaccines, and medical devices, COVID-19 might be considered the opportunity of a century for the pharmaceutical sector. This can be seen as one of the primary short-term effects of the COVID-19 epidemic. However, as a result of the challenges associated with monitoring performance and the disruptions that have occurred during COVID-19, performance management has been severely constrained or even eliminated. Because employees can now perform their jobs remotely, it is challenging for businesses to determine and administer rewards and bonuses as a kind of monetary incentive for workers (Aguinis and Burgi-Tian 2021). Furthermore, there are more short-term and long-term implications to it. As short-term impacts, we have demand changes, supply shortages, panic buying and stocking, regulation changes, and a shift of communication

and promotions to remote interactions through technology. Additionally, changes in the research and development process can be seen as short-term impacts of COVID-19 on the health market. Long-term effects of COVID-19 on the health and pharmaceutical sectors may include a slowdown in industry growth, probable shifts in consumer trends, approval delays, and moves toward self-sufficiency in the supply chain for the production of pharmaceuticals.

Table 10. Summary of hypothesis verification of model (5) and (6).

Variables	Variable's Effect (5)	ROA (5)	Variable's Effect (6)	ROE (6)	Final Decision
Independent variables					
EPR	-	Not supported	-	Supported ***	Supported
TraiCos	+	Not supported	+	Supported *	Supported
Firm-specific variables					
LnFsize	+	Supported *	-	Not Supported	Supported
Fage	+	Not supported	+	Not Supported	Not Supported
Liquid	+	Not Supported	-	Not Supported	Not Supported
Tang	-	Supported **	-	Not supported	Supported
Risk	+	Not Supported	-	Not Supported	Not Supported

***: Significant at 1% level. **: Significant at 5% level. *: Significant at 10% level. Source: Authors.

6. Conclusions

The influence of human resources on a company's financial performance is a relatively new field of study, and as a result, most businesses, and particularly pharmaceutical companies in Belgium, have not yet obtained a complete understanding of it. The dissemination of this study's findings within the business community in Belgium represents a substantial contribution to the promotion of this influence. In conclusion, there is an urgent and immediate need for business executives to start freely sharing human resources indicators. This requirement has been emphasized throughout this article. It is arguable that a good financial report is impossible to provide without an appropriate HR evaluation. The current study is a useful step forward, particularly for academics, practitioners, and policymakers who are looking for logical factors that can explain why there is a perfect relationship between the performances of Belgian pharmaceutical firms and their human resources management teams.

The pandemic caused by the coronavirus has been one of the most challenging collective tasks that humanity must overcome. In the middle of the chaos, pharmaceutical companies have been working feverishly to discover new treatments in the hope of preventing more deaths and mitigating the devastating social and economic effects of the pandemic. As companies and specialists work to develop new treatments, research and development (R&D) is going through a period of transformation. The traditional way for the pharmaceutical industry to drive innovation is to go through a long process that starts with finding and making potential drug compounds, moves on to a long phase of refining and choosing the best candidates, and ends with a phase of gradual development, clinical testing, and regulatory approval. In order to be successful in this race towards vaccines and to generate large revenues as a result, pharmaceutical companies invested large sums of money in research and development during COVID-19. This is something that negatively impacted the financial performance of the pharmaceutical industry during the first year of the crisis, and this is in parallel with other factors such as logistics and containment. On the other hand, the money spent on research and development has paid off, as the discovery of the vaccine shows. This is in line with how the scientific community usually acts. In conclusion, spending money on training and staff is seen as an expense in the short term. However, the money spent in these two areas has the potential to greatly improve financial performance in the long term.

Undoubtedly, well-trained and developed employees comprise a superior workforce, which is a crucial asset for any firm. These trained employees contribute to the enhanced performance, growth, and development of an organization. Therefore, firms can flourish

swiftly through the planned and systematic implementation of employee training and development programs. Indeed, a well-trained and developed workforce is an advantage to the business since they boost the organization's efficiency, successes, and goals by executing the training-acquired tasks with skill.

Due to intensifying rivalry and the introduction of new ideas to the market, the significance of training and development has increased dramatically in recent years. Research demonstrates that no company can compete and excel in the market if its staff are not taught to meet the market's evolving demands and requirements. Moreover, technological advancements and developments have resulted in substantial changes, and businesses must recognize that their success is contingent on the honed and trained skills of their employees, necessitating substantial and ongoing investments in training and development. In addition, HRM (human resource management) concepts such as organizational commitment and the advent of the quality movement have prompted organizational management to acknowledge the increasing importance of training, staff development, and long-term education. Such concepts require not only careful planning but also a greater emphasis on personnel development.

To summarize, the financial compensation that is offered to employees plays an important part in retaining employees' self-confidence, lowering the turnover rate of employees, and motivating employees to put in a lot of effort, all of which are to the benefit of the company. Training, on the other hand, is an essential action towards the development, improvement, and expansion of the organization. This is because having a workforce that is both well-trained and with advanced skill levels is necessary for an organization to be successful. Therefore, we can say that employee training and pay play an important role in the growth of both organizations and their workforce.

Author Contributions: Conceptualization, R.M. and M.N.T.; data curation, M.N.T.; formal analysis, M.N.T.; investigation, M.N.T.; methodology, M.M.; project administration, R.M.; resources, R.M.; software, M.N.T.; supervision, M.M.; validation, R.M. and M.M.; visualization, M.N.T.; writing—original draft, R.M.; writing—review and editing, M.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Data used in this study is collected from financial statements of Belgian companies published in Bureau Van Djik.

Acknowledgments: This research is encouraged by the university of Hassan First (https://www.uh1.ac.ma/ accessed on 21 November 2022), Settat-Morocco and university of Cadi Ayyad (https://www.uca.ma/ accessed on 21 November 2022), Marrakech-Morocco.

Conflicts of Interest: The authors declare no conflict of interest.

References

Aguinis, Herman, and Jing Burgi-Tian. 2021. Talent management challenges during COVID-19 and beyond: Performance management to the rescue. *BRQ Business Research Quarterly* 24: 233–40. [CrossRef]

Ahmad, Noor Azmi, Azri Abdul Aziz, Syaquif Yasin Kamarudin, Azdel Abdul Aziz, and Mohd Faeez Saiful Bakhtiar. 2012. The influence of direct financial compensation towards future-graduates career choice in hotel industry. *Journal of Tourism, Hospitality & Culinary Arts (JTHCA)* 4: 18–30.

Alqahtani, Mohammed M. J., Boshra A. Arnout, Fahmi Hassan Fadhel, and Nabil Saleh SLeh Sufyan. 2021. Risk perceptions of COVID-19 and its impact on precautionary behavior: A qualitative study. *Patient Education and Counseling* 104: 1860–67. [CrossRef]

Anghel, Ion, Marian Siminică, Mirela Cristea, Mirela Sichigea, and Gratiela Georgiana Noja. 2018. Intellectual capital and financial performance of biotech companies in the pharmaceutical industry. *Amfiteatru Economic Journal* 20: 631–46. [CrossRef]

Arellano, Manuel, and Olympia Bover. 1995. Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics* 68: 29–51. [CrossRef]

Armstrong, Chris. 2012. *Global Distributive Justice: An Introduction*. Cambridge: Cambridge University Press.

Ayati, Nayyereh, Parisa Saiyarsarai, and Shekoufeh Nikfar. 2020. Short and long term impacts of COVID-19 on the pharmaceutical sector. *DARU Journal of Pharmaceutical Sciences* 28: 799–805. [CrossRef]
Batool, Maryam, Huma Ghulam, Muhammad Azmat Hayat, Muhammad Zahid Naeem, Abdullah Ejaz, Zulfiqar Ali Imran, Cristi Spulbar, Ramona Birau, and Tiberiu Horațiu Gorun. 2021. How COVID-19 has shaken the sharing economy? An analysis using Google trends data. *Economic Research-Ekonomska Istraživanja* 34: 2374–86. [CrossRef]
Becker, Gary Stanley. 1993. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago: University of Chicago Press. First published 1964.
Blundell, Richard, and Stephen Bond. 2000. GMM estimation with persistent panel data: An application to production functions. *Econometric Reviews* 19: 321–40. [CrossRef]
Bogaert, Petronille, Tomasz Bochenek, Anna Prokop, and Andrzej Pilc. 2015. A qualitative approach to a better understanding of the problems underlying drug shortages, as viewed from Belgian, French and the European Union's perspectives. *PLoS ONE* 10: e0125691. [CrossRef] [PubMed]
Boubaker, Sabri, Zhenya Liu, and Yaosong Zhan. 2022. Customer relationships, corporate social responsibility, and stock price reaction: Lessons from China during health crisis times. *Finance Research Letters* 47: 102699. [CrossRef]
Breusch, Trevor Stanley, and Adrian Rodney Pagan. 1979. A simple test for heteroscedasticity and random coefficient variation. *Econometrica: Journal of the Econometric Society* 47: 1287–94. [CrossRef]
Choudhury, Jyotirmayee, and Bishu Bhusan Mishra. 2010. Theoretical and empirical investigation of impact of developmental HR configuration on human capital management. *International Business Research* 3: 181. [CrossRef]
Dae-Bong, Kwon. 2009. Human Capital and It's Measurement. Paper presented at the 3rd OECD World Forum on "Statistics, Knowledge and Policy" Charting Progress, Building Visions, Improving Life, Busan, Korea, October 27–30; pp. 27–30.
Davidson, Russell, and James Gordon MacKinnon. 1993. *Estimation and Inference in Econometrics*. New York: Oxford University Press, vol. 63.
Deneulin, Severine, and Lila Shahani. 2009. *An Introduction to the Human Development and Capability Approach: Freedom and Agency*. Ottawa: International Development Research Centre.
Devi, Sunitha, Ni Made Sindy Warasniasih, Putu Riesty Masdiantini, and Lucy Sri Musmini. 2020. The impact of COVID-19 pandemic on the financial performance of firms on the Indonesia stock exchange. *Journal of Economics, Business, & Accountancy Ventura* 23: 226–42.
Drukker, David M. 2003. Testing for serial correlation in linear panel-data models. *The Stata Journal* 3: 168–77. [CrossRef]
Esthi, Raniasari Bimanti. 2021. Effect of Compensation, Work Environment and Communication on Employee Performance in ud. Djaya listrik and Material. *Forum Ekonomi* 23: 145–54.
Gao, Xin, Juqin Shen, Weijun He, Fuhua Sun, Zhaofang Zhang, Weijian Guo, Xin Zhang, and Yang Kong. 2019. An evolutionary game analysis of governments' decision-making behaviors and factors influencing watershed ecological compensation in China. *Journal of Environmental Management* 251: 109592. [CrossRef] [PubMed]
Garcia-Zamor, Jean-Claude. 2014. The Role of Cultural Promotion As an Integral Component of Leipzig's Urban Development. In *Strategies for Urban Development in Leipzig, Germany*. Leipzig: Springer, pp. 25–36.
Girdwichai, Luedech, and Chutikarn Sriviboon. 2020. Employee motivation and performance: Do the work environment and the training matter? *Journal of Security & Sustainability Issues* 9: 42–54.
Green, Donald Philip, and Lynn Vavreck. 2008. Analysis of cluster-randomized experiments: A comparison of alternative estimation approaches. *Political Analysis* 16: 138–52. [CrossRef]
Guo, Jonathan, Junzheng Wang, Jingchun Zhang, Joseph Fortunak, and Andrew Hill. 2022. Current prices versus minimum costs of production for CFTR modulators. *Journal of Cystic Fibrosis* 21: 866–72. [CrossRef] [PubMed]
Hewa-Wellalage, Nirosha, Sabri Boubaker, Ahmed Imran Hunjra, and Peter Verhoeven. 2022. The gender gap in access to finance: Evidence from the COVID-19 pandemic. *Finance Research Letters* 46: 102329. [CrossRef]
Hoang, Trung, and Ngoc Chu. 2013. *Statistics Applied in Socio-Economic Research*. Hanoi: Statistical Publishing House.
Hung, Li-Mei, Yueh-Shian Lee, and De-Chih Lee. 2018a. The moderating effects of salary satisfaction and working pressure on the organizational climate, organizational commitment to turnover intention. *International Journal of Business and Society* 19: 103–16.
Hung, Wei-Hsi, Tzu-Hao Wang, Yu-Hao Chen, and Mei-Fang Wu. 2018b. Aligning Organizational Critical Activities and Information Technology Capabilities with Organizational Performance. Paper presented at the 2nd International Conference on Business and Information Management, Barcelona, Spain, September 20–22.
Ichsan, Reza Nurul, Sudirman Suparmin, Mohammad Yusuf, Rifki Ismal, and Saleh Sitompul. 2021. Determinant of Sharia Bank's Financial Performance during the COVID-19 Pandemic. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)* 4: 298–309. [CrossRef]
Khan, Raja Abdul Ghafoor, Furqan Ahmad Khan, and Muhammad Aslam Khan. 2011. Impact of training and development on organizational performance. *Global Journal of Management and Business Research* 11: 63–68.
Koenker, Roger. 1981. A note on studentizing a test for heteroscedasticity. *Journal of Econometrics* 17: 107–12. [CrossRef]
Kretchy, Irene, Michelle Asiedu-Danso, and James-Paul Kretchy. 2021. Medication management and adherence during the COVID-19 pandemic: Perspectives and experiences from low-and middle-income countries. *Research in Social and Administrative Pharmacy* 17: 2023–26. [CrossRef] [PubMed]

Kurnia, Sherah, Tanya Linden, and Gang Huang. 2019. A hermeneutic analysis of critical success factors for Enterprise Systems implementation by SMEs. *Enterprise Information Systems* 13: 1195–216. [CrossRef]
López-Toro, Alberto Antonio, Eva María Sánchez-Teba, María Dolores Benítez-Márquez, and Mercedes Rodríguez-Fernández. 2021. Influence of ESGC indicators on financial performance of listed pharmaceutical companies. *International Journal of Environmental Research and Public Health* 18: 4556. [CrossRef]
Manju, Nair, and Beulah Suresh. 2011. Training Design Interventions and Implications for the Productivity Effectiveness. *Synergy (0973-8819)* 9: 52–68.
Marimuthu, Maran, Lawrence Arokiasamy, and Maimunah Ismail. 2009. Human capital development and its impact on firm performance: Evidence from developmental economics. *Journal of International Social Research* 8: 2–8.
Molloy, Janice, and Jay Bryan Barney. 2015. Who captures the value created with human capital? A market-based view. *Academy of Management Perspectives* 29: 309–25. [CrossRef]
Niu, Jing, Siping Zhang, Shaodong Liu, Huijuan Ma, Jing Chen, Qian Shen, Changwei Ge, Xiaomeng Zhang, Chaoyou Pang, and Xinhua Zhao. 2018. The compensation effects of physiology and yield in cotton after drought stress. *Journal of Plant Physiology* 224: 30–48. [CrossRef] [PubMed]
Odhon'g, Emily Atieno, and Jacob Omolo. 2015. Effect of human capital investment on organizational performance of pharmaceutical companies in Kenya. *Global Journal of Human Resource Management* 3: 1–29.
Odhong, Emily Atieno, and Susan Were. 2013. Human Capital Management as a Tool for Value Creation. Paper presented at the First SHRD Annual Research Conference, Nairobi, Kenya, September 12–13.
Pignarre, Philippe. 2004. Peut-on enrayer le déclin de l'industrie pharmaceutique? *Diplomatie* 10: 74–81.
Rababah, Abedalqader, Lara Al-Haddad, Muhammad Safdar Sial, Zheng Chunmei, and Jacob Cherian. 2020. Analyzing the effects of COVID-19 pandemic on the financial performance of Chinese listed companies. *Journal of Public Affairs* 20: e2440.
Roodman, David. 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal* 9: 86–136. [CrossRef]
Safuan, Safuan, and Tedi Kurnia. 2021. Literature review of pandemic Covid 19 effects on employee compensation. *Journal of Business and Management Review* 2: 57–64. [CrossRef]
Salama, Feras M., and Karl Putnam. 2013. The impact of corporate governance on the financial outcomes of global diversification. *The International Journal of Accounting* 48: 364–89. [CrossRef]
Sarkees, Matthew E., M. Paula Fitzgerald, and Cait Lamberton. 2021. The pandemic ripple effect: Understanding marketing and public policy opportunities in the pharmaceutical industry. *Journal of Public Policy & Marketing* 40: 103–4.
Schultz, Theodore William. 1961. Investment in human capital. *The American Economic Review* 51: 1–17.
Schultz, Theodore William. 1993. The economic importance of human capital in modernization. *Education Economics* 1: 13–19. [CrossRef]
Shokohifard, Sara, Najmeh Hamid, and Mansour Soodani. 2017. The effect of hardiness training on quality of life of teacher training female students. *Knowledge and Research in Applied Psychology* 14: 14–25.
Umer, Mehvish, and Sohnia Salman. 2018. Effect of Organizational Politics on Job Commitment Leading to Job Performance: Evidence from Private Banking Sector in Lahore. *Journal of Organisational Studies and Innovation* 5: 14–31.
Van Voorhis, C. R. Wilson, and Betsy L. Morgan. 2007. Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods for Psychology* 3: 43–50. [CrossRef]
Wooldridge, Jeffrey Marc. 2002. Inverse probability weighted M-estimators for sample selection, attrition, and stratification. *Portuguese Economic Journal* 1: 117–39. [CrossRef]
Yan, Wenli, and Margaret F. Sloan. 2016. The impact of employee compensation and financial performance on nonprofit organization donations. *The American Review of Public Administration* 46: 243–58. [CrossRef]
Zhang, Xiao-Bing, Tran Phuong Duc, Eugene Burgos Mutuc, and Fu-Sheng Tsai. 2021. Intellectual capital and financial performance: Comparison with financial and Pharmaceutical Industries in Vietnam. *Frontiers in Psychology* 12: 595615. [CrossRef]
Zhu, Linnan, Penghui Yang, Yingze Zhao, Zhenkun Zhuang, Zhifeng Wang, Rui Song, Jie Zhang, Chuanyu Liu, Qianqian Gao, Qumio Xu, and et al. 2020. Single-cell sequencing of peripheral mononuclear cells reveals distinct immune response landscapes of COVID-19 and influenza patients. *Immunity* 53: 685–96.e3. [CrossRef]