systems

MDPI

Article

Does Innovation Create Employment Indirectly through the Improvement Generated in the Company's Economic and Financial Results?

Antonio Fernández-Portillo [1,*], Nuria Ramos-Vecino [1], María Calzado-Barbero [1] and Rafael Robina-Ramírez [2]

[1] Department of Financial Economics and Accounting, Faculty of Business, Finance and Tourism, Universidad de Extremadura, Avd. De la Universidad S/n, 10001 Cáceres, Spain; nuriarv@unex.es (N.R.-V.); mcalzadob@unex.es (M.C.-B.)
[2] Department of Business Management and Sociology, Faculty of Business, Finance and Tourism, Universidad de Extremadura, Avd. De la Universidad S/n, 10001 Cáceres, Spain; rrobina@unex.es
* Correspondence: antoniofp@unex.es

Abstract: Innovation has traditionally been related to unemployment because people are replaced by machines. By analyzing the different approaches in the literature, we focused on the relationship between innovation and employment with the aim of exploring whether the most innovative companies create more employment, or hope to create it, taking into account the company performance. For this purpose, we performed multivariate analysis, using the partials least squares (PLS) technique, to study the direct and indirect relationship between business innovation and employment through the economic and financial performance of the company, focusing on Spanish companies in the year 2022. The results obtained show that innovation has a positive effect on employment and on the performance of the company, and thus on the creation of employment. In conclusion, the administration should encourage business innovation to improve employment rates and company performance.

Keywords: innovation; employment; unemployment; business performance; SmartPLS

Citation: Fernández-Portillo, A.; Ramos-Vecino, N.; Calzado-Barbero, M.; Robina-Ramírez, R. Does Innovation Create Employment Indirectly through the Improvement Generated in the Company's Economic and Financial Results? *Systems* **2023**, *11*, 381. https://doi.org/10.3390/systems11080381

Academic Editors: Francisco J. G. Silva, Luís Pinto Ferreira, José Carlos Sá and Maria Teresa Pereira

Received: 16 June 2023
Revised: 23 July 2023
Accepted: 24 July 2023
Published: 26 July 2023

1. Introduction

Traditionally, innovation has been associated with significant employment shifts [1]. However, this link primarily emerges when innovations pertain to unskilled labor, as postulated in the literature [2].

Innovation is pivotal for businesses. To ensure their survival, businesses must consistently rejuvenate their practices to keep pace with the market trends and evolving consumer needs. By doing so, they also contribute to the economic growth, employment, and development of their respective countries [3,4].

In the current landscape, the [5] Oslo Manual's perspective (2005) warrants attention. It stresses the significance of domestic firms collaborating with companies or universities internationally, leading to the global expansion of markets. A pivotal element of this collaborative approach is innovation, largely fostered by the Internet's evolution, which facilitates efficient global connectivity between buyers and sellers [6].

The competitive scenario presents considerable challenges to small- and medium-sized enterprises (SMEs) that are pitted against large multinationals. To overcome these challenges, SMEs must enhance their specialization, efficiency, and innovation capacity [7]. Here, a key competitive advantage can be derived from a well-qualified workforce, enabling organizations to achieve their objectives more effectively and with less risk.

Innovation induces intriguing changes that warrant exploration. It is progressively becoming an economic catalyst in today's globalized world. It provides businesses with novel opportunities to compete more effectively by reshaping their workforce strategy via recruiting new talent, retaining existing employees, or redeploying them into new roles, all without the necessity of eliminating one job to create another [2].

Several studies have demonstrated that technological innovation offers dual benefits to a company. First, it enhances their performance, and second, it helps maintain the novelty of products or services in the market, making them harder to replicate [8,9] Various researchers have also explored the relationship between innovation and employment, yielding diverse and often asymmetric outcomes [2,10].

It is generally accepted that job creation in a company hinges on numerous factors, one of which could be innovation. However, economic theories do not explicitly elucidate the impact of innovation on employment [6] Nevertheless, several studies have confirmed that product innovation can bolster employment rates [10–12] as it may boost sales and market share, thereby fostering both economic growth and an increase in job creation within companies. However, it is essential to recognize that innovation is not the sole factor influencing these outcomes.

We identified a gap in the prior research, as it often overlooks company performance, which is crucial for smooth operations and subsequently impacts employment generation or destruction. Moreover, it has been established on numerous occasions that innovation enhances business performance [13,14]. Consequently, it is essential to scrutinize whether the positive impact on job creation is a direct consequence of a company's innovation or perhaps an indirect effect brought about by their improved performance. This latter factor might be the actual driving force behind job creation, instigated by company growth and enhanced outcomes.

Consequently, we are prompted to pose the following question, which forms the basis of our research: Does innovation indirectly stimulate employment through improvements in a firm's economic and financial performance?

In response to this question, our study aims to ascertain whether the most innovative companies indirectly foster job creation via improved business performance.

To fulfil this objective, we plan to execute this study and apply our theoretical model to Spanish firms. One of the key contributions of our work will be to discern whether innovation indirectly influences job creation through the enhancement of a firm's economic and financial performance. This approach contrasts with previous research that studied the direct effects of innovation on employment. Thus, our investigation offers a novel contribution to the literature.

In practical terms, our study's insights will empower companies with similar characteristics to expand their workforce, fostering job generation in various regions through innovation and subsequently improving their performance.

Our theoretical model will strive to illustrate whether innovation indirectly contributes to job creation by enhancing a firm's economic and financial results, as opposed to the direct linkage studied in the previous research.

Our findings will offer valuable indications and recommendations for policymakers, society, and researchers, promoting a greater appreciation of the positive impact of innovation and its consideration in job creation policies.

The structure of our research is designed to meet the proposed objectives and consists of five parts. First, we will elaborate on the theoretical underpinnings that form the foundation of our research. Second, empirical analysis will be conducted. Third, we will present the obtained results. Fourth, we will discuss these results. Finally, we will draw conclusions, acknowledging the limitations encountered in our study, and propose future research avenues.

2. Theoretical Framework

Those companies or organizations that have engaged in supporting the introduction of innovation in some aspect of their activity increase their advantages and opportunities in the market; thus, the introduction of innovation has become a way to grow in social and economic terms and to improve the welfare of the society [13,14].

Regarding scientific research, the relationship between innovation and employment is something that, in economic terms, has been an important line of study for years and has

garnered different results [13–16]. As early as 1776, Adam Smith claimed that the invention of specific machinery was a factor that affects the division of labor by providing an increase in productive capabilities [17].

We can consider that the first definition of the word innovation was given by [18] Schumpeter (1942), although he did not refer to it as such, but referred, in a general way, to the change that takes place in the market after introducing a new good, a new way of marketing a new product, a new market that opens in a specific territory, or new production methods. However, over the years, the term innovation has been defined by many other authors.

Ref. [19] Peter Drucker (1985) states in his book Innovation and the Innovative Entrepreneur that for innovative entrepreneurs, innovation is a specific tool, and that it is the means by which a change in a business is exploited and turns what is different into an opportunity.

Ref. [20] Damanpour (1996) focused on a specific part of innovation—that is, on ideas—proposing that innovation is an adoption of a new idea for the organization that manages to implement it. This definition may not be accepted by everybody as until new procedures, products, or services that are based on these ideas are implemented and are established in the market with a successful application, this cannot be defined as innovation.

But the definitions given by other authors can also be taken as reference, such as [21] Lumpkin and Dess (1996), who mentioned that innovation reflects the tendency of an organization to support new, innovative, experienced, and creative ideas that may result in new products, services, or technological processes.

According to the Ref. [22] Oslo Manual (1997), the definition of innovation is to use the knowledge available, or to generate it if it is not available, in order to create new products, services, or processes for the company, or to improve existing ones, that will be successful in the market. This definition, as we can see, considers that innovation does not necessarily have to be new for the market, as long as it results in a benefit; if it is not beneficial, it is not considered an innovation. Subsequently, the Oslo Manual (2005) [5] updates the definition by including instances when there is a new method of organization for the company or a new form of external relations.

In general, although the concept in question may seem new, it can be traced back to the first half of the twentieth century, when it was defined by [18] Schumpeter (1942) as the productive use of an invention.

Based on the definitions listed above, we consider that innovation is everything that is novel and perceptible, both for the company or organization that produces it, as well as for the consumer or the market—either of the product or the service—of the organization or production process; in short, innovation is any change that is based on knowledge and that generates value for the company, having successfully entered the market to reduce competition and gain market shares.

With the last point of our definition, we can see the close relationship between novelty and the satisfaction of a social need, and also between innovation and competitiveness.

In our case, due to our aim of analyzing the impact on the creation or destruction of employment by companies, we must bear in mind that innovation plays an increasingly important role because if competitors innovate and offer the market new products, customers will demand these developments, so it is necessary to meet those needs and stay at the forefront to have economic solvency and, thus, have more capability to establish other new improvements and obtain the relevant results and benefits [7,10].

In addition, for a company to be innovative, the main innovation capital is the staff that work in the company, who have to be motivated in order to show their initiative, their creativity, their skills, and their capabilities. Furthermore, it is essential to train staff so that they can develop their skills within the company and to focus them towards a common goal, letting their ideas flow, allowing them to do new things, and in conclusion, to innovate [10].

Innovation, Business Performance, and Employment

Views on the relationship between innovation and employment remain highly diverse, with some asserting that innovation and new technologies often lead to job losses. For instance, Ref. [23] Frey and Osborne (2017) forecast that 47% of jobs in the United States (US) could be displaced by machines within the next two decades. However, it is also important to note that many contemporary roles did not exist two centuries ago.

Ref. [1] highlight the historical shifts in labor: in 1800, approximately 90% of Americans were employed in agriculture, dropping to 41% in 1900, and further to 2% in 2000. As workers migrated away from agriculture, new jobs were created in emerging sectors.

It is evident that over time, novel innovations have displaced many jobs, even in fields traditionally associated with human labor, such as driving. Many manufacturers have now developed autonomous vehicles [1]. This heralds the onset of a new industrial revolution that will reshape not only the economic and productive models, but also the nature of human labor.

At the same time, we must not overlook the job opportunities created by innovation and technology. For instance, Ref. [24] Aemoglu and Restrepo (2020) concluded from their study on the impact of industrial robots on US employment that despite long-term concerns, industrial robots could potentially yield compensatory employment gains in other sectors. Online platforms like eBay and Amazon have created hundreds of direct and indirect jobs by connecting sellers and buyers globally. Sites like LinkedIn list jobs such as cloud service specialists or digital marketing specialists—roles that did not exist a decade ago. Moreover, the ICT sector continues to generate a substantial number of job opportunities [6].

As we observe the evolution of work, machines are replacing jobs that once required human labor, but there are also new roles designed for human–machine collaboration.

This dynamic lends credence to another model that investigates the impact of innovation on employment through the lens of two types of innovation: product and process innovations [6,13,16]. These two types of innovation create a displacement effect on employment, thus elucidating the "compensation theory" [6,10,13]. In addition, studies like those conducted by Ref. [25] Cachón, Blanco, Prado, and Del Castillo (2022) have found that employees' social capital promotes greater participation in the organization and not only aids job creation, but also job retention.

Hence, the displacement effect could be offset by the indirect effects of innovation, such as an increase in income stemming from a rise in demand and prices [6] These effects lead to an improved economic performance, which in turn facilitates job creation. Also, the magnitude of employment and sales growth depends on the elasticity of demand triggered by price changes, while the extent to which productivity gains are reflected in benefits or wages, as opposed to prices, affects the compensatory effect.

In alignment with our research trajectory, Ref. [10] Baffour et al. (2020) concluded that changes in job quantity and quality are contingent on the company's chosen innovation strategy, and how this strategy and absorptive capacity influence the employment dynamics is associated with innovation.

Corroborating our thesis, Ref. [16] Harrison et al. (2014) found that while process innovations may displace employment in the industry, this effect is counterbalanced by the compensatory impact of product innovations.

Ref. [10] Baffour et al. (2020) also posit a clear positive effect of product innovations on employment and suggest that firms that innovate in their processes typically transfer their profits to their prices, thereby offsetting the displacement effect on employment through an expansionary effect. Consequently, they assert that process innovations do not lead to job losses, while product innovations drive employment growth due to the increased sales of new products. This is the hypothesis we aim to investigate.

A study conducted by Ref. [26] Aubert-Tarby et al. (2018) provides valuable insight. Their research demonstrates how the advent and subsequent evolution of the Internet led to significant job losses in the 1990s; however, with the digitization of the newspaper

industry, more jobs were created, albeit with temporary contracts, offering a compelling example of the compensatory effect.

As authors such as [27] Edquist, Hommen, and McKelvey (2001) said, not all economic growth has an impact on job creation, nor do all increases in productivity come from job destruction. From the above, we propose the following hypotheses:

H1. *Business innovation has an indirect and positive influence on the employment generated by the company.*

H2. *Business innovation has a direct and positive influence on the employment generated by the company.*

After reviewing the literature related to this study and listing those previous theories or models, we propose a new conceptual model based on this research topic. Next, in Figure 1, we can see the conceptual model obtained from the theoretical study, where the variables that compose it will be defined.

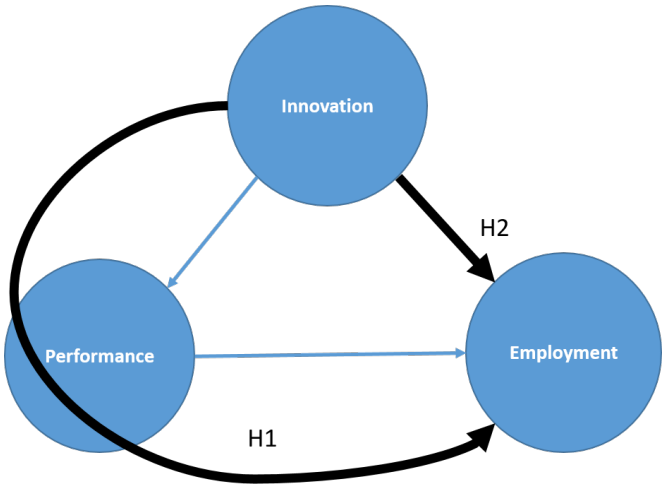

Figure 1. Conceptual model. Source: Own elaboration.

3. Empirical Framework

3.1. Design of the Field Study

To begin with, we must indicate that we have conducted a microeconomic study, where our unit of study is Spanish companies, which enables us to delimit a homogeneous space regarding their geographic, cultural, legal, political, and sociological scope, all in order to reduce the influence of uncontrollable variables [28].

Once the target population was located, we had to find an efficient and viable way to reach these companies. To do so, taking advantage of the fact that we needed reliable economic data from the companies, the target population was biased and aimed at commercial companies due to their obligation to present their economic and financial accounts annually in the mercantile registry. This obligation allowed us to obtain the official (not estimated) data on the economic and financial performance of the companies included in the registry. To access these data, we used the SABI database, in which we found the data of all the commercial companies in Spain. The sample data can be seen in Table 1.

Table 1. Population and sample data.

Active Companies		Sample Significance	
Sample	**Population (SABI)**	**Confidence Level**	**Error**
120	805,588	95%	8.95

Source: own elaboration.

The fieldwork we conducted by email and phone took place in December 2022. Once we input the survey data in Excel, the data were cross-referenced with the SABI data using the Tax Identification Code, which is a unique code for each company.

In relation to the collected data, we must mention that we prepared a brief questionnaire based on questions used in previous investigations, as seen below.

3.1.1. Number of Workers

To quantify the workforce size, we incorporated the data from the SABI database and consulted with the business owners to mitigate potential discrepancies. Several studies have utilized different metrics to measure firm size. Ref. [29] Zhu et al. (2006) and Ref. [30] Teo (2007), for instance, employed the total number of company employees as an indicator. In contrast, Ref. [31] Chen et al. (2016) used the natural logarithm of the employee count.

In light of these practices, we adopted three measures to gauge the number of employees: the count as provided by the business owners, the count as recorded by the SABI, and the natural logarithm of the employee number as reported by the business. These measurements were adopted in line with recommendations from the existing literature.

3.1.2. Innovation

Innovation can be measured in different ways, based on three fundamental blocks [9,32,33]: the level of novelty of the products or services, the competition that the company has in its target market, and the age of the technology used by the company. In addition to this, following [29] Zhu et al. (2006) and [34] Vilaseca, Torrent, Meseguer, and Rodríguez (2007), we analyzed the items (see Table 2).

Table 2. Questions that make up the innovation level of the company.

Survey Question	Scale
What is the market share of your company?	1–20% 21–40% 41–60% 61–80% 81–100%
Has your company's market share increased, decreased, or remained the same in the last 12 months?	1 to 5-point Likert
How many companies offer the same products or services to their customers?	76–100% 51–75% 26–50% 1–25% 0%
How old is your company's technology?	over 5 years between 1 and 5 years less than a year
Has any new or substantially improved product or service been launched in your company in the last 12 months?	1 to 5-point Likert
Has your company introduced new internal or significantly improved processes in the last 12 months—for example, for the production or provision of goods and services?	1 to 5-point Likert
How many employees are mainly engaged in research and development in your company?	0% 1–25% 26–50% 51–75% 76–100%

Source: own elaboration based on [6,9,32] (Fernández-Portillo et al., 2015; Fernández-Portillo et al., 2018; Fuentelsaz and Montero, 2015).

3.1.3. Indicators to Measure the Performance of New Companies

Objective measures for evaluating performance, such as financial and economic indicators including cash flow, profit, and sales revenue, offer a quantitative assessment. Ref. [35]

Brush and Vanderwerf (1992) identified over 35 distinct objective markers for assessing business success, with similar indicators being used in studies like that of [36] Barbu and Militaru (2019).

Ref. [37] Chandler and Jansen (1992) demonstrated that objective measures (e.g., growth and turnover) generally provide superior relevance, availability, internal consistency, realism, and validity compared to subjective ones.

However, assessing a company's performance can be challenging due to its unique circumstances. Ref. [37] Chandler and Jansen (1992) acknowledged the specific difficulties in measuring the performance of new companies as they lack historical data and often experience minimal profits in their initial operational years. Additionally, the accuracy of the data poses another challenge for researchers [38].

In response to these concerns, our study utilizes the official data submitted to the state by the participating companies. This method enabled us to access the companies' reported financial statements, including their operational income, ordinary pre-tax profit, end-of-year financial results, and equity.

3.2. Multivariate Analysis

To perform this analysis, multivariate analysis based on the variance with the *partial least squares* (PLS) technique and on structural equations was developed.

In addition, coinciding with [39] Fernández-Portillo, Almodóvar-González, and Hernández-Mogollón (2020), we consider that the appropriate statistical technique for the study is structural modelling, and that it will also be analyzed through an analysis of the minimum least squares or PLS.

4. Results

Next, we show the results obtained from the analysis of the data used in this investigation. Table 3 shows the descriptive data of the indicators used in our study.

Table 3. Average rating of the questions that make up the study.

Variable	Scale	Average
No. employees variation	1–5	3.33
Ln (no. workers)		3.69
Last no. employees		74.09
Market share	1–5	1.63
Market share variation	1–5	3.20
Level of competition	1–5	3.12
Age of technology	1–3	1.69
Product innovation	1–5	3.46
Process innovation	1–5	3.32
Operational income K€ last year		14,599.33 €
Ordinary profit before tax K€		556.56 €
Results for the financial year K€		355.20 €
Equity K€		5636.34 €

4.1. Model Analysis

The PLS technique first requires analyzing the adjustment of the proposed model, then the measurement instrument, and after that, the proposed structural model, where we will test the hypotheses. Later, we will study the predictive effect of the proposed model, and finally, we will perform an analysis of the performance of the different indicators used in our study.

4.1.1. Model Adjustment Analysis

First, we will validate the global model through the FIT model and the use of the indicators proposed by [40] Williams, Vandeberg, and Edwars (2009, p. 585), which requires the standardized root mean square residual (SRMR) to be lower than 0.08 of the results of the saturated model; as shown in Table 4, our model fulfils this. In addition, following the recommendations of [41] Henseler, Hubona, and Ray (2016), the original sample for the SRMR, d_ULS, and d_G must be lower than the values of 95% or 99%, as in our case, so we can say that the model is valid (see Table 4).

Table 4. Validation of the global model.

Saturated Model	Original Sample	95%	99%
SRMR	0.067	0.085	0.099
d_ULS	0.408	0.663	0.897
d_G	0.267	0.780	1.283

4.1.2. Evaluation of the Measurement Model

Once we have tested the validity of the model in relation to the sample, we proceed to evaluate the indicators that we use to measure the latent variables, following the limitations shown in Table 5; in order to do this, we first evaluate the constructs in Mode A, according to the steps marked by the PLS technique, listed below:

(1) Individual item reliability.
(2) Reliability of the construct of the scale or internal consistency.
(3) Convergent validity.
(4) Discriminant validity.

Table 5. Justification of parametric values.

Analysis	Parameter	Values Higher Than	Justification
Individual reliability	Loadings	0.4	Hair et al. (2014) [42]
Construct reliability	Cronbach's Alpha	0.7	Nunnally and Bernstein (1994) [43]
	rho_A	0.7	Dijkstra and Henseler (2015) [44]
	Composite Reliability	0.7	Nunnally and Bernstein (1994) [43]
Convergent validity	Average variance extracted	0.5	Fornell and Larcker (1981) [45]
Discriminant validity	Compares the average variance extracted with the correlations between constructs	Average variance extracted > Correlations	Barclay et al. (1995); Henseler et al. (2009); Hair et al. (2011) [46–48]
	Heterotrait-monotrait (HTMT) Ratio	<0.85	Henseler et al. (2015; 2016) [41,49]

The following results are highlighted from the previous ones in Tables 6 and 7 to validate the constructs in Mode A.

Table 6. Construct reliability and validity.

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
Econ. and Fin. Perf.	0.810	0.812	0.874	0.635
Employment	0.831	0.900	0.894	0.739
Innovation	0.720	0.878	0.821	0.607

Table 7. HTMT.

	Econ. and Fin. Perf.	Employment
Econ. and Fin. Perf.		
Employment	0.724	
Innovation	0.324	0.469

To finish the analysis, we can see the refined model remains, as shown in Figure 2.

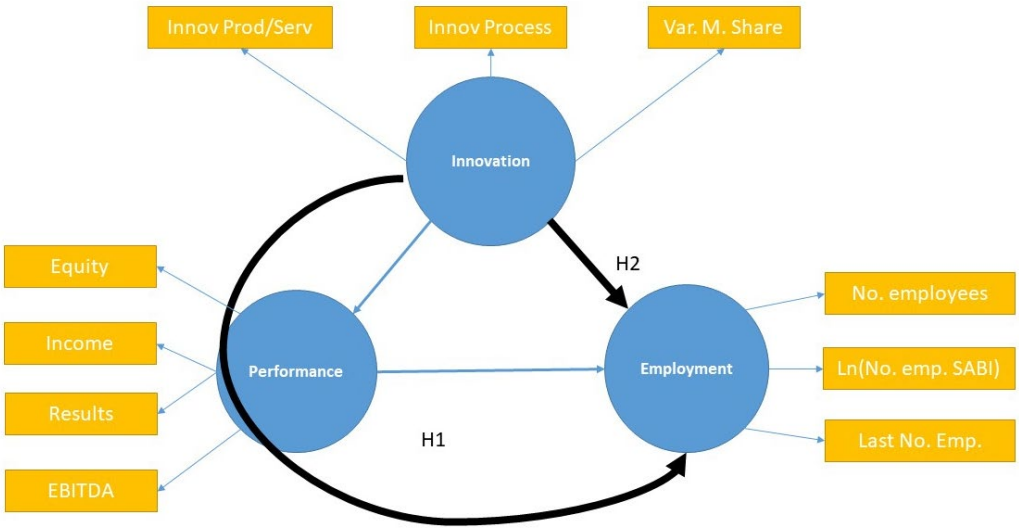

Figure 2. Model remains.

Next, we perform the analysis of the structural model in order to perform the hypothesis contrast of our theoretical model.

4.2. Analysis of the Structural Model

In the first step, we must evaluate the "path coefficient" of the relationships; for them to be accepted, if they are positively proposed, the value of the path must have the same sign, the confidence interval cannot contain the value zero, and the T-Student statistic must be significant for the one-tailed test. In the event that one of these conditions is not fulfilled, the hypothesis will be invalidated.

Once the hypotheses are tested (see Table 8), we must emphasize that all the hypotheses proposed are accepted with the highest level of significance, and also Hypothesis 1, which refers to the indirect effect of *Innovation* on *Employment* through *Economic and Financial Performance*, obtains the greatest value for the t statistic.

Table 8. Hypothesis testing.

	Original Sample	T Statistics	P Values	5.0%	95.0%
Innov → Econ. and Fin. Perf.	0.290	3.449	0.001	0.034	0.413
Econ. and Fin. Perf. → Employment	0.590	4.866	0.000	0.280	0.758
H1 Indirect Effect Innov→ Employment	**0.171**	**133.242**	**0.000**	**0.055**	**0.298**
H2 Direct Effect Innov→ Employment	**0.248**	**3.449**	**0.008**	**0.069**	**0.421**

Next, we analyze the explained variance of the latent dependent variables (R^2), here following [50] Falk and Miller (1992); the minimum value required is 0.1, and as we can see in Table 9, this requirement is fulfilled. Regarding the predictive relevance of the model, following [42] Hair et al. (2014), we require values greater than 0 of Q^2, and for this, we

apply the "blindfolding" algorithm. In this case, we can see that the two endogenous constructs obtain a positive value; therefore, the model has a predictive nature. Despite the performance yielding an R-squared value of less than 0.1, this is understandable, given that business performance is influenced by numerous variables not included in our model. The omission is intentional, as these additional variables do not align with the objectives of our study. In addition, as shown in our study, the construct with the greatest explained variance is the *Employment* construct, with 49.4% coming mostly from *Innovation*. In fact, it directly provides 10.39% of the explained variance, and indirectly through the improvement that *Innovation* contributes to *Performance*, and this in turn to *Employment*; the explained variance amounts to 40.8%.

Table 9. Evaluation of the level of R^2, Q^2, explained variance in the model.

Relationship	R^2	Q^2	Path	Correlation	Explained Variance
Innovation → Performance			0.290	0.290	8.41%
Performance	**0.084**	**0.026**			
Performance → Employment			0.590	0.662	39.06%
H2. Direct Effect Innovation→ Employment			**0.248**	**0.419**	**10.39%**
Employment	**0.494**	**0.272**			
H1. Indirect Effect Innov→ Employment			**0.171**		**40.80%**

In addition, at this point, according to [42] Hair et al. (2014, p. 225), we must mention that there is a complementary partial mediation because all the relationships involved are significant and also positive.

Finally, we conducted an Importance-Performance Matrix Analysis (IPMA) in order to measure the performance of each of the indicators used in relation to the *Employment* construct (see Table 10).

Table 10. Performance of employment indicators.

Indicator	Employment Performance
Innovation—New Products or services last year	**61.458**
Innovation—New Processes in the last year	**57.990**
Innovation—Market share variation in the last year	**54.897**
Performance—Result of the last financial year in billion EUR	**57.954**
Performance—Ordinary result before Tax last year thousand EUR	**50.070**
Performance—Equity in thousands EUR in the last year	8.104
Performance—Operating income in thousands EUR in the last year	7.153

The obtained results are discussed below.

5. Discussion of Results

First, we will comment on the obtained results. Hypotheses 1 and 2 are accepted with the highest level of significance, in line with what is stated by [10] (Baffour, 2020), and Hypothesis 1 obtains the highest t statistic value.

Thus, we must highlight the strong role of reduced competition, the creation of new processes, the results of the last financial year, and the increase in market share in the effect on job creation. Therefore, coinciding with previous studies [6] an increase in the income generated by sales leads to a better economic performance of the company, and this enables the creation of employment.

As mentioned at the beginning of the investigation, we have detected that previous investigations do not take into account the performance of the company in terms of innovation, when performance is essential for the company to function correctly and,

therefore, can create or destroy employment [13,14] (Our results are contrary to these as we have shown that an increase in the income generated by sales leads to a better economic performance of the company, and this makes job creation possible.

In the case of process innovations, this is one of the indicators with the highest performance, to vary *Employment*, which is contrary to what was announced by [16] who indicates that process innovations have less influence on job creation. Perhaps the results may come from the improvement of the processes, which improves the efficiency of the company, and this serves to achieve better positioning in the market, and this can help improve the company's results and in turn increase the number of recruitments. This is a point that would require further study in future research.

On the other hand, it should be noted that the variance explained by the model is moderate, as it reaches 49.4% [51]. This indicates that one part of the generated employment depends on the performance of the company as the company's performance represents 39.6% of the explained variance of employment. However, in this regard, we must highlight that 40.8% of the employment variance comes from the indirect effect of innovation through the performance of the company. This result is very important as, to a great extent, it allows us to respond to and justify the study as it coincides with the initial postulation that there is a mediating and positive effect on employment.

These results encourage the continuing support for an economy based on innovation, not only to improve its competitiveness, but also to improve job creation. In this vein, we must take into account that economies based on innovation are also economies that have lower unemployment rates, according to the World Bank data.

6. Conclusions

In considering the relationship between innovation and employment, some scholars argue that innovation could positively influence job creation, although this would be contingent on a range of factors [52]. Meanwhile, other authors, such as [53] Bessen (2019), suggest that technological innovation can facilitate the creation of new jobs. Despite differing perspectives, the evidence indicates that innovation significantly influences job creation and plays a critical role in enhancing a company's performance. Consequently, we posit that innovation not only contributes to a potential "compensation effect", but also creates more jobs than it eliminates.

Addressing the competitive challenges that small- and medium-sized enterprises (SMEs) face when competing with multinational corporations, the literature suggests that they can enhance their competitive position by increasing their specialization, efficiency, level of innovation, and highly-skilled human capital.

The findings of this study carry significant implications for organizational managers, as they illustrate how the relationships between model variables exert different impacts. Consequently, managers should devise strategies to foster innovation across their business ecosystems. Promoting innovation is essential not only because it contributes to job creation, but also because it enables companies to remain viable in a fiercely competitive, globalized economy. Furthermore, innovation can help to improve business outcomes and enhance the welfare state.

As for the limitations found, it is possible that we have not taken into account all of the publications related to the research topic. However, the collected studies clearly address the situation of innovation and employment variables.

Nevertheless, as a major future line of research, we consider it necessary to investigate the proposed indicators and to be able to test and verify whether the aforementioned effect occurs in all cases in order to confirm the main causes affecting employment and business innovation, as this is a subject of great social concern. Therefore, the aim of the future research is to expand the sample in order to explain in detail the behavior of each indicator in the results.

Author Contributions: Conceptualization, A.F.-P. and R.R.-R.; methodology, A.F.-P.; software, A.F.-P.; validation, A.F.-P., N.R.-V. and M.C.-B.; formal analysis, A.F.-P.; investigation, A.F.-P. and R.-R.R.; resources, A.F.-P.; data curation, N.R.-V.; writing—original draft A.F.-P. and R.R.-R.; preparation, N.R.-V., M.C.-B., R.R.-R. and A.F.-P.; writing—review and editing, N.R.-V.; M.C.-B., R.R.-R. and A.F.-P.; visualization, A.F.-P.; supervision, A.F.-P.; project administration, A.F.-P.; funding acquisition, A.F.-P. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Junta ta de Extremadura across Consejería de Economía, Ciencia y Agenda Digital and the Fondo Europeo de Desarrollo Regional, grant number IB20183 and The APC was funded by Fondo Europeo de Desarrollo Regional.

Data Availability Statement: Not available.

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

References

1. Brynjolfsson, E.; McAfee, A. *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies*; WW Norton & Company: New York, NY, USA, 2014.
2. Ugur, M.; Mitra, A. Technology adoption and employment in less developed countries: A mixed-method systematic review. *World Dev.* **2017**, *96*, 1–18. [CrossRef]
3. Lema, R.; Rabellotti, R.; Sampath, P.G. Innovation trajectories in developing countries: Co-evolution of Global Value Chains and innovation systems. *Eur. J. Dev. Res.* **2018**, *30*, 345–363. [CrossRef]
4. ONU. World Summit Outcome. 2005. Available online: http://www.un.org/womenwatch/ods/A-RES-60-1-E.pdf (accessed on 23 July 2022).
5. Manual de Oslo. In *Guia de la Recogida e Interpretación de Datos Sobre Innovación*, 3rd ed; Publicación conjunta de la OCDE y Eurostat; Tragsa: Madrid, Spain, 2005.
6. Fernández-Portillo, A.; Hernández-Mogollón, R.; Sánchez-Escobedo, M.C.; Pérez, J.L.C. Does the Performance of the Company Improve with the Digitalization and the Innovation? In *Annual Meeting of the European Academy of Management and Business Economics*; Springer: Cham, Switzerland, 2018; pp. 276–291.
7. Lachenmaier, S.; Rottmann, H. Effects of innovation on employment: A dynamic panel analysis. *Int. J. Ind. Organ.* **2011**, *29*, 210–220. [CrossRef]
8. Azar, G.; Ciabuschi, F. Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *Int. Bus. Rev.* **2017**, *26*, 324–336. [CrossRef]
9. Fernandez-Portillo, A.; Sánchez-Escobedo, M.C.; Jiménez-Naranjo, H.V.; Hernandez-Mogollon, R. La importancia de la Innovación en el Comercio Electrónico. *Universia Bus. Rev.* **2015**, *47*, 106–125.
10. Baffour, P.T.; Turkson, F.E.; Gyeke-Dako, A.; Oduro, A.D.; Abbey, E.N. Innovation and employment in manufacturing and service firms in Ghana. *Small Bus. Econ.* **2020**, *54*, 1153–1164. [CrossRef]
11. Ciriaci, D.; Moncada-Paternò-Castello, P.; Voigt, P. Innovation and job creation: A sustainable relation? *Eurasian Bus. Rev.* **2016**, *6*, 189–213. [CrossRef]
12. Falk, M.; Hagsten, E. Employment impacts of market novelty sales: Evidence for nine European Countries. *Eurasian Bus. Rev.* **2018**, *8*, 119–137. [CrossRef]
13. Lim, J.; Lee, K. Employment effect of innovation under different market structures: Findings from Korean manufacturing firms. *Technol. Forecast. Soc. Chang.* **2019**, *146*, 606–615. [CrossRef]
14. Tsai, Y.H.; Joe, S.W.; Ding, C.G.; Lin, C.P. Modeling technological innovation performance and its determinants: An aspect of buyer–seller social capital. *Technol. Forecast. Soc. Chang.* **2013**, *80*, 1211–1221. [CrossRef]
15. Coad, A.; Rao, R. Los efectos en el empleo a nivel de empresa de las innovaciones en las industrias manufactureras estadounidenses de alta tecnología. *J. Evol. Econ.* **2011**, *21*, 255–283. [CrossRef]
16. Harrison, R.; Jaumandreu, J.; Mairesse, J.; Peters, B. Does innovation stimulate employment? A firm-level analysis using comparable micro-data from four European countries. *Int. J. Ind. Organ.* **2014**, *35*, 29–43. [CrossRef]
17. Smith, A. *An Inquiry into the Nature and Causes of the Wealth of Nations*; Campbell, E.R., Skinner, S., Eds.; Clarendon: Oxford, UK, 1976.
18. Schumpeter, J.A. Socialism, Capitalism and Democracy. Harper and Brothers: New York, NY, USA, 1942.
19. Drucker, P. La Innovación y el Empresario Innovador. Edhasa: Barcelona, Spain, 1985.
20. Damanpour, F. *Innovation Effectiveness, Adoption and Organizational Performance*; Weat, E.M.A., Farr, J.L., Eds.; Innovation and Creativity at Work; Wiley: Hoboken, NJ, USA, 1996; pp. 125–141.
21. Lumpkin, G.; Dess, G. Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance. *Acad. Manag. Rev.* **1996**, *21*, 135–172. [CrossRef]
22. Manual de Oslo. 1997. Available online: https://www.madrid.org/bvirtual/BVCM001708.pdf (accessed on 22 July 2022).
23. Frey, C.B.; Osborne, M.A. The future of employment: How susceptible are jobs to computerisation? *Technol. Forecast. Soc. Chang.* **2017**, *114*, 254–280. [CrossRef]

24. Aemoglu, D.; Restrepo, P. Robots and jobs: Evidence from US labor markets. *J. Political Econ.* **2020**, *128*, 2188–2244. [CrossRef]
25. Cachón-Rodríguez, G.; Blanco-González, A.; Prado-Román, C.; Del-Castillo-Feito, C. How sustainable human resources management helps in the evaluation and planning of employee loyalty and retention: Can social capital make a difference? *Eval. Program Plan.* **2022**, *95*, 102171. [CrossRef] [PubMed]
26. Aubert-Tarby, C.; Escobar, O.R.; Rayna, T. The impact of technological change on employment: The case of press digitisation. *Technol. Forecast. Soc. Chang.* **2018**, *128*, 36–45. [CrossRef]
27. Edquist, C.; Hommen, L.; McKelvey, M.D. *Innovación y empleo: Innovación de proceso versus innovación de producto*; Edward Elgar: Cheltenham, UK, 2001.
28. Riquel-Ligero, F.J. Análisis Institucional de las Prácticas de Gestión Ambiental de los Campos de golf Andaluces. Ph.D. Thesis, University of Huelva, Huelva, Spain, 2010.
29. Zhu, K.; Kraemer, K.L.; Xu, S. The process of innovation assimilation by firms in different countries: A technology diffusion perspective on e-business. *Manag. Sci.* **2006**, *52*, 1557–1576. [CrossRef]
30. Teo, T.S.H. Organizational characteristics, modes of Internet adoption and their impact: A Singapore perspective. *J. Glob. Inf. Manag.* **2007**, *15*, 91–117. [CrossRef]
31. Chen, C.; Chen, Y.; Hsu, P.H.; Podolski, E.J. Be nice to your innovators: Employee treatment and corporate innovation performance. *J. Corp. Financ.* **2016**, *39*, 78–98. [CrossRef]
32. Fuentelsaz, L.; Montero, J. ¿Qué hace que algunos emprendedores sean más innovadores? *Universia Bus. Rev.* **2015**, *47*, 14–31.
33. Schott, T.; Sedaghat, M. Innovation embedded in entrepreneurs´ networks and national educational systems. *Small Bus. Econ.* **2014**, *43*, 463–476. [CrossRef]
34. Vilaseca-Requena, J.; Torrent-Sellens, J.; Meseguer-Artola, A.; Rodríguez-Ardura, I. An integrated model of the adoption and extent of e-commerce in firms. *Int. Adv. Econ. Res.* **2007**, *13*, 222–241. [CrossRef]
35. Brush, C.G.; Vanderwerf, P.A. A comparison of methods and sources for obtaining estimates of new venture performance. *J. Bus. Ventur.* **1992**, *7*, 157–170. [CrossRef]
36. Barbu, A.; Militaru, G. The Key Indicators Used to Measure the Performance of the Service Companies: A Literature Review. *Ovidius Univ. Ann. Econ. Sci. Ser.* **2019**, *19*, 355–364.
37. Chandler, G.N.; Jansen, E.J. Founders' Self Assessed Competence and Venture Performance. *J. Bus. Ventur.* **1992**, *3*, 223–236. [CrossRef]
38. Vibahakar, N.N.; Tripathi, K.K.; Johari, S.; Jha, K.N. Identification of significant financial performance indicators for the Indian construction companies. *Int. J. Constr. Manag.* **2023**, *23*, 13–23.
39. Fernández-Portillo, A.; Almodóvar-González, M.; Hernández-Mogollón, R. Impact of ICT development on economic growth. A study of OECD European union countries. *Technol. Soc.* **2020**, *63*, 101420. [CrossRef]
40. Williams, L.; Vandenberg, R.; Edwards, J. 12 structural equation modeling in management research: A guide for improved analysis. *Acad. Manag. Ann.* **2009**, *3*, 543–604. [CrossRef]
41. Henseler, J.; Hubona, G.; Ash, P. Using PLS path modeling in new technology research: Updated guidelines. *Ind. Manag. Data Syst.* **2016**, *116*, 2–20. [CrossRef]
42. Hair, J.; Sarstedt, M.; Hopkins, L.; Kuppeiwieser, V. Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research. *Eur. Bus. Rev.* **2014**, *26*, 106–121.
43. Nunnally, J.; Bernstein, I. *Psychological Theory*; MacGraw-Hill: New York, NY, USA, 1994.
44. Dijkstra, T.; Henseler, J. Consistent partial least squares path modeling. *MIS Q.* **2015**, *39*, 297–316. [CrossRef]
45. Fornell, C.; Larcker, D. Structural equation models with unobservable variables and measurement error: Algebra and Stadistics. *J. Mark. Res.* **1981**, *18*, 39–50. [CrossRef]
46. Barclay, D.; Higgins, C.; Thompson, R. The Partial Least Squares (PLS) approach to causal modeling: Personal computer adoption and use as an illustration. *Technol. Stud.* **1995**, *2*, 285–309.
47. Henseler, J.; Ringle, C.; Sinkovics, R. The use of partial least squares path modeling in international marketing. In *New Challenges to International Marketing*; Emerald Group Publishing Limited: Bingley, UK, 2009; pp. 277–319.
48. Hair, J.; Hurt, T.; Ringle, C.; Sarstedt, M. PLS-SEM: Indeed a silver bullet. *J. Mark. Theory Pract.* **2011**, *19*, 139–152. [CrossRef]
49. Henseler, J.; Ringle, C.; Sarstedt, M. A new criterion for assessing discriminant validity in variance-based structural equation modeling. *J. Acad. Mark. Sci.* **2015**, *43*, 115–135. [CrossRef]
50. Falk, F.; Miller, N. *A primer for soft modeling*; University of Akron Press: Akron, OH, USA, 1992.
51. Chin, W.W. The partial least squares approach to structural equation modeling. *Mod. Methods Bus. Res.* **1998**, *295*, 295–336.
52. Vivarelli, M. Innovation, employment and skills in advanced and developing countries: A survey of economic literature. *J. Econ. Issues* **2014**, *48*, 123–154. [CrossRef]
53. Bessen, J.E. AI and jobs: The role of demand. In *The Economics of Artificial Intelligence: An Agenda*; NBER Working Paper No. 24,235; University of Chicago Press: Chicago, IL, USA, 2019.