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# IMPACT OF TECHNOLOGICAL INNOVATION ON FINANCIAL RESULTS: A CORRELATIONAL META- ANALYSIS

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## ABSTRACT

Technological innovation has been identified as a key element for business growth and competitiveness, affecting not only the optimisation of internal processes, but also the creation of innovative products and the opening of new market opportunities. However, the relationship between technological innovation and financial results shows considerable dispersion in extant studies, reflecting methodological, contextual and approach differences between previous researches. This study aims to address this lacuna through a correlational meta-analytical analysis, synthesising evidence on the impact of the adoption of emerging technologies on the financial results of organisations. The methodology, aligned with the PRISMA 2020 guidelines, facilitates precise evaluation of the studies and the identification of consistent patterns, thereby highlighting the complexity of this relationship. While the majority of the results are positive, the heterogeneity between studies and the influence of moderating factors underscore the necessity of a strategic approach that considers the unique characteristics of each organization and its context.

**KEYWORDS:** Technological Innovation; Financial Results; Correlation; Technological Adoption; Business Competitiveness, Código JEL: O32, G32, C83.

## 1. INTRODUCTION

Technological innovation has firmly established itself as a pivotal factor for growth and competitiveness in today's business environment. Its impact extends beyond the enhancement of internal processes, giving rise to new market opportunities, optimised resources, and the creation of disruptive products or services. Consequently, the integration of technological innovations has the potential to exert a substantial influence on the financial outcomes of organisations, whether through enhanced operational efficiency, cost reduction, or the expansion of the customer base (Giron et al., 2024). Therefore, a comprehensive understanding of the relationship between technological innovation and financial results is imperative to ascertain how companies can maintain competitiveness in a dynamic environment (Li, 2021).

This study is situated within a period of accelerated digital transformation, wherein the integration of emerging technologies such as artificial intelligence, the Internet of Things, process automation, and big data is effecting a modification of business strategies (Do et al., 2023). The comprehension of the manner in which these advancements impact the economic performance of organisations is presented as a crucial area of research. A substantial body of research has identified a positive correlation between technological innovation and profitability (Lee, 2024; Omonijo & Yunsheng, 2022). However, the extant literature on the impact of technological innovation on financial results exhibits significant statistical dispersion, reflecting the variability of findings across studies. Some reports suggest a positive relationship between the adoption of technological innovations and improvements in financial results, while others do not present conclusive evidence of such a relationship (Tong & Yang, 2025; Li et al., 2021). This disparity creates a fragmented picture that makes it difficult to identify a clear and consistent relationship between these factors. The heterogeneity of research contexts, methodologies, and the characteristics of the studied organisations (e.g. size, sector) is a key factor contributing to this inconsistency (Hua et al., 2024).

Methodological difficulties, such as the lack of a homogeneous and standardised framework for measuring technological innovation and its impact on financial results, are also a significant contributing factor (Li et al., 2021). The models employed in the majority of studies exhibit variations in terms of variables, indicators and statistical approaches, thereby contributing to the ambiguity of the results obtained and complicating the identification of clear patterns in the relationship between innovation and financial performance (Li et al., 2021; Lee, 2023). In this

sense, the objective of the research is to carry out a correlational meta-analytic analysis to explore the relationship between technological innovation and financial results in various organisational contexts. The research will focus on synthesising and evaluating the existing evidence on how the adoption of technological innovations impacts financial results, seeking to identify consistent patterns in the effects of this relationship across different studies and sectors.

To achieve the stated objective, the following research questions are addressed:

1. What is the impact of random effects on the relationship between technological innovation and financial results?
2. What are the heterogeneity statistics observed in the literature that affect the relationship between both variables?
3. What is the usefulness of the forest plot in visualizing the relationship between technological innovation and financial results?
4. What is the interpretation of the funnel plot in this context and what does it imply for the results?
5. What are the implications of publication bias in studies on technological innovation and financial results?

Finally, this study makes an innovative contribution to the scientific body by addressing the relationship between technological innovation and financial results from a correlational meta-analytical perspective. The approach is original in its integration and synthesis of various research, providing a consolidated and updated view on how the adoption of technological innovations impacts financial results in different organisational contexts. Furthermore, existing knowledge will be updated by incorporating the most recent trends at the intersection between technology and finance, considering advances in emerging technologies and their impact on corporate finance. The present study is also relevant for the creation of a new research agenda, identifying and addressing unexplored gaps in the current scientific literature.

## 2. METHODOLOGY

The methodology employed in this study is founded upon a meta-analytical approach, in accordance with the PRISMA 2020 guidelines, with the objective of examining the correlational relationship between technological innovation and financial results. This approach enables the synthesis of previous studies (Sulyok et al., 2023), thus facilitating the collection and analysis of quantitative data to obtain consistent conclusions (Schniedermann, 2021) on the impact of technological innovation on financial results. According to Page et al. (2021), meta-analysis facilitates the identification of patterns and the

assessment of heterogeneity between studies, thereby providing a comprehensive and detailed view of the relationship in different organisational contexts.

### 2.1. Eligibility Criteria

The studies included in this meta-analysis must meet inclusion criteria that ensure their relevance and quality. Those that analyse the relationship between technological innovation and financial results will be selected, specifically those that examine the correlation between the adoption of innovations and economic performance, such as profitability and financial performance. The studies must be based on quantitative analysis that allows this relationship to be directly assessed, using economic performance variables and technological innovation indicators. The exclusion process will consist of three phases. In the first phase, studies with indexing errors or incorrect metadata will be eliminated, as they prevent an adequate interpretation of the data and affect the validity of the analysis. In the second phase, studies for which there is no access to the full text will be excluded, as this limits the detailed analysis of the methodology, results and quality of the evidence. In the third phase, studies that do not directly address the relationship between technological innovation and financial results or that do not adopt a correlational approach will be excluded, thus ensuring that only studies relevant to the research are included.

### 2.2. Sources of Information

This study utilised the Scopus and Web of Science databases as its information sources. Scopus is a key database in areas such as technology and innovation, providing access to an extensive collection of peer-

reviewed articles and conferences (Vermaut et al., 2024). Web of Science covers a wide variety of disciplines, offering access to scientific journals, conferences and patents, and is essential for obtaining interdisciplinary literature (Potter et al., 2024). Both databases were selected for their rigor in indexing and global coverage, making them reliable sources for research. Furthermore, these platforms have been found to provide high-quality and representative coverage in various areas of knowledge (Asubiaro et al., 2024; Dyachenko et al., 2024).

### 2.3. Search Strategy

The search strategy was meticulously designed with specific equations for each database, with adjustments made to align with the previously established inclusion criteria. In the Scopus database, the search equation was as follows: (TITLE ("Innovation") OR TITLE ("Technological Innovation") OR TITLE ("Innovative Practice\*")) AND (TITLE ("Profitability") OR TITLE ("Financial Performance") OR TITLE ("Economic Outcomes")) AND TITLE-ABS-KEY ("Correlation"). In Web of Science, the search equation was adapted to align with the platform's specific conventions: TI=("Innovation") OR TI=("Technological Innovation") OR TI=("Innovative Practice\*") AND TI=("Profitability") OR TI=("Financial Performance") OR TI=("Economic Outcomes") AND TS=("Correlation"). Both searches were refined with filters to ensure maximum precision in retrieving relevant articles. These adjustments are derived from the inclusion criteria, which ensure the relevance and quality of the selected studies.

### 2.4. Selection Process

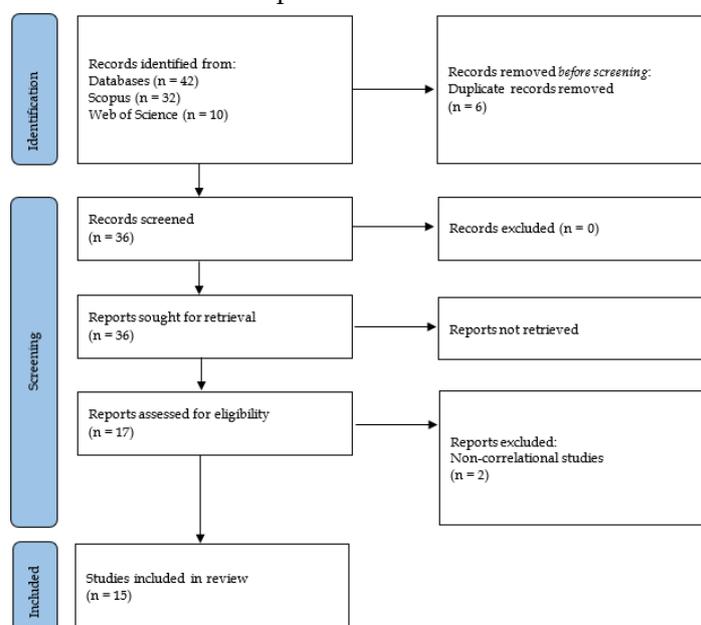


Figure 1: PRISMA Flow Chart. Own Elaboration.

The study selection process is shown in a flow chart (Figure 1). Initially, preliminary searches were

conducted in the selected databases, followed by the removal of duplicates and the application of the eligibility criteria. Subsequently, the studies that passed the initial filters were subjected to a full-text analysis to verify their relevance. Studies that did not meet the requirements established in the inclusion criteria were excluded. This process resulted in the collection of a representative set of studies, which serve as a basis for the analysis and synthesis of the results.

### 2.5. Data Processing

The data obtained from the selected studies was extracted, recorded and organised in the Microsoft Excel programme. This facilitated the structuring of key information, including sample size, variables analysed, correlation coefficients and significance values. Statistical analysis was performed using Jamovi, an R-based software that allows the execution of extensions such as MAJOR and metafor to perform meta-analysis. According to Cooke (2024), Jamovi offers a simple interface and powerful capabilities for multivariate analysis and meta-analysis. Utilising this tool, analyses of average effects, heterogeneity, and bias were conducted to obtain a comprehensive view of the relationship between technological innovation and financial results.

### 2.6. Risk of Bias

The risk of bias was assessed using standard techniques, with potential publication biases being identified through the funnel plot, which shows the distribution of study effects according to sample size and variance of results, allowing the detection of omission of studies with negative or null results. Design and selection biases derived from the inclusion of studies with non-representative methodologies or samples were also considered. Despite the implementation of various strategies, a risk of bias persists associated with the exclusive use of databases such as Scopus and Web of Science, and the search terms used, which may limit the inclusion of relevant studies. Likewise, a risk of reporting bias in the analysis is recognised.

## 3. RESULTS

Table 1 provides a concise overview of the studies incorporated within this research, enumerating the authors, the samples utilised, and the correlation coefficients obtained in each instance. This table offers a clear overview of the studies selected for the meta-analytic analysis, thereby enabling the identification of the key characteristics of each research and the correlational results obtained. It facilitates the comparison of methodological and contextual approaches, contributing to a more precise

understanding of the relationship between technological innovation and financial results in different organisational environments.

**Table 1: Studies Included in Research. Prepared by the Authors**

Authors	Sample size (n)	Correlation coefficient (r)
Venter, 2021	224	0.791
Popović-Pantić, 2020	46	0.393; 0.682; 0.392
Mansour, 2024	383	0.109; 0.0748
Sun, 2019	240	0.5036; 0.4211; -0.1567; 0.0021
Oláh, 2021	100	0.1896; 0.0021; 0.1455
Li, 2023	2082	0.445; -0.039; 0.893
Wei, 2021	275	-0.182; 0.041; 0.317
Wang, 2024	280	0.1737; 0.4629
Jamai, 2021	247	0.388; 0.245; 0.52
Yan, 2022	1143	0.38
Lin, 2019	163	0.00571; 0.300; 0.517
Jusufović, 2023	150	0.309; 0.383; 0.559; 0.573
Pavlovic, 2023	124	0.640; 0.591; 0.507
Dhawan, 2021	9	0.251; -0.666; 0.914; 0.927; 0.766
Khan, 2022	134	0.693; -0.020; -0.061

The analysis of the mixed effects model is presented in Table 2, where the results obtained are shown. The intercept of the model is significant, with an estimated value of 0.406 (SE = 0.073), with a z-value of 5.52 and a p-value less than 0.001. The 95% confidence interval for this estimate ranges from 0.262 to 0.550, indicating that the observed effect is statistically significant within the limits of the confidence interval. This result suggests a positive relationship between the variables studied in the context of technological innovation and financial results.

**Table 2: Random Effects Model. Own Elaboration**

	Estimate	se	Z	p	CI Lower bound	CI Upper bound
Intercept	0.406	0.0736	5.52	<.001	0.262	0.550

The heterogeneity statistics presented in Table 3 show a Tau<sup>2</sup> value of 0.359 and an I<sup>2</sup> of 97.73%, indicating high heterogeneity among the included studies. The H<sup>2</sup> value is 8, suggesting considerable variability among the studies. The R<sup>2</sup> value of 0.1288 indicates that a substantial proportion of the observed variability in the results remains unexplained by the analysed factors. Furthermore, the Q value is 977.25 with 439 degrees of freedom and a p-value less than 0.001, confirming the presence of significant heterogeneity, highlighting the importance of considering variability in the reported effects.

**Table 3: Heterogeneity Statistics. Own Elaboration**

Tau	Tau <sup>2</sup>	I <sup>2</sup>	H <sup>2</sup>	R <sup>2</sup>	df	Q	p
0.359	0.1288 (SE=0.0394)	97.73%	43977	.	25000	2142492	<.001

The forest plot (Fig 2) presents the results of a random effects model, utilising the Fisher r-to-z

transformed correlation coefficient as the outcome measure. The graph shows the distribution of correlation coefficients for the 15 included studies, including those with multiple outcomes, represented by horizontal lines, with the estimated average value indicated by a dot. A 95% confidence interval for the average coefficient, estimated at 0.4059, is also included. The graph provides information on the

heterogeneity of the studies, such as the  $\tau^2$ ,  $I^2$  values, and the Q test result, which indicate high variability between studies. The graph further facilitates the visualisation of the relationship between technological innovation and financial outcomes, highlighting influential studies and potential asymmetry in the funnel plot.

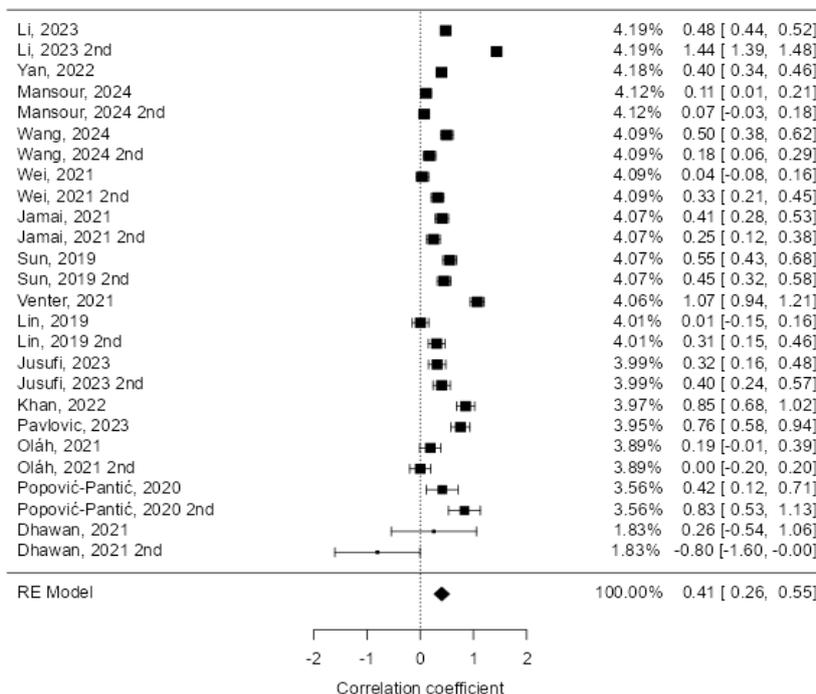


Figure 2: Forest Plot. Own Elaboration.

As demonstrated in Figure 2, the funnel plot that corresponds to the analysis with the transformed Fisher  $r$ -to- $z$  correlation coefficient presents the distribution of the included studies, with correlation coefficients ranging from -0.8035 to 1.4365. It is possible to observe a certain degree of asymmetry in the distribution, as indicated by the rank correlation

test ( $p = 0.0271$ ). The analysis of studentized residuals and Cook distances identifies one study (Li, 2023) as potentially influential or outlier. Although most studies report positive results, the prediction interval suggests that some studies might have negative results.

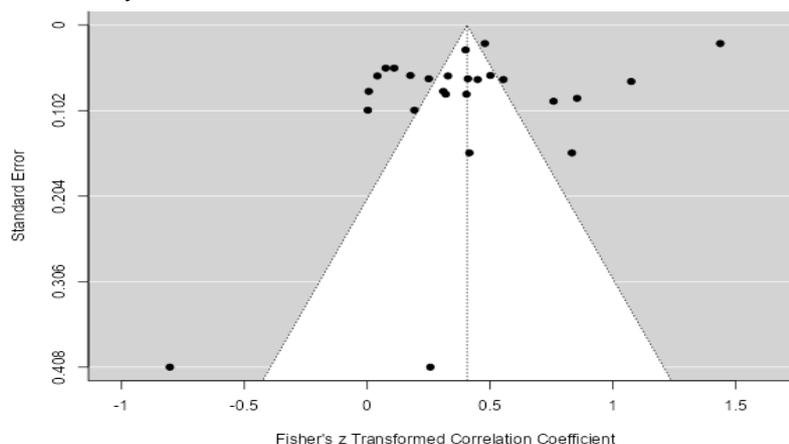


Figure 3: Funnel Plot. Own Elaboration.

The assessment of publication bias is presented in Table 4. The Begg and Mazumdar rank correlation

test yielded a value of 0.313 with a  $p$ -value of 0.027, suggesting potential asymmetry in the distribution of

studies. Conversely, the Egger regression test yielded a value of -17850 with a p-value of 0.074, indicating insufficient evidence to detect significant publication bias through this test.

**Table 4: Evaluation of Publication Bias. Own Elaboration**

Test name	Value	p
Begg and Mazumdar Rank Correlation	0.313	0.027
Egger's Regression	-1785	0.074

#### 4. DISCUSSION

The ensuing discussion of this study is organised into key subsections that facilitate a thorough analysis of the results. Firstly, the findings will be analysed in relation to the stated objectives, assessing their relevance in the context of technological innovation and financial results. These results will then be compared with those of previous studies to identify significant similarities and differences. The theoretical, policy and practical implications of the results will then be discussed, along with the limitations of the study. Finally, recommendations based on the findings and an agenda for future research in unexplored areas will be presented.

##### 4.1. Analysis of Results

The findings indicate a substantial positive correlation between technological innovation and financial outcomes, as evidenced by an estimated mean coefficient. The random effects model proves to be an appropriate one in this context, as it allows for the capturing of both the variability between studies and the heterogeneity intrinsic to them, in contrast to the fixed effects model (Halme, McAlpine, & Martini, 2023). This methodological approach is advantageous in that it engenders a more generalisable estimate by incorporating a diverse array of conditions and contexts inherent to the analysed studies (Dettori, Norvell, & Chapman, 2022). The results obtained are significant and lend further support to the hypothesis that technological innovation has a consistent impact on financial results.

The heterogeneity results demonstrate significant variability between the analysed studies. High heterogeneity, as indicated by the  $Tau^2$  and  $I^2$  values, signifies substantial variations in the observed effects, which may be attributable to factors such as demographic, methodological, or contextual characteristics (Stogiannis, Siannis, & Androulakis, 2024). This substantial heterogeneity suggests that the observed outcomes are not entirely consistent and that certain variations may not be fully explained by the factors taken into consideration. Furthermore, the  $R^2$  value demonstrates that a significant proportion of the variability remains unexplained, underscoring the necessity for further investigation into the factors

influencing the relationship between technological innovation and financial outcomes (Kepes, Wang, & Cortina, 2024). An adequate interpretation of heterogeneity is essential for an accurate understanding of the meta-analysis results and their relevance in diverse contexts (Kepes, Wang, & Cortina, 2024).

The Forest Plot analysis reveals a varied distribution of correlation coefficients across the included studies, with the presence of a confidence interval and an estimated average value providing clarity on the relationship between technological innovation and financial outcomes. However, the high heterogeneity indicated by the  $tau^2$ ,  $I^2$  and  $Q$  test values suggests that the studies differ considerably in their results, which could be related to uncontrolled contextual factors. Visualisation also highlights the potential for influential studies and asymmetry in the funnel plot, which may indicate biases in the sample (Ghajarzadeh, 2025).

The results of the publication bias assessment suggest an asymmetry in the distribution of studies, as reflected in the Begg and Mazumdar rank correlation test. This indicates that some studies may be over-represented in the sample, which could affect the validity of the results obtained. However, the Egger regression test does not provide sufficient evidence to confirm a significant bias, suggesting that, despite the asymmetry, publication bias is not a determining factor in this analysis (Sadeghi, 2025).

The interpretation of these results should consider the combination of both tests for a comprehensive assessment. The results of the publication bias assessment suggest the possible presence of bias, as the Begg and Mazumdar rank correlation test indicates an asymmetry in the distribution of the studies. However, the Egger regression test does not provide sufficient evidence to confirm a significant bias, which is consistent with the notion that identifying publication biases is complex and may vary depending on the test used (Sadeghi, 2025). Consequently, the interpretation of these results should be cautious, considering the heterogeneity of the studies and the sensitivity of the tests used to assess bias.

##### 4.2. Comparison of Results with other Studies

A comparison of the results of this study with those of previous research reveals both key similarities and differences. Like the study by Kuzma et al. (2020), which found a significant positive relationship between innovation and performance, this analysis also shows a positive average coefficient in the correlation between technological innovation and financial performance. However, the current study presents a high heterogeneity ( $I^2 = 97.73\%$ ),

indicating that the effects of innovation are not homogeneous across studies, in contrast to the findings of Kuzma *et al.* (2020), who reported a consistent effect across various sustainability dimensions.

The results of the present study also align with those of Rubera and Kirca (2012), who identified direct positive effects of innovation on the financial position and value of the firm. However, the current analysis shows that in some studies the results may be negative, suggesting that the effects are not always uniformly favourable, especially when looking at the asymmetry in the funnel plot.

Conversely, the study by Rosenbusch *et al.* (2011) underscores the contextual dependency of the relationship between innovation and performance in SMEs, while the present analysis also demonstrates variability across the included studies, albeit more generally, reflecting significant heterogeneity that can be attributed to contextual and methodological factors. This study emphasises the necessity of considering publication bias, an aspect that was not explicitly addressed in some previous studies.

Finally, the findings of this study align with Pigola and Da Costa (2022) in highlighting the variability of innovation effects across contexts. Both studies reveal that innovation performance is not uniformly positive, with Pigola and Da Costa (2022) reporting a negative total effect of knowledge, while our analysis shows heterogeneous financial outcomes. A key difference lies in their emphasis on learning as a positive mediator, whereas our study focuses on methodological and contextual heterogeneity ( $I^2 = 97.73\%$ ) and publication bias. Despite these differences, both studies underscore the complexity of innovation dynamics and the need for nuanced analysis.

## 5. IMPLICATIONS

The theoretical, policy and practical implications of the findings of this study are profound and could transform the understanding of the relationship between technological innovation and financial performance. From a theoretical standpoint, the results substantiate the favourable impact of technological innovation on financial performance, concurrently unveiling the intricate nature of this association. The high heterogeneity observed indicates that the effects of innovation are neither uniform nor linear, thus challenging previous theories that assumed a constant relationship. This finding underscores the necessity to re-evaluate extant theories and to develop more detailed models that take into account contextual and methodological factors. Consequently, theories such as the Diffusion

of Innovations Model (DOI) and the Theory of Reasoned Action (TAM) could be extended to incorporate additional variables, including the nature of innovation, the business context, and the internal dynamics of organisations.

From a policy perspective, the results emphasise the necessity for public policies that foster technological innovation in a flexible manner. The heterogeneity observed in the studies indicates that a homogeneous approach will not be sufficient to maximize the benefits of innovation. Policies must be designed to adapt to the specific characteristics of each sector and company, especially in the case of SMEs, allowing them to adapt technologies according to their capabilities and needs. Furthermore, policies should focus not only on promoting technological adoption, but also on creating an environment that fosters organisational learning and the integration of disruptive innovations.

In practical terms, companies should review their innovation strategies, given that the results of this study suggest that the effects of innovation are not always positive or predictable. This implies that decisions related to technological adoption must be based on a contextual and exhaustive analysis. Organisations must be prepared to manage the risks inherent in innovation, adopting agile and flexible approaches that allow them to adapt to changes quickly. The publication bias identified in this study underscores the necessity for enhanced transparency in the disclosure of innovation outcomes, which may precipitate a review of research and reporting practices within academic and business communities. This, in turn, could catalyse the evolution of public policies and business practices, equipping them to confront the challenges and capitalise on the opportunities presented by technological innovation.

## 6. LIMITATIONS

The present study acknowledges several limitations that must be considered when interpreting the results. A significant constraint pertains to the absence of moderating variables that might have exerted an influence on the association between technological innovation and financial outcomes. Furthermore, the sample size, which is based exclusively on the selected studies, may not be representative of all extant literature. The possibility of bias in the selection of studies also limits the generalizability of the findings. The study is based on a single database, which restricts the diversity and scope of the results obtained.

## 7. RECOMMENDATIONS

Nevertheless, the findings of the study provide a solid foundation upon which a number of

recommendations can be proposed. These recommendations aim to enhance the comprehension of the impact of technological innovation on financial results within both academic circles and business and political practice. These recommendations are grounded in the key findings, which illuminate the intricate relationship between technological innovation and financial performance. It is imperative that these proposals are approached with critical and strategic scrutiny to ensure their optimal utility.

The results underscore the necessity for researchers to expand existing theoretical models. Despite the growing literature on the impact of technological innovation, current models tend to oversimplify the relationships between technology and financial results. In order to obtain a more nuanced view of the effects of innovation, it is recommended that moderating variables be incorporated. Factors such as the nature of innovation (incremental versus disruptive), the organisational context, and the internal capabilities of companies play a relevant role in mediating these effects.

It is imperative to integrate contextual and methodological factors specific to each sector and organisation to develop more robust and applicable theories, thereby increasing the capacity of the models to reflect the diversity of situations in which companies adopt new technologies. Research should be conducted on how incremental innovation, which gradually improves existing products and processes, can generate a different financial impact than disruptive innovation, which involves radical changes in business models. This analysis is pivotal to understanding how innovation affects companies of different sizes, sectors, and organisational characteristics.

From a policy perspective, the findings suggest that public policies need to be more flexible and adaptive to address the diverse realities of businesses, especially small and medium-sized enterprises (SMEs). Policies that focus solely on promoting technological adoption without taking into account the specific characteristics of each type of company may prove ineffective. SMEs face significant limitations in terms of resources, infrastructure and technological absorption capacity, which can make the adoption of new technologies more risky and costly.

In this regard, the design of policies that encourage the adoption of new technologies, whilst also fostering the establishment of innovative ecosystems adapted to the particularities of each sector and company type, is imperative. Such policies should

encompass tax incentives, subsidies and soft loans, specifically targeted at SMEs, with a view to mitigating the financial risks associated with the adoption of emerging technologies. Furthermore, it is imperative to foster collaboration between companies, academic institutions and research centres, with a view to enhancing knowledge transfer and innovation, particularly in sectors encountering challenges in adopting advanced technologies.

The study's findings underscore that the process of technological adoption by businesses should not be regarded as a linear or guaranteed one, as the impact of innovation on financial outcomes is not invariably positive or predictable. Consequently, a more deliberate and contextualised strategic approach is required. It is imperative for organisations to acknowledge that the impact of technological innovation can vary significantly, contingent on their capacity to implement it effectively. A circumspect approach is incumbent upon companies when evaluating the potential benefits of innovation, with a concomitant consideration of the inherent risks and their internal capacity to manage the adoption of new technologies.

It is erroneous to perceive innovation as a panacea for financial challenges; rather, it should be regarded as a process necessitating meticulous management, encompassing continuous evaluation of associated costs, benefits, and risks. It is imperative for companies to allocate resources towards the training of their workforce, the development of internal capabilities, and the establishment of agile organisational structures that facilitate expeditious adaptation to technological advancements. This necessitates the implementation of continuous training programmes, the establishment of interdisciplinary teams, and the creation of mechanisms to support innovation within the company. Furthermore, it is recommended that organisations consider integrating technological tools in an incremental manner, commencing with modest, scalable solutions prior to undertaking more substantial projects.

## 8. CONCLUSIONS

The findings of this study demonstrate that the relationship between technological innovation and financial outcomes is complex and subject to various influences. The meta-analytic analysis, employing random effects models, furnishes an overview of the variance in the effects of technological innovation, contingent on the particular characteristics of each study, as evidenced by the substantial heterogeneity observed among studies. This underscores the necessity of incorporating organisational contexts,

innovation types, and other moderating factors that may influence outcomes.

The Forest Plot has been demonstrated to be a valuable instrument for visualising the distribution of effects, thereby illustrating the manner in which individual studies contribute to the overall result, while concurrently highlighting the potential impact of influential studies. Nevertheless, the presence of asymmetry in the funnel plot, in conjunction with evidence of publication bias, necessitates a cautious interpretation of the results. Bias has the potential to distort perceptions of the true impact of innovation, leading to the exaggeration of positive effects associated with technological adoption in certain studies.

While the results generally reflect a positive relationship, the implications of this study suggest

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- that technological innovation should not be considered a guaranteed solution to improve financial results. A strategic approach that considers companies' internal constraints and capabilities, as well as a deeper analysis of specific contexts, is essential before adopting new technologies.

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