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THE ROLE OF INNOVATION IN SME PERFORMANCE IN MALAYSIA

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ABSTRACT

The study investigates the intricate correlation between innovation and the performance of small and medium-sized enterprises (SMEs) within the Malaysian context. A substantial body of literature underscores the pivotal role of innovation in driving growth and bolstering the competitive advantage of SMEs. Our research delves deeper into this relationship, with a primary focus on how innovation practices impact crucial SME performance metrics, including revenue growth, profitability, and market share. The analysis adopts a comprehensive approach, examining the effects of various forms of innovation, namely product innovation, process innovation, and organizational innovation. To execute this investigation, we employ a robust research methodology that encompasses data collection from a diverse sample of SMEs spanning across various industries in Malaysia. We utilize statistical techniques, such as regression analysis, to evaluate the significance of the connection between innovation and SME performance. Furthermore, our research takes into account potential moderating factors that could influence the strength of this relationship, such as firm size, industry sector, and market dynamics.

KEYWORDS: Innovation, Small and Medium-sized Enterprises (SMEs), Performance, Malaysia, Revenue Growth, Profitability, Market Share, Product Innovation, Process Innovation, Organizational Innovation.

1. INTRODUCTION

In the context of this study, small and medium-sized Malaysian enterprises (SMEs) have reached a phase of relative maturity, necessitating a shift towards increased independence and reduced reliance on government support (Nasir, Al Mamun, & Breen, 2017). Since the 1970s, Malaysian SMEs have played a pivotal role in the national economy, constituting 99.2 percent of all businesses, contributing 19 percent to exports, and accounting for three percent of the GDP. Furthermore, they are projected to employ approximately 56 percent of the workforce and generate value-added products valued at RM 120 billion in the manufacturing sector by 2020 (Bhuiyan et al., 2016). However, Malaysian SMEs are grappling with significant growth constraints due to their limited adoption of information and communication technology (ICT), resulting in missed growth opportunities and struggles to

compete in digital markets (Ongori & Migiro 2011; Mokaya, 2012). The majority of Malaysian SMEs need to grasp the importance of acquiring and utilizing ICT tools, considering their socio-economic context, as their reluctance has led to higher production costs and reduced profits, along with missed opportunities to leverage data and trends (Kariuki, 2009). This trend is prevalent in developing nations, where SMEs often underestimate the role of ICT in fostering trade growth. In alignment with Malaysia's 2020 vision, it is crucial for the SME sector to embrace ICT to surmount challenges and facilitate future growth (Kiveu & Ofafa, 2013). In this context, innovation emerges as a pivotal factor influencing the continuous growth of SMEs, as it enhances overall performance and competitiveness, leading to increased sales volume and revenue (Nasir et al., 2017). This research seeks to explore the impact of innovation on small and medium-sized enterprises in Malaysia. Many SMEs in the developing world remain hesitant to embrace growth and continue to rely on traditional methods. However, ICT plays a crucial role in fostering creativity, and companies investing in ICT are more likely to engage in successful innovation and service offerings (Gago and Rubalcaba, 2007). By integrating ICT into their business processes, SMEs can tap into its valuable potential for growth. Nevertheless, to promote ICT adoption among SMEs, addressing the high cost of acquiring ICT equipment and facilitating access to e-business solutions are essential steps to develop technological and management skills and propel these enterprises towards growth (Apulu & Latham, 2011). The primary objective of this study was to investigate the influence of innovation on the development of small and medium-sized enterprises (SMEs) in Malaysia. This encompassed a comprehensive investigation into the influence of technological innovation practices on the expansion of SMEs' output and an in-depth analysis of the impact of product innovation on the growth of SME output within the Malaysian context.

1.3 Literature Review

Information and Communication Technology (ICT) encompasses a wide array of advanced data processing and communication capabilities, including computers, the internet, mobile phones, and electronic applications such as e-banking and e-commerce (Olise et al., 2014). ICT plays a pivotal role in enhancing communication, data collection, planning, and delivery, thereby increasing efficiency and connectivity in modern business operations. It has revolutionized traditional modes of communication, making global information sharing accessible. Within the context of small and medium-sized enterprises (SMEs), research has shown that innovation significantly influences growth and success. Innovative product development has been found to contribute to revenue growth, while innovations in both products and processes enhance product quality, expand offerings, and increase production capacity (Lehtimaki, 1991; Roper, 1997; Lumiste, 2004). Therefore, the adoption of ICT and a culture of innovation are critical for SMEs, enabling them to thrive in today's dynamic and technologically-driven business landscape (Olise et al., 2014; Lehtimaki, 1991; Roper, 1997; Lumiste, 2004).

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1.4 Technology Innovation

The crucial role of technological innovation in enhancing an organization's competitiveness cannot be overstated, as technological change is integral to gaining a competitive edge and accessing new markets (Becheikh, 2006). Small and medium-sized enterprises (SMEs) are well-positioned to harness their inherent characteristics, such as flexibility, streamlined organizational structures, risk aversion, and responsiveness, to foster innovation (Harrison and Watson, 1998). Nevertheless, there remains untapped potential for industrial innovation within SMEs (Chaminade & Vang, 2006), with studies highlighting the significant contribution of technological advancements to profit generation in organizations (Ruttan, 1997). Technology plays a pivotal role in promoting SME growth, offering the potential for distinct products and services tailored to local economies. Initiatives that connect SMEs with technology specialists can nurture technological potential, leading to success by aligning offerings with available resources and business needs. However, SMEs also encounter specific challenges that can impact their growth and profitability (Hill, 1987). In essence, technological progress and innovation are central drivers of competitiveness, revenue growth, and overall expansion for SMEs, making them key contributors to sustainable economic development.

1.5 Product Innovation

While only a minority of SMEs engage in innovation, those that do tend to yield higher returns, particularly in terms of acquiring new patents (Nooteboom, 1994). Nooteboom advocates the adoption of product innovation strategies, especially for SMEs in emerging markets, to leverage these potential benefits. However, SMEs may face challenges in fully executing the New Product Development process compared to larger organizations (Woodcock, 2000). To remain competitive in dynamic markets, companies, regardless of size, must be adaptable and capable of change, as emphasized by Trott (1998). Adaptability becomes particularly crucial to withstand challenges posed by new entrants introducing disruptive products. Modern product design plays a pivotal role in shaping today's market offerings to meet evolving consumer demands (Choi, 2005). These innovative products often serve as replacements for existing items in a company's product line, offering higher quality or enhanced perceived value (Avermaete et al., 2003). Engineering design, encompassing mechanical, electrical, software, and industrial design elements, including aesthetics, ergonomics, and user interfaces, determines both the functional and aesthetic aspects of a product (Ulrich et al., 2004). Product innovation is a strategic avenue for SMEs to meet market demands, bolster competitiveness, and adapt to changing conditions. By embracing product innovation and modern product design principles, SMEs can position themselves for growth, improved market positioning, and continued relevance in today's dynamic business landscape.

2. METHODOLOGY AND FINDINGS

This research entailed a descriptive analysis of a cross-sectional study, focusing on Malaysian SME

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enterprises. The study utilized a descriptive design to examine the impact of innovation on the development of the Construction, Manufacturing, Services, and Other Sectors within the study's scope. A combination of stratified random sampling and purposeful sampling methods were employed to select a sample of 49 participants from the population. The population was categorized into four sectors engaged in activities related to innovation. To gather data for each section of the study, information was collected, organized, and coded systematically. The collected dataset was subjected to statistical analysis using the Statistical Package for Social Science (SPSS) version 22. The research study design encompassed both descriptive and inferential statistical methods. Descriptive analysis involved the calculation of frequency distributions and percentages, along with measurements of central tendency, including mean, standard deviation, skewness, and kurtosis values for the dataset. In conclusion, this study highlights the need for more academic attention and a comprehensive analysis of this significant social phenomenon.

Table 1: Demographic

Item	Counting	Percentage
Gender		
Female	32	65%
Male	17	35%
Years		
18-25 years	1	2%
26-35 years	9	18%
36-45 years	26	53%
46-55 years	10	20%
Over 55 years	3	6%
Race		
Indian	1	2%
Malay	47	96%
Others	1	2%
Education Level		
Degree	21	43%
Diploma	11	22%
Postgraduate degree	11	22%
SPM	6	12%
Internet Knowledge		
Average	17	35%
Good	17	35%
Poor	1	2%
Very good	14	29%

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Use of Internet		
3 times a week	2	4%
Everyday	47	96%
Experience in Business		
11-15 years	9	18%
1-5 years	13	27%
16-20 years	5	10%
6-10 years	10	20%
Over 20 years	12	24%
Sector		
Construction	3	6%
Manufacturing	3	6%
Others	17	35%
Services	26	53%
Business Ownership		
Foreign Invested Company	2	4%
Others	21	43%
Partnership/Joint venture	2	4%
Private Company	14	29%
Public Company	10	20%
Year of Business		
11-15 years	8	16%
1-5 years	12	24%
16-20 years	4	8%
6-10 years	8	16%
Over 20 years	17	35%
Grand Total	**49**	**100%**

As depicted in Table 1, the majority of respondents had 1-5 years of business experience, comprising 27% of the total, followed closely by those with over 20 years of experience, accounting for 24%. When considering the business sectors of the respondents, services emerged as the most prevalent sector, representing 53%, followed by the "others" sector at 35%, while the construction and manufacturing sectors each had a 3% share. Additionally, the study furnishes information about the age distribution of respondents. The largest cohort falls within the 36-45 years age group, constituting 53% of the respondents, followed by the 26-35 years age group at 18%, and the 46-55 years age group at 20%. The remaining age groups, 18-25 years and over 55 years, represented smaller proportions of the total respondents.

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Table 2: Descriptive Statistic

Construct	Item Code	Item	Descriptive Statistics				Normality Criteria	
			Min	Max	Mean	Standard Deviation	Excess Kurtosis	Skewness
INNOV	INV1	1. I will get more knowledge about creativity in the area of ICT.	1	5	3.469	0.971	-0.383	-0.256
	INV2	2. ICT innovations are available to the SMEs industry.	2	5	3.449	0.927	-0.844	-0.084
	INV3	3. ICT innovation is an important to SMEs.	2	5	3.878	0.799	-0.917	-0.018
	INV4	4. Innovation in ICT is not needed to sustain business.	2	5	4.061	0.793	0.119	-0.619
	INV5	5. The success of a ICT in SMEs is related to innovation.	2	5	3.714	0.881	-0.317	-0.502
	INV6	6. SMEs must be involved in planning for ICT innovation.	2	5	3.878	0.773	-0.158	-0.327
	INV7	7. ICT innovation plays a critical role in improving the performance of SMEs.	2	5	4.082	0.724	0.078	-0.462
PERFORM	PRF1	1. SME's performance increased due to a better understanding of employee attitudes towards SME environtment.	3	5	4.061	0.712	-1.004	-0.092

PRF2	2 The increase in the SME's performance is due to several government interventions, such as support and innovation to make the SME more attractive to employees.	3	5	4.02	0.82	-1.547	-0.039
PRF3	3. Performance of SMEs is increasing due to the exposure of information quality in the SME industry.	2	5	4	0.728	-0.139	-0.327
PRF4	4. The performance of SMEs increased due to the existence of trust factors in the system of business activities.	3	5	4.122	0.659	-0.67	-0.14
PRF5	5. Effective policies implemented by the government to attract more interest by engaging and connecting employees with ICT have improved the performance of SMEs.	3	5	4.163	0.765	-1.25	-0.295
PRF6	6. Performance SME's are increasing due to exposure to ICT through awareness in the SME industry.	3	5	4.163	0.681	-0.82	-0.222

PRF7	7. Employee involvement in ICT use in SMEs performance is increasing due to exposure to ICT innovation.	3	5	3.98	0.742	-1.18	0.034

As presented in Table 2, the research on innovation construction reveals that the mean ratings for these items hover around 3.5. This suggests that, on average, respondents hold a moderate level of agreement with the statements concerning innovation in the context of ICT (Information and Communication Technology). The standard deviation values, which range from approximately 0.8 to 0.9, indicate some variability in responses to these items. This signifies that while the mean rating centers around 3.5, individual responses deviate from this average. Assessing the normality criteria for Innovation, which take into account both excess kurtosis and skewness, suggests that these items generally conform to the criteria for normality. The values of excess kurtosis and skewness fall within a range typically considered acceptable for a normal distribution. Conversely, the mean ratings for performance are approximately 4.0, implying that respondents generally hold a positive perception of factors related to SME (Small and Medium-sized Enterprise) performance. Standard deviation values for these items range from 0.65 to 0.82, indicating some variability in responses. Much like the innovation items, individual responses exhibit variation from the mean rating. The excess kurtosis values for these items vary. Some items display negative kurtosis (indicating flatter distributions), while others exhibit positive kurtosis (indicating more peaked distributions) compared to a normal distribution. Skewness values for these items also fluctuate. Some items have negative skewness (left-skewed), while others display positive skewness (right-skewed). The normality criteria for these items suggest that while some of them meet the criteria for normality (with excess kurtosis and skewness close to zero), others do not. Certain items deviate from normality in terms of kurtosis and skewness. The descriptive statistics and normality criteria offer insights into how respondents perceive statements related to innovation and SME performance. The mean ratings provide an overview of the overall sentiment, while the standard deviation indicates the spread of responses. Negative excess kurtosis values suggest flatter distributions, and skewness values near zero indicate roughly symmetric distributions. The normality criteria help assess whether the data distributions conform to the assumptions of a normal distribution, which can be crucial for specific statistical analyses.

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Table 3: Convergent Validity

Construct	Item	Outer Loading	Cronbach's Alpha	CR	AVE
INNOV	INV1	**0.583**	**0.908**	**0.928**	**0.652**
	INV2	0.836			
	INV3	0.869			
	INV4	0.836			
	INV5	0.832			
	INV6	0.836			
	INV7	0.826			
PERFORM	PRF1	**0.929**	**0.95**	**0.959**	**0.771**
	PRF2	0.823			
	PRF3	0.842			
	PRF4	0.897			
	PRF5	0.855			
	PRF6	0.905			
	PRF7	0.892			

The study presented in Table 3 focuses on convergent validity, a statistical evaluation that gauges the alignment of various items or measures within the same constructs, specifically innovation and performance. This assessment encompasses several crucial measures:

1. Outer Loadings: These values quantify the strength of the relationship between each item and its respective construct. Higher outer loading values signify a more robust association between the items and the construct they intend to measure.
2. Cronbach's Alpha: Cronbach's alpha evaluates the internal consistency reliability. For the innovation construct, a substantial Cronbach's alpha of 0.908 suggests that the items consistently measure the same underlying concept within this construct.
3. Composite Reliability (CR): CR is another indicator of internal consistency reliability. An ideal CR value, exceeding 0.7, confirms strong convergent validity. In the case of the innovation construct, the CR value of 0.928 demonstrates remarkable reliability.
4. Average Variance Extracted (AVE): AVE represents the average amount of variance explained by the items within a construct. To establish solid convergent validity, the AVE should surpass 0.5. Notably, the innovation construct exceeds this threshold with an AVE of 0.652, indicating a significant portion of variance is collectively accounted for by the items.

Regarding the performance construct, while outer loading values are available for PRF1 (0.929), the absence of outer loading values for PRF2 to PRF7 presents a challenge in individually assessing the

strength of their relationships with the construct. Nevertheless, the performance construct demonstrates robust convergent validity, supported by an exceptionally high Cronbach's alpha of 0.95, signifying outstanding internal consistency. It also exhibits an impressive Composite Reliability (CR) of 0.959, indicating remarkable reliability, and an Average Variance Extracted (AVE) of 0.771, surpassing the 0.5 threshold, signifying substantial collective explanation of variance within the construct. In conclusion, the results demonstrate strong convergent validity for both the innovation and SME performance constructs. However, it's worth noting that having outer loading values for all items would offer a more comprehensive assessment of the relationships between each item and its corresponding construct, further reinforcing the validity assessment.

Table 4: Construct Validity

Constructs	Cronbach's Alpha	CR	AVE
INNOVATION	0.908	0.928	0.652
SME PERFORMANCE	0.950	0.959	0.771

Table 4 addresses the essential concept of construct validity, which evaluates the accuracy of a measurement tool like a questionnaire in capturing the underlying ideas it intends to measure. In this study, two constructs are examined: "INNOVATION" and "SME PERFORMANCE." The table provides data on Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE) for each construct. For the innovation construct, Cronbach's alpha is 0.908, indicating a high level of internal consistency. This suggests that the questionnaire's innovation-related items are closely related and consistently measure the same underlying idea. The CR for innovation is 0.928, signifying strong reliability. The AVE is 0.652, indicating that the items collectively explain a substantial part of the innovation construct's variance, confirming good construct validity. In the SME performance construct, the Cronbach's alpha is an excellent 0.950, demonstrating high internal consistency. The CR for SME performance is an exceptional 0.959, reaffirming the strong reliability of the items. The AVE, at 0.771, surpasses the recommended threshold, indicating that the items collectively explain a significant portion of the SME performance construct's variance, further supporting its validity. In summary, both the innovation and SME performance constructs exhibit robust construct validity. The high values of Cronbach's alpha, composite reliability, and AVE affirm that the items consistently measure the intended concepts with a high level of internal consistency and reliability. These results instill confidence in the questionnaire's ability to accurately assess and measure the innovation and SME performance constructs.

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Table 5: Cross Loading

ITEM	INNOV	SMEPERFM
INV1	**0.583**	0.398
INV2	**0.836**	0.596
INV3	**0.869**	0.549
INV4	**0.836**	0.475
INV5	**0.832**	0.473
INV6	**0.836**	0.479
INV7	**0.826**	0.588
PRF1	0.601	**0.929**
PRF2	0.629	**0.823**
PRF3	0.515	**0.842**
PRF4	0.496	**0.897**
PRF5	0.596	**0.855**
PRF6	0.533	**0.905**
PRF7	0.516	**0.892**

In Table 5, we're looking at how much each item contributes to two different things, like innovation and SME performance. Some items, such as INV2, INV3, PRF1, and PRF2, have strong cross-loadings on both "INNOV" (Innovation) and "SMEPERFM" (SME Performance). This suggests they might not be specific to just one concept and could be measuring aspects of both innovation and SME performance. It's important to consider these cross-loading results when looking at how items relate to concepts because when items have high cross-loadings, it can be unclear which concept they really belong to. This can make it tricky to understand how items and concepts are connected, and it might affect how reliable and valid our measurement model is. To make things clearer, we might need to analyze or adjust these items. Items with strong cross-loadings can make it hard to attribute them to a single concept. Addressing this issue through adjustments can make our research findings more accurate and reliable.

Table 6: Fornell-Larcker Criterion

CONSTRUCT	INNOV	SMEPERFM
INNOV	0.808	
SMEPERFM	0.638	0.878

In the Table 6, the study on the Fornell-Larcker Criterion has been used to assess the discriminant validity of constructs in a measurement model, particularly in the context of factor analysis or

structural equation modeling (SEM). Discriminant validity is the extent to which different constructs in a model are truly distinct from each other. In other words, it will helps to determine if the items measuring one construct are more strongly correlated with each other than they are with items measuring other constructs. The Fornell-Larcker Criterion involves creating a correlation matrix between the constructs' latent variables and comparing these correlations to the square roots of the average variance extracted (AVE) for each construct. Here's how it works in your case:

Construct Correlation Matrix:
Two constructs: "INNOV" (Innovation) and "SMEPERFM" (SME Performance).
The correlation between "INNOV" and itself is 0.808 (the square root of the AVE for "INNOV").
The correlation between "SMEPERFM" and itself is 0.878 (the square root of the AVE for "SMEPERFM").
The correlation between "INNOV" and "SMEPERFM" is 0.638.
Interpretation: The correlation between "INNOV" and itself (0.808) is greater than the square root of the AVE for "INNOV" ($0.808 > \sqrt{0.652}$), which is expected because constructs are perfectly correlated with themselves.
The correlation between "SMEPERFM" and itself (0.878) is greater than the square root of the AVE for "SMEPERFM" ($0.878 > \sqrt{0.771}$), which is also expected. While, the correlation between "INNOV" and "SMEPERFM" (0.638) is less than the square root of the AVE for both constructs ($0.638 < \sqrt{0.652}$ and $0.638 < \sqrt{0.771}$), indicating that the constructs have discriminant validity. In other words, they are distinct from each other.
The Fornell-Larcker Criterion suggests that the constructs "INNOV" and "SMEPERFM" have discriminant validity because the correlation between them (0.638) is smaller than the square roots of the AVE values for both constructs. This indicates that these two constructs are distinct and not measuring the same underlying concept. Discriminant validity is an essential criterion to ensure that your measurement model accurately captures the unique aspects of each construct in your research.

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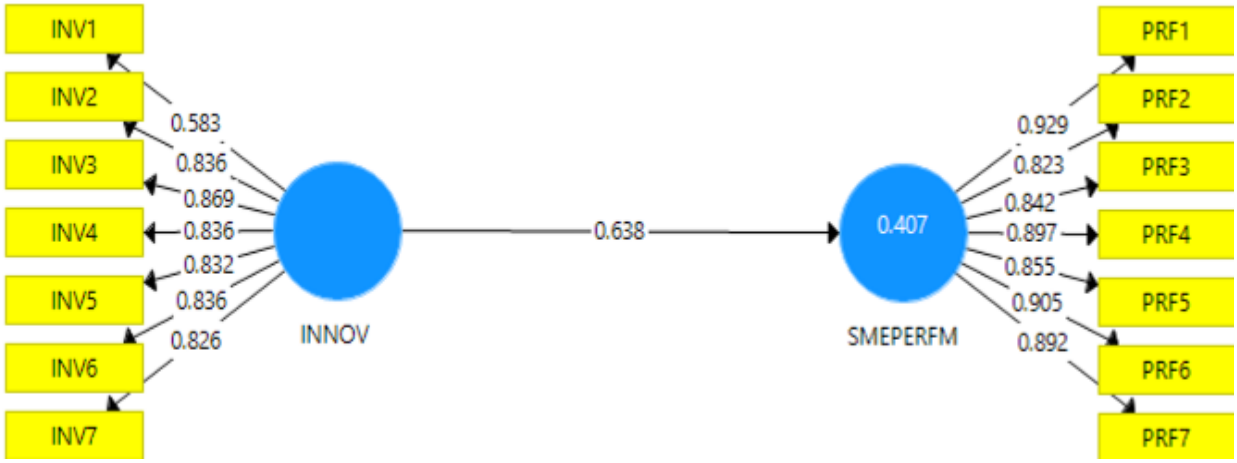

Figure 1: Structural Model

The research hypothesis testing is done by looking at the path coefficients that are positive or negative. In Table 7, Hypothesis (H1) test results indicate that the relationship from "INNOV" to "SMEPERFM" is "Significant." This means that the relationship is statistically significant, suggesting that there is strong evidence to support the hypothesis that innovation has a significant impact on SME performance. In summary, the hypothesis test results show that there is a statistically significant and positive relationship between innovation ("INNOV") and SME performance ("SMEPERFM"), with a standardized beta coefficient of 0.655. This supports the research hypothesis (H1) that innovation positively influences SME performance.

Table 7: Hypothesis Test

Hypothesis	Path	Std. Beta	Std Error	T-Value	Bias	5.00 %	95.00 %	Results
H1	INNOV -> SMEPERFM	0.655	0.063	10.112	0.017	0.496	0.713	Significant

3.1 Technological Innovation and Product Innovation

Innovation and Economic Growth:

Studies confirm that innovation boosts a country's economy. For example, research by Aghion and Howitt (1992) shows it makes a nation more economically productive. The Sheehan, J. (2005) says new technology drives long-term economic growth, and Jones et al. (1999) found that innovation leads to better income and living standards.

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Technology Transfer and Learning:

When companies do research and development (R&D), they learn from advanced technologies created elsewhere. This learning makes them more competitive and helps them grow. Griffith et al. (2001) explains how R&D helps firms understand advanced technologies, and López-Bazo, E. (2017) found that this learning boosts productivity, especially in local regions.

Product Innovation and Competitive Advantage:

Creating new and better products is a way for companies to stay competitive and grow. Studies, like Lichtenthaler's (2009) research, show that firms doing this tend to do well financially. Laforet and Tann's study (2006) also tells us that product innovation helps companies do better in their markets and financially.

Innovation and New Markets:

Innovation not only makes existing markets better but also creates entirely new markets. For example, Christensen, C. M. (2006) introduced the idea of disruptive innovation, where new products and technology shake up old markets and make new opportunities. We see this in action with things like smartphones changing the mobile phone industry.

Innovation and Consumer Welfare:

Innovation doesn't just help companies; it also helps people and society. Innovation leads to better products and services, improving our lives and solving big problems. Mazzucato's research (2016) shows how government-led innovation tackles issues like healthcare and the environment. Studies on tech adoption, like the internet, show that it gives people better access to information, education, and online shopping Bakos, Y., & Brynjolfsson, E. (1999).

4. CONCLUSIONS

This study emphasizes the importance of innovation in technology and science for economic growth, productivity, and sustainable development. Drawing on various studies, we've found that technological advancements shape modern economies and societies. In simpler terms, technological innovation doesn't just add to our knowledge; it also makes people more productive. New technologies and practices improve operations, resource use, and drive economic development. Science and technology innovation (STI) are crucial for economic growth. STI accelerates progress, making societies more competitive and driving positive change. These insights align with the OECD's view that technological progress is essential for economic growth and living standards. Studies also show that technology is vital for sustainable development by addressing complex challenges with eco-

friendly practices, renewable energy, and efficient resource use. In conclusion, these findings stress the need to encourage innovation, invest in research and development, and embrace new technology to support sustained economic growth, productivity, and a future that balances prosperity with environmental and societal well-being. This study also establishes a strong connection between technological and product innovation among small and medium-sized businesses. It's linked to factors like a business's age, funding sources, new product creation, market expansion, and supplier choices. To make the most of innovation, we should focus on making our technology sustainable. Research and development should prioritize technologies that conserve resources, reduce carbon emissions, and support sustainable development goals. This approach positions businesses and societies to thrive while also addressing environmental and societal challenges in our changing world.

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