

# Technology Influence on Value Creation among Rural Small and Micro Enterprises in Nyamira County, Kenya: The Moderating Role of Regulatory Policies

Maengwe James.O<sup>1</sup> & Arogo Phyllis A.<sup>2</sup> <sub>1</sub>Kisii University & <sub>2</sub>University of Eldoret

#### Abstract

Technology has become a strategic resource in sustaining competitiveness among firms regardless of their size. However, competition through globalization and strategic alliances are some of the issues underpinning technology adoption among SMEs both in developed and developing economies. The main objective of this study was to examine the moderating role of regulatory policies on technology influence on value creation among rural small and micro enterprises in Nyamira county, Kenya. The Specific objectives of this study however, was to; examine technology influence on value creation among rural small and micro enterprises in Nyamira county Kenya, and, to determine the moderating role of regulatory policies on the relationship between technology influence and value creation among rural small and micro enterprises in Nyamira county Kenya. The study was anchored on the Resource-Based View Theory. The researcher adopted a cross - sectional descriptive research design. A sample size of 443 respondents was drawn from a target population of 1,846 registered small and micro enterprises by use of Yamane, (1967) formula where stratification sampling technique was used. A questionnaire was the main data collection tool. The reliability test was done using Cronbach alpha while the validity test was based on expert's judgment. Means, standard deviations, and coefficient of variation were used to describe respondents' profiles. Pearson's correlation was used to examine the relationship between the study variables while multiple regression analysis was done to test study hypotheses. The findings that 13.6 percent variation was explained by technology (R2 = .136). The results further indicated that regulatory policies moderated the relationship between technology influence and value creation by 18.9%. This implies that regulatory policies influenced the relationship between technology and value creation among rural small and micro enterprises in Nyamira county, Kenya. The study findings are expected to provoke both the national and county governments in formulating policy insights aimed at empowering SMEs since they are a source of creativity and innovation mostly in social-economic development especially in rural areas.

Keywords: Technology influence, regulatory policies, value creation

# Introduction

Rural small and micro enterprises (RSMEs) have received increased interests both from scholars, researchers, academicians, and policy makers as a solution not only to combating unemployment and poverty but also as a framework for the development of economies and a source for creativity and innovation of new products and services (Oppong, Owiredu, & Churchill, 2014). SMEs give enormous contributions to various world economies as they contribute to about 80 percent newly created jobs and about 13 percent of GDP (Aarikka- Stenroos & Jaakkola, 2012). The emergency of globalization, intense competition, information asymmetry on existing products and markets, most of these small businesses have been unable to contribute much of their needed economic value. The legal framework on SMEs and technology adoption is still a major challenge (Kiiru, Mukulu, & Ngatia, 2022). The excessive and inadequately enforced legal requirements on new business start-up, access to loans from banks and other micro finance institutions (MFIs), and competition from the already established large firms, has adversely affected the SME sector which is believed to create several employment opportunities if well-regulated. Existing SME legal framework has always ensured that start-up businesses and those existing have to comply with the set minimum standards which is perceived by many as an impediment to business performance and a costly affair to comply (Ouma-Mugabe, Chan, & Marais, 2021). Technology adoption by SMEs has witnessed the increase in their productivity and total sales volume, lower production costs and related wastages, spur growth and infrastructure, and aid them in achieving a competitive edge over other firms. Most of these businesses are now able to make efficient decisions that can help elevate their performance in meeting customer requirements and ensure sustainability of the business (Brooks et al., 2021). Technology influence among SMEs is a growing concern in developing and developed economies as it leads to organizational efficiency, reduced transaction costs, and reduced uncertainty in the production of goods and services. Use of technology has enabled SMEs to maximumly use the locally available resources, making them have a competitive edge in uncertainty business environment (Hanadi & Aruna, 2013).

Mwangi & Namusonge (2014), opine that indigenous skills, technology and innovation practiced by SMEs, have led to quality production of goods and services in homegrown industries. Stakeholders have identified various initiatives to support indigenous technology among SMEs, one being the promotion of infrastructure. This is likely to result in a great performance of SMEs as it provides discerned products, services, and technical services following the resources available and the market needs in the context of these SMEs (Omolekan & Alli, 2020).

In Kenya, Micro and Small Enterprises are defined by the number of workers, annual turnover, and assets owned by the enterprises. Among the unique features of SMEs are; the size of the firm, number of employees, and the level of independence in decision-making (Mabhungu & Van Der Poll, 2017). According to Kenya's Micro Small Enterprises Act 2012, micro-enterprises are defined as a firm, trade, service, industry, or business activity whose annual turnover does not exceed Kshs. 500,000 and whose total employees is less than ten people. The same statute defines a small enterprise as that which has an annual turnover of between Kshs 500,000 - 5 million, with the number of employees in the range of 10-50 people. In this study, SMEs refers to enterprises with a workforce of between 1 – 49 employees who includes the owner manager.

# **Statement of the Problem**

Unlike other industrialized countries, Kenya's industrialization process may not be realized in practice. Markets are rapidly globalized and information on available use of technologies has caused some uncertainties and opportunities among SMEs. To achieve much needed value, Kenyan SMEs have to produce goods and services that are locally and internationally accepted both in quality and price. However, lack of coherence and coordination on technology policies in Kenya, inhibits SMEs in dynamic decision-making process that slows their contributions in economic growth. With proper legal framework on technology, SMEs can increase their productivity and total sales volume, lower their production costs, spur growth and infrastructure, and aid in achieving a competitive edge over other firms.

# **Objective of the Study**

The main objective of this study was to examine the moderating role of regulatory policies on technology influence on value creation among rural small and micro enterprises in Nyamira county Kenya'.

The specific objectives were; a) to examine the influence of Technology on value creation among rural small and micro enterprises in Nyamira county Kenya; and to determine the moderating role of regulatory policies on the relationship between technology influence and value creation among rural small and micro enterprises in Nyamira county Kenya role of new productivity.

# Hypothesis of the Study

This study had two null hypotheses; one the effect of technology influence on value creation and the other on the effect of the moderator (regulatory policies and technology influence on value creation among rural small and micro enterprises in Nyamira county, Kenya.

The following null hypotheses were tested:

**Ho1**: There is no statistically significant relationship between technology influence and value creation among rural small and micro enterprises in Nyamira County, Kenya.

**H**<sub>0</sub>**2**. There is no significant effect of regulatory policies on the relationship between technology influence and value creation among rural small and micro enterprises in Nyamira County, Kenya.

# **Literature Review**

Value creation is a multi-dimensional concept that denotes customer satisfaction while embracing returns on owners' investments (Msamula, Vanhaverbeke, & Petro, 2016). However, for value contribution to be realized by the stakeholders (SMEs), there has to be regulatory policies and technology adoption in place (Ghobakhloo, Iranmanesh, Vilkas, Grybauskas, & Amran, 2022).

Technology has become a strategic resource pillar in sustaining competitiveness among firms regardless of their size. However, globalization and strategic alliance influences are some of the issues underpinning technology adoption among SMEs (Abdullah, Shamsuddin, Wahab, & Hamid, 2012). For sustainable growth and profitability for firms, technological innovation and attentive control must be put into perspective. Technology adoption has led to product development and design innovations, prompt deliveries in goods and services, and reduced transaction costs (Hanadi & Aruna, 2013).

In developing countries, most SMEs face technology adoption-associated challenges due to their size and uncertainty operating environment. This has forced firms to rely on modern cheap technology in retaining their competitiveness, improve on productivity, and prosper in contemporary dynamic markets(Yunis, Tarhini, & Kassar, 2018). In a study on the adoption of digital marketing technology by small businesses in Indonesia (Aarikka-Stenroos & Jaakkola, 2012), the study found out that most SMEs do not know how to use digital platforms in the available technology. Most SMEs are not in google maps, for marketing of their products.

A study done in the UK on 24 small owner-managed businesses operating in the economy Used qualitative research design, established that a strong appetite for the adoption of a marketing technology was a clear recognition of the opportunities relating particularly to how it could create stronger market orientation and even more agile marketing. This is in adherence to the principles of effectual reasoning. Nevertheless, the lack of necessary technology to measure investment return by SMEs hindered them from taking advantage of these opportunities (Alford & Page,2015).

In a study on the influence of innovativeness dimensions towards the growth of university students-owned micro-enterprises in Moshi Tanzania, it was established that innovation dimensions among university-owned enterprises had a significant positive influence on the growth of Micro Enterprises. The findings indicated that technology positively affect the growth of micro-enterprises. The study recommended that SME owners should encourage innovative tendencies among employees to impact on firm growth, competitiveness, profitability, and survival (Komba & Kazungu, 2018).

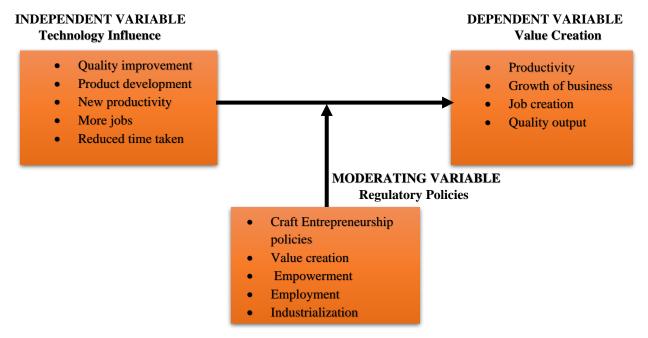
The impact of technological change on the future of SMEs in Kenya has brought about growing concerns. Most small business entrepreneurs appear unfamiliar with new technologies since it's neither locally available nor affordable or suitable to local conditions. Appropriate and affordable technology innovations among rural small and micro enterprises are the only reason to revitalize rural entrepreneurship (Nyongesa, Sewe, & Ng'ang'a, 2012). In a study done on the adoption of marketing technology by small businesses, Alford & Page, (2015), cited by Dwiputri (2022), the study found that a strong appetite for the adoption of technology and a clear recognition of its opportunities relating, particularly to how it could create a stronger marketing orientation and more agile marketing adhering to the principles of effectual reasoning. However, the ability to take advantage of these opportunities is constrained by a lack of knowledge and, inability to measure the return on investment (Dwiputri, Permana, & Fajar, 2022).

Rural SME technology is perceived to be appropriate not just in terms of its sophistication and complexity but for its suitability to a specific societal contest with desired social goals. SMEs have embraced technologies and processes that upscale national competitiveness and facilitate job creation. However, regardless of the many benefits of SMEs to the local communities, promoting their output to the outside world due to the localization of operation is a major challenge. Many

SME practitioners lack modern-day information and architectures to propel their businesses for future use (Muturi, 2015). Most African countries have initiated various missions to establish sustained

Most African countries have initiated various missions to establish sustained economic growth by increasing productivity with the ultimate goal of reducing extreme poverty among communities. However, there is a high mortality rate witnessed in the sector, due to among other things; the inadequate SME policy framework (Abisuga-Oyekunle, Patra, & Muchie, 2020).

Having a review of the regulations that govern the establishment of an enterprise, it's of essence to create a favorable regulatory environment particularly suitable for the establishment of small businesses. Inadequate SME policy regulations appear to discourage the creation of new technology and innovative startups on SMEs that are important for employment growth, innovation, and technological change. SMEs need a supportive regulatory framework in achieving a sustainable economy (Ndemo, 2020)



*Figure 1*: Conceptual Framework

The prominence of SME economies in Sub-Saharan Africa (SSA) face numerous economic and social challenges, which have necessitated the intensification of policy enactment directed towards the development of entrepreneurship (Mamman, Bawole, Agbebi, & Alhassan, 2019). However, within this context, existing SME policies are often framed as burdens that threaten their growth. In Kenya, SME activities form a breeding ground for businesses and Employees and provide one of the most prolific sources of employment. Their operations are more labor-intensive than the larger manufacturers." As such, policy provisions would mean boosting the operations of these enterprises and the country's economy (Wanjohi, 2010). The metrics of technology is measured based on the knowledge and innovation adopted by RSMEs for quality output of products and services and by developing entrepreneurs' new skills, where firms could achieve self-sustainability.

# **Research Methodology**

This study adopted a positivist philosophical stance, a paradigm characterized by a belief in theory before research, statistical justification of conclusions, and empirically testable hypothesis, the core tenets of scientific methods (Chell, 2013). Co-founded by Auguste Comte in the early 19th Century, positivism's philosophical stance is a research orientation that assumes that useful research is based on an existing theory, hypotheses, and quantitative data. A positivist paradigm asserts that real events can be observed empirically and explained with logical analysis to arrive at conclusions for viable decision-making This study used a cross-sectional survey research design for collecting and analysing data towards understanding the development of a Value Creation framework for small and micro enterprises (Creswell, Klassen, Plano Clark, & Smith, 2011). Cross-sectional studies are appropriate where the main objective is to establish whether there exist significant associations among variables under study.

The study was conducted in Nyamira County, Kenya, where it targeted rural small and micro enterprises involved in brick making, fish farming, and beekeeping. Nyamira County has 4 clusters of administrative boundaries; North Mugirango, West Mugirango, Kitutu Masaba and Borabu (Website: www.nyamira.go.ke,2018). The target population comprised fish farmers, brick makers, and beekeepers in Nyamira County, Kenya. According to the Ministry of fisheries and livestock development in Nyamira County and Lake Basin Development Authority, there were 1,846 registered small and micro enterprises practicing beekeeping, fish farming, and brick-making (Website: www.nyamira.go.ke, (2018), Ministry of Fisheries and Livestock Development, (2018), Lake Basin Development Authority, (2018).

Target Population	
Categories	Total
Fish Farmers	563
Bee Keepers	451
Brick Makers	832
Total	1846

#### Table 1

Source: Ministry of fisheries and livestock development, Lake Basin Development
Authority, 2018

The sample size of the specific groups of persons engaging in craft business i.e. beekeeping, fish farming, and brick making was calculated using Yamane's (1967) formula.

$$n = \frac{N}{1+N(e)^2} \qquad \dots \qquad (1)$$

Where, n = corrected sample size, N = population size, and e = Margin of error (MoE). e = 0.05 based on the research condition.

$$n = \frac{1846}{1 + 1846(0.05)^2} \qquad \dots \qquad (2)$$

# $n \approx 328$

To cater for non-responses during data collection, 35% of the sample size calculated was added to the main sample.

# $0.35\times328\approx115$

# 115+328=443

Stratified sampling was used to identify sample groups with the characteristics of interest. Simple random sampling was carried out to identify the respondents who took part in the study while, at some stage and condition, snowball method was used in cases where the desired quota failed to be randomly obtained until such a time where the researcher was convinced beyond doubt that all possible respondents were exhausted within that sample category. The study used both descriptive and inferential statistics were used to collect primary data from 443 targeted respondents by using a questionnaire (Mishra et al., 2019).

The reliability of the survey instrument was determined by conducting a pilot survey at Tabaka Sub-County in the neighbouring Kisii County of those who were practicing similar craft businesses. One hundred questionnaires were administered to targeted respondents, where eighty responses were received from returned filled questionnaires. For cross-sectional studies, descriptive, exploratory, or pilot studies reliability of the data collection instrument should equal to or be more than 0.6. This demonstrates that the research instrument is reliable if used to collect data from the targeted respondents. Any data collection instrument which is

0.5 and below, has a low reliability and should not be relied upon. However, the data collection instrument that yields between 0.05-0.70, is reliably moderate and can be used in

data collection. On the same note, the data collection instrument that yields between 0.70-0.90, is of moderate reliability, the instrument which yields more than 0.90 is of high reliability (Straub, Boudreau, & Gefen, 2004).

# Table 2

Reliability Statistic								
	Items							
	Alpha	Based on Standardized						
		Items						
Technology Influence	0.846	0.849	5					
<b>Regulatory Policies</b>	0.847	0.848	5					
Value Creation	0.714	0.715	4					

Reliability Analysis

From results in Table 2, its clearly demonstrated that Cronbach's Alpha results were between 0.70-0.90 implying that the instrument highly reliable to be used in data collection of targeted respondents.

To determine technology influence on value creation among rural small and micro enterprises in Nyamira County, Kenya. The following model was used

$$Y = \beta o + \beta_1 X_1 + \varepsilon \qquad (3)$$

Where:

 $\mathbf{Y} =$ value creation,

 $\beta o = \text{coefficient of the constant}$ 

 $\beta_1$  = regression coefficient or change induced in X1

 $X_1$  = independent variable (technology influence)

 $\boldsymbol{\varepsilon} = is$  the error term.

The last general model is to establish the moderating role of regulatory policies between technology influence and value creation.  $Y = \beta 0 + \beta i X i Z$ 

$$Y = \beta o + \beta_1 X_1 Z \qquad \dots \qquad (4)$$

Where;

 $\mathbf{Y}$  = dependent variable (value creation),

 $X_1$  = technology influence.

 $\mathbf{Z}$  = regulatory policies,

 $B_1$  = coefficients of the variables while;

 $\boldsymbol{\varepsilon}$  = the error,

**XiZ** = Interaction between regulatory policies and Technology influence

An enhanced Value Creation Model articulates the logic and shows the variables and other evidence that demonstrates how a business creates and delivers value. It defines how the enterprise creates and delivers value to itself and customers, and then converts payments received for business expansion to profits.

#### Findings

#### Influence of Technology on Value Creation

The hypothesis H01 stated: There is no statistically significant relationship between technology influence and value creation among rural small and micro enterprises in Nyamira County, Kenya

$$\mathbf{Y} = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1 \boldsymbol{X}_1 + \boldsymbol{\varepsilon}$$

			Adjusted R-	Std. Error of
Model	R	R -Square	Square	the Estimate
1	.368ª	.136	.134	.79624

#### Source: Field Data, 2019

The findings on the influence of technology on value creation among rural small and micro enterprises in Nyamira County were presented in table 3a revealed that 13.6 percent variation of value creation was explained.

#### Table 3b

ANOVA for Influence of Technology

Model		Sum of	df	Mean	f	Sig.	
	Sq		res Square				
1	Regression	43.338	1	43.338	68.357	.000 <sup>b</sup>	
	Residual	276.422	436	.634			
	Total	319.760	437				
a. Dependent Variable: Value Creation							
b. Predicte	ors: (Constan	t), Technolog	gy Influen	се			

The ANOVA model showed model fitness for the effect of technology influence on value creation was statistically significant (F = 68.357,  $\rho$ =.000). Thus, the model was fit to predict value creation using technology.

# Table 3c

Coefficients of Technology Influence

		Unstandard	lized	Standa	rdized			
		<b>Coefficients</b> Coeff		ficients				
Model		В	Std. Error Beta		t	Sig.		
1	(Constant)	2.857	.147		19.462	.000		
	Technology Influence	.296	.036	.368	8.268	.000		
a. Depend	a. Dependent Variable: Value Creation							

Findings showed that technology influence had coefficients of the estimate which was significant basing on  $\beta 4 = 0.368$  (p-value = 0.000 which is less than  $\alpha = 0.05$ ) implying that the null hypothesis was rejected and it was concluded that technology influence had a significant effect on value creation among rural small and micro enterprises in Nyamira County. This indicated that for each unit increase in technology influence, there was up to 0.368 unit increase in value creation. The effect of value creation was stated by the t-test value = 8.268 which indicated that the effect of technology influence was over 8times that of the error associated with it. Based on the above results the study derived the following simple linear regression model as shown

$$Y = \beta_0 + \beta_1 X_1 + \epsilon$$
  
$$Y = 2.857 + 0.296 X_1 + \epsilon$$

These results are consistent with Xiong & Qureshi, (2015), who found that Technology is a driving force for social-economic development and can change how SMEs ensure value addition in both developing and developed countries. They also found that technology has the potential to capitalize on strategic market opportunities and aligning organizational strengths with market opportunities. According to Ng'ang'a & Nyongesa, (2012), technology aims to facilitate novelty in diversification thus enriching market opportunities.

# **Regulatory Policies on the Relationship between Technology Influence and Value Creation**

The fourth and last sub hypothesis of the second objective sought to determine the effect of regulatory policies on the relationship between technology influence and value creation among rural small and micro enterprises in Nyamira County, Kenya. Linear regression was employed to find the moderating effect of regulatory policies on the relationship between table banking and value creation. Findings are shown in table 4a, b, and c.

# Table 4a

Model Summary for Regulatory Policies on The Relationship Between Technology Influence and Value Creation

	Change Statistic								
				Std Error	R-				
		R-	Adjusted	of the	Square				Sig. F
Model	R	Square	R-Square	Estimate	Change	F Change	$df_1$	df <sub>2</sub>	Change
1	.368b	.136	.134	.79624	.136	68.357	1	436	.000
2	.570	.325	.322	.70448	.189	121.975	1	435	.000
a. Predi	a. Predictors: (Constant), Technology Influence								
b. Predi	ictors: (C	onstant), T	echnology In	fluence, $X_1$	Ζ				

The study results in table 4a showed a change of R squared to be 18.9 % ( $R^2\Delta$ = .189) indicating that regulatory policies moderate the relationship between technology influence and value creation by 18.9%. This implies that regulatory policies influenced the relationship between technology influence and value creation.

#### Table 4b

ANOVA Regulatory Policies on The Relationship Between Technology Influence

Μ	lodel	Sum of Squares	df	Mean Square	f	Sig		
1	Regression	43.338	1	43.338	68.357	.000 <sup>b</sup>		
	Residual	276.422	436	.634				
	Total	319.760	437					
2	Regression	103.873	2	51.937	104.649	.000 <sup>c</sup>		
	Residual	215.887	435	.496				
	Total	319.760	437					
a. Depena	lent Variable:	Value Cre	ation					
b. Predict	ors: (Constan	t), Technol	logy Influence					

c. Predictors: (Constant), Technology Influence, X<sub>1</sub>Z

H<sub>0</sub>1. stated that there is no significant effect of regulatory policies on the relationship between technology influence and value creation among rural small and micro enterprises in Nyamira County, Kenya. The results showed that regulatory policies positively moderated the relationship between technology influence and value creation (F = 104.649,  $\rho$ <.05), hence the null hypothesis was rejected.

			UnstandardizedStandardizedCoefficientsCoefficients				
Model		В	Std. Err	Std. Error Beta t			
1	(Constant)	2.857	.147		19.462	.000	
	Technology Influence	.296	.036	.368	8.268	.000	
2	(Constant)	2.460	.135		18.252	.000	
	Technology Influence	.332	.036	.368	10.441	.000	
	X <sub>1</sub> Z	.023	.002	.437	11.044	.000	
a. Depend	ent Variable: Value Crec	ition		1			

#### Table 4c

Coefficients for Regulatory Policies on The Relationship Between Technology Influence

The model indicated that an increase of technology influence moderated by regulatory policies increased value creation by .437 units. Based on the above results the study derived the following simple linear regression model as shown

 $Y = 2.460 + 0.023X1 + \epsilon$ 

# Discussion

The results indicated a strong relationship between craft entrepreneurial practices and value creation. It was also established to have a significant moderating role of regulatory policies in the relationship between craft entrepreneurial practices and value creation. It also emerged that the individual and combined effects of the independent variables (craft entrepreneurial practices) on the dependent variable (value creation) are significant. These research results, therefore, support hypotheses that were posed based on the conceptual model. These findings are supported by those of Tower, Hewett & Saboo, (2021), that improved value creation depends on how strategically SMEs are managed in meeting overall business objectives (Tower, Hewett, & Saboo, 2021).

Theoretically, the study distinguished craft entrepreneurial practices and regulatory policies as two important resources that can be used to steer SME's value creation. It, therefore supports Resource-Based View (RBV) theory as it contributes greatly to value creation among rural small and micro enterprises. This study has given useful insights into the use of RBV based on earlier works of (Kull, Mena, & Korschun, 2016), which had identified the firm's competitive priorities is to develop, acquire and assemble entrepreneurial resources hence creating a competitive advantage.

Rural small and micro enterprises can benefit from the findings of this study through the acquisition of new skills and knowledge on how they can use the available resources to influence value in their business practices. At the same, policymakers will use the study findings to create a conducive working environment for SMEs, since these businesses can contribute greatly to revenue generation, creation of more employment opportunities, and eradication of extreme poverty among people. The study will also form a basis for insights concerning the role of craft entrepreneurial practices and value creation. Furthermore, the results will help most small business owners to recognize the need for a better and efficient application of craft entrepreneurial practices aligned to overall business strategy, which can improve overall value creation.

### Conclusion

The policy and practical implications regarding regulatory policies on value creation are that entrepreneurial practices that are not supported with favourable regulatory policies cannot lead to any great improvement in the SME's value addition. From the study, the results showed a significant and positive relationship between Technology influence and value creation (r=0.337, p>0.01). These results are consistent with findings of past studies which found a positive relationship between creativity and value creation (Roper, Love, & Bonner, 2017). Once well regulated, the SME sector can create huge employment opportunities, support large-scale industries, enhance the quality of human resources, stimulate competition, cultivate a culture of entrepreneurship, and open new business opportunities (Dwivedi et al.,2017).

The study results in table 4a, showed a change of R squared to be 18.9 % ( $R_2\Delta$ = .189) indicating that regulatory policies moderate the relationship between technology influence and value creation by 18.9%. This implies that regulatory policies influenced the relationship between technology influence and value creation.

# Recommendations

Based on the study findings, this study makes the following recommendations;

1. The policymakers both in national and county governments should bring closer regulatory and institutional framework to save on time and cost of having RSMEs in Nyamira County getting formally registered for business undertaking

2. Owners of SMEs should be taught how to select and use appropriate technology in their operational processes

3. Future research can use the indicators on technology influence, Regulatory policies and value creation to get qualitative information and issues regarding the use of technology in enhancing economic value to RSMEs in Nyamira County and Kenya at large.

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