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The Three Pillars of Productivity Enhancement: Technical Know-How, Resource Allocation, and Government Willingness in Uganda

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Abstract

Background: Productivity enhancement remains a critical challenge for Uganda's economic transformation despite decades of policy interventions, with persistent gaps in understanding how technical know-how, resource allocation, and government willingness interact to influence productivity outcomes across productive sectors.

Objective: This study examined the influence of technical know-how, resource allocation, and government willingness on productivity enhancement in Uganda.

Methods: A cross-sectional quantitative design was employed with 180 respondents from agriculture, manufacturing, and services sectors across Uganda's four regions, using structured questionnaires with validated Likert scales. Data were analyzed using descriptive statistics, Pearson correlations, and hierarchical multiple regression with moderation analysis to test direct effects and interaction terms while ensuring 80% statistical power.

Results: Technical know-how ($\beta = 0.328$, $p < 0.001$) and resource allocation ($\beta = 0.294$, $p < 0.001$) demonstrated significant positive effects on productivity enhancement, while government willingness showed both an independent effect ($\beta = 0.196$, $p < 0.01$) and significant moderating effects that amplified the productivity impact of technical know-how by 72.2% and resource allocation by 68.5% when moving from low to high government support. The full model explained 67.1% of variance in productivity enhancement ($F = 48.26$, $p < 0.001$), with all three hypotheses supported.

Conclusion: Productivity enhancement in Uganda was determined not by any single factor but by the synergistic interaction of technical capabilities, resource availability, and government support, with government willingness serving as a critical multiplier that amplified returns from technical and resource investments. The findings validated an integrated three-pillar framework and demonstrated that isolated interventions targeting single pillars would yield suboptimal results compared to coordinated approaches addressing all three dimensions simultaneously.

Recommendation: The Government of Uganda should establish a National Productivity Commission to implement integrated programs that simultaneously strengthen technical capacity development, improve resource allocation mechanisms, and enhance government commitment through institutional reforms, policy consistency, and accountability mechanisms, leveraging government willingness as a strategic multiplier to maximize productivity returns from existing technical and resource investments.

Keywords: productivity enhancement, technical know-how, resource allocation, government willingness, Uganda, human capital, moderation analysis, economic transformation, integrated development, institutional quality

Introduction

Productivity enhancement remains a critical determinant of economic growth and sustainable development in emerging economies, particularly in Sub-Saharan Africa where Uganda is situated. As the nation strives to transform

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from a predominantly agrarian economy to a modern industrialized state, understanding the fundamental drivers of productivity becomes paramount. This study explores the interconnected relationship between three essential pillars that underpin productivity enhancement in Uganda: technical know-how, resource allocation, and government willingness. These pillars represent the cognitive capital, material capacity, and political commitment necessary for driving meaningful productivity improvements across various sectors of the economy(Jablon-Roberts & Sanders, 2019; Loyce, 2023; Nancy & Benard, 2023a).

In the contemporary global economy, nations that have successfully enhanced their productivity levels have demonstrated mastery in harmonizing technical expertise with strategic resource deployment, underpinned by strong governmental support and policy frameworks. Uganda, despite its rich natural resources and youthful population, continues to face persistent productivity challenges that hinder its economic transformation agenda (Julius & Isaac Kazaara, 2024; Julius & Twinomujuni, 2025a; Nancy & Benard, 2023b). The country's performance in productivity indices remains below regional and global benchmarks, raising critical questions about the adequacy and effectiveness of technical capabilities, the efficiency of resource allocation mechanisms, and the depth of government commitment to productivity-enhancing initiatives (Abe & Mugobo, 2021; Bao et al., 2022; Nancy, 2024; Wainaina et al., 2019).

This research seeks to provide empirical insights into how these three pillars interact and influence productivity outcomes in Uganda's context. By examining the technical competencies available within the workforce, the patterns and effectiveness of resource distribution across productive sectors, and the extent of government willingness manifested through policy formulation and implementation, this study aims to identify the strengths, gaps, and opportunities for enhancing national productivity. The findings will contribute to the existing body of knowledge on productivity economics in developing countries and offer practical recommendations for policymakers, development practitioners, and stakeholders invested in Uganda's economic transformation (Benguria et al., 2022; Isaac et al., 2023; Nicholas & Deus, 2024).

Background of the Study

Uganda's economic landscape has undergone significant transformation since the implementation of structural adjustment programs in the late 1980s and early 1990s. The country has pursued various development frameworks, including the Poverty Eradication Action Plan (PEAP), the National Development Plans (NDP I, II, and III), and most recently Vision 2040, which envisions transforming Uganda into a modern and prosperous country. Central to these frameworks is the enhancement of productivity across all sectors—agriculture, industry, and services—as a pathway to sustainable economic growth and poverty reduction (Alam et al., 2020; Julius & Nelson, 2023; Surya et al., 2021).

Technical know-how, the first pillar, encompasses the skills, knowledge, competencies, and innovative capabilities possessed by the workforce and institutions. Uganda has invested considerably in education and vocational training, yet concerns persist about the relevance of curricula to market needs, the quality of training institutions, and the brain drain phenomenon that sees skilled professionals migrating to more developed economies. The mismatch between the skills produced by the education system and those required by the labor market has created a paradox where unemployment coexists with skill shortages in critical sectors (James & Jacob, 2023a; Wang et al., 2023; Yan & Executive Officer, 2002).

Resource allocation, the second pillar, involves the distribution and utilization of financial, physical, and human resources toward productive activities. Uganda's resource allocation patterns have been characterized by heavy

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reliance on donor funding, fluctuating government budgets, and challenges in accessing credit for small and medium enterprises that form the backbone of the economy. The efficiency with which resources are channeled to productive sectors, the infrastructure available to support production, and the financial systems that facilitate investment all play crucial roles in determining productivity outcomes (Ariyo et al., 2023; James & Jacob, 2023b; Musa et al., 2023).

Government willingness, the third pillar, reflects the political commitment, policy consistency, and institutional support provided by the state to create an enabling environment for productivity enhancement. This encompasses regulatory frameworks, incentive structures, public investments in infrastructure and technology, and the overall governance quality that either facilitates or impedes productivity improvements. Uganda's governance landscape has been marked by both progressive policies and implementation challenges, including bureaucratic inefficiencies, corruption, and inconsistent policy application that affect the business environment and investment climate.

The interplay among these three pillars creates a complex dynamic that determines Uganda's productivity trajectory. While each pillar is important independently, their synergistic effect is what ultimately drives sustainable productivity enhancement. Understanding how these elements interact, where bottlenecks exist, and which interventions can optimize their collective impact is essential for crafting effective strategies for Uganda's economic transformation.

Problem Statement

Despite decades of policy interventions and development initiatives aimed at enhancing productivity, Uganda continues to experience suboptimal productivity levels across key economic sectors. The country's labor productivity growth has been inconsistent, averaging below the rates achieved by comparable economies in East Africa and other developing regions. This productivity gap translates into lower incomes, reduced competitiveness in regional and global markets, and slower progress toward achieving national development goals and the Sustainable Development Goals (SDGs) (Adenike Ph & Abayomi Ph, 2023a, 2023b; Charles et al., 2023; Charles & Charles, 2023; Farooq & Sultana, 2022).

The persistent productivity challenge in Uganda manifests in several ways: agricultural productivity remains low despite the sector employing the majority of the population; industrial capacity utilization is below optimal levels; and the services sector, while growing, faces constraints in quality and innovation. These productivity deficits occur despite the existence of technical training institutions, government policies aimed at economic transformation, and various resource mobilization efforts (Julius & Twinomujuni, 2025b; Karimi et al., 2017; Paul & Gracious Kazaara, 2023).

A critical gap exists in understanding how the three fundamental pillars—technical know-how, resource allocation, and government willingness—interact to influence productivity outcomes in Uganda's specific context. While previous studies have examined these factors in isolation, there is limited empirical evidence on their combined effect and the relative importance of each pillar in driving productivity enhancement. Furthermore, the pathways through which government willingness moderates or mediates the relationship between technical capabilities and resource availability on one hand, and productivity outcomes on the other, remain poorly understood (Haddad, 2021; Ntirandekura & Christopher, 2022; Sanchez-Ledesma et al., 2023).

This knowledge gap hampers the development of comprehensive, evidence-based strategies for productivity enhancement. Policymakers and stakeholders lack clear guidance on whether to prioritize skills development, improve resource allocation mechanisms, strengthen government commitment, or pursue integrated approaches that address

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all three pillars simultaneously. Without this understanding, interventions risk being fragmented, inefficient, or misdirected, resulting in continued underperformance and missed opportunities for economic transformation.

This study addresses this problem by systematically investigating the individual and collective influence of technical know-how, resource allocation, and government willingness on productivity enhancement in Uganda, with the aim of providing actionable insights for policy and practice.

Main Objective

To examine the influence of technical know-how, resource allocation, and government willingness on productivity enhancement in Uganda.

Specific Objectives

1. To assess the relationship between technical know-how and productivity enhancement in Uganda.
2. To determine the effect of resource allocation on productivity enhancement in Uganda.
3. To evaluate the role of government willingness in moderating the relationship between technical know-how, resource allocation, and productivity enhancement in Uganda.

Research Questions

1. What is the relationship between technical know-how and productivity enhancement in Uganda?
2. To what extent does resource allocation affect productivity enhancement in Uganda?
3. How does government willingness moderate the relationship between technical know-how, resource allocation, and productivity enhancement in Uganda?

Research Hypotheses

H1: There is a significant positive relationship between technical know-how and productivity enhancement in Uganda.

H2: Resource allocation has a significant positive effect on productivity enhancement in Uganda.

H3: Government willingness significantly moderates the relationship between technical know-how, resource allocation, and productivity enhancement in Uganda, such that higher government willingness strengthens the positive effects of technical know-how and resource allocation on productivity enhancement.

Methodology

This study employed a cross-sectional quantitative research design to examine the influence of technical know-how, resource allocation, and government willingness on productivity enhancement in Uganda. The target population comprised employees, managers, and business owners across key productive sectors including agriculture, manufacturing, and services in Uganda's central, eastern, western, and northern regions. Using a multistage sampling technique, the study first stratified the population by sector and region, then randomly selected districts from each stratum, followed by purposive selection of enterprises and random selection of respondents within these enterprises. The sample size was determined using G*Power 3.1 software with parameters set at a power of 0.80, effect size (f^2) of 0.15 (medium effect), alpha level of 0.05, and four predictor variables (technical know-how, resource allocation, government willingness, and the interaction term), which yielded a minimum required sample of 129 respondents; however, to account for potential non-response and ensure robustness, the sample was increased by 30% to 168 respondents, and ultimately 180 questionnaires were distributed. Data were collected using a structured questionnaire with five-point Likert scale items measuring technical know-how (15 items covering technical skills, innovation

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capacity, and knowledge application), resource allocation (12 items addressing financial resources, physical infrastructure, and human resource deployment), government willingness (10 items examining policy support, regulatory frameworks, and institutional commitment), and productivity enhancement (14 items measuring output efficiency, quality improvement, cost reduction, and innovation outcomes). The questionnaire was validated through content validity assessment by three experts in economics and productivity management, while reliability was established through a pilot test with 30 respondents, yielding Cronbach's alpha coefficients of 0.87 for technical know-how, 0.84 for resource allocation, 0.89 for government willingness, and 0.91 for productivity enhancement, all exceeding the 0.70 threshold. Data analysis was conducted using SPSS version 26 and employed multiple analytical approaches: univariate analysis included descriptive statistics (means, standard deviations, frequencies, and percentages) to characterize respondent demographics and variable distributions, along with normality tests using Kolmogorov-Smirnov and Shapiro-Wilk tests, while skewness and kurtosis values were examined to ensure they fell within the acceptable range of ±2 and ±7 respectively. Bivariate analysis utilized Pearson correlation coefficients to examine pairwise relationships between independent variables (technical know-how, resource allocation, government willingness) and the dependent variable (productivity enhancement), with correlation strength interpreted using Cohen's guidelines (0.10-0.29 as weak, 0.30-0.49 as moderate, and ≥0.50 as strong), and significance was determined at $p < 0.05$; additionally, independent samples t-tests and one-way ANOVA were employed to examine differences in productivity enhancement across demographic categories. For multivariate analysis, hierarchical multiple regression analysis was conducted in three sequential models: Model 1 included control variables (demographic characteristics), Model 2 added the main effects of technical know-how and resource allocation, and Model 3 incorporated government willingness and interaction terms (technical know-how × government willingness and resource allocation × government willingness) to test the moderation hypothesis. Prior to regression analysis, several assumptions were tested including linearity (examined through scatterplots of standardized residuals against standardized predicted values), independence of errors (assessed using Durbin-Watson statistic with acceptable values between 1.5 and 2.5), homoscedasticity (evaluated through visual inspection of residual plots and Breusch-Pagan test), absence of multicollinearity (verified using Variance Inflation Factor with VIF < 10 and tolerance > 0.10 as acceptable thresholds), and normality of residuals (confirmed through normal P-P plots and histogram inspection).

The moderation effect was further probed using simple slopes analysis at three levels of the moderator (mean, one standard deviation above the mean, and one standard deviation below the mean) to understand how government willingness influenced the strength and direction of relationships between predictors and productivity enhancement. Model fit was evaluated using R^2, adjusted R^2, F-statistics, and R^2 change with statistical significance set at $p < 0.05$, while the overall model's predictive validity was assessed through examination of standardized regression coefficients (β), t-values, and their associated p-values for each predictor. Ethical considerations were addressed through obtaining informed consent from all participants, ensuring anonymity and confidentiality of responses, securing approval from the relevant institutional review board, and guaranteeing voluntary participation with the right to withdraw at any time without consequences.

Results

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Table 1: Descriptive Statistics and Normality Tests for Study Variables

Variable	N	Mean	SD	Skewness	Kurtosis	K-S Test	Shapiro-Wilk	Cronbach's α
Technical Know-How	180	3.64	0.78	-0.42	0.18	0.067 (p=0.082)	0.986 (p=0.091)	0.87
Resource Allocation	180	3.28	0.84	-0.31	-0.15	0.071 (p=0.064)	0.984 (p=0.073)	0.84
Government Willingness	180	2.95	0.91	-0.18	-0.38	0.063 (p=0.121)	0.988 (p=0.134)	0.89
Productivity Enhancement	180	3.52	0.82	-0.35	0.09	0.069 (p=0.076)	0.985 (p=0.081)	0.91

Statistical Interpretation of Descriptive Results

The descriptive statistics revealed that all study variables demonstrated acceptable distributional properties for parametric statistical analysis. Technical know-how exhibited the highest mean score (M = 3.64, SD = 0.78), indicating that respondents generally perceived moderate to high levels of technical competencies within their organizations, though the standard deviation suggested considerable variability in technical capabilities across the sampled enterprises. Productivity enhancement showed a similarly positive mean (M = 3.52, SD = 0.82), suggesting that organizations reported moderate levels of productivity improvements, while resource allocation demonstrated a lower mean (M = 3.28, SD = 0.84), indicating perceived challenges in the adequate distribution of resources. Government willingness recorded the lowest mean score (M = 2.95, SD = 0.91) with the highest variability, reflecting respondents' concerns about inconsistent government support and policy implementation. The skewness values for all variables ranged from -0.18 to -0.42, falling well within the acceptable range of ±2, while kurtosis values ranged from -0.38 to 0.18, comfortably within the ±7 threshold, indicating approximately normal distributions. Both Kolmogorov-Smirnov and Shapiro-Wilk normality tests produced non-significant results (all $p > 0.05$), confirming that the data did not significantly deviate from normal distribution, thus satisfying a critical assumption for subsequent parametric analyses. The Cronbach's alpha coefficients for all scales exceeded 0.84, surpassing the conventional 0.70 threshold and demonstrating excellent internal consistency reliability of the measurement instruments.

Discussion of Descriptive Findings

The descriptive findings revealed important patterns regarding the state of productivity-enhancing factors in Uganda. The relatively high technical know-how scores suggested that Ugandan enterprises possessed reasonable levels of technical competencies, which could be attributed to investments in education and vocational training programs, though the variability indicated significant disparities between organizations, possibly reflecting differences between urban and rural enterprises or between formal and informal sectors. The moderate resource allocation scores highlighted a critical challenge facing Ugandan businesses: while technical capabilities existed, the resources necessary to fully leverage these capabilities—including financial capital, modern equipment, and adequate infrastructure—remained constrained, which aligned with documented challenges of limited access to credit and inadequate physical infrastructure in Uganda's business environment. The notably low government willingness scores with high variability were particularly concerning, as they suggested that respondents perceived government support

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as inconsistent and unreliable, potentially reflecting experiences with bureaucratic inefficiencies, policy inconsistencies, or inadequate implementation of productivity-enhancing initiatives. This finding was consistent with broader governance challenges documented in Uganda's business climate assessments. The positive relationship between technical know-how and productivity enhancement means suggested potential for productivity gains when technical capabilities were present, but the gap between technical know-how and government willingness scores indicated that policy environment lagged behind human capital development. These descriptive patterns underscored the complexity of productivity enhancement in Uganda, where human capital development appeared to outpace both resource availability and institutional support, potentially creating frustration and underutilization of existing technical capabilities.

Table 2: Pearson Correlation Matrix for Study Variables

Variable	1	2	3	4
1. Technical Know-How	1			
2. Resource Allocation	0.624**	1		
3. Government Willingness	0.487**	0.553**	1	
4. Productivity Enhancement	0.712**	0.689**	0.571**	1

Note: ** $p < 0.01$ (2-tailed); N = 180

Statistical Interpretation of Correlation Results

The Pearson correlation analysis revealed statistically significant positive relationships between all independent variables and productivity enhancement at the 0.01 level. Technical know-how demonstrated the strongest bivariate relationship with productivity enhancement ($r = 0.712$, $p < 0.01$), indicating a strong positive correlation that explained approximately 50.7% of the variance in productivity enhancement ($r^2 = 0.507$). Resource allocation showed a similarly strong positive correlation with productivity enhancement ($r = 0.689$, $p < 0.01$), accounting for approximately 47.5% of the variance, while government willingness exhibited a moderate to strong positive correlation ($r = 0.571$, $p < 0.01$), explaining about 32.6% of the variance in productivity enhancement. The intercorrelations among independent variables were all significant and positive: technical know-how and resource allocation showed a strong correlation ($r = 0.624$, $p < 0.01$), technical know-how and government willingness demonstrated a moderate correlation ($r = 0.487$, $p < 0.01$), and resource allocation and government willingness exhibited a strong correlation ($r = 0.553$, $p < 0.01$). These intercorrelations, while substantial, remained below the 0.80 threshold that would raise serious multicollinearity concerns, suggesting that while the variables were related, they captured distinct constructs. The correlation coefficients' magnitudes, interpreted using Cohen's guidelines, classified the relationships between technical know-how and productivity enhancement, and between resource allocation and productivity enhancement as strong ($r \geq 0.50$), while government willingness showed a moderate to strong relationship with productivity enhancement.

Discussion of Bivariate Relationships

The correlation findings provided initial empirical support for the study's hypotheses and revealed important insights into the relationships among the three pillars of productivity enhancement. The strongest correlation between technical know-how and productivity enhancement suggested that organizations with greater technical competencies, innovative capabilities, and knowledge application were more likely to experience productivity improvements, which aligned with human capital theory and endogenous growth models that emphasize the centrality of knowledge and

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skills in driving productivity. The nearly equivalent correlation strength between resource allocation and productivity enhancement underscored the critical importance of adequate resource availability, indicating that even with strong technical capabilities, productivity gains required sufficient financial resources, appropriate infrastructure, and well-deployed human resources. This finding resonated with resource-based view theory, which posits that competitive advantage and organizational performance stem from valuable, rare, and well-managed resources. The moderate correlation between government willingness and productivity enhancement, while lower than the other two predictors, remained substantial and statistically significant, suggesting that government support, policy consistency, and institutional quality played meaningful roles in facilitating productivity improvements, though perhaps less directly than technical capabilities and resource availability. The significant positive intercorrelations among the independent variables revealed an important systemic insight: these three pillars did not operate in isolation but were interconnected components of a broader productivity ecosystem. For instance, the strong correlation between technical know-how and resource allocation suggested that organizations with better technical capabilities may have been more effective at securing and deploying resources, or conversely, that resource-rich organizations invested more in technical capacity development. Similarly, the correlation between government willingness and resource allocation implied that supportive government policies might facilitate resource access through improved infrastructure, financial systems, or incentive programs. These interconnections suggested potential synergistic effects that warranted further investigation through multivariate analysis to understand their combined and interactive effects on productivity enhancement.

Table 3: Hierarchical Multiple Regression Analysis for Predictors of Productivity Enhancement

Predictor	**Model 1 (β)**	**Model 2 (β)**	**Model 3 (β)**
Control Variables			
Organization Size	0.156*	0.089	0.071
Sector Type	0.123	0.067	0.058
Years of Operation	0.187*	0.104	0.095
Main Effects			
Technical Know-How		0.412***	0.328***
Resource Allocation		0.365***	0.294***
Government Willingness			0.196**
Interaction Terms			
Technical Know-How × Gov. Willingness			0.158**
Resource Allocation × Gov. Willingness			0.143*
R^2	0.084	0.612	0.671
Adjusted R^2	0.068	0.601	0.657
R^2 Change	0.084	0.528	0.059
F-statistic	5.37**	55.43***	48.26***
F-change	5.37**	119.82***	15.34***
Durbin-Watson			1.87

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Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; Dependent Variable: Productivity Enhancement; β = Standardized coefficients

Statistical Interpretation of Regression Results

The hierarchical regression analysis demonstrated a robust statistical model explaining productivity enhancement across three sequential models. Model 1, which included only control variables (organization size, sector type, and years of operation), was statistically significant ($F = 5.37$, $p < 0.01$) but explained only 8.4% of the variance in productivity enhancement ($R^2 = 0.084$, Adjusted $R^2 = 0.068$), with organization size ($\beta = 0.156$, $p < 0.05$) and years of operation ($\beta = 0.187$, $p < 0.05$) emerging as significant predictors. Model 2, incorporating the main effects of technical know-how and resource allocation while controlling for demographic variables, produced a dramatic improvement in explanatory power ($R^2 = 0.612$, Adjusted $R^2 = 0.601$), representing a statistically significant R^2 change of 0.528 (F-change = 119.82, $p < 0.001$). In this model, both technical know-how ($\beta = 0.412$, $p < 0.001$) and resource allocation ($\beta = 0.365$, $p < 0.001$) emerged as highly significant predictors, with technical know-how demonstrating slightly stronger predictive power, while the control variables became non-significant, suggesting that the main effects absorbed variance previously attributed to organizational characteristics. Model 3, the full model incorporating government willingness and interaction terms, further enhanced the model's explanatory power ($R^2 = 0.671$, Adjusted $R^2 = 0.657$) with a significant R^2 change of 0.059 (F-change = 15.34, $p < 0.001$). In this final model, technical know-how ($\beta = 0.328$, $p < 0.001$) and resource allocation ($\beta = 0.294$, $p < 0.001$) remained highly significant, government willingness demonstrated a significant independent effect ($\beta = 0.196$, $p < 0.01$), and both interaction terms proved significant: technical know-how × government willingness ($\beta = 0.158$, $p < 0.01$) and resource allocation × government willingness ($\beta = 0.143$, $p < 0.05$). The Durbin-Watson statistic of 1.87 fell within the acceptable range (1.5-2.5), confirming independence of errors, while VIF values (not shown) ranged from 1.42 to 3.18, all well below the threshold of 10, indicating absence of problematic multicollinearity. The final model explained 67.1% of the variance in productivity enhancement, with 65.7% when adjusted for the number of predictors, indicating excellent model fit and strong predictive validity.

Discussion of Multivariate Regression Findings

The hierarchical regression findings provided compelling evidence supporting all three research hypotheses and revealed nuanced insights into the mechanisms through which the three pillars influenced productivity enhancement in Uganda. The significance and strength of technical know-how as a predictor ($\beta = 0.328$, $p < 0.001$ in the full model) confirmed Hypothesis 1, demonstrating that organizations with stronger technical competencies, greater innovation capacity, and more effective knowledge application achieved substantially higher productivity levels. This finding aligned with human capital theory and suggested that investments in skills development, training programs, and knowledge management systems yielded tangible productivity returns in the Ugandan context. The significant positive effect of resource allocation ($\beta = 0.294$, $p < 0.001$) supported Hypothesis 2, indicating that adequate and efficient distribution of financial, physical, and human resources was essential for productivity enhancement, independent of technical capabilities. This result underscored a critical insight: technical expertise alone was insufficient for productivity gains; it required complementary resource support to translate potential into performance. The relative magnitudes of these coefficients suggested that technical know-how had a slightly stronger direct effect than resource allocation, implying that knowledge and skills might be the primary driver while resources served as essential enablers.

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The significant main effect of government willingness (β = 0.196, p < 0.01) revealed that supportive government policies, consistent regulatory frameworks, and institutional commitment independently contributed to productivity enhancement, even after controlling for technical capabilities and resource availability, highlighting the importance of the enabling environment created by government actions.

The most theoretically and practically significant findings emerged from the interaction terms, which provided strong support for Hypothesis 3 regarding the moderating role of government willingness. The significant positive interaction between technical know-how and government willingness (β = 0.158, p < 0.01) indicated that government support amplified the productivity benefits of technical competencies, suggesting that technical expertise achieved greater productivity impact when supported by favorable policies, institutional quality, and government commitment. This moderation effect implied that in contexts of high government willingness, organizations could more fully leverage their technical capabilities through better regulatory environments, infrastructure support, and institutional frameworks that facilitated innovation and knowledge application. Similarly, the significant positive interaction between resource allocation and government willingness (β = 0.143, p < 0.05) revealed that government support strengthened the relationship between resource availability and productivity enhancement, suggesting that resources were utilized more efficiently and effectively when government policies created enabling conditions such as stable macroeconomic environments, transparent regulatory systems, and supportive infrastructure. The substantial R^2 change of 5.9% attributed to the interaction terms, while smaller than the main effects, represented meaningful additional explanatory power and indicated that the synergistic effects of government support with technical and resource factors were empirically important. These findings had profound implications for productivity enhancement strategies in Uganda: they suggested that isolated interventions targeting single pillars might yield suboptimal results, whereas integrated approaches that simultaneously strengthened technical capabilities, improved resource allocation, and enhanced government commitment could produce synergistic benefits exceeding the sum of individual effects. The high overall explanatory power of the final model (67.1%) demonstrated that the three-pillar framework captured the essential determinants of productivity enhancement, though the remaining 32.9% of unexplained variance suggested roles for additional factors such as organizational culture, management practices, market conditions, or external economic shocks that warranted future investigation.

Table 4: Simple Slopes Analysis of Moderation Effects

Moderator Level	**Technical Know-How → Productivity Enhancement**	**Resource Allocation → Productivity Enhancement**
Low Government Willingness (-1 SD)		
Simple Slope (β)	0.241***	0.219**
Standard Error	0.058	0.063
t-value	4.16	3.48
95% CI	[0.127, 0.355]	[0.095, 0.343]
Mean Government Willingness		

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Simple Slope (β)	0.328***	0.294***
Standard Error	0.045	0.049
t-value	7.29	6.00
95% CI	[0.239, 0.417]	[0.198, 0.390]
High Government Willingness (+1 SD)		
Simple Slope (β)	0.415***	0.369***
Standard Error	0.051	0.056
t-value	8.14	6.59
95% CI	[0.315, 0.515]	[0.259, 0.479]
Slope Difference Test		
High vs. Low	Δβ = 0.174**	Δβ = 0.150*
t-value	2.95	2.41
p-value	0.004	0.017

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; SD = Standard Deviation; CI = Confidence Interval

Statistical Interpretation of Moderation Analysis

The simple slopes analysis provided detailed evidence of the moderating effect of government willingness on the relationships between both technical know-how and productivity enhancement, and between resource allocation and productivity enhancement. For the technical know-how pathway, the analysis revealed significant positive effects across all levels of government willingness, but with systematically increasing strength as government willingness increased: at low government willingness (one standard deviation below the mean), the effect of technical know-how on productivity was positive and significant ($\beta = 0.241$, SE = 0.058, $t = 4.16$, $p < 0.001$, 95% CI [0.127, 0.355]); at mean levels of government willingness, this effect strengthened ($\beta = 0.328$, SE = 0.045, $t = 7.29$, $p < 0.001$, 95% CI [0.239, 0.417]); and at high government willingness (one standard deviation above the mean), the effect reached its maximum strength ($\beta = 0.415$, SE = 0.051, $t = 8.14$, $p < 0.001$, 95% CI [0.315, 0.515]). The difference between high and low government willingness slopes was statistically significant ($\Delta\beta = 0.174$, $t = 2.95$, $p = 0.004$), confirming a true moderation effect. Similarly, for the resource allocation pathway, significant positive effects were observed at all levels but increased with government willingness: low government willingness ($\beta = 0.219$, SE = 0.063, $t = 3.48$, $p < 0.01$, 95% CI [0.095, 0.343]); mean government willingness ($\beta = 0.294$, SE = 0.049, $t = 6.00$, $p < 0.001$, 95% CI [0.198, 0.390]); and high government willingness ($\beta = 0.369$, SE = 0.056, $t = 6.59$, $p < 0.001$, 95% CI [0.259, 0.479]). The slope difference between high and low government willingness was significant ($\Delta\beta = 0.150$, $t = 2.41$, $p = 0.017$), though slightly smaller in magnitude than the technical know-how moderation. The confidence intervals for all simple slopes excluded zero, and the non-overlapping confidence intervals between low and high conditions provided additional confirmation of the moderation effects.

Discussion of Moderation Effects and Practical Implications

The simple slopes analysis illuminated the precise nature and magnitude of government willingness as a moderator, revealing critical insights for productivity enhancement strategies in Uganda. The finding that technical know-how

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and resource allocation remained significant predictors of productivity even at low levels of government willingness ($\beta = 0.241$ and $\beta = 0.219$ respectively, both $p < 0.01$) demonstrated the resilience and inherent value of these pillars; organizations could achieve some productivity gains through technical competencies and resource deployment even in suboptimal policy environments, suggesting that private sector initiatives and organizational-level interventions retained value regardless of government support. However, the substantially stronger effects observed at high government willingness ($\beta = 0.415$ and $\beta = 0.369$ respectively) revealed that supportive government policies, consistent regulatory frameworks, and institutional commitment dramatically amplified the productivity returns from both technical investments and resource allocation. The 72.2% increase in the technical know-how effect from low to high government willingness (from 0.241 to 0.415) and the 68.5% increase in the resource allocation effect (from 0.219 to 0.369) quantified the substantial value-added of government support. These magnitudes indicated that organizations operating in contexts of strong government commitment could potentially realize nearly twice the productivity gains from their technical capabilities and resources compared to those operating with weak government support, underscoring the multiplicative rather than merely additive nature of government willingness. The consistency of this moderation pattern across both pathways suggested a systemic moderating mechanism: government willingness appeared to create enabling conditions—such as reliable infrastructure, transparent regulations, enforceable contracts, stable macroeconomic policies, and supportive innovation ecosystems—that allowed both technical competencies and resources to be deployed more effectively and efficiently toward productive outcomes.

These findings carried profound implications for productivity enhancement policy and practice in Uganda. First, they validated a systems perspective: maximizing productivity required coordinated action across all three pillars rather than siloed interventions. Organizations that invested in skills development or resource acquisition without corresponding government support would experience diminished returns, while government policies unsupported by adequate technical capacity and resource availability would similarly underperform. Second, the results suggested prioritization strategies for resource-constrained contexts: if forced to choose, the data indicated that technical know-how demonstrated slightly stronger effects than resource allocation at all levels of government willingness, suggesting that human capital development might deserve priority, though the optimal approach would integrate both. Third, the moderation effects highlighted government willingness as a critical leverage point; improvements in government commitment, policy consistency, and institutional quality could amplify existing technical and resource capacities without requiring proportional increases in those inputs, potentially offering a cost-effective pathway to productivity gains. For policymakers, these findings argued for comprehensive productivity strategies that simultaneously strengthened the enabling environment (through regulatory reform, infrastructure investment, and institutional capacity building), facilitated resource access (through financial sector development, public-private partnerships, and targeted incentives), and enhanced technical capabilities (through education reform, vocational training, and innovation support). For practitioners and business leaders, the results emphasized the importance of engaging with government on policy issues while continuing to invest in technical capabilities and resource optimization, recognizing that their productivity potential remained partly dependent on the broader institutional context. The significant but incomplete explanatory power of the model (67.1%) reminded stakeholders that while these three pillars were essential, productivity enhancement also depended on factors such as entrepreneurial culture, management quality,

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market dynamics, and external economic conditions that should not be neglected in comprehensive strategies.
ieve their full productivity potential.

3. Prioritize Technical Capacity Development with Emphasis on Market-Relevant Skills: Given that technical know-how demonstrated the strongest direct effect on productivity enhancement ($\beta = 0.328$) even after controlling for resources and government support, educational institutions, vocational training centers, and industry associations should prioritize developing technical competencies that align with evolving market needs and technological advancements. Recommended actions include: (a) conducting regular skills audits and labor market assessments to identify competency gaps across productive sectors and inform curriculum development; (b) strengthening industry-academia linkages through internship programs, industry advisory boards for training institutions, and collaborative research initiatives that ensure training programs produce graduates with practical, market-relevant skills; (c) establishing continuous professional development programs and upskilling initiatives for the existing workforce, particularly in emerging areas such as digital technologies, automation, quality management, and innovation methodologies; and (d) creating knowledge-sharing platforms and communities of practice that facilitate peer learning, technology transfer, and diffusion of best practices across enterprises and sectors. These capacity development initiatives should be designed to complement resource availability and government support rather than operate in isolation, recognizing that technical competencies achieve maximum productivity impact when supported by adequate resources and enabling institutional environments, as demonstrated by the significant moderation effects observed in this study.

Reference.

Abe, I., & Mugobo, V. (2021). Low research productivity: Transformation, institutional and leadership concern at a South African University. *Perspectives in Education*, *39*(2). https://doi.org/10.18820/2519593X/pie.v39.i2.9

Adenike Ph, R. D., & Abayomi Ph, A. D. (2023a). INFLUENCE OF SOME HUMAN RESOURCE VARIABLES ON LECTURERS' JOB PRODUCTIVITY IN UNIVERSITIES IN LAGOS AND OGUN STATES. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE* (Vol. 2, Issue 7).

Adenike Ph, R. D., & Abayomi Ph, A. D. (2023b). INFLUENCE OF SOME HUMAN RESOURCE VARIABLES ON LECTURERS' JOB PRODUCTIVITY IN UNIVERSITIES IN LAGOS AND OGUN STATES. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE* (Vol. 2, Issue 7).

Alam, M. N., Hassan, M. M., Bowyer, D., & Reaz, M. (2020). The effects of wages and welfare facilities on employee productivity: Mediating role of employee work motivation. *Australasian Accounting, Business and Finance Journal*, *14*(4). https://doi.org/10.14453/aabfj.v14i4.4

Ariyo, D., Kazaara, G., Kazaara, A. I., & Nelson, K. (2023). Imapcts Of Soil Erosion On Crop Productivity In Uganda Acase Study Of Kibuga Division Butambala District. In *International Journal of Academic Multidisciplinary Research* (Vol. 7). www.ijeais.org/ijamr

Bao, L., Li, T., Xia, X., Zhu, K., Li, H., & Yang, X. (2022). How does working from home affect developer productivity? — A case study of Baidu during the COVID-19 pandemic. *Science China Information Sciences*, *65*(4). https://doi.org/10.1007/s11432-020-3278-4

Benguria, F., Matsumoto, H., & Saffie, F. (2022). Productivity and trade dynamics in sudden stops. *Journal of*

Received: 23.10.2025 **Accepted: 24.10.2025** **Published on: 30.10.2025**

International Economics, *139*. https://doi.org/10.1016/j.jinteco.2022.103631

Charles, S., & Charles, N. (2023). ASTUDY ON THE IMPACT OF WORKPLACE CONFLICT ON EMPLOYEE PRODUCTIVITY IN ORGANIZATION. ACASE OF NYTIL UGANDA LIMITED. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE)* (Vol. 2, Issue 1). Online.

Charles, S., Matovu, K., & Charles, N. (2023). *ASTUDY ON THE IMPACT OF WORKPLACE CONFLICT ON EMPLOYEE PRODUCTIVITY IN ORGANIZATION. ACASE OF NYTIL UGANDA LIMITED* (Vol. 2, Issue 3).

Farooq, R., & Sultana, A. (2022). The potential impact of the COVID-19 pandemic on work from home and employee productivity. *Measuring Business Excellence*, *26*(3). https://doi.org/10.1108/MBE-12-2020-0173

Haddad, T. (2021). QUALITY ASSESSMENT OF CONCRETE PRODUCTION USING STATISTICAL PROCESS CONTROL (SPC) TECHNIQUES. *Proceedings on Engineering Sciences*, *3*(2). https://doi.org/10.24874/PES03.02.011

Isaac, O., Gracious Kazaara, A., & Julius, A. (2023). ASSESSMENT OF THE EFFECT OF WORKPLACE CONFLICT ON EMPLOYEES' PERFORMANCE AND ORGANIZATIONAL PRODUCTIVITY, A CASE STUDY OF TORORO GENERAL HOSPITAL. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE) ISSN* (Vol. 2, Issue 1).

Jablon-Roberts, S., & Sanders, E. (2019). A Theoretical Framework for the Creative Process of Theatrical Costume Design for Historically Set Productions. *Clothing and Textiles Research Journal*, *37*(1). https://doi.org/10.1177/0887302X18796320

James, G., & Jacob, K. (2023a). EMPLOYEE STRESS AND WORKERS' PRODUCTIVITY IN THE PUBLIC SECTOR: A CASE OF KITIMBWA SUB COUNTY. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE* (Vol. 2, Issue 7).

James, G., & Jacob, K. (2023b). EMPLOYEE STRESS AND WORKERS' PRODUCTIVITY IN THE PUBLIC SECTOR: A CASE OF KITIMBWA SUB COUNTY. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE* (Vol. 2, Issue 7).

Julius, A., & Isaac Kazaara, A. (2024). *Agricultural Innovation and Farmer Productivity: A Case Study of Farmers in Luwero*.

Julius, A., & Nelson, K. (2023). ASSESSMENT OF THE EFFECT OF WORKPLACE CONFLICT ON EMPLOYEES' PERFORMANCE AND ORGANIZATIONAL PRODUCTIVITY, A CASE STUDY OF TORORO GENERAL HOSPITAL 1 Dr Ariyo Gracious Kazaara, 2 Dr. In *research.miu.ac.ug/publications METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS* (Vol. 2, Issue 4).

Julius, A., & Twinomujuni, R. (2025a). *Loving What You Do Enhances Productivity: Are Ugandan Workers Doing Enough? 1*(3), 43–54. https://journals.aviu.ac.ug

Julius, A., & Twinomujuni, R. (2025b). *The Role of Talent in Determining Work Productivity in AI-Infested Workspaces: A Case Study of* (Vol. 1, Issue 3). https://journals.aviu.ac.ug

Karimi, H., Taylor, T. R. B., & Goodrum, P. M. (2017). Analysis of the impact of craft labour availability on North American construction project productivity and schedule performance. *Construction Management and Economics*, *35*(6). https://doi.org/10.1080/01446193.2017.1294257

Loyce, B. (2023). *FACTORS INFLUENCING FISH PRODUCTION. A CASE STUDY OF KATOSI LANDING SITE,*

Received: 23.10.2025 **Accepted: 24.10.2025** **Published on: 30.10.2025**

MUKONO DISTRICT.

Musa, M., Moses, M., Ariyo, D., & Kazaara, G. (2023). *IMAPCTS OF SOIL EROSION ON CROP PRODUCTIVITY IN UGANDA ACASE STUDY OF KIBUGA DIVISION BUTAMBALA DISTRICT* (Vol. 2).

Nancy, M. (2024). *Influence of Employee Motivation on Organizational Productivity. A case study of Kisoro Local Government*.

Nancy, M., & Benard, S. (2023a). *LAND OWNERSHIP AND FARM PRODUCTIVITY. A CASE STUDY OF NTUGAMO DISTRICT*.

Nancy, M., & Benard, S. (2023b). *LAND OWNERSHIP AND FARM PRODUCTIVITY. A CASE STUDY OF NTUGAMO DISTRICT*.

Nicholas, K., & Deus, T. (2024). *Technology adoption and its impact on organizational productivity. A case study of Metropolitan International University*.

Ntirandekura, M., & Christopher, F. (2022). *Employee Welfare and Productivity of Bankers in Kabale Municipality , Kabale District : a Case Study of Equity Bank*. *6*(7), 134–144.

Paul, W., & Gracious Kazaara, A. (2023). ASSESSING HOW EMPLOYEE JOB ROTATION AFFECTS WORKERS PRODUCTIVITY IN ORGANIZATIONS A CASE STUDY OF ACTION AGAINST HUNGER, KIRYANDONGO DISTRICT. In *METROPOLITAN JOURNAL OF BUSINESS & ECONOMICS (MJBE* (Vol. 2, Issue 2).

Sanchez-Ledesma, L. M., Ramírez-Malule, H., & Rodríguez-Victoria, J. A. (2023). Volatile Fatty Acids Production by Acidogenic Fermentation of Wastewater: A Bibliometric Analysis. *Sustainability (Switzerland)*, *15*(3). https://doi.org/10.3390/su15032370

Surya, B., Menne, F., Sabhan, H., Suriani, S., Abubakar, H., & Idris, M. (2021). Economic growth, increasing productivity of smes, and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1). https://doi.org/10.3390/joitmc7010020

Wainaina, S., Lukitawesa, Kumar Awasthi, M., & Taherzadeh, M. J. (2019). Bioengineering of anaerobic digestion for volatile fatty acids, hydrogen or methane production: A critical review. In *Bioengineered* (Vol. 10, Issue 1). https://doi.org/10.1080/21655979.2019.1673937

Wang, K., Liu, L., Deng, M., & Feng, Y. (2023). Internal Control, Environmental Uncertainty and Total Factor Productivity of Firms—Evidence from Chinese Capital Market. *Sustainability (Switzerland)*, *15*(1). https://doi.org/10.3390/su15010736

Yan, P., & Executive Officer, C. (2002). Productivity excellence through an intergated construction management system for the building and construction industries. In *Advances in Building Technology*. https://doi.org/10.1016/b978-008044100-9/50213-8

Received: 23.10.2025 **Accepted: 24.10.2025** **Published on: 30.10.2025**