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Operational Efficiency as a Mediator between Regulation, Capital Adequacy, Risk Management, Technology and Financial performance: Evidence from Insurance Firms

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ABSTRACT

This research explore the mediating role of operational efficiency in the relationship between regulation, capital Adequacy, Risk management, Technology and Financial performance of insurance firms. Despite findings from previous research in finance and accounting has investigated the direct effects of regulatory and firm specific factors on performance, insufficient attention has been given to the efficiency mechanisms through which these factors influence the financial outcomes. Utilizing firm level panel data within the insurance sector, the research involves Structural Equation Modelling (SEM) to study both direct and indirect relationships among the variables. The results prove that regulation, capital adequacy, risk management, and technological adoption employ profound impact on financial performance. In addition, operational efficiency plays a mediating role, showing that regulatory compliance often impact firms internal efficiency constitute an important transmission channel through capital strength, effective risk management and technological capabilities translate into superior financial performance. This study provides to the quantitative finance and context of insurance literature incorporating efficiency metrics into performance analysis. From a managerial and policy standpoint, the results indicate that in order to achieve sustainable financial performance, insurance companies and regulators should supplement capital and regulatory requirements with efficiency-boosting tactics.

Key Words: Regulation, Capital Adequacy, Operational Efficiency, Financial Performance, Insurance firms, Mediation Analysis.

1. Introduction

As a method of externalizing risk, encourages financial intermediation, and contributes to overall financial stability, the insurance industry is an essential part of the financial system. Insurance companies are heavily regulated to ensure solvency, safeguard policyholders, and uphold market discipline because of their systemic significance. The operational environment of insurance companies have to changed significantly in recent years due to growing regulatory complexity, changing capital adequacy standards, increased risk exposure, and quick technological improvements. The necessity to comprehend the effects

of firm-specific and regulatory issues on financial performance within a strict quantitative finance framework has increased as a result of these advancements.

The research currently in publication offers conflicting data about how regulation and capital adequacy affect business performance from the standpoint of quantitative finance and accounting. Although it is commonly believed that capital strength and regulatory compliance will improve financial stability, their effects on profitability and returns are not always clear-cut. Higher capital buffers may result in opportunity costs that have an impact on financial performance, while regulatory requirements may raise operating costs. Previous empirical research mostly looks at these connections directly, providing little understanding of the internal processes by which capital sufficiency and regulation affect financial results.

Crucially, the degree of operational efficiency of insurance companies determines their capacity to convert capital strength, regulatory compliance, efficient risk management techniques, and technological investments into enhanced financial success. Operational efficiency measures how well businesses use their resources to handle risk controls, administrative procedures, and underwriting tasks. Nevertheless, operational efficiency has not gotten much attention as an explanatory mechanism in empirical research looking at the performance of insurance firms, despite its importance. There is a sizable vacuum in the quantitative finance and insurance literature since the majority of current research either analyses efficiency as an outcome variable or completely overlooks its mediating role.

Capital adequacy acts as another fundamental pillar of financial soundness in insurance firms. Sufficient capital buffers enhance an insurer's capacity to absorb losses, support underwriting activities, and maintain solvency throughout adverse economic conditions. Objective evidence generally advisable a positive association linking capital strength and financial performance, especially in terms of return on assets and return on equity. However, resources are not optimally utilized it holding excess capital that leads to opportunity costs and lower returns. This dual effect focus the need to examine effective capital allocation within organizational operations.

Given their exposure to underwriting, market, credit, and operational risks, insurance companies must exercise effective risk management. High risk management procedures assistant businesses in identifying, reduce risks, which stabilizes cash flows and enhances financial results. Businesses with well-organized risk management systems typically perform better and experience less volatility, according to empirical data. However, the performance advantages of risk management are not guaranteed and may rely on how well risk-related procedures are incorporated into daily operations.

In the insurance sector, technology adoption has become a disruptive force. Innovations in digital technologies, data analytics, and automated procedures offer the ability to boost service delivery, save administrative costs, and increase operational efficiency. Technology affects business performance from the standpoint of quantitative finance by enhancing information processing, operational scalability, and risk assessment accuracy. Empirical research frequently looks at technology as a direct predictor of performance, ignoring its indirect role through efficiency improvement, despite the increased interest in insurance technology.

The operational efficiency is growingly recognized as a key internal mechanism that connects regulatory and capital related factors to financial results. Optimization of resources, streamlined processes and cost control allow insurance firms bear the financial burden of new regulations and harnessing their substantial capital base more efficiently. From resource based view perspective, operational efficiency creates a strategic capability that transforms regulatory compliance and capital adequacy into sustainable financial performance. However, operational efficiency has often been regarded as a performance outcome rather than as an intermediary channel through which external and financial constraints affect profitability.

While the existing literature provides insights about the relationships between regulation, financial performance, and capital adequacy. These studies mainly concentrate on direct effects and ignore internal efficiency mechanisms that shape financial performance. Empirical evidence regarding the mediating role of operational efficiency in the insurance sector remains notably limited. The current body of research has not comprehensive how operational efficiency acts as a mediator in achieving specific outcomes in this industry.

Addressing this gap, focus on the mediating function of operational efficiency, this study investigates how legislation, capital sufficiency, risk management techniques, and technological adoption affect the financial performance of insurance companies. The study aims to separate the direct impacts of these firm-specific and regulatory factors on financial performance from their indirect effects through internal efficiency mechanisms using a quantitative finance methodology. The research offers empirical evidence on the efficiency-driven transmission channels that translate technological capabilities, capital strength, efficient risk management, and regulatory compliance into financial outcomes in the insurance industry by modelling these relationships concurrently.

Research contributions:

This study adds significantly to the literature on accounting and quantitative finance in a number of ways. First, it offers empirical support for the mediating function of operational efficiency, a mechanism that has not gotten much attention in earlier research on insurance financing. Second, the study provides a thorough examination of insurance firm performance by integrating technology, risk management, capital sufficiency, and regulation into a single quantitative framework. Third, the paper enhances empirical technique in insurance finance research by utilising firm-level data for mediation analysis and structural equation modelling (SEM). Lastly, the results highlight the significance of efficiency-boosting tactics in addition to capital and regulatory requirements to achieve sustainable financial performance, providing pertinent insights for insurance managers and regulators.

1. Review of Literature

Zhang, T., & Cao, J. (2023). According to the report, regulation significantly improves insurers' cost efficiency as well as their absolute expenses. This implies that while regulatory actions may result in higher overall costs for insurers, they also increase their productivity and operational effectiveness. Kavubu, A. (2024). To preserve the stability of the insurance market, protect the interests of policyholders, and provide financial security, effective regulation is necessary. Regulators must regularly monitor the financial stability and market risks of insurers while striking a balance between innovation and consumer protection. (Zhang, N. et al, 2025). Institutions and employees' cumulative infractions severely impede business expansion, yet staff fines have little effect. Administrative fines lower premium revenue but could improve insurance companies' business evaluation scores. Matiş, C. (2019). In light of European Directives on data protection and IT security regulations, this paper examines risk management. Through the identification of threats, vulnerabilities, and their financial effects, it assesses the risks that insurance distributors face. (Shah, H. et al, 2018). This study looks at methods for managing financial losses from natural disasters and reducing catastrophe risks through the use of insurance and reinsurance. Tools for estimating losses, risk-sharing arrangements, and the contributions of parametric insurance and Insurtech to the growth of "Insurance for the Masses (IFM)" are also covered. (Abdullah-Ou-Moussa, S. et al, 2025). The results demonstrate that opinions regarding the acceptance of digital transformation (DT) are positively influenced by intended behavioural elements and digital innovation aspects. As a result, new technologies are more widely adopted by Moroccan organizations. By differentiating between social and individual acceptance levels

and providing recommendations for successful DT leadership, the study advances both theory and practice. Dudayev, K. (2025). The study examines effective FinTech developments in the insurance sector, highlighting practical applications and potential opportunities for expansion. It looks at how the future of the industry is being shaped by the digital revolution. The study highlights the necessity for insurers to create flexible plans in order to prosper in the new digital landscape. Dafny, L. (2008). In markets with few insurers, where earnings increase employers' switching costs and are abused when insurers have bargaining leverage, the relationship is strongest. Consolidation in the industry suggests that healthcare insurers are gaining market share in more areas. Kaur, A. (2024). The Boone indicator demonstrates that efficiency is the main way that competition improves financial stability. These observations have important ramifications for Indian officials, scholars, and insurers. Bryzgalov, D. (2018). While life/pension insurers show a U-shaped connection, market power increases stability for non-life insurers up to a certain point, creating an inverse U-shape. There is no nonlinear relationship between stability and competition. Escobar-Anel, M et al (2021). Optimal reinsurance enables insurers to offer greater capital guarantees without lowering expected utility, according to numerical research. Longer investing horizons and reduced risk aversion yield larger benefits. Opeshko, N. S. (2015). The essay creates a reinsurance-based approach to capital adequacy management for insurance companies. The outcomes of the experiments verify its efficacy. (Pukała, R et al, 2017). By taking reinsurance default risk into account, the research improves capital adequacy evaluation in a novel way. It incorporates a scaled assessment of the insurer's capital adequacy, which sets it apart from other approaches. Coverage levels are categorized by the indicator as "inadequate," "adequate," "medium," "good," and "excellent." (Xu, Z. et al, 2025). In addition to offering theoretical and practical recommendations for policymakers to improve risk management and promote green finance, this work deepens our understanding of how climate risk affects the sustainable growth of the insurance sector. Ige-Gbadeyan, O., & Swanepoel, M. (2025). According to the findings, financial health is improved by liquidity and leverage, and larger businesses benefit more from efficiency and profitability. However, when a firm gets bigger, the impact of liquidity decreases. Zhang, W., & Li, Z. (2022). This study looks at the relationship between an organization's internal structure and the operational effectiveness of life insurance businesses. From the standpoint of configuration, it describes the reasoning and routes to improve efficiency. Additionally, it provides helpful advice for enhancing the functioning of Chinese life insurers. Tsvetkova, L. (2021). The study's conclusions can direct scholars and insurance experts in Russia and around the world, assisting industry evaluations to pinpoint factors and mold regulations. The findings aid in formulating suggestions for the insurance industry. These insights can be used by top management to improve corporate tactics and strategies. (Sharma, A et al. 2020). Based on the analysis, the financial performance of UK insurance businesses is highly influenced by factors such as profitability, liquidity, size, and organizational structure. As a better indicator of business size, we advise utilizing gross premium written. The size of insurers in the market is more accurately represented by this metric. Morara, K., & Sibindi, A. (2021). According to the study, size and leverage have a positive correlation with insurer financial performance in Kenya, whereas age has a negative correlation. It examines the main factors influencing performance in the insurance industry. The results guide managerial tactics to improve and maintain high performance as well as scholarly study. Zalukhu, K., & Palupiningtyas, D. (2025). The results reveal significant variations in ROE between the two businesses. With a combined ratio of 78.76%, PT Asuransi Ramayana Tbk's outstanding operating efficiency helped it achieve a 13.08% ROE in 2023. This performance was further enhanced by an impressive investment yield of 9.42%.

2.1 Research Gap Justification:

Although a wide range of studies has focused on the impact on organisational and financial performance, which includes influences from regulation, risk management, technological capability, competition,

capital adequacy, etc., the literature available has been fragmented and conceptually incomplete. Many recent works are concentrated on **specific drivers in isolation** [i.e., block chain-based transaction security (Yang & Chen, 2025), regulatory technology and banking performance (Mamun et al., 2025); risk management and capital structure deviations (Li & Shiu, 2024)] without consideration of such factors in a collective frame to assess their combined effect on banks' performance. Thus, the **synergy and their process-based account** with respect to how strategic and regulatory-driven forces collectively shape financial returns are under-theorised and empirically unvetted.

In addition, a large portion of the existing literature is under the influence of **cross-sectional designs and short observation periods**, which limit the potential to understand how regulation, technology deployment, and risk management strategies evolve and affect firm performance (Bekata & Kero, 2025; Maksum et al., 2024; Sokołowska et al., 2024). Academics constantly call for more structural explanations and longitudinal understanding, especially in times of regulatory change, economic shocks and increasing competitive intensity. But very few studies go beyond direct-effect models of the determinants of performance, in terms of **how performance results are endogenously produced within organisations**.

Importantly, although operating efficiency is often recognised as a critical product or performance measure, it is infrequently considered in the context of being an intermediate means by which regulatory pressure, technological investment decisions, risk **mitigation approaches and capital adequacy** choices are translated into financial results. Previous research on risk management and sustainability has focused on cost cuts, resilience, and compliance gains (Mamun et al., 2025; Rashed et al., 2025), but has not modelled these in terms of **operationally improving profitability, return on assets, or return on equity**. Such an oversight is a significant blind spot in theory, as operating efficiency serves as the first tier of how firms absorb **regulatory costs, leverage technology, deploy capital, and remain competitive**.

Moreover, current studies tend also to be contextually narrow, being limited to singular countries (i.e., Bangladesh, Indonesia, Malaysia and Russia) or industries like logistics, insurance, public procurement or social enterprises (Ilias et al., 2023; Grishunin et al., 2022; Li & Shiu, 2024). These contextual constraints limit the applicability of findings and inhibit comparative learning across regulatory jurisdictions and market settings. Academia now ever more urgently **demands multi-factor models that capture institutional, technological and strategic effects simultaneously** (Rashed et al., 2025; Maksum et al., 2024).

Bridging these gaps, the contribution of this study to the literature is original as it proposes and empirically examines a mediation-based model including operating efficiency as a main intermediary system through which **regulation, risk control, IT use and replacement, competition pressure and capital adequacy affect financial performers**. By changing the focus from individual effects to process-based performance paths, we contribute to theory by elucidating how internal efficiency dynamics translate external pressures and strategic resources into financial results. However, the results are virtually significant for **policymakers, regulators and financial managers** who want to balance between compliance with **regulation, innovation and competitiveness** at the same time maintaining their own levels of profitability.

2.2. Theory and development of the hypothesis

Numerous organizational and environmental factors impact the insurance industry's performance and stability. This study examines the effects of operational, strategic, and regulatory elements on financial outcomes, with a foundation in institutional theory and the resource-based view (RBV).

Regulatory stringency (REG) enforces compliance standards that lower operational risks and improve long-term stability, so promoting transparency, solvency, and consumer confidence in the insurance industry. Risk management practices (RMP) help in reducing exposure to market and underwriting risks,

guaranteeing profitability, operational management, and company continuity. Technological adoption (TECH) strengthens competitiveness by promoting innovation, cutting expenses, and improving service quality through digital transformation. Market competition (COMP) supports cost reduction, product innovation, and efficiency, while intense competition can reduce profit margins. Capital adequacy and reinsurance support (CAP) enhance policyholder trust and risk-bearing ability to fortify financial resilience, which will increase profitability. Operational efficiency (OE) operates as a mediator between important factors and financial returns, reflecting the best use of resources to reduce expenses and boost productivity. Finally, financial returns examine overall performance, profitability, and solvency; this is the final result of stable, effective, and well-run insurance activities. Musaigwa, M., & Netswera, F. (2025). Notwithstanding advancements, there are still many obstacles to overcome, including integration with legacy systems, cybersecurity threats, and expensive technology. By outlining important potential and obstacles in the insurance industry, this study adds to the body of knowledge on digital transformation. It also serves as a foundation for upcoming research on how worker dynamics and performance are affected over the long run by digitalization.

H1: Regulatory stringency (REG) is positively associated with Operational Efficiency (OE).

H2: Risk management practices (RMP) are positively associated with Operational Efficiency (OE).

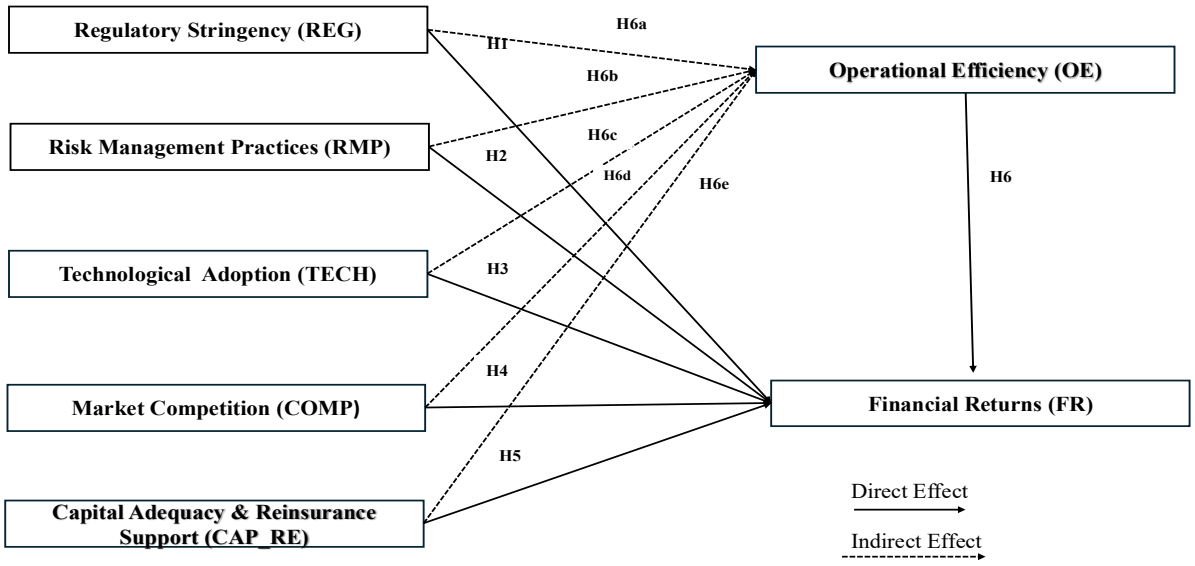
H3: Technological adoption (TECH) is positively associated with Operational Efficiency (OE).

H4: Market competition (COMP) is associated with Operational Efficiency (OE).

H5: Capital adequacy & reinsurance support (CAP) is positively associated with Operational Efficiency (OE).

H6: Operational Efficiency (OE) is positively associated with Financial Returns (RET).

H6a–e: Operational Efficiency mediates the relationship between each Interdepend Variable (REG, RMP, TECH, COMP, CAP) and dependent variable (RET.)



3. Methods

3.1. Data Collection

The present study focused on employees those who are employed in Indian manufacturing sector. A purposive sampling technique was chosen to collect data and respondents are selected based on employment type (Full and part-time), employment tenure (more than 5 years of experience) and between the age brackets of 20- 50 years. A structured questionnaire was conducted from April to September 2025 among in Indian manufacturing sector employees. Respondents are informed regarding assurances of anonymity and confidentiality as well as purpose of the study. There were closed ended questions on the survey and responses are recorded on a 5- point Likert scale (1= Strongly disagree and 5= strongly agree). Data is gathered from 300 samples.

3.2. Research Design

In the present study an exploratory research approach has used to investigate the factors that influence the stability of the insurance sector, namely Regulatory Stringency, Risk Management Practices, Technological Adoption, Market Competition, and Capital Adequacy & Reinsurance Support. According to the conceptual model, these elements were thought to be independent variables affecting financial returns, with operational efficiency acting as the mediating variable. To ascertain whether Operational Efficiency successfully establishes a connection between the independent and dependent variables, a mediation test was performed. Statistical analyses included Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and Structural Equation Modelling (SEM), with responses measured on a 5-point Likert scale. Three main steps were involved in the data analysis process: first, EFA was used to determine the structure among the scale items; second, CFA was used to evaluate the constructs' validity (convergent and discriminant), reliability, and model fit; and third, SEM was used to test the hypotheses and assess the direct and indirect relationships among the variables in the model

3.3. Common Method Bias

The study assessed the possibility of common method bias using Harman's one-factor test, as recommended by (Baumgartner, H. et al 2021) All measurement items were subjected to Exploratory Factor Analysis (EFA), and the results showed that a single factor accounted for less than 50% of the total variance, indicating the absence of common method bias. Items with factor loadings below 0.45 were noted, as low loadings can reduce Average Variance Extracted (AVE) and affect convergent validity (Gupta, P. et al 2020) However, all other factors in the analysis were found to be statistically significant and within acceptable standards.

Additionally, the study examined internal consistency reliability using the Cronbach's alpha (α) coefficient. The results revealed that all constructs had alpha values exceeding the minimum acceptable threshold of 0.70, confirming good internal reliability of the measurement scales.

3.4. Exploratory Factor Analysis

SPSS 20.0 was used to conduct the EFA. The sample's adequacy was evaluated using the Kaiser Mayer-Olkin test, which produced a result of 0.860, above the 0.80 is an acceptable threshold (Hair, J. F. et al 2011). As seen in Table 1, the EFA suggested seven variables with varimax rotation. The compiled results for the item loadings were also included in Table 1. Because of their low factor loadings. Indicators with low factor loading lead to poor AVE scores,

These items have a factor loading below 0.45. Low factor loading items lead to poor AVE scores, this may lead to issues with convergent validity (Gupta, P. et al 2020). But all factors included in the analysis were found to be statistically significant and within acceptable thresholds.

The Cronbach's alpha (α) coefficient was used in the study to evaluate internal consistency dependability. According to the results, all constructs showed satisfactory reliability with α values above the required minimum level of 0.70. Generally speaking, a Cronbach's alpha (α) value greater than 0.70 indicates strong internal consistency (Gupta, P. et al 2020).

Table-1. EFA and Cronbach alpha

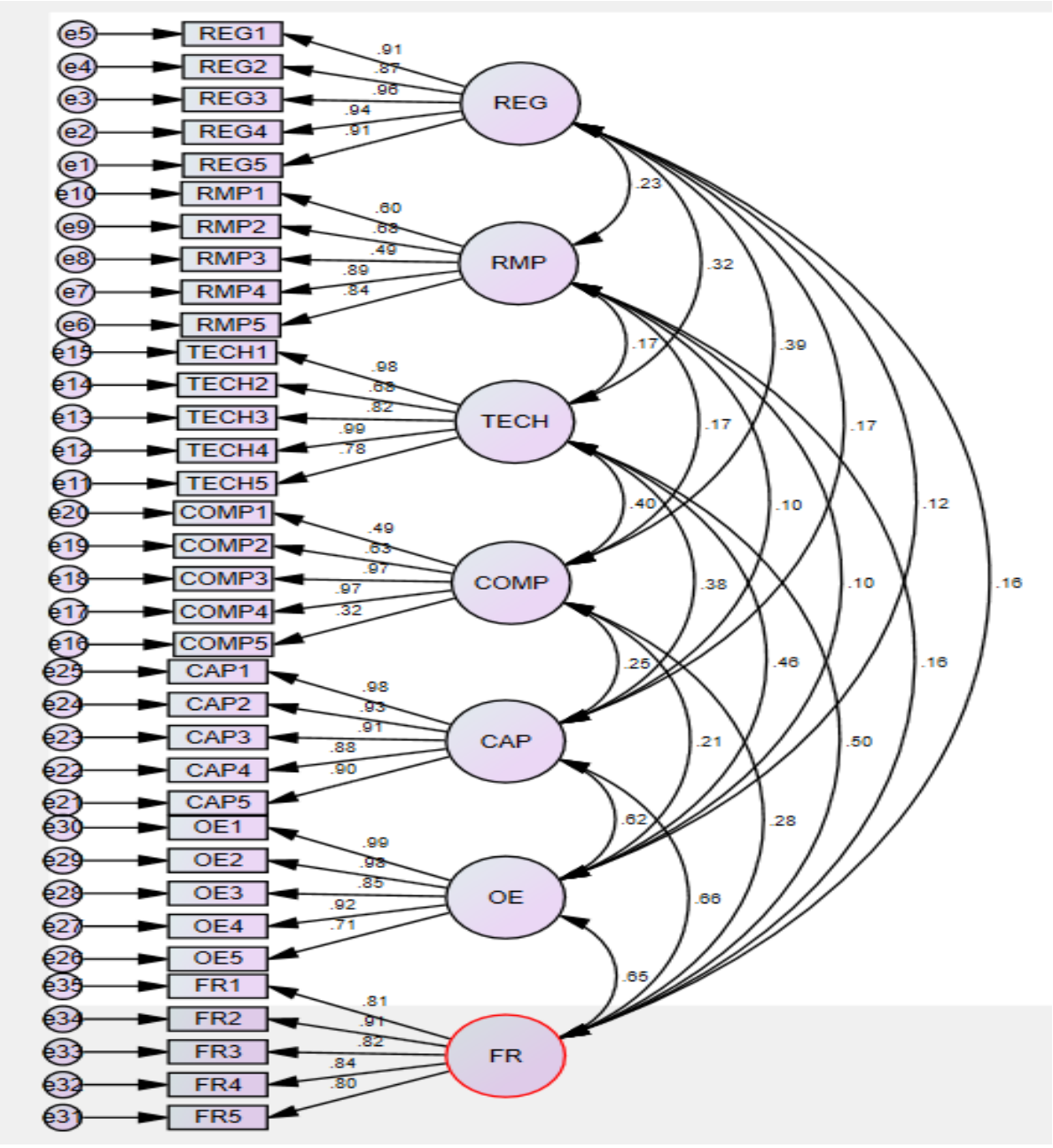
Rotated Component Matrix[a]							
	Component						
	CAP	**REG**	**OE**	**TECH**	**FR**	**COMP**	**RMP**
Cronbach α	**0.964**	**0.960**	**0.948**	**0.931**	**0.920**	**0.825**	**0.830**
CAP1	**.866**						
CAP2	**.854**						
CAP5	**.851**						
CAP3	**.835**						
CAP4	**.830**						
REG3		**.939**					
REG4		**.926**					
REG1		**.904**					
REG5		**.900**					
REG2		**.859**					
OE2			**.865**				
OE1			**.861**				
OE4			**.848**				
OE3			**.785**				
OE5			**.689**				
TECH4				**.890**			
TECH1				**.873**			
TECH3				**.816**			
TECH5				**.788**			
TECH2				**.649**			
FR2					**.802**		
FR3					**.787**		
FR5					**.770**		
FR4					**.744**		
FR1					**.669**		
COMP3						**.810**	
COMP2						**.798**	
COMP4						**.789**	
COMP1						**.771**	
COMP5						**.552**	
RMP4							**.841**
RMP2							**.813**
RMP5							**.792**
RMP1							**.752**
RMP3							**.642**
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.							
a. Rotation converged in 6 iterations.							

Using the Cronbach alpha (α) coefficient, the study examined the dependability of internal consistency. Every construct in the current investigation has Cronbach alpha (α) values that are higher than the cut-off value of 0.70. Excellent internal reliability is indicated by a Cronbach alpha (α) score greater than 0.70.

3.5. Confirmatory Factor Analysis

CFA is a multivariate statistical technique used to assess the validity of a construct. In the present study, CFA was performed on the construct items to measure their reliability and to estimate the fitness of the model statistically. The CR values for the measurement constructs are greater than 0.700. Moreover, the model fit indices for the final measurement model were found to be acceptable range.

Figure-1: Standardized CFA output for the Measurement Model



The standardized Confirmatory Analysis (CFA) results for measurement model are presented in Fig.1, demonstrating acceptable factor loadings and overall model fit.

Table-2. Model fit indices.

Goodness of fit indices	Threshold Values	Measurement Values
χ2/df	< 3 (sometimes ≤ 5 for large samples)	3.232
RMSE	≤ 0.06 (good), ≤ 0.08 (acceptable)	0.86
GFI	≥ 0.90 (good), ≥ 0.95 (excellent)	.762
AGFI	≥ 0.90	.721
NFI	≥ 0.90	.856
CFI	≥ 0.95 (good), ≥ 0.90 (acceptable)	.895

3.6. Discriminant and Convergent Validity

Validity analysis was conducted by evaluating both convergent and discriminant validity. The minimum acceptable cut-off value for AVE is 0.50 and the square root of the AVE for each construct should be greater than its correlations with all other constructs. In this study all values of AVE are greater than 0.50. Also, the values of CR are above 0.70, representing good reliability.

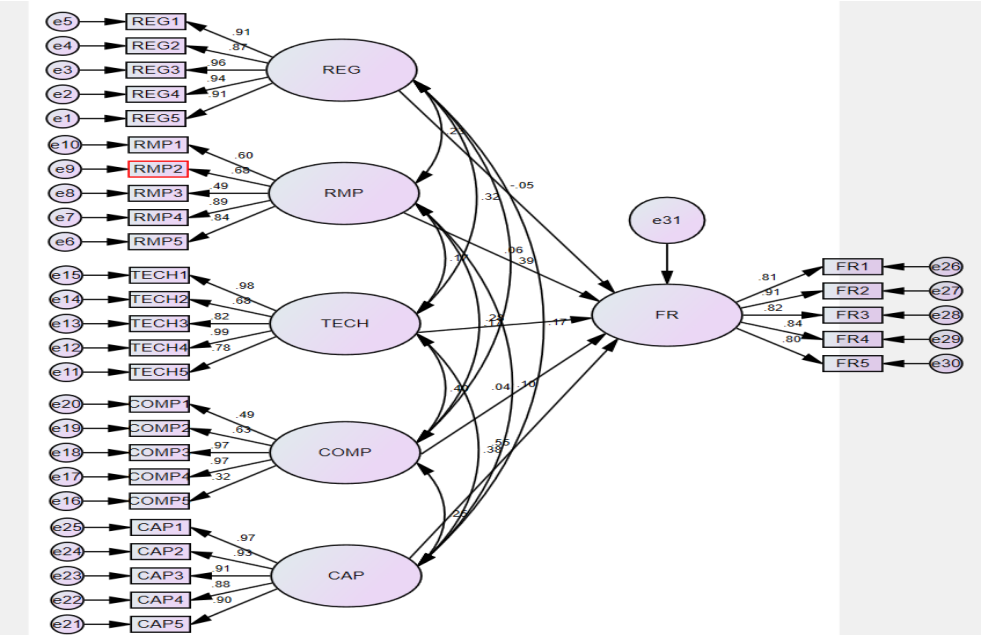
Table 3- Correlation Matrix, Composite Reliability and Average Variance Extracted.

	CR	AVE	REG	RMP	TECH	COMP	CAP	OE	FR
REG	0.964	0.841	**0.917**						
RMP	0.834	0.512	0.232	**0.716**					
TECH	0.941	0.737	0.320	0.171	**0.858**				
COMP	0.828	0.525	0.387	0.166	0.398	**0.725**			
CAP	0.965	0.845	0.168	0.098	0.377	0.246	**0.919**		
OE	0.816	0.800	0.123	0.099	0.458	0.206	0.618	**0.894**	
FR	0.922	0.704	0.165	0.161	0.500	0.278	0.662	0.654	**0.839**

3.7. Structural Model

The structural relationships between the determinants of insurance industry stability and Financial Returns are illustrated in Fig.2.

Figure-2: Model Linkage between determinants of insurance industry stability and Financial Returns.



3.7.1. Hypotheses Testing (Direct Effect)

The SEM analysis was used for hypothesis testing. As presented in Table 3, the outcome shown that H_1 (β=-0.047, p.346<) H_2 (β=0.064, p<.185) H_3 (β=.282, p<.000), H_4(β=.038, p<.459), H_5(β=.548, p<000), H_6(β=0.653, p<0.000), H_{6a} (β=-0.052, p<0.306) H_{6b} (β=0.015, p<0.764), H_{6c} (β=0.282, p<0.000), H_{6d} (β=-0.017, p<0.741), H_{6e} (β=0.523, p<0.000) are supported.

The relationship between the determinants of insurance industry stability and Operational Efficiency is depicted in Fig.3.

Figure-3: Model Linkage between determinants of insurance industry stability and Operational Efficiency.

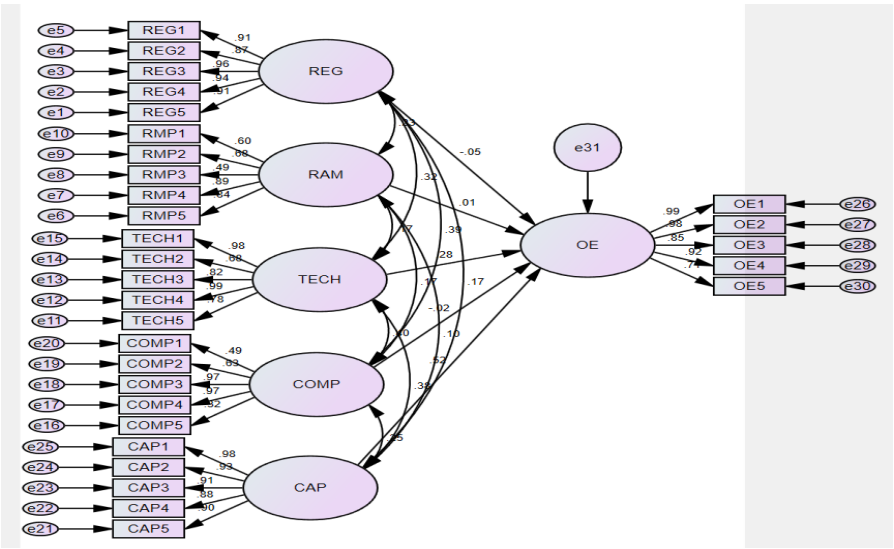
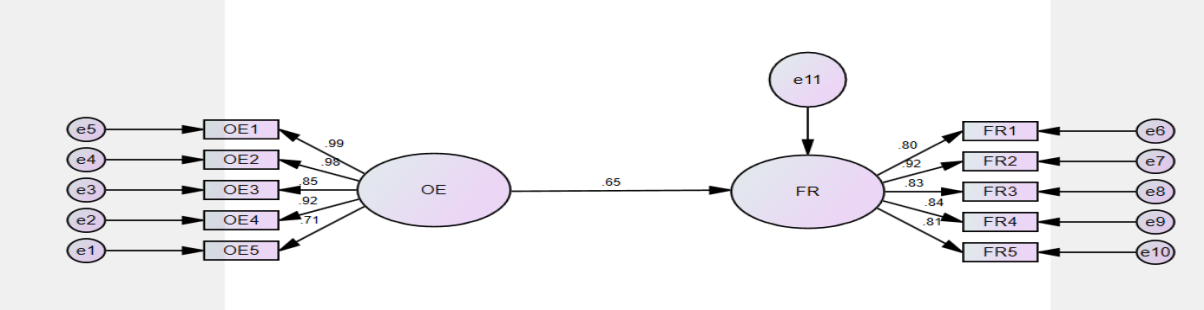


Figure-4: Model Linkage between Operational Efficiency and Financial Returns



The direct effect of Operational efficiency on Financial Return is presented in Fig.4.

The results of hypothesis testing are summarized in table 4.

Table 4 – Hypothesis Testing.

Independent Variable → Dependent Variable	Hypothesis	β	Sig	Result
REG → FR	H_1	-0.047	0.346	H_1 Not Supported
RMP →FR	H_2	0.064	0.185	H_2 Not Supported
TECH → FR	H_3	0.282	0.000	H_3 Supported
COMP → FR	H_4	0.038	0.459	H_4 Not Supported
CAP → FR	H_5	0.548	0.000	H_5 Supported
OE → FR	H_6	0.653	0.000	H_6 Supported
REG → OE	H_{6a}	-0.052	0.306	H_{6a} Not Supported
RMP →OE	H_{6b}	0.015	0.764	H_{6b} Not Supported
TECH → OE	H_{6c}	0.282	0.000	H_{6c} Supported
COMP → OE	H_{6d}	-0.017	0.741	H_{6d} Not Supported
CAP → OE	H_{6e}	0.523	0.000	H_{6e} Supported

3.7.2. Hypotheses Testing (Indirect Effect)

The bootstrap estimation approach in SPSS-AMOS was used to test hypotheses (H6a–H6e) and investigate the mediating influence of Operational Efficiency (OE) on Financial Returns (FR). Through operational efficiency, the mediation study investigated the indirect effects of Market Competition (COMP), Risk Management Practices (RMP), Technological Adoption (TECH), Regulatory Stringency (REG), and Capital Adequacy & Reinsurance Support (CAP) on financial returns. Confidence ranges for indirect effects were calculated using the bootstrap approach, as suggested by MacKinnon et al. (2004). The indirect effects of REG, RMP, TECH, COMP, and CAP_RE on financial returns through operational efficiency were statistically significant, according to the results shown in Table 5.

The mediating role of Operational efficiency between the determinants of insurance industry stability and Financial returns is illustrated in Fig.5.

Figure-5: Operational Efficiency is a mediator between determinants of insurance industry stability (REG, RMP, TECH, COMP, CAP) and Financial Returns.

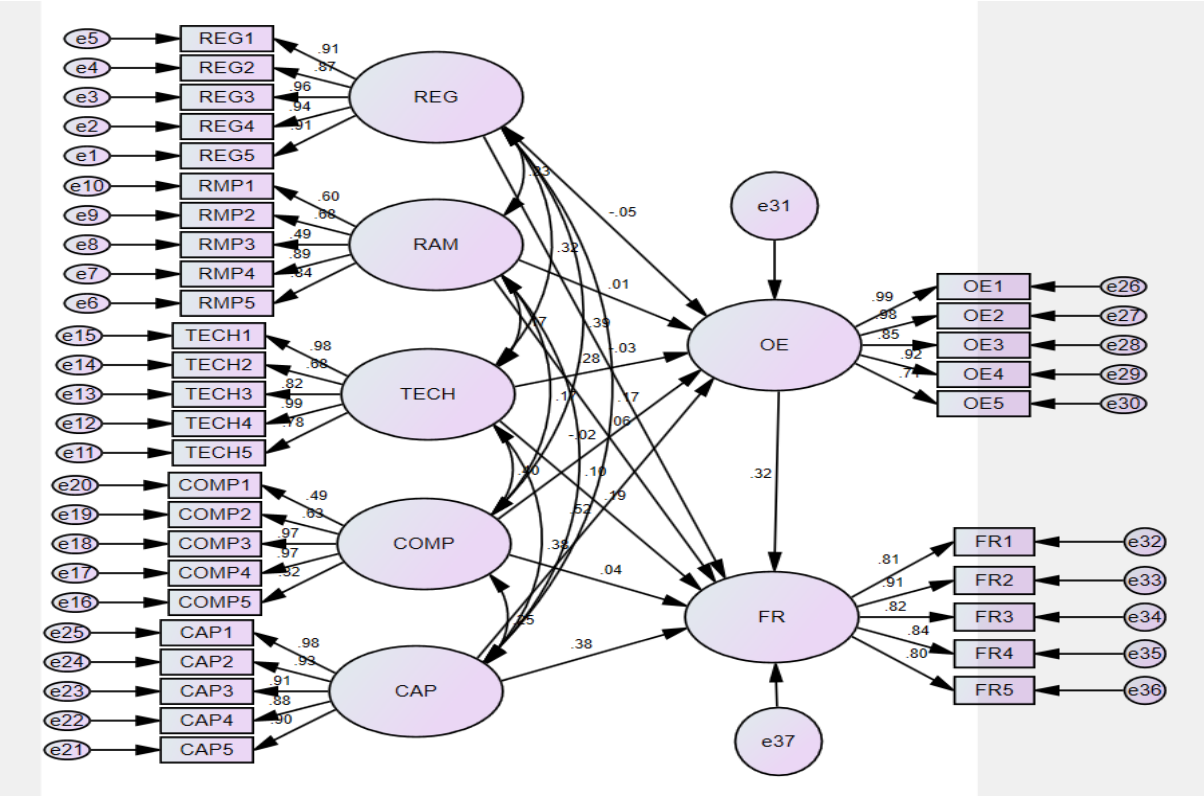


Table 5 – Hypothesis Testing (Mediation Analysis)

Path	Direct Effect	Indirect Effect	Result
REG → OE→ FR	-0.047	-0.031	No Mediation H_{6a} Not Supported
RMP →OE→ FR	0.064	0.059	No Mediation H_{6b} Not Supported
TECH → OE→ FR	0.282***	0.192***	Partial Mediation H_{6c} Supported
COMP →OE→ FR	0.038	0.044	No Mediation H_{6d} Not Supported
CAP →OE→ FR	0.548***	0.318***	Partial Mediation H6e Supported

4. Result and Discussion

The study's conclusions show that, out of all the variables that were looked at, Technology (TECH), Capital Adequacy (CAP), and Operational Efficiency (OE) significantly and favorably affect Financial Returns (FR). In particular, OE ($\beta = 0.653$, $p < 0.001$) shows up as a powerful predictor of performance, while TECH ($\beta = 0.282$, $p < 0.001$) and CAP ($\beta = 0.548$, $p < 0.001$) directly improve financial outcomes. However, there is no discernible direct impact of Regulatory Stringency (REG), Risk Management Practices (RMP), or Competition (COMP) on financial returns. This suggests that without effective internal procedures, external factors by themselves cannot ensure better performance.

Operational efficiency's function as a performance facilitator is further supported by the mediation study, which also shows that it partially mediates the relationship between technology and capital adequacy with financial returns. This implies that when combined with operational efficiency, investments in technology and sound financial structures yield larger returns. Nevertheless, there is no evidence of mediation for competitive, risk, or regulatory variables. Overall, the findings support the Resource-Based View (RBV), which emphasizes the significance of internal resources in gaining sustained competitive advantage, by highlighting the relevance of internal efficiency and technological aptitude as the primary drivers of financial success.

Conclusion and Implications

The study comes to the conclusion that a number of factors, including market competition, technological adoption, regulatory stringency, risk management practices, and capital adequacy and reinsurance support, are critical in determining the financial returns of financial institutions. Among these, operational efficiency is a key mediator that converts financial, technological, and regulatory advantages into increased profitability. According to the data, organizations that prioritize effective procedures, technology integration, and prudent risk management see better financial results.

Practically speaking, in order to improve institutional efficiency, governments ought to encourage clear legislation and technological upgrading. To guarantee long-term viability, managers are urged to make investments in capital adequacy and risk management systems. In a competitive market, improving operational procedures can greatly increase financial performance and competition. By providing insightful information for strategic decision-making and performance improvement in the financial sector, the study adds to the body of literature by empirically validating the mediating function of operational efficiency.

Theoretical Implications

By combining operational, financial, technological, and regulatory aspects into a single model of financial performance, this study enhances the body of current knowledge. It emphasizes the role of Operational Efficiency (OE) as a mediator between Financial Returns (FR) and institutional practices. By highlighting efficiency as a key mechanism, the model enhances ideas of financial performance and strategic management. It also confirms how internal and regulatory forces interact to shape results. The study backs up the use of Institutional Theory and the Resource-Based View (RBV) in financial settings. All things considered; it offers a solid empirical foundation for upcoming theoretical advancements in the financial services industry.

Practical Implications

By improving capital sufficiency, technology adoption, and risk management, financial institutions can increase profitability. In order to foster innovation and stability, regulators should make sure that regulations are fair and encouraging. In order to translate strategic efforts into quantifiable financial results, managers need to concentrate on operational efficiency. The results assist decision-makers in determining important levers for enhancing performance. Costs and earnings can be maximized by investing in digital technologies and process automation. The model acts as a tactical manual for coordinating financial expansion with regulatory observance.

Limitations and Future Research

Generalizability may be impacted by the study's sample size and geographic breadth limitations. Due to its reliance on cross-sectional data, long-term consequences cannot be observed. The model's applicability to other sectors is limited due to its primary concentration on financial institutions. A longitudinal design might be used in future studies to record performance dynamics over time. Insights can be enhanced by

adding more moderators or mediators, such as corporate governance or innovation. The study's comparative and global relevance could be strengthened by extending it to other nations.

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