Business Education Journal 11 (2025)

journal homepage: https://bej.cbe.ac.tz

Analysing the Degree of Profit Persistence in Tanzania's Insurance Companies: A Markov Chain Approach

Doreen L Rutagumirwa [a,*]

[a] Department of Mathematics and Actuarial Studies, Institute of Finance Management
*Corresponding author
E-mail address: doreen.rutagumirwa@ifm.ac.tz/doreenlaurentnarcis@gmail.com

Abstract

Although extensive research has explored profit persistence in financial services, relatively little focus has been on insurance companies. This study addresses this gap by analysing the degree of profit persistence among insurance companies in Tanzania. The empirical analysis utilised data from a sample of 20 insurance companies in Tanzania from 2010 to 2020. It applied Markov chain stochastic processes to analyse profitability categories, which are based on the changes in insurers' return on assets (ROA). The empirical findings revealed a relatively low degree of profit persistence in Tanzania's insurance companies, both in the short and long term. The results also support the hypothesis that low-profit persistence exists in developing countries. The model predicted that the profit level of insurance companies in Tanzania would be in low-profit, medium-profit, and high-profit states, with probabilities of approximately 0.22, 0.31, and 0.46, respectively. The relatively high probability of remaining in a high-profit state suggests that insurance companies with higher profit levels will likely experience profit persistence in the long run.

Keywords: *Tanzania; Insurance companies; Profit Persistence; Markov Chain Approach*

1.0 Introduction

The insurance industry, as a critical pillar of the financial sector, has gained increasing attention due to its pivotal role in promoting economic growth and financial development across both developed and developing economies (Mahdavi & Majed, 2011; Outreville, 2013; Alhassan & Fiador, 2014; Din et al., 2017; Okonkwo & Eche, 2019; Eling & Jia, 2019; Horera & Maganya, 2020; Kassahun, 2020; Singhal et al., 2022; Worku et al., 2024). Insurance facilitates risk transfer, mobilises capital for investment, and provides financial protection against unforeseen events such as death, disability, and accidents. Globally, the industry contributes about 5% to 7% of GDP (Azman-Saini & Smith, 2011; Dragoș et al., 2019; Swiss Re, 2021; Bhatia et al., 2021). Furthermore, beyond its core functions, the insurance sector supports long-term savings, enhances liquidity, enables economies of scale in investment, reduces uncertainties, and creates employment. An efficient insurance sector also promotes capital formation, technological advancement, and lower intermediation costs (Ahmed et al., 2011; Malik, 2011; Deshmukh, 2012; Bawa & Chattha, 2013; Akotey et al., 2013; Boadi et al., 2013; Razak et al., 2014).

Over the past two decades, Tanzania's insurance industry has undergone a significant transformation, emerging as a vital pillar of the country's economic development. Regulatory reforms, structural adjustments, and integration into regional blocs, such as the East African Community (EAC) and the Southern African Development Community (SADC), have collectively fostered the observed sectoral growth. Demand for insurance services continues to rise, driven by large-scale infrastructure projects, including the Standard Gauge Railway (SGR) and the Julius Nyerere Hydropower Plant (JNHP), as well as expanding socio-economic activities such as oil and gas exploration and mortgage financing (TIRA, 2020). Nevertheless, insurance penetration remains relatively low despite these advances, and concerns persist regarding the sector's long-term financial sustainability and competitive dynamics (FSD Tanzania, 2024). These concerns underscore the importance of examining financial performance indicators, particularly the degree of profit persistence, which reflects the insurers' ability to maintain profitability over time (Djankov et al., 2002)

Given the sector's centrality to risk management and economic resilience, a stable and profitable insurance industry is essential. The persistence of profitability enhances a firm's capacity to absorb shocks, make informed strategic decisions, and maintain long-term solvency. Understanding the degree of profit persistence thus offers valuable insights into the sector's sustainability and competitiveness (Maury, 2018; Pimentel, 2022). As such, firms must innovate, control costs, and adapt to market demands in competitive environments. As a result, abnormal profits, whether above or below the norm, should diminish over time due to market forces that promote efficiency and normalise returns (McMillan & Wohar, 2011; Iskenderoglu & Ozturk, 2016). Analysing the degrees of profit persistence in Tanzania's insurance sector is, therefore, crucial for evaluating the market's fairness, efficiency, and overall performance.

Although profit persistence has been extensively examined, many studies have focused on non-financial sectors such as manufacturing (Mueller, 1990; Maruyama & Odagiri, 2002a; Yurtoglu, 2004; Agostino et al., 2005; Aslan et al., 2010; Goddard et al., 2011; Hirsch, 2014; Guan & Cao, 2015; Eklund & Lappi, 2019; Molnar et al., 2023), and studies on financial intermediaries have concentrated mainly on the banking sector (Pervan et al., 2015; Amidu & Harvey, 2016; Tan, 2016; Sanderson et al., 2018; Goswami, 2022). In contrast, investigations into insurance firms remain scarce and limited (Pervan et al., 2013; Tunay et al., 2014; Konuk et al., 2014), particularly in developing countries. To the researcher's knowledge, no study has been conducted on this subject in Tanzania. Moreover, most studies focus on developed countries, whose structural and institutional characteristics may differ significantly from those of Tanzania. This difference underscores a notable knowledge gap in understanding the degree of profit persistence among Tanzanian insurance companies and its implications for the industry's structure and competitiveness. Consequently, there is a clear need for a localised empirical investigation. This study, therefore, analyses the degree of profit persistence among Tanzanian insurance firms using a first-order Markov Chain Model, which allows for the modelling of probabilities associated with firms moving between low, moderate, and high profitability states, providing insights into both short-term dynamics and long-run equilibrium behaviour. While this technique has been applied in other sectors, such as banking and manufacturing (Amidu & Harvey, 2016; Molnar et al., 2023), its application to the insurance sector, particularly in Tanzania, is empirically novel and contextually significant. Towards this end, the study specifically seeks to:

i. Determine the levels of profit persistence in Tanzania's insurance industry.
ii. Examine how insurance firms transition from different profit levels (low, moderate, high) over time.

These objectives enabled the study to provide valuable insights into the stability and dynamics of profitability within Tanzania's insurance sector. A probabilistic modelling approach enhances understanding of the industry's competitive structure and the movement of firms across profitability levels over time. The findings provide evidence-based guidance for strategic decision-making by industry stakeholders, supporting the formulation of informed regulatory policies. Moreover, the study contributes to the limited literature on profit persistence in Sub-Saharan Africa. These findings also have practical implications for enhancing financial resilience, promoting sustainable growth, and improving the long-term performance of insurance firms.

1.1 Definition of Key Terms

Insurance Business: The insurance business involves pooling risks and providing financial protection against uncertain future events in exchange for a premium. It plays a vital role in financial intermediation and economic stability (Anderson & Brown, 2005; Skipper & Kwon, 2007).

Persistent Profit: Persistent profit refers to a firm's consistent ability to maintain above-average or below-average profitability over time, despite the pressures of competition. It reflects the firm's competitive advantage, structural barriers, or inefficiencies within the market (Goddard & Wilson, 1999; Djankov et al.,2002).

Profitability Classifications: This term refers to the classification of firms into different performance levels (low, moderate, and high profitability) based on return indicators such as ROA or ROE. These classifications enable the analysis of how firms move between different performance levels over time (Pervan et al., 2013).

Short and Long Run: The short run refers to a period during which firms have fixed specific business inputs, during which they earn abnormal profits or losses. In contrast, the long run is a time horizon characterised by variable inputs, and firms are projected to earn only normal profits due to market adjustments (Varian, 2010).

Return on Assets (ROA): ROA measures a firm's profitability relative to its total assets. It indicates how efficiently a company uses its assets to generate earnings and is commonly used to assess firm performance in profit persistence studies due to its benefits compared to other profitability proxies (Flamini et al., 2009; Bodie et al., 2014).

Section 2 of this paper reviews the relevant literature on profit persistence. Section 3 outlines the methodology used in the study. Section 4 presents the data analysis and empirical findings. Finally, Section 5 concludes and delineates policy implications.

2.0 Literature review

2.1 Theoretical review

Theoretically, two dominant frameworks have been widely discussed regarding the persistence of profit. The first is commonly known as the static competitive environment hypothesis, which posits that industry profit levels are shaped by the structural characteristics of the market, including the ability of firms to reduce competitive pressures by establishing barriers to entry. This perspective aligns with the well-known Structure Conduct Performance (SCP) model, which suggests that a market's profit, particularly in terms of profitability, is closely linked to the degree of market concentration and the industry's overall structure.

Although the SCP framework has provided valuable insights, it has attracted criticism due to its static nature, as it often overlooks dynamic market factors, such as technological change, innovation, and strategic interactions among firms. As Mueller (1990) contends, early theoretical work on profit persistence can be traced back to the classical models of Adam Smith (1776) and Augustin Cournot (1838). These models argue that greater market concentration leads to higher profitability, as firms in concentrated industries are more likely to set prices above marginal cost, resulting in a sustained gap between prices and costs and, consequently, abnormal profits.

Moreover, increased competition within an industry tends to result in more subdued levels of profitability. On the other hand, an industry protected from competitive pressures would generate better profits, all other things being equal (Carlton & Perloff, 2005; Goddard et al., 2011). Competition restrictions can be direct and indirect, often stemming from collusive competition behaviours. These include practices such as price fixing, bid rigging, market allocation, and the formation of cartels, which undermine fair market dynamics. This assumption provides valuable insight into the company's strategies for generating and sustaining profits (Tamirat et al., 2018).

The second school of thought emphasises that industries respond to change and can also be agents of change, reacting to innovation, emerging markets, regulatory shifts, or geopolitical disruptions (Teece, 2023). This adaptive view aligns with the dynamic capabilities framework, first articulated by Teece et al. (1997), which posits that to remain competitive, firms must develop capabilities to sense and seize new opportunities and reconfigure their internal resources accordingly. As globalisation, technological advancements, or deregulation-driven strategic environments evolve, firms must modify their strategies and operations to remain viable (Teece, 2007). Eisenhardt and Martin (2000) extend this perspective by emphasising that dynamic capabilities involve flexible and iterative routines that enable firms to respond effectively to environmental turbulence. Similarly, Zollo and Winter (2002) highlight the role of organisational learning and accumulated experience in reshaping routines to navigate change. Mintzberg et al. (1998) further argue that strategy formation is often emergent and shaped by continuous interactions between the firm and its environment, rather than being fixed through planning.

According to microeconomic theory, when markets are effectively competitive, consumers benefit from lower prices, improved quality, and better service. In such environments, firms are incentivised to operate efficiently and respond to consumer needs (Carlton & Perloff, 2015). Therefore, assessing profit persistence in the insurance industry is essential, as it reflects the market's degree of competition and efficiency. From a customer perspective, higher competition is often associated with lower profit persistence and can lead to enhanced benefits, such as better claim services, pricing, and innovation, which promote customer satisfaction and loyalty (Mueller, 1977; Goddard & Wilson, 1999).

2.2 Empirical review

Most prior studies on profit persistence focus on developed countries, with limited research in developing contexts. Nonetheless, their insights are valuable for understanding the underlying theory. The following paragraphs provide a brief review of key studies across the manufacturing and financial sectors, regardless of country context.

Since the 1970s, numerous empirical studies have analysed the persistence of profitability, examining both static and dynamic hypotheses within the non-financial sector. Studies on the persistence of profits on financial intermediaries, particularly in the insurance industry, remain scarce. Mueller (1977) formulated the persistence profit hypothesis as an alternative perspective on the competitive environment. Mueller (1986) later expanded on the persistence of profits hypothesis, distinguishing it from static industrial organisation and resource-based literature. He introduced a dynamic perspective that links competition and profitability, arguing that abnormal profits do not persist in the long term. Since the seminal contribution by Mueller, the dynamics of company profits have been specified as an autoregressive process, typically of first order.

Mueller (1990) extended Mueller's profits persistence (1986) framework model which is the Schumpeterian framework driven by creative destruction or market competition and incorporates the Cubbin and Geroski (1987) model to analyse the dynamic of company profits persistence in seven developed economies (Sweden, Japan, US, UK, Canada, Japan and France) from 1960 to 1980, concluding that there is high degree of profit persistence in all these countries, indicating that the speed of adjustment towards the long- run equilibrium profit is comparatively low. Moreover, the results reveal significant variations in profit persistence across the countries. Profit persistence facilitates understanding the policies that work effectively, enabling efficient resource allocation, promoting balanced development within a country, enhancing product innovation, reducing costs, improving the efficient production of insurance services, and enhancing prospects for economic growth (Karulkar & Jain, 2020; Abel & Marire, 2021).

Several studies on profit persistence have focused on the non-financial industry (Mueller, 1986; Geroski & Jacquemin, 1988; Kambhampati, 1995; Cefis, 2003a; Cefis, 2003b; Yurtoglu, 2004; Tarzijan & Eylerts, 2010; Gschwandtner et al., 2011; Gschwandtner & Hirsch, 2018; Bareith, 2019). Specifically, Gschwandtner et al. (2011) analyse the profit persistence and the drivers of persistence for 4,676 European food industries during the period 1996-2008. Results reveal a lower degree of profit persistence in the food industry than in other manufacturing sectors, primarily due to intense competition among food processors and high retailer concentration. Gozbasi and Aslan's (2015) study, which focuses on the energy industry, examined the profit persistence of 13 energy companies in Turkey from 1997 to 2011. They found a high level of profit persistence in the energy industry. Contrary to previous studies, the persistence in their research is greatly influenced by a low degree of market saturation, weak price competition, and low concentration in the retailing industry, rather than intense competition in Turkey. Esmeray and Esmeray (2016) re-examine profit persistence in the Turkish energy market by employing the panel Autoregressive Distributed Lag (ARDL) model. They examined five companies running from 2005 to 2015. They concluded that persistence is more common in the short run than in the long run. However, they observed high entry barriers in Turkey's energy industry.

A recent study by Hirsch et al. (2021) focuses on the differences between top competitors and fringe food retailers. It investigates the drivers and persistence of profits in EU food retailing using a sample of 12,786 firms from France, Spain, and Sweden between 2006 and 2014. They found higher profit persistence among top competitors in the food retailing sector, likely due to their strong bargaining power with processors.

In the financial sector, several studies on profit persistence have focused on banking sectors both in developed and developing countries (Levonian, 1994; Roland, 1997; Berger et al., 2000; Knapp et al., 2006; Bektas, 2007; Lee et al., 2014; Pervan et al., 2015; Amidu & Harvey, 2016), and few have focused on African economies. Some of these studies examined individual countries, while others explored multinational firms. As expected, findings vary significantly across countries, companies, and industries due to differences in market structure, regulatory environments, and economic conditions.

Studies on a single country include Roland (1997), Agostino et al. (2005) Knapp et al. (2006) Bektas (2007), Athanasoglou et al. (2008), Kaplan and Aslan (2008), Aslan et al. (2010), Pervan et al. (2015), Tan (2016), Batten and Vo (2019). Specifically, Roland (1997) examined the persistence of bank profits of US bank holding companies from 1986 to 1992. Roland employed a two-dimensional measure of persistence and confirmed the presence of abnormal profit persistence. The level of persistence seems to be greater in inefficient banks than in their efficient counterparts. Athanasoglou et al. (2008) examined the persistence of profitability and its determining factors in a dataset of Greek banks from 1985 to 2001, despite variations in data availability across years. The GMM estimation results for the first-order autoregressive model show an average level of profit persistence, implying that deviations from a competitive market structure may not be substantial. On the other hand, the study did not reveal any evidence to support the Structure-Conduct-Performance hypothesis.

Iskenderoglu et al. (2011) analysed profit persistence using a panel dataset of eight Turkish banks, covering the period from the first quarter of 1998 to the fourth quarter of 2009. The analysis employed Return on Assets (ROA) and Return on Equity (ROE) as profitability indicators. The Lagrange Multiplier (LM) unit root test results rejected the presence of unit roots in both ROA and ROE, suggesting that profit persistence does not exist during the observed period. Additionally, the findings indicate high competition within the Turkish banking sector. These results are consistent with those of Bektas (2007), who reported that the long-run average profit rate was nearly zero, concluding that profit persistence is absent in the long term. Similarly, Kaplan and Celik (2008) found moderate short-term profit persistence, with excess profits diminishing over time, suggesting intense competition in the Turkish banking industry during the period from 1980 to 1998.

Pervan et al. (2015) applied Markov Chain analysis to assess profit persistence in the Croatian banking sector from 2002 to 2010, using Return on Assets (ROA) as the profitability indicator. The Markov Chain results indicated low profit persistence among highly profitable banks, and relatively higher persistence among less profitable ones. The findings are consistent with the study done by Roland (1997). On the other hand, Mohammed et al. (2015) analysed the link between concentration and competition in Malaysia's Islamic and conventional banking industries. They empirically employed a structural approach whereby their findings confirm the structure-conduct-performance (SCP) paradigm, which reflects a greater degree of competition in the Malaysian dual banking system.

Sanderson et al. (2018) investigated the persistence of profit and the determinants of profitability in the Zimbabwean banking sector from 2009 to 2014. The study found that profitability does not persist, implying that any abnormal profits are eroded over time due to market competition, consistent with the theoretical expectations of monopolistic competition. This finding aligns with the theoretical expectations of monopolistic competition, suggesting that banks do not sustain abnormal profits in the long run.

Other studies that examine the profit persistence across countries (Goddard et al., 2004; Goddard et al., 2011; Lee et al., 2014; and Amidu & Harvey, 2016) have employed dynamic panel models to assess the degree of profit persistence in the global banking sector. Goddard et al. (2011) analysed the level of competition across 65 national banking industries. They reported and compared country-level dynamic panel estimates regarding the persistence of bank profits. They revealed that the profit persistence tends to be lower and competition stronger in countries with more advanced institutional development and robust external governance mechanisms. Moreover, Amidu and Harvey (2016) evaluate the persistence of profits of 330 banks across 29 African countries from 2002 to 2009. Markov Chain analysis results provide evidence of a high level of profit persistence among banks in Africa, which is inconsistent with the study by Goddard et al. (2011), who suggest a lower persistence level in developing economies compared to developed economies. The results also indicate that bank regulations and earnings management play a significant role in influencing both the level and persistence of bank profitability. Likewise, it was noted that increased competition and the global financial crisis of 2008–2009 lowered both the level and persistence of bank profits.

To date, the literature has limited analysis of profit persistence in the insurance industry. Most existing studies (see, for example, Sarpong-Kumankoma et al., 2018; Faizulayev et al., 2020; Horera & Maganya, 2020; Kasman et al., 2020; Vojinović et al., 2022; Worku et al., 2024) in the sector have focused on determining the factors that influence insurers' profitability, with comparatively little attention given to the degree/level of profit persistence. Ferruz et al. (2007) investigated performance persistence in Spanish equity pension funds from 1996 to 2002 using a non-parametric (contingency table) approach. Their findings revealed evidence of short-term profit persistence, but no indication of long-term persistence. Implicitly, although some Spanish pension funds may benefit from superior managerial skills in the short term, these advantages are not maintained over the long run.

The persistence of profitability among non-life insurance firms operating in Croatia, an emerging market economy, was investigated from 2002 to 2011 (Curc, 2013). Using a Markov Chain stochastic process applied to profitability classes based on changes in the Return on Assets (ROA) indicator, the study found that profit persistence was more common within moderate profitability states. Furthermore, an analysis of profit persistence in the Turkish insurance sector was conducted for 58 insurance companies from 2002 to 2012, using ROA and ROE as profitability indicators (Tunay et al., 2014). Employing a dynamic panel model, the study found evidence of short-term profit persistence. However, the results suggest that profitability does not persist in the long run.

Through the literature review, this study identifies several notable gaps. To the researcher's knowledge, no previous studies have specifically analysed the degree of profit persistence within the Tanzanian insurance sector. Second, while the Markov Chain framework is a robust mathematical tool for assessing profit persistence and modelling transitions between discrete states over time, its application in the insurance industry has been limited. Third, most existing studies employing the Markov Chain approach have primarily concentrated on identifying the determinants of profit persistence, rather than quantifying its magnitude. By addressing these gaps, this study provides deeper insights into the nature and extent of profit persistence, as well as the transitional dynamics of insurance firms in Tanzania, thereby contributing to academic discourse and informing policy formulation.

3.0 Materials and Methods

3.1 Data set and Sampling

The study analyses the degree of profit persistence among insurance companies in Tanzania. It is based on secondary data obtained from the Tanzania Insurance Regulatory Authority (TIRA), covering a sample of 20 insurance companies that were active between 2010 and 2020. The data were extracted from annual reports published by TIRA, as well as from the official websites of the respective insurers. The sample was selected primarily based on data availability and the companies' years of operational experience. To analyse the degree of profit persistence among insurance companies, a discrete-time first-order Markov Chain model with a finite state space was employed, where the states were defined based on changes in insurers' return on assets (ROA).

3.2 Measurement of variable(s)

Return on Assets (ROA) was employed as the key measurement variable for profitability to analyse the degree of profit persistence among insurance companies. ROA is defined as:

$$ROA = \frac{\text{Net Income}}{Total\ Assets} \tag{1}$$

This ratio indicates how efficiently a company utilises its assets to generate profits, making it a suitable indicator for measuring the degree of profit persistence in the sector. A discrete-time first-order Markov Chain model with a finite state space was used to evaluate firms' transitions between different profitability levels over time. Each state represents a distinct profitability category based on the ROA value. According to Bartoloni and Baussola (2009), an insurer falls in the low-profit class (l) if its ROA is below the average minus the standard deviation, and in the high-profit class (h) if its ROA exceeds the average plus the standard deviation. Insurers with ROA values falling between these thresholds fall into the moderate-profit class (m). Based on this classification, the Tate space is defined as $S = \{l, m, h\}$. This state-based classification allows the application of a Markov Chain model to analyse how insurers transition between profitability levels over time, providing insights into the persistence (i.e., degree of profit persistence).The variations observed in return on assets (ROA), analysed through the transition probability matrix (TPM), provide insights into the transition of state changes over time. Since past changes in ROA suggest potential future shifts, these variations can be modelled as random variables governed by a stochastic process. The TPM effectively captures the behaviour of a Markov Chain, with each element indicating the probability of transitioning from one profit state to another. Profitability states were calculated over the study period using the average annual ROA and its corresponding standard deviation. The standard deviation was computed using equation (2):

$$\sigma = \sqrt{\frac{n(\sum x_i^2 - (\sum x_i)^2}{n^2}} \tag{2}$$

Where, σ = standard deviation, x_i = individual ROA observation, n =number of observations, and index $i = 1, 2, 3, \ldots\ldots.., n$

3.3 Model Specification: Markov Chain Processes

This study examines profit persistence in Tanzania’s insurance sector by modelling firm returns using the Markovian properties of stochastic processes. It posits that profitability states adhere to a first-order Markov process, capturing the probabilities of transitioning between various profit levels over time. Through the Chapman-Kolmogorov framework, the analysis derives transition matrices and their limiting distributions, providing valuable insights into the long-term stability and persistence behaviour of the sector.

Markov Chain processes, introduced by Andrey Markov in 1907, are foundational to the stochastic theory. These processes operate on the principle that future states depend only on the present state and not on the sequence of events that preceded it, a property known as the Markov (or memoryless) property (Bhat & Miller, 2002; Brooks et al., 2011). A Markov Chain is a discrete stochastic process defined by a sequence of random variables. $X = \{X_n : n = 0, 1, 2, \ldots\}$ over a state space S where S={0,1,2,…,n}. It uses conditional probability to model transitions between states, making it suitable for analysing systems over time, such as insurer profitability levels in this study. So, A Markov chain is a discrete stochastic process. X which possesses the following Markov property (memoryless property).

$$P(X_n = j \mid X_m = i,\ X_{m-1} = i_{m-1}, X_{m-2} = i_{m-2}, \ldots\ldots\ldots, X_0 = i_0) = P(X_n = j \mid X_m = i) \tag{3}$$

For all states $i_0, i_1 \ldots\ldots i_{m-1}, i, j \in S \text{ and } n > m$

The conditional probabilities on the right-hand side of equation (3) are fundamental to describing a Markov chain. These are known as transition probabilities, and they are denoted as:

$$P_{ij} = P(X_n = j \mid X_m = i) \tag{4}$$

Where: P_{ij} is the probability of transitioning from state i to j. X_m and X_n represent the states at times m and n respectively (IFoA, 2010; Doubleday & Esunge, 2011). It is customary to represent the transition probability in a matrix, whose entries show the probabilities of moving from one state of the Markov Chain to another. Thus, we can write:

$P\ (X_n = j|X_m = i) = p_{ij}$ in $n \times n$ square matrix form as:

$$p = p_{ij} = \begin{pmatrix} p_{00} & p_{01} & p_{02} & p_{03} & \cdots & p_{0n} \\ p_{10} & p_{11} & p_{12} & p_{13} & \cdots & p_{1n} \\ p_{20} & p_{21} & p_{22} & p_{23} & \cdots & p_{2n} \\ \cdots\cdots & \cdots\cdots & \cdots\cdots & \cdots\cdots & \cdots & \cdots\cdots \\ p_{n0} & p_{n1} & p_{n2} & p_{n3} & \cdots & p_{nn} \end{pmatrix} \tag{5}$$

Where n is the number of states in S. The entry in the i^{th} row and j^{th}column is P_{ij}

The Transition Probability Matrix (TPM), P_{ij} satisfies the following properties:

i. $p_{ij} \geq 0,$

ii. $\sum_{j=1}^{n} p_{ij} = 1, \qquad for\ all\ i, j\ and\ n > m$ (6)

iii. p_{ii} the diagonal elements indicate transition from state i to state i.

The distribution of a Markov chain is fully determined once equation (4) and the initial probability distribution are given. $x_0$is specified. Additionally, n-step transition probability P_{ij}^n (i.e., the probability of moving from state i to state j in exactly n – steps) can be obtained by calculating the $(i, j)^{th}$ entry of the matrix P_{ij}^n.

3.4 Assumptions of the Markov Chain Model

For a system to be modelled using a Markov chain, the following assumptions must be satisfied:

i. Memoryless Property – The system's current state depends only on the immediate previous state and not on any earlier states.

ii. Time or Space Homogeneity – The transition probability matrix remains constant over time.

3.5 Estimating transition probabilities

Based on the state space identified previously, the next step was to fit the data into the model by developing a Transition probability matrix (TPM). Before undertaking further Markov analysis of the three states in a discrete time, first, a 3 x 3 transition matrix was formulated as presented in Table 1.

Each entry, R_{ij} in the table indicates the number of times a transition has occurred from a state. i to state j at a specified time and $i, j = l, m, h$. For instance R_{mm}, indicates the number of transitions from state m to state m, and R_{lh} indicates the number of transitions from state l to state h in a specified time, and so on.

Table 1: Transition Matrix

From/To	Low profit ($\boldsymbol{l}$)	Mean profit ($\boldsymbol{m}$)	High profit ($\boldsymbol{h}$)
Low profit ($\boldsymbol{l}$)	R_{ll}	R_{lm}	R_{lh}
Mean profit ($\boldsymbol{m}$)	R_{ml}	R_{mm}	R_{mh}
High profit ($\boldsymbol{h}$)	R_{hl}	R_{hm}	R_{hh}

3.6 Transition probability matrix (TPM)

The transition matrix obtained from the table facilitated the formulation of a TPM with entries called transition probabilities. The TPM forms the basis of Markov analysis. Subsequently, we employ maximum likelihood estimators to find the best estimate. p_{ij}which is obtained by dividing each element in a particular row by the sum for each component in the row, as in equation (7) and the resulting TPM ($\hat{p}_{ij}$)as presented in Table 2:

$$\widehat{p}_{ij} = \frac{R_{ij}}{R_j}, \text{where } R_j = \sum_{j=1}^{3} R_{ij} \tag{7}$$

Table 2: Transition probabilities matrix (TPM)

From/To	Low profit ($\boldsymbol{l}$)	Mean profit ($\boldsymbol{m}$)	High profit ($\boldsymbol{h}$)
Low profit ($\boldsymbol{l}$)	p_{ll}	p_{lm}	p_{lh}
Mean profit ($\boldsymbol{m}$)	p_{ml}	p_{mm}	p_{mh}
High profit ($\boldsymbol{h}$)	p_{hl}	p_{hm}	p_{hh}

The TPM indicates the movement from one profit class to another profit class and also refers to a short-term transition. Each element on the main diagonal of the TPM represents the persistence of profitability within each state over the short-term period. When all elements on the main diagonal of the TPM are closer to one, it indicates a high level of profit persistence. (Pervan et al., 2013). Thus, p_{ll}, p_{mm} and p_{hh} reflect the average annual probabilities of insurers remaining in low-profit, moderate-profit, and high-profit classes, respectively, over the short period.

The off-diagonal elements of the transition matrix represent the probabilities of moving between different profit states. Specifically,p_{lm} and p_{lh} refer to the probabilities of moving from the low-profit class to the moderate and high-profit classes, respectively. Similarly, p_{ml} and p_{mh} represent the probabilities of moving from the moderate profit class to the low and high-profit classes. Conversely, p_{hl} and p_{hm} represent the probabilities of moving from the high- to the low and moderate-profit classes, respectively. These probabilities are subject to the condition that the sum of each row probabilities adds up to one, written as:

$$\sum_j P_{ij} = 1, \text{ for all } i \in \{l, m, h\} \tag{8}$$

3.7 Steady-state probability-stationary probability distribution

The convergence of a transition probability matrix (TPM) to a steady state over time is ergodicity. The corresponding ergodic distribution refers to the limiting or stationary probability distribution of a dynamic system that reaches a unique steady state, regardless of its initial condition (Borovkov, 1998). In the case of a regular Markov chain with a finite state space, the process will eventually stabilise, and all rows of the TPM were raised to a sufficiently high power (i.e.,TPM^n) was identical. The steady-state probabilities are obtainable by solving equation (9) as follows:

$$\pi = \pi P \tag{9}$$

Subject to the condition that, $\pi_l + \pi_m + \pi_h = 1$ to a unique stationary distribution, each of these rows gives the steady-state probabilities and is given by a vector. $\pi = (\pi_l, \pi_m, \pi_h)$ where π_i isthe row vector of steady-state probabilities, and P, which amounts to is the transition probability matrix.

4.0 Findings and discussion

The study employed the standard—and most commonly used—measure of profitability, return on assets (ROA), as a proxy for the persistence of profits. As a standard measure of profitability in the extensive literature on profit persistence within insurance companies, ROA reflects a company's efficiency and profitability, as it is a product of the net profit margin and the asset turnover ratio. A similar approach has been employed in the extant literature (Berger et al., 2002; Pervan et al., 2013; Chronopoulos & Liu, 2015; Gugler & Peev, 2018; Adel & Meknassi, 2022). The choice of data was primarily determined by the availability of data and the economic framework from previous studies, with some modifications made to suit the needs of this study. Data were extracted from the TIRA (2022) database. In contrast, the study population comprises insurance companies in Tanzania that offer life and non-life insurance services, particularly those that have been in operation for at least three years prior to the study. This study applies the Markov Chain technique to analyse the profit persistence of insurance companies in Tanzania and draw meaningful conclusions.

4.1 Test for randomness

Before we apply the Markov Chain to model the persistence of insurers' profitability, our task in this section is to confirm the use of a three-state Markov Chain to establish the suitability of this method to the set of the assumption that the profit rate (ROA) available for analysis consists of a sequence of observations, recorded in the order of occurrence which can be categorized into two mutually exclusive events. The runs test proposed by Bradley (1968) has been adopted to test the randomness of a data set (Markov property). We code ROA values above the median as positive and those below the median as negative. The null hypothesis for the runs test posits that the Return on Assets (ROA) was generated randomly, in contrast to the alternative hypothesis, which asserts that the sequence of ROA was not generated randomly. The test statistic is given by:

$$z = \frac{R - E[R]}{\sigma_R} \tag{10}$$

Where R represents the number of runs, $E[R]$ represents the expected number of runs, and σ_R represents the standard deviation of the observed number of runs, mathematically, are written in equation (11)

$$E[R] = \frac{2n_1 n_2}{n_1 + n_2} + 1 \quad \text{and} \quad \sigma_R = \sqrt{\frac{2n_1 n_2 (2n_1 n_2 - n_1 - n_2)}{(n_1 + n_2)^2 (n_1 + n_2 - 1)}} \tag{11}$$

Where, n_1 and n_2 indicate the number of positive and negative values in the observed sequence of a given data. At the 5% significance level, a test statistic with an absolute value greater than 1.96 indicates non-randomness (reject H_0). For this study, the run's test results with n_1= 150 and n_2= 70 and R = 0 give the critical value Z_c= -1.005 at a 0.05 significance level. Since the test statistic < 1.96, the analysis accepts H_0. Implicitly, there is enough evidence to support the claim that the sequence of data (ROA) is determined by randomness. In other words, the runs test suggests the presence of randomness at a 5% significance level. Henceforth, applying the first-order Markov process in modelling the persistence of insurers' profitability is plausible.

4.2 Determination of transition probability matrix (TPM)

We employ a finite-state discrete-time Markov Chain to model the persistence of profitability in Tanzania's insurance companies. Using TPM behaviour effectively establishes the Markov process analysis, as the TPM offers a convenient way to describe the behaviour of a Markov Chain. Each element in TPM represents the probability of transition from one particular state to another.

The average annual ROA was calculated based on the average yearly ROA values, and the corresponding standard deviation was computed using equation (2). Table 3 presents the results:

Table 3: Average Annual ROA and Corresponding Standard Deviations

Year	Average annual ROA	Standard deviation
2010	0.009935	0.101567
2011	-0.012080	0.129931
2012	0.004669	0.126355
2013	0.016379	0.125057
2014	0.046524	0.121036
2015	0.044932	0.056478
2016	0.030835	0.040177
2017	-0.012121	0.069296
2018	-0.025832	0.097956
2019	-0.034572	0.281098
2020	0.000059	0.098378
Grand Total	0.006248	0.128045

4.3 Model Determination

An insurer is in the low-profit class when its ROA is below the average minus the standard deviation. Conversely, an insurer belongs to the high-profit class if its ROA exceeds the average plus the standard deviation. Otherwise, we define the Moderate (mean) ROA class, i.e., all insurers whose ROA falls between the average plus or minus standard deviation. Thus, the study observed transitions from one state to another (i.e., changes in ROA, which could occur from a high-profit level to a low-profit level, followed by another high-profit level, and so on). The results from 2010 – 2020 were computed using the Advanced Excel program (Matrix - numerical computations). Figure 1 presents a graph that helps identify the states of the transition probability matrix used in this study. Additionally, it illustrates the long-term average ROA of the insurance industry, along with the corresponding standard deviation intervals:

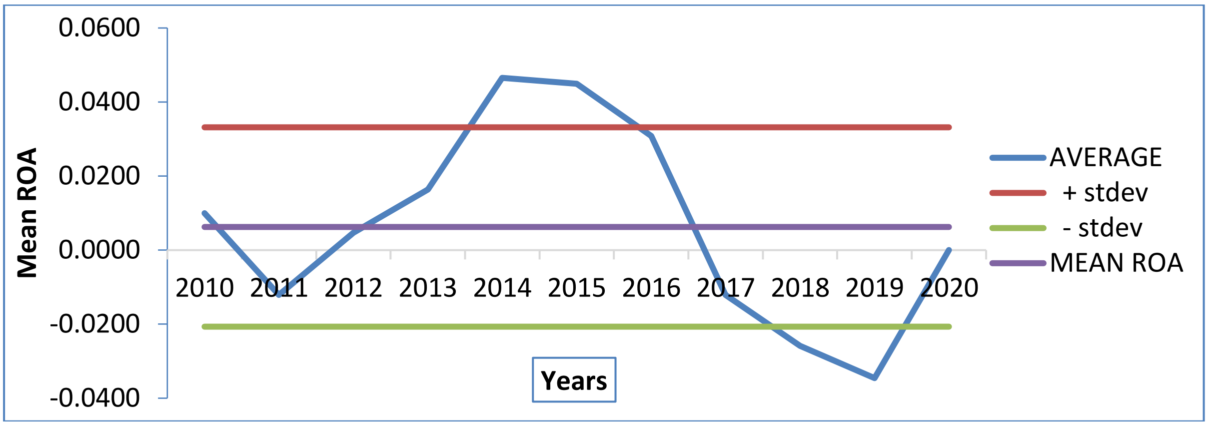

Figure 1: Return on assets (ROA) with Corresponding Standard Deviation Interval

The data collected was further analysed to obtain more information regarding the objective of this study. Using the assigned states l, m, and h the given time frame. The transition matrices and TPM were formed for the period (2010-2020. With the help of Table 1 and equation (7), the TPM of insurers over the period 2010-2020 was empirically computed and compiled using the Advanced Excel program, and the results are presented in Table 4 as follows:

Table 4: Transition Probabilities Matrix (TPM) during the 2010-2020 Period

From/To	Low profit (L)	Medium profit (M)	High profit (H)
Low profit (L)	0.2245	0.3265	0.4490
Medium profit (M)	0.1884	0.3478	0.4638
High profit (H)	0.2451	0.2843	0.4706

The TPM in Table 4 can be well illustrated using a transition digraph depicted in Figure 2:

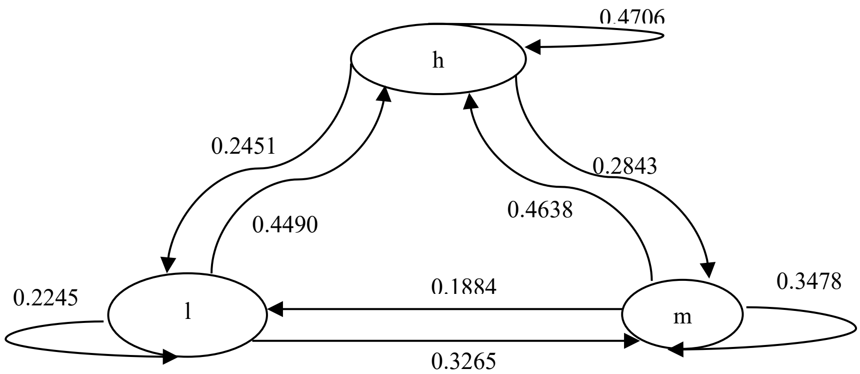

Figure 2: Transition Diaphragm for Insurance Firms in Tanzania, 2010-2020

4.4 *Steady-state probability distribution*

The steady-state probabilities of insurers are computed to capture the long-run behaviour of return on assets (ROA) across multiple transitions. These probabilities indicate the likelihood that an insurer will remain in each profitability class over an extended period, regardless of its initial state. This long-term distribution, also known as the ergodic or limiting distribution (Basu, 2003), represents the system's equilibrium state. As the transition probability matrix (TPM) is regular, it is expected to converge to a form with identical rows over time. Each row of this limiting matrix represents the steady-state probability vector, denoted as:

$\pi = (\pi_l, \pi_m, \pi_h)$.

As Table 5 further illustrates, this convergence confirms that the Markov Chain is ergodic, meaning each state is accessible from any other within a finite number of steps. The relatively quick attainment of steady state also suggests that the insurance industry is minimally affected by external fluctuations over time.

Table 5: Annual TPM and Steady-state Vectors for the 2010-2020 Period Combined

Transition period	Transition Probabilities Matrix (TPM)	Number of transitions to reach the steady state (n)	The steady-state vectors $\pi = (\pi_l \ \ \pi_m \ \ \pi_h)$
2010 -2020	$\begin{bmatrix} 0.2245 & 0.3265 & 0.4490 \\ 0.1884 & 0.3478 & 0.4638 \\ 0.2451 & 0.2843 & 0.4706 \end{bmatrix}$	4	$[0.22272 \quad 0.31363 \quad 0.46364]$

4.5 Short-run transition

The diagonal elements of TPM in Table 5 provide insights into short-run dynamics over the 2010–2020 period. According to the Markov Chain framework, higher values along the diagonal suggest stronger profit persistence, with values near one indicating a high likelihood that firms remain in the same profitability class over time (Bartoloni & Baussola, 2009; Pervan et al., 2013, 2014). The analysis reveals that all diagonal elements are below 0.5, signalling moderately low short-term profit persistence within the industry. However, variations exist across profitability classes: insurers in the high-profit class exhibit relatively stronger persistence (0.4706) compared to those in the moderate (0.3478) and low-profit (0.2245) classes. These findings suggest that high-profit insurers are more likely to maintain their status in the short run than those in lower classes, who experience greater volatility. This distribution highlights the uneven stability of profitability across firms, reflecting structural dynamics and potential market inefficiencies in the Tanzanian insurance sector.

Regarding off-diagonal elements, it is evident that there is a higher probability that insurers in the high-profit class (24.51%) will find themselves in less profitable businesses than moderately profitable insurers (18.84%) in the short run. This higher likelihood of downward movement among highly profitable insurers may be due to their tendency to take greater risks, making them more vulnerable to adverse outcomes. Consequently, highly profitable insurers may be more likely to transition into the low-profitability class than those in the moderate class. Notably, moderately profitable insurers (46.38%) are also more likely to find themselves in highly profitable businesses. A plausible explanation may be that moderate-profit insurers are aggressively improving their operations to win more profitable companies/deals, thereby transitioning into the high-profit class.

Moreover, the probability of transitioning from the low-profitability class to the moderately profitable class is higher than the likelihood of remaining in the low-profit category over a short period. Furthermore, there is a 45% chance that insurers in the low-profitability class can progress directly into the high-profitability class within the short term. Conversely, highly profitable insurers face a 28% probability of transitioning to the moderate-profit class, indicating a potential decline in performance even among top performers.

4.6 Long-run transitions

On the other hand, Table 5 presents the results of the long-term transition of insurers (see the steady state vector column), indicating that the probability of insurers being in any profitable state in the long term is independent of their initial state. Overall, as observed in the short term, the same was revealed in the long term: there is moderate persistence in the insurance industry in Tanzania. Generally, in the insurance industry, persistence declines slightly to 0.2227, compared with 0.2245 in the short term, in a state of low profitability. The same scenario has been observed in the moderate profit class, where persistence decreases to 0.3136, compared with a probability of 0.3478 in the short term. Furthermore, the persistence in the highly profitable state decreases to 0.4636, compared to 0.4706 in the short term. In the long term, insurers are more likely to remain in the highly profitable class, with a probability of 46.36%. In comparison, the chances of being in the low and moderately profitable classes are 22.27% and 31.36%, regardless of the starting point. This pattern signals intense competition in Tanzania's insurance market, characterised by easy entry and exit for firms and high customer mobility due to freedom of choice. Additionally, limited public awareness of insurance may suppress demand, constraining the sector's profitability.

Further analysis using the Markov chain model estimated the expected time for insurers to return to a given profitability class, a measure known as the recurrence time. Mathematically, recurrence time is defined as: Recurrence time $= {}^{1}/_{\pi_i}$, π_i represents the long-run (steady-state) probability of being in state i. The calculated recurrence times for each profitability class are presented in Table 6:

Table 6: Steady-state probability and the recurrence time for the period 2010 - 2020

State	Steady-state probability	Recur/ $\mathbf{1/\pi}$
L	0.222726	4.489822
M	0.313636	3.188405
H	0.463637	2.156860

As Table 6 illustrates, insurers in the low-profitability class take an average of 4.49 years to return to the same state, while those in the moderate and high-profitability classes take approximately 3.19 and 2.16 years, respectively. These differences in return times suggest that insurers in the high-profitability class recover more quickly than those in other categories. The shorter recurrence time for highly profitable insurers may be attributed to their more substantial market presence, better customer retention, and greater operational experience, which enable them to recover faster after setbacks.

5.0 Conclusion and Recommendations

This study has presented the first empirical analysis of profit persistence in Tanzania's insurance industry, utilising a Markov Chain transition probability model—a method rarely employed in developing countries. The findings reveal a relatively low degree of profit persistence, with firms showing medium stability in high-profit states (53% probability) but weaker retention in moderate (22%) and low-profit (25%) states. This pattern of stability suggests that, though top-performing firms maintain their positions, lower-tier insurers face challenges in improving profitability, reflecting market volatility, regulatory inefficiencies, and structural barriers. This pattern is consistent with evidence from other emerging markets (Goddard et al., 2005; Pervan et al., 2013). The shorter recurrence time for high-profit firms (2 years) compared to medium (5 years) and low-profit (4 years) indicates a competitive imbalance, possibly driven by limited innovation, scale constraints, and uneven market access. These dynamics underscore the need for policy reforms that foster innovation, reduce regulatory bottlenecks (e.g., VAT burdens), enhance ethical standards, and promote financial literacy to stimulate market expansion. Ultimately, enhancing profit sustainability in Tanzania's insurance sector requires a coordinated strategy to strengthen both the competitive landscape and the regulatory environment. Such efforts will create an ecosystem that enables both established and emerging insurers to thrive. This study posits that, if these structural gaps are systematically addressed, the Tanzanian insurance industry is poised to develop into a robust and resilient driver of inclusive economic growth.

6.0 Limitations and Future Research

This study experiences a few limitations that need to be addressed in future studies. As the study employed a first-order Markov Chain model, future studies could explore higher-order Markov processes or alternative modelling approaches, such as dynamic autoregressive models or Lagrange Multiplier tests, to capture deeper temporal dependencies and improve robustness. Moreover, the study's exclusive focus on Tanzania's insurance market has limited the generalisability of its findings.

As such, comparative analyses involving multiple countries or regional blocs could provide broader insights into structural differences in profit persistence across diverse regulatory and economic environments. Furthermore, this study's focus on life and general insurance suggests that future research should also examine microinsurance, a rapidly growing yet under-researched segment in Tanzania. Investigating this area could yield valuable insights into the profitability dynamics of underserved markets.

Reference

Abel, S., & Marire, J. (2021). Competition in the insurance sector: An application of the Boone indicator. *Cogent Economics & Finance, 9*(1), 1974154.

Adel, N., & Meknassi, S. (2022). Profit persistence: Is there A conglomerate effect: The case of banking and insurance in Morocco. *European Scientific Journal (ESJ) 18*(15), 106-126.

Agostino, M., Leonida, L., & Trivieri, F. (2005). Profits persistence and ownership: evidence from the Italian banking sector. *Applied Economics, 37*(14), 1615–1621.

Ahmed, N., Ahmed, Z., & Usman, A. (2011). Determinants of performance: A case of the life insurance sector of Pakistan. *International Research Journal of Finance and Economics, 61*(1), 123–128.

Alhassan, A. L., & Fiador, V. (2014). Insurance-growth nexus in Ghana: An autoregressive distributed lag bounds cointegration approach. Review of Development Finance, 4(2), 83-96.

Amidu, M., & Harvey, S. K. (2016). The persistence of profits of banks in Africa. *Review of Quantitative Finance and Accounting, 47*(1), 83–108.

Anderson, J. F., & Brown, R. L. (2005). Risk and insurance. Education and Examination Committee of the Society of Actuaries, Society of Actuaries.

Aslan, A., Kula, F. & Kaplan, M. (2010). New Evidence on the Persistence of Profit in Turkey with first and second generation unit root tests, METU Studies in Development, 37, April, 25-40.

Azman-Saini, W. N. W., & Smith, P. (2011). Finance and growth: New evidence on the role of insurance. *South African Journal of Economics, 79*(2), 111–127.

Banerjee, S., & Savitha, B. (2021). Competition reduces profitability: the case of the Indian life microinsurance industry. *The Geneva Papers on Risk and Insurance-Issues and Practice, 46*, 383–398.

Bareith, T. (2019). Profit persistence examination in Hungarian agriculture. *Glo. Adv. Res. J. Agric. Sci, 8*(4), 151-158.

Bartoloni, E., & Baussola, M. (2009). The Persistence of Profits, Sectoral Heterogeneity and Firms' Characteristics. *International Journal of the Economics of Business*, *16*(1), 87–111. https://doi.org/10.1080/13571510802638973

Batten, J., and Vo, X. V. (2019). Determinants of bank profitability: Evidence from Vietnam. *Emerging Markets Finance and Trade, 55*(6), 1417-1428.

Bawa, S. K., & Chattha, S. (2013). Financial performance of life insurers in the Indian insurance industry. *Pacific Business Review International, 6*(5), 44–52.

Berger, A. N., Bonime, S. D., Covitz, D. M., & Hancock, D. (2000). Why are bank profits so persistent? The roles of product market competition, informational opacity, and regional/macroeconomic shocks. *Journal of Banking & Finance, 24*(7), 1203–1235.

Bhat, U. N., & Miller, G. K. (2002). Elements of applied stochastic processes (Vol. 3). Hoboken, NJ: Wiley-Interscience.

Bhatia, R., Bhat, A. K., & Tikoria, J. (2021). Life insurance purchase behaviour: A systematic review and directions for future research. *International Journal of Consumer Studies, 45*(6), 1149–1175.

Boadi, E. K., Antwi, S., & Lartey, V. C. (2013). Determinants of profitability of insurance firms in Ghana. *International Journal of Business and Social Research (IJBSR), 3*(3), 43–50.

Bodie, Z., Kane, A., & Marcus, A. J. (2014). *Investments.* 10th edition. New York: McGraw-Hill Education.

Brooks, S., Gelman, A., Jones, G., & Meng, X. L. (Eds.). (2011). *Handbook of Markov Chain.* Monte Carlo: CRC Press.

Carlton, D. W., & Perloff, J. M. (2015). Modern industrial organisation, global edition. *Higher Education*, 4.

Cefis, E. (2003). Persistence in innovation and profitability. Rivista internazionale di scienze sociali. GEN./MAR., 2003, 1000–1019.

Cefis, E. (2003). Is there persistence in innovative activities*? International Journal of Industrial Organization, 21*(4), 489–515.

Chakraborty, J. (2016). Market concentration and firm performance: Evidence from the Indian life insurance industry. *Indian Journal of Finance, 10*(9), 30–52.

Chronopoulos, D. K., Liu, H., McMillan, F. J., & Wilson, J. O. (2015). The dynamics of US bank profitability. *The European Journal of Finance, 21*(5), 426–443.

Cubbin, J., & Geroski, P. (1987). The convergence of profits in the long run: inter-firm and inter-industry comparisons. *The Journal of Industrial Economics*, *35* (4), 427–442.

Demsetz, H. (1973). Industry Structure, Market Rivalry, and Public Policy. *Journal of Law and Economics, 16*(1), 1–9.

Deshmukh, S. R. (2012). Multiple decrement models in insurance: an introduction using R. New Delhi: Springer Science & Business Media.

Din, S. M. U., Angappan, R., & Baker, A. A. (2017). Insurance effect on economic growth among economies in various phases of development. *Review of International Business and Strategy, 27*(4), 409–427.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *The Quarterly Journal of Economics, 117*(1), 1–37. https://doi.org/10.1162/003355302753399436

Doubleday, K. J., & Esunge, J. N. (2011). Application of Markov Chains to Stock Trends. *Journal of Mathematics and Statistics, 7*(2), 103–106.

Dragos, S. L., Mare, C., Dragota, I. M., Dragos, C. M., & Muresan, G. M. (2017). The nexus between the demand for life insurance and institutional factors in Europe: new evidence from a panel data approach. *Economic research-Ekonomska istraživanja, 30*(1), 1477-1496.

Dragoş, S. L., Mare, C., & Dragoş, C. M. (2019). Institutional drivers of life insurance consumption: a dynamic panel approach for European countries. *The Geneva Papers on Risk and Insurance-Issues and Practice, 44*(1), 36-66.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal, 21*(10-11), 1105-1121.https://doi.org/10.1002/1097-0266

Eklund, J. E., & Lappi, E. (2019). Persistence of profits in the EU: how competitive are EU member countries? *Empirica, 46*(2), 327-351.

Eling, M., & Jia, R. (2019). Efficiency and profitability in the global insurance industry. *Pacific-Basin Finance Journal, 57*, 101190

Esmeray, A., & Esmeray, M. (2016). Re-examining profit persistence in the Turkish energy market: evidence from panel autoregressive-distributed lag. *International Journal of Business Quantitative Economics and Applied Management Research, 2*(8), 54-59.

Faizulayev, A., Bektas, E., & Ismail, A. G. (2020). Profitability and persistency in the service industry: The case of QISMUT+3. The Service Industries Journal, 40(3–4), 290–314. https://doi.org/10.1080/02642069.2019.1604366

Ferruz, L., Vicente, L., & Andreu, L. (2007). Performance persistence of Spanish pension funds: the best winners and losers usually repeat. The Geneva Papers on Risk and Insurance-Issues and Practice, 32, 583-594.

Financial Sector Deepening Trust Tanzania. (2024, April 25). FSDT annual report 2022–2023. Dar es Salaam, Tanzania: FSDT. https://www.fsdt.or.tz/resource_type/annual-reports/

Flamini, V., Schumacher, M. L., & McDonald, C. A. (2009). The determinants of commercial bank profitability in Sub-Saharan Africa (IMF Working Paper No. 09/15). International Monetary Fund. https://doi.org/10.5089/9781451871623.001

Geroski, P. A., & Jacquemin, A. (1988). The persistence of profits: a European comparison. *The Economic Journal, 98*(391), 375-389.

Goddard, J. A., & Wilson, J. O. (1999). The persistence of profit: a new empirical interpretation. *International Journal of Industrial Organisation, 17*(5), 663–687. https://doi.org/10.1080/13571519984304

Goddard, J., Molyneux, P., & Wilson, J. O. (2004). The profitability of European banks: a cross-sectional and dynamic panel analysis. *The Manchester School, 72*(3), 363–381.

Goddard, J., Molyneux, P., & Wilson, J. O. S. (2005). The Persistence of Bank Profit. *Journal of Banking & Finance, 29*(5), 1071–1083.

Goddard, J., Liu, H., Molyneux, P., & Wilson, J. O. (2011). The persistence of bank profit. *Journal of Banking & Finance, 35*(11), 2881–2890.

Goswami, A. (2022). Does credit risk persist in the Indian banking industry? Recent evidence. *Asian Journal of Economics and Banking, 6*(2), 178–197.

Gozbasi, O., & Aslan, A. (2015). Persistence of profit in the energy industry: Dynamic evidence from Turkish companies. *International Journal of Economics and Financial Issues, 5*(2), 624–628.

Gschwandtner, A., & Hirsch, S. (2011). Profit persistence in the food industry: Evidence from five European countries. Paper presented at the EAAE Congress, Zurich, Switzerland.

Gschwandtner, A. (2012). Evolution of profit persistence in the USA: Evidence from three periods. The Manchester School, 80(2), 172-209.

Gschwandtner, A., & Hirsch, S. (2018). What drives firm profitability? A comparison of the US and EU food processing industry. *The Manchester School, 86*(3), 390-416.

Guan, J., Cai, H., & Cao, Y. (2015). Industry versus firm effects on the profit persistence in China. *China Economic Review, 34*, 83-93.

Gugler, K., & Peev, E. (2018). The persistence of profits in banking: An international comparison. *Applied Economics, 50*(55), 5996-6009.

Hirsch, S., & Hartmann, M. (2014). Persistence of firm-level profitability in the European dairy processing industry. *Agricultural Economics, 45*(S1), 53-63

Hirsch, S., Lanter, D., & Finger, R. (2021). Profitability and profit persistence in EU food retailing: Differences between top competitors and fringe firms. *Agribusiness, 37*(2), 235–263.

Horera, I. J., & Maganya, M. H. (2020). The determinants of insurance firms' profitability in Tanzania: An empirical investigation. *Risk and Financial Management, 2*(2), 30. https://doi.org/10.3390/rfm2020025

IFoA. (2010). Study guided Model (CT 4), the Faculty and Institute of Actuaries Education Examinations.

Iskenderoglu, O., & Ozturk, I. (2016). Research on the competitive environment hypothesis in the short run for the Turkish manufacturing industry. *Economic research-Ekonomska istraživanja, 29*(1), 140-147.

Jeng, V. S. C., Wang, K. C. L., & Hsiao, K. W. H. (2017). The impact of concentration and efficiency on market competition: An analysis of the Japanese non-life insurance industry. *Tai Da Guan Li Lun Cong, 27*(2S).

Kambhampati, U. S. (1995). The persistence of profit differentials in Indian industry. *Applied Economics, 27*(4), 353–361.

Kaplan, Y. D. D. M., & Çelik, Y. D. D. T. (2008). The persistence of profitability and competition in the Turkish banking sector. *Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 30,* 157-167.

Karulkar, Y., & Jain, S. (2020). Forecasting Business Persistency at HDFC Life: Smart Insights Powered by Data Analytics. South Asian Journal of Business and Management Cases, 9(3), 343-358.

Kasman, A., Kasman, S., & Gökalp, G. (2020). Stability, competition, and concentration in the Turkish insurance sector. *International Journal of the Economics of Business, 27*(2), 269–289. https://doi.org/10.1080/13571516.2020.1738399

Kassahun, B. (2020). Determinant of Profitability of Insurance Business in Ethiopia: Unpublished Thesis, University of Gondar.

Knapp, M., Gart, A., & Chaudhry, M. (2006). The impact of mean reversion of bank profitability on post-merger performance in the banking industry. *Journal of Banking & Finance, 30*(12), 3503–3517.

Konuk, F., Zeren, F., & Demirci, Ş. D. (2014). Persistence of Profitability in Turkey: Evidence from the Insurance Sector. *Journal of Applied Economic Sciences, 27*, 57-64.

Lee, C. C., Yang, S. J., & Chang, C. H. (2014). Non-interest income, profitability, and risk in the banking industry: A cross-country analysis. *The North American Journal of Economics and Finance, 27*, 48-67.

Lin, Z., Yang, H., & Arya, B. (2009). Alliance partners and firm performance: Resource complementarity and status association. *Strategic Management Journal, 30*(9), 921–940. https://doi.org/10.1002/smj.778

Mahdavi, G., & Majed, V. (2011). The impact of socio-economic and psychological factors on life insurance demand in Iran. *Journal of Economic Modelling Research, 2*(5), 21-46.

Makadok, R. (2011). Invited editorial: The four theories of profit and their joint effects. *Journal of Management, 37*(5), 1316-1334.

Malik, H. (2011). Determinants of insurance companies' profitability: an analysis of the insurance sector of Pakistan. *Academic Research International, 1*(3), 315.

Maruyama, N., & Odagiri, H. (2002). Does the 'persistence of profits' persist? A study of company profits in Japan, 1964–97. *International Journal of Industrial Organization, 20*(10), 1513-1533.

Maury, B. (2018). Sustainable competitive advantage and profitability persistence: Sources versus outcomes for assessing advantage. *Journal of Business Research, 84*, 100–113.

McMillan, D. G., & Wohar, M. E. (2011). Profit persistence revisited: the case of the UK. *The Manchester School, 79*(3), 510–527.

Mintzberg, H., Ahlstrand, B. W., & Lampel, J. (1998). *Strategy safari: A guided tour through the wilds of strategic management.* Upper Saddle River: Prentice Hall.

Mohammed, N., Ismail, A. G., & Muhammad, J. (2015). Evidence on market concentration in the Malaysian dual banking system. *Procedia-social and Behavioural Sciences, 172*, 169–176.

Molnar, D., Horváth, T., & Bareith, T. (2023). Investigating Profit Persistence Among Hungarian Plastic Manufacturing Companies. *Regional and Business Studies, 15*(1), 33-45.

Mueller, D. C. (1977). The persistence of profits above the norm. *Economica, 44*(176), 369–380. https://doi.org/10.2307/2553387

Mueller, D. C. (1986). *Profits in the long run.* Cambridge, UK: Cambridge University Press.

Mueller, D. C. (1990). *The dynamics of company profits.* Cambridge, UK: Cambridge University Press.

Mueller, D. C. (1977). The persistence of profits above the norm. *Economica, 44*(176), 369–380.

Okonkwo, I. V., & Eche, A. U. (2019). Insurance penetration rate and economic growth in Nigeria: 1981-2017. *International Journal of Social Sciences and Management Review*, *2*(1), 21-45.

Oscar Akotey, J., Sackey, F. G., Amoah, L., & Frimpong Manso, R. (2013). The financial performance of life insurance companies in Ghana. *The Journal of Risk Finance, 14*(3), 286–302.

Outreville, J. F. (2013). The relationship between insurance and economic development: 85 empirical papers for a review of the literature. *Risk Management and Insurance Review, 16*(1), 71–122.

Pervan, M., Arnerić, J., & Ćurak, M. (2013). The persistence of insurers' profitability. *Croatian Operational Research Review, 4*(1), 132-141.

Pervan, M., Pelivan, I., & Arnerić, J. (2013). Profit persistence and determinants of insurance companies in selected CEE countries. *Economic Research-Ekonomska Istraživanja, 26*(1), 219–242.

Pervan, M., Pelivan, I., & Arnerić, J. (2013). Profit persistence and the level of competition in the Croatian insurance industry. *Economic Research-Ekonomska Istraživanja, 26*(1), 207–220. https://doi.org/10.1080/1331677X.2013.11517599

Pervan, M., Pelivan, I., & Arnerić, J. (2015). Profit persistence and determinants of bank profitability in Croatia. *Economic research-Ekonomska istraživanja, 28*(1), 284-298.

Pimentel, R. C. (2022). Earnings Persistence and Market Reaction to Earnings in the International Insurance Industry. *Revista de Administração Contemporânea, 26*(03), e200404.

Porter, M. E., & Strategy, C. (1980). *Techniques for analysing industries and competitors. Competitive Strategy*. New York: Free, 1.

Razak, M. I., Kasim, S. H., Ghazali, R. M., Paramasivam, S., & De Mello, G. J. P. (2014). An overview of the demand for life insurance in Malaysia. *International Journal of Humanities and Social Science, 4*(4), 244-250.

Roland, K. P. (1997). Profit persistence in large US bank holding companies: An empirical investigation (No. 97). Office of the Comptroller of the Currency.

Sanderson, A., Hlalefang, K., Le Roux, P., & Mutandwa, L. (2018). Review of the banking sector profit persistence. *International Journal of Economics and Financial Issues, 8*(1), 54.

Sarpong-Kumankoma, E., Abor, J., Aboagye, A. Q., & Amidu, M. (2018). Differences in bank profit persistence in Sub-Saharan Africa. *African Journal of Economic and Management Studies, 9*(4), 512–522.

Singhal, N., Goyal, S., & Singhal, T. (2022). The relationship between insurance and economic growth in Asian countries: a regional perspective. *Macroeconomics and Finance in Emerging Market Economies, 15*(3), 301–322.

Skipper, H. D., & Kwon, W. (2007). *Risk Management and Insurance: Perspectives in a Global Economy.* Malden, MA: Blackwell Publishing.

Swiss Re Sigma. (2021). World Insurance premiums. Retrieved from https://www.sigmaexplorer.com/index.htm

Tamirat, A. A., Trujillo-Barrera, A. A., & Pennings, J. M. (2018). Do Profit Rates Converge? Evidence on the Persistence of Farm Profit in the Long-run, in the Agricultural and Applied Economics Association annual meeting. Washington, D.C.

Tanzania Insurance Regulatory Authority (TIRA). (2020). Annual Insurance Market Performance Report for the Year that Ended December 31, 2019, Retrieved from https://www.tira.go.tz

Tanzania Insurance Regulatory Authority (TIRA). (2022). Annual Insurance Market Performance Report for the Year that Ended December 31, 2021, Retrieved from https://www.tira.go.tz.

Tan, Y. (2016). The impacts of risk and competition on bank profitability in China. *Journal of International Financial Markets, Institutions and Money*, *40*, 85–110.

Tarziján, J., & Eylerts, I. (2010). Persistence of profitability in Latin America: Explaining the differences among countries, industries and firms. *Academia: Revista Latinoamericana de Administración, 44*, 99-114.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2023). The dynamic competition paradigm: Insights and implications. Colum. Bus. L. Rev., 373.

Tunay, N., Ozatac, N., & Tunay, K. B. (2014). Profit persistency in the insurance companies: The case of Turkey. Insurance markets and companies: analyses and actuarial computations, (5, Iss. 2), 38-43.

Varian, H. R. (2010). *Intermediate microeconomics: A modern approach* (8th ed.). New York: W.W. Norton & Company.

Vojinović, Ž., Milutinović, S., Sertić, D., & Leković, B. (2022). Determinants of sustainable profitability of the Serbian insurance industry: Panel data investigation. *Sustainability, 14*(9), 5190. https://doi.org/10.3390/su14095190

Worku, A. T., Bayleyegne, Y. W., & Tafere, Z. B. (2024). Determinants of profitability of insurance companies in Ethiopia: Evidence from insurance companies from 2011 to 2020. *Journal of Innovation and Entrepreneurship, 13*(1), 4. https://doi.org/10.1186/s13731-024-00324-w

YeeChia, S., Keoh, L. Y., & Lim, E. S. (2015). The Relationship between Market Concentration and Performance: Evidence from Malaysian General Insurance Industry. Proceedings of Universiti Sains Malaysia, 188.

Yurtoglu, B. B. (2004). Persistence of firm-level profitability in Turkey. *Applied Economics*, *36*(6), 615–625.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organisation Science, 13*(3), 339–351. https://doi.org/10.1287/orsc.13.3.339.2780

ity

Exchange (DSE), a Case of Selected Listed Companies. *Journal of Finance and Accounting*, *4*(4), 190- 202.

Farsio, F., Geary, A., & Moser, J. (2004). the Relationship Between Dividends and Earnings. *Journal for Economic Educators* , *4*(4), 1–5.

Field, A. (2005). *Second Edition of the Discovering Statistics Using SPSS 5th Edition*.London SAGE.

Gow, I. D., Ormazabal, G., & Taylor, D. J. (2010). Correcting for cross-sectional and time-series dependence in accounting research. *Accounting Review*, *85*(2), 483–512.

Hasan, M., Ahmad, M. I., Rafiq, M. Y., & Rehman, R. U. (2015). Dividend Payout Ratio and Firm's Profitability. Evidence from Pakistan. *Theoretical Economics Letters*, *05*(03), 441–445.

Hauser, R., & Thornton, J. H. (2017). Dividend policy and corporate valuation. Managerial Finance, 43(6), 663–678.

Into, T. C., Solutions, S., & Report, F. (2024). *INDUSTRIAL DEVELOPMENT REPORT 2024 The New Era Of Industrial Policy*.

Issa, A. I. F. (2015). The Determinants of Dividend Policy: Evidence from Malaysian Firms. *Research Journal of Finance and Accounting Www.Iiste.Org ISSN*, *6*(18), 69–87.

Jaara, B., Alashhab, H., & Jaara, O. O. (2018). *The Determina n ts of Dividend Policy for Non-financial Companies in Jordan*. *8*(2), 198–209.

Johansson, J., & Hallberg, M. (2021). *Does Corporate Liquidity Affect Dividend Policy? A quantitative study on public European firms.Economics and Statistics 12, 41–60*

Kassie, W. D. (2021). The Determinants of Dividend Payout: Evidence from Private Banks in Ethiopia. *Research Journal of Finance and Accounting*, *12*(3), 23–35.

Kaźmierska-Jóźwiak, B. (2015). Determinants of Dividend Policy: Evidence from Polish Listed Companies. *Procedia Economics and Finance*, *23*(October 2014), 473–477.

Kilincarslan, E., & Demiralay, S. (2020). Dividend policies of travel and leisure firms in the UK. *International Journal of Accounting and Information Management*, *29*(2), 324–344.

Kumar, B. R., & Waheed, K. A. (2014). Determinants of Dividend Policy: Evidence from GCC Market. *Accounting and Finance Research*, *4*(1), 17–29.

Kuzucu, N. (2015). Determinants of Dividend Policy: A Panel Data Analysis for Turkish Listed Firms. *International Journal of Business and Management*, *10*(11), 149–167.

Labhane, N. B., & Mahakud, J. (2016). Determinants of Dividend Policy of Indian Companies. *Paradigm*, *20*(1), 36–55.

Li, P. (2023). Annual Report 2022. *AIMS Energy*, *11*(1), 135–139.

Lintner J. (1956). Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes. *The American Economic Review*, *46*(2), 97–113.

Louziri, R. (2022). *Determinants of Dividend Policy : The Case of the Casablanca Stock Exchange*.

Lyimo, B. J., Mtawa, M. A., & Academy, O. (2021). *Factors Influencing Dividend Payout Policy : A Case of Commercial*. *3*(1), 1–5.

Moscone, F., & Tosetti, E. (2011). GMM estimation of spatial panels with fixed effects and unknown heteroskedasticity. *Regional Science and Urban Economics*, *41*(5), 487–497.

Munawar, A. (2020). *Determinants of Corporates Leverage in Indonesia*. *143*(Isbest 2019), 302–306.

Narindro, L., & Basri, H. (2019). Assessing determinants of dividend policy of the government-owned companies in Indonesia. *International Journal of Law and Management*, *61*(5–6), 530–541.

NBS. (2023). Highlights on the Second Quarter (April - June). October.

Olarewaju, O. M. (2018). Dividend policy, agency cost, and bank performance in selected Sub-Saharan African countries: the role of market risk. *The Business & Management Review*, *9*(4), 2018.

Pathak, R., & Gupta, R. Das. (2022). The stability of dividends and its predictability: a cross-country analysis. *International Journal of Managerial Finance*, *18*(2), 261–285.

Rajput, M., & Jhunjhunwala, S. (2019). Corporate governance and payout policy: evidence from India. *Corporate Governance (Bingley)*, *19*(5), 1117–1132.

Ranajee, R., Pathak, R., & Saxena, A. (2018). To pay or not to pay: what matters the most for dividend payments? *International Journal of Managerial Finance*, *14*(2), 230–244.

Razak, A., Pontianak, P. N., Fathihani, F., Nusantara, U. D., Suparmun, H., & Trisakti, S. (2022). *Determinants Of Dividend Policy Of Manufacturing Companies In Indonesia*. Academy of Accounting and Financial Studies Journal, *26*(1), 1–11.

Renneboog, L., & Trojanowski, G. (2007). Control structures and payout policy. *Managerial Finance*, *33*(1), 43–64.

Rój, J. (2019). The Determinants of Corporate Dividend Policy in Poland. *Ekonomika* , *98*(1), 96–110. Setiawan, C., & Vivien, V. (2021). *Determinants of Dividend Policy : An Empirical Study of Consumer Goods Firms in Indonesia*. *8*(6), 71–77.

Sharma, R. K., & Bakshi, A. (2019). An evident prescience of determinants of dividend policy of Indian real estate companies: An empirical analysis using co-integration regression and generalised method of moments. *Journal of Financial Management of Property and Construction*, *24*(3), 358–384.

Singla, H. K., & Samanta, P. K. (2019). Determinants of dividend payout of construction companies: a panel data analysis. *Journal of Financial Management of Property and Construction*, *24*(1), 19–38.

TBL. (2022). *Tanzania Breweries Public Limited Company*. *September*, 2022. TCC.

(2022). Tanzania Cigarette Public Limited Company. December, 2023. Wooldridge,

J. M. (2015). Introductory Econometrics 6th Edition. *London SAGE.*

Yasar, B., Martin, T., & Kiessling, T. (2020). An empirical test of signalling theory. *Management Research Review*, *43*(11), 1309–1335.

Yousef, I., Tanna, S., & Patra, S. (2021). Testing dividend life-cycle theory in the Islamic and conventional banking sectors of GCC countries. *Journal of Islamic Accounting and Business Research*, *12*(2), 276–300.

Yusof, Y., & Ismail, S. (2016). Determinants of dividend policy of public listed companies in Malaysia. *Review of International Business and Strategy*, *26*(1), 88–99.