EFFECT OF MANAGEMENT EFFICIENCY ON FINANCIAL PERFORMANCE OF DEPOSIT-TAKING SACCOS IN KENYA

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DECLARATION

I, the undersigned, declare that this is my original work and has not been presented to any institution or university other than the University of Nairobi for examination.

Signed: _____ Date: 15/11/2022

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D63/6238/2017

This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I dedicate this project first and foremost to Almighty God who has been there right from the beginning to this very point.

To my loving, selfless and hardworking mother, i dedicate this work of mine. You have always believed in me and my capabilities and ensured that I lacked nothing to it. I appreciate all you have been to me and for bringing the best out of me! I hope this achievement will help fulfill the dream you envisioned for me.

TABLE OF CONTENTS

DECLARATION.....**ii**

ACKNOWLEDGMENT.....**iii**

DEDICATION.....**iv**

LIST OF TABLES.....**vii**

LIST OF ABBREVIATIONS.....**viii**

ABSTRACT.....**ix**

CHAPTER ONE: INTRODUCTION.....**1**

1.1 Background of the Study
..... 1

1.1.1 Management Efficiency.....2

1.1.2 Financial Performance.....3

1.1.3 Management Efficiency and Financial Performance.....5

1.1.4 Deposit Taking Savings and Credit Cooperative Societies in Kenya.....6

1.2 Research Problem
..... 7

1.3 Research Objective
.....9

1.4 Value of the Study
..... 10

CHAPTER TWO: LITERATURE REVIEW.....**11**

2.1 Introduction
..... 11

2.2 Theoretical Framework

..... 11

2.2.1 X-efficiency Theory..... 11

2.2.2 Agency Theory..... 12

2.2.3 Stewardship Theory..... 14

2.3 Determinants of Financial Performance

..... 15

2.3.1 Management Efficiency..... 15

2.3.2 Asset Quality..... 16

2.3.3 Firm Liquidity..... 16

2.3.4 Firm Size..... 17

2.3.5 Capital Adequacy..... 18

2.4 Empirical Review

..... 18

2.4.1 Global Studies..... 18

2.4.2 Local Studies..... 20

2.5 Summary of the Literature Review and Research Gaps

..... 23

2.6 Conceptual Framework

..... 23

CHAPTER THREE: RESEARCH METHODOLOGY..... 25

3.1 Introduction

..... 25

3.2 Research Design

..... 25

3.3 Population and Sample

..... 25

3.4 Data Collection

..... 25

3.5 Data Analysis 26
3.5.1 Diagnostic Tests 26
3.5.2 Analytical Model 27
3.5.3 Tests of Significance 28
CHAPTER FOUR: DATA ANALYSIS RESULTS AND FINDINGS 29
4.1 Introduction 29
4.2 Descriptive Statistics 29
4.3 Diagnostic Tests 30
4.3.2 Multicollinearity Test 31
4.3.3 Heteroskedasticity Test 31
4.3.4 Autocorrelation Test 32
4.3.5 Stationarity Test 33
4.3.6 Hausman Test 34
4.4 Correlation Results 34
4.5 Regression Results 35
4.6 Discussion of Research Findings 36
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS. 39
5.1 Introduction 39
5.3 Conclusions 40

5.4 Recommendations for Policy and Practice
.....41
5.5 Limitations of the Study
.....42
5.6 Suggestions for Further Research
.....43
REFERENCES.....45
APPENDICES.....54
Appendix I: Deposit Taking SACCOs in Kenya
.....54
Appendix II: Research Data
.....58

LIST OF TABLES

Table 3.1: Diagnostic Tests..... 26
Table 4.1: Descriptive Results.....29
Table 4.2: Test for Normality..... 31
Table 4.3: Multicollinearity.....31
Table 4.4: Heteroskedasticity Results..... 32
Table 4.5: Test of Autocorrelation.....33
Table 4.6: Levin-Lin Chu unit-root test..... 33
Table 4.7: Hausman Test Results..... 34
Table 4.8: Correlation Results.....35
Table 4.9: Regression Results..... 36

LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
DTS	Deposit Taking SACCO
FSD	Financial Sector Deepening
GDP	Gross Domestic Product
IGU	Income Generating Units
NPL	Non- Performing Loans
ROA	Return on Assets
ROE	Return on Equity
ROS	Return on Assets
SACCO	Savings and Credit Cooperative Societies
SASRA	SACCO Society Regulatory Authority
SMU	Strategic Management Unit
SPSS	Statistical Package for Social Sciences
SWA	Student Welfare Authority
UON	University of Nairobi
VIF	Variance Inflation Factors

ABSTRACT

Management efficiency focuses on changing and creating operational capabilities. This positively affects firm performance and reduces information asymmetry. High-ability managers focus on innovating and increasing productivity, whereas low-ability managers make ineffective decisions. High managerial ability prompts scanning a firm's environment to identify threats, opportunities, and competitive advantages. The main aim of this research was to determine management efficiency effect on ROA of DT-SACCOs in Kenya. The independent variables for the research were management efficiency, asset quality, liquidity, firm size and capital adequacy while the dependent variable was financial performance measured using ROA. The study was guided by x-efficiency theory, agency theory as well as the stewardship theory. Descriptive research design was utilized in this research. The 175 DT-SACCOs in Kenya as at December 2021 served as target population. The study collected secondary data for five years (2017-2021) on an annual basis from SASRA and individual DT-SACCOs annual reports. Descriptive, correlation as well as regression analysis were undertaken and outcomes offered in tables followed by pertinent interpretation and discussion. The research discovered a 0.5301 R square value implying that 53.01% of changes in DT-SACCOs ROA can be described by the five variables chosen for this research. The multivariate regression analysis further revealed that individually, management efficiency unveiled a positive though not statistically significant influence on ROA. Asset quality has a negative effect on ROA of DT-SACCOs (β=-0.337, p=0.017). Firm liquidity exhibited a positive and significant effect on ROA (β=0.178, p=0.043). The other control variables which were SACCO size and capital adequacy displayed a positive and significant ROA influence as shown by (β=0.679, p=0.011) and (β=0.858, p=0.006) respectively. The study recommends that DT-SACCOs should work at improving their liquidity and their asset quality as they significantly affect ROA. Future research ought to focus on other financial institutions in Kenya to corroborate or refute the findings of this research.

CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Management efficiency is significant in establishing, progressing, and achieving firm success, measured by productivity, investment decisions, compensation, and overall financial performance. Literature shows that specific manager traits, such as ability, skills, and talent, affect a firm's performance, such as finance, accounting, and managerial research and practice (Demerjian, Lev & McVay, 2012). Bhutta, Sheikh, Munir, Naz and Saif (2021) found that managers with better ability take initiatives and innovative actions to utilize firm resources for long-run financial sustainability. Additionally, they found that a manager's personality traits and competencies drive optimal resource utilization. High-ability managers are receptive to risk-taking, associated with an increased firm value (Yung & Chen, 2018). Phan, Tran, Nguyen and Le (2020) found that more able managers better understand their firm's operating environment, allowing them to make better investment decisions and improve financial performance.

This study will draw support from x-efficiency theory, agency theory as well as the stewardship theory. X-efficiency theory by Leibestain (1966) is the anchor theory as it states that firms with efficient management are in a better position to enhance technical efficiency and increase profit, moving the firms to best practice, and eventually lowering the total cost curve. The theory hypothesizes a positive relationship between management efficiency and financial performance. Agency theory by Jensen and Meckling (1976) also supports this study as it claims that managers choose to derive personal gain from their companies. This increases agency costs, which are seen through inefficient investment selection and/or managers that do

not put out adequate or effective effort. Stewardship theory by Davis and Donaldson (1991) contrasts

The study focused on Deposit Taking Savings and Credit Cooperatives (DT SACCOs) in Kenya; this is because DT-SACCOs play a role in financial intermediation which has included 6.3% Kenyans and approximately 60% of Kenyans are dependent on them (FinAccess, 2019). Despite this, 30% lack prudent management practices as evidenced by unremitted deductions by employer institutions and high borrowers' default (SASRA, 2018). Availing members with credit and availing saving products are the main goals of SACCOs and these are threatened by lack of efficient managers hence the need to keep monitoring management actions.

1.1.1 Management Efficiency

This is the measure of how good the managers utilize the assets at their disposal to create wealth for the shareholders (Ghosh, 2015). It is the measure of productivity per unit of output, where a higher output with lower input is desirable (Breuer, 2006). Management efficiency according to Daraio and Simar (2007) is management's capacity to produce a certain output level using the least possible resources. The current study defines management efficiency the capability of managers to yield the highest returns per unit asset availed to them by members.

Management efficiency is viewed as one of the key internal factors that determine firm's profitability. Quality of management impacts operational expenses, which in turn has an impact on a business's bottom line. As a result, management efficiency has a significant impact on financial performance (Kusa & Ongore, 2013). Shareholders tend to reward efficient managers and punish those deemed inefficient. This implies that the principal will prefer the highest output with little input; this optimizes productivity (Sarpong & Winful, 2017).

There are both financial and non-financial measures of management efficiency and although they differ in approach and composition, they tend to indicate how best the management performs (Maudos & Guevara, 2004). Financial ratios such as return on assets and return on equity are often utilized to ascertain the extent to which managers used available assets or equity to generate profits for shareholders (Messai & Jouini, 2013). Non-financial measures of efficiency include productivity, customer and employee satisfaction among others. Since non-financial measures are highly judgmental, unverifiable and complex to assess, most researchers using quantitative data prefer to use financial variables (Terraza, 2015). In the SACCO sub-sector, management is judged by their ability to utilize the available inputs (member deposits) to generate outputs (interests and dividends). The current study measured management efficiency as the ratio of interest income and dividends to member deposits.

1.1.2 Financial Performance

Financial performance as defined by Almajali, Alamro and Al-Soub (2012) refers to the ability of a firm to achieve the range of set financial goals such as profitability. Financial performance can be described as a degree of the extent to which a firm's financial benchmarks has been achieved or surpassed. It shows the extent at which financial objectives are being accomplished. As outlined by Baba and Nasieku (2016) financial performance show how a company uses assets to generate revenues and thus it gives direction to the stakeholders in their decision making. Nzuve (2016) asserts that, the health of the bank industry largely depends on their financial performance which is an indicator of the strengths and weaknesses of individual banks. Moreover, the government and regulatory agencies are interested on how banks perform for the

regulation purposes.

The focus on financial performance is of importance as it majorly touches on items that directly alter the statements of finance or the firm's reports (Omondi & Muturi, 2013). The firm's performance is the main external parties' tool of appraisal (Bonn, 2000). Hence this explains why firm's performance is used as the gauge. The attainment level of the objectives of the firm describes its performance. The results obtained from achieving objectives of a firm both internal and external, is the financial performance (Lin, 2008). Several names are given to performance, including growth, competitiveness and survival (Nyamita, 2014).

Various methods of evaluating financial performance are used and should be harmonized. Asset returns (ROA), size of company, equity returns (ROE) and sales return (ROS) are factors recognized as measures of financial performance. ROA and ROE are the most recognized ways of measuring financial performance. The ROA evaluates the company's profitability using its total assets, whereas the ROE examines the way a company is using shareholder's equity (Mwangi & Murigu, 2015). Baba and Nasieku (2016) posit that market based metrics like earnings per share, dividend yield, market to book value of equity and market capitalization can too be employed in financial performance measure. The current research will use ROA as a metric of financial performance as it is the most recognized measure (Fatihudin & Mochklas, 2018).

1.1.3 Management Efficiency and Financial Performance

According to the agency theory, managers operate the business on behalf of shareholders. As agents of the owners (principal), managers should run firms in the interest of the shareholders hence efficiency is key in determining achievement

shareholders objectives (Joleski, 2017). Shareholders tend to reward efficient managers and punish th

The x-efficiency theory by Leibestain (1966) supports the agency theory as it states that firms with efficient management and good production practices are in a better position to enhance efficiency and increase profit, moving the firms to best practice, and eventually lowering the total cost curve. Stewardship notion contrasts sharply with the agency paradigm. Managers are seen as stewards whose duty is to safeguard and maximize the wealth of shareholders because this improves managers' utility functions (Davis, Donaldson & Schoorman, 1997). This means that a firm does not have to incur agency costs as the managers will act in the best interest of the firm.

Managers' exercise delegated authority on behalf of investors. They, therefore, have a big say on discretionary firm choices like acquisitions and capital investments (Schoar & Bertrand, 2003). Consequently, firms with knowledgeable executives have a high likelihood of investing efficiently compared to those with low-ability managers. High ability managers tend to uphold both financial transparency and corporate governance controls unlike low ability managers (Khurana et al., 2018). High management efficiency therefore affects firm operational efficiencies and increases the financial performance (Luo & Zhou, 2017).

1.1.4 Deposit Taking Savings and Credit Cooperative Societies in Kenya

Government of Kenya (2018) defined deposit-taking SACCOs as carrying out the business of accepting savings and in turn offers credit facilities to her members. The DTS also accepts to undertake business of depositing and withdrawing monies on daily basis like what banks do. Non-Deposit taking SACCOs normally operate at the back office only and have not obtained licensing from SASRA to have operations at a front office. FOSAs are one of the major profit centers for SACCOs, and they offer

valuable services to their members (Wambua, 2015). By introducing FOSAs, there has been positive

According to Mudibo (2015), deposit taking SACCOs highly impact Kenya's economy. These institutions are responsible for approximately 45% of Kenya's GDP. This is in spite of the fact that they had not been formally recognized into the financial system. In 2010, the SACCO Societies Act No.14 of 2008 was enacted where these institutions have registered tremendous growth. The SASRA Annual report (September, 2021) at the end of 2020 stated that they had grown to 175 from 110 DTS in 2011 a growth of 59%. In 2020, these institutions' total assets under their management totaled over 393 billion, up from 167 billion in 2011, a 135 percent increase in ten years.

Availing members with credit and availing saving products are the main goals of SACCOs and these are threatened by lack of efficient managers hence the need to keep monitoring management actions. The main cause of failures in SACCOs is poor management (Mugo et al., 2019). The returns from making investments in a business are the reward for risk taken by business owners. Proper management practices can assist deposit-taking SACCOs in lowering their general exposures to risks. This will ensure they can compete in the sector and will have an effect on the bottom line which is financial performance (Odhiambo, 2019).

1.2 Research Problem

Management efficiency focuses on changing and creating operational capabilities. This positively affects firm performance and reduces information asymmetry (Ambrosini & Altintas 2019; Curi & Lozano-Vivas, 2020). High-ability managers focus on innovating and increasing productivity, whereas low-ability managers make ineffective decisions. High managerial ability prompts scanning a firm's environment

to identify threats, opportunities, and competitive advantages (Bellner, 2014). According to Andreou

DT-SACCOs play a role in financial intermediation which has included 6.3% Kenyans and approximately 60% of Kenyans are dependent on them (FinAccess, 2019). Despite this, 30% lack prudent management practices as evidenced by unremitted deductions by employer institutions or borrowers' default and unskilled staff (SASRA, 2018). This renders them susceptible to de-licensing for having financial vulnerabilities thereby, putting the 341 billion shillings member funds at risk (FSD, 2017). Even with the government's investment in a regulatory authority to ensure that DT-SACCOs follow regulations and are financially viable, this remains an issue. This is because members can lose value for their hard-earned money because their deposits lack protection. This can in turn cause panic and reduced confidence in the subsector (SASRA, 2018).

Although there have been international studies in this field, there exists research gaps which the current study intends to fill. Adegbie et al. (2019) examined managerial efficiency and corporate financial performance of quoted Nigerian firms. Findings revealed that management efficiency has moderate explanatory power on variations in ROA. Liu, Jantan and Huang (2020) investigate the relationship between management efficiency and firm performance. The empirical result indicates that management efficiency positively relates with firm performance. Bhutta et al. (2021) empirically examines the impact of managerial ability on firm performance and finds that more able managers significantly increase the firm performance while less able managers significantly reduce the firm performance. All these investigations were conducted in a distinct setting thus, their results cannot be applied to the current situation.

Locally, Wanjohi and Njeru (2016) examined how management efficiency affects the

credit risk profile of deposit taking SACCOs in Kenya. The study found out that management efficien

The current study was motivated by the fact that despite the increased acceptance of DT-SACCOs by Kenyans, some of them are still experiencing financial performance challenges. Deposit-taking SACCOs play a key role in financial intermediation and therefore need to ensure their objectives are achieved. Despite the existence of prior studies there exist contextual, conceptual and methodological gaps that need to be filled. Conceptually, prior studies have operationalized management efficiency and financial performance differently hence findings depend on the operationalized method. Contextually, prior studies have mostly focused on other sectors which operate differently compared to DT-SACCOs and therefore their findings cannot be used to represent DT-SACCOs. Methodologically, data collection techniques as well as data analysis techniques employed by different researchers led to different results. The current research was based on these gaps and attempted to answering the research question; how does management efficiency influence financial performance of deposit-taking SACCOs in Kenya?

1.3 Research Objective

The objective of this study was to determine the effect of management efficiency on financial performance of deposit-taking SACCOs in Kenya.

1.4 Value of the Study

This study's results will contribute to the existing theoretical and empirical literature on management efficiency and performance. The findings will also help in theory development as they will offer insights on the shortcomings and relevance of the current theories to the variables of the study. Subsequent studies may also be carried out based on the recommendation and suggestions for further research.

The findings of the research might be relevant to the government and the regulator SASRA in developing regulations for the population under investigation. The study's findings will help investors who are considering investing in the population under investigation by providing information on the risk-return tradeoffs that exist in such organizations and their impact on performance.

The conclusions will aid investors as well as practitioners understand the relationship between the two variables, that is important for ensuring strong management team with diverse viewpoints and competences streamlining operations as well as managing firm activities, as well as for building confidence among corporate stakeholders, which will ultimately optimize performance.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter explains the theories on which management efficiency and performance is based. It further discusses the previous empirical studies, knowledge gaps identified and summarizes with a conceptual framework and hypotheses showing the expected

relationship among the study variables.

2.2 Theoretical Framework

This segment examines the theories that underpin the study of management efficiency and performance. The study reviewed the X-efficiency theory, agency theory and stewardship theory.

2.2.1 X-efficiency Theory

This theory was proposed by Leibestain (1966) and it serves as the anchor theory. The theory questions whether market forces in a perfectly competitive market ensure allocative efficiency. The theory posits that individuals and firms under conditions of imperfect competition will have inherently persistent inefficiencies. The idea continues to challenge the neoclassical economics theory, which has dominated economic analysis for decades and assumes that under perfect competition, individuals and organizations must optimize their efficiency to survive, and those who do not would fail and be driven out of the market (Leibestain, 1978). The X-efficiency theory, like other theories, is founded on a number of assumptions, including the acknowledgment of the individual as the basic decision unit, the existence of discretionary effort and incomplete employment contracts, presence of inertia areas, and non –maximization or optimization (Leibestain, 1966).

This theory has been criticized by Perelman (2011) who recognizes that the X efficiency theory did not introduce any new concept, but justified sub-optimization in monopolistic and regulated markets where firms do not face any immediate competition or challenges. Additionally, the introduction of motivation as a variable in the determination of efficiency suffers from the lack of accurate and true measurability (Taylor &Taylor, 2003). The variability of motivation between

individuals means that different levels of motivation will be exhibited for an equal set of motivators m

This theory is relevant because by having efficient managers, deposit-taking SACCOs are able to utilize their deposits in a way that enhances financial performance. Introducing efficiency measures in a firm shields management's decisions within the set control limits and allowing them to make optimal choices as long as they are within set compliance, a key likely cause of management efficiency. This theory relates management efficiency with financial performance which are the key variables for the study.

2.2.2 Agency Theory

Agency problem was explored initially by Ross (1973). Jensen and Meckling (1976) further explored the agency relationship theoretically that led to the development of Agency theory. The theory asserts that shareholders, who are the firm's owners (principals), appoint corporate management (agents) and further states that the principal anticipates the agent to make the right judgments while operating in the best interest of the owner/principal. The directors/agents, conversely, may have self-interests that are at odds with the principals. According to Eisenhardt (1989) agency theory is based on various basic assumptions for instance information asymmetry, risk aversion, personal interest, efficiency, information as a commodity, goal conflict and restricted rationality. The agency theory proposes strategies of reconciling shareholders' interests and management. Control procedures which are external like takeovers, are among the mechanisms. Control mechanisms that are internally instituted for instance non-executive director control as well as management share ownership incentives may also help to reduce the likelihood of conflict between them (Easterwood, 1997).

Control, according to critics, strengthens individual behavior, reduces proactive organizational efforts

The theory explains the role of management on financial performance. The conflicting interests between company managers and shareholders are central to the agency theory. One of the goals of this research is to see how management efficiency affects financial performance among deposit-taking SACCOs. This theory is relevant as it relates management efficiency with financial performance of firms.

2.2.3 Stewardship Theory

The theory by Donaldson and Davis (1991) is rooted in sociology as well psychology. A steward protects and tries to optimize shareholders' interests using company performance since doing so increases the steward's worth. The steward, in this case is the management, which works for the shareholders, protecting and maximizing their returns. The responsibility of firm managers as stewards, embracing their objectives, is emphasized in stewardship theory. As a result, when the firm's success is achieved, they are satisfied and encouraged as stewards. The agency theory is completely contradictory to the stewardship theory. It claims that company executives are trustworthy and upright custodians of the funds entrusted to them, rendering monitoring ineffective (Donaldson & Davis, 1991; Davis et al., 1997).

The motivation of firm managers within the firm is to maximize firm performance, according to Daily et al. (2003), in attempts to protecting their decision making authority. Similarly, according to Fama (1980), company managers preserve their careers in order to be considered effective as well as competent company stewards. As per Davis et al. (1997), the theory is criticized, claiming that the job of the "steward" is oversimplified and impractical, and that it stresses senior directors' personalities and egos. The theory has received support from Nguyen and Nguyen (2020) and

Mutunga (2017).

The theory is relevant to this research in the sense that company executives are viewed as "stewards" acting on shareholders behalf. Stewardship theory, like stakeholder theory, is valuable in describing outcomes where the X-efficiency theory and agency theory lacks backing. Because this theory highlights the stewardship role of business managers, it is believed the higher the management efficiency, the higher the financial performance will be.

2.3 Determinants of Financial Performance

There are several financial performance determinants of a firm; these factors are found either within or outside the firm. Internal factors are firm-specific and can be manipulated internally. They are management efficiency, asset quality, liquidity, asset base and capital adequacy. Factors outside a firm that influence efficiency includes; inflation, GDP, political stability and interest (Athanasoglou et al., 2005).

2.3.1 Management Efficiency

Management efficiency, as a financial performance determinant, is a qualitative measure indicated by staff quality, the effectiveness as well as efficiency of internal controls, and management systems effectiveness (Athanasoglou, Sophocles & Matthaois, 2009). Quality of management impacts operational expenses, which in turn has an impact on a business's bottom line. As a result, management efficiency has a significant impact on financial performance (Kusa & Ongore, 2013).

The efficiency of management of a business is determined by the research conducted by Olalere et al. (2015) as the capacity of the company to provide high-quality goods and services at the lowest feasible cost to consumers. Higher competitiveness and improved resource utilization seem to be supported by management efficiency. The

use of operational efficiency as a measure of management efficiency in firms is often seen in the litera

2.3.2 Asset Quality

This indicates an SACCO's asset risk and stability. It estimates the asset quality magnitude among the characteristics that impact banks' health. The value of assets under the control of a SACCO is heavily dependent on credit risk, and the quality of the assets owned by the SACCO heavily relies on specific risks, level of NPLs, and debtors cost to the SACCO. This ratio should be at the lowest level. If lending is susceptible to risk in a well-functioning bank, the indicator in this case would be the applied interest margins. A low ratio shows an insufficient risk cover by the margins (Athanasoglou et al., 2009).

A Sacco's assets primarily consist of a loan portfolio, current as well as fixed assets, and other investments. The quality of assets mostly improves with the age and bank size (Athanasoglou et al., 2005). The primary assets that generate income for SACCOs' are loans. The loan portfolio quality hence determines bank performance. Good quality assets reduce losses arising from NPLs, and this subsequently impacts performance (Dang, 2011).

2.3.3 Firm Liquidity

Liquidity is used to denote the capability of a firm in this case an SACCO to settle its debt obligations that are incurred within twelve months by the use of cash and short-lived assets that are rapidly convertible into cash. It hence occurs as a result of the ability to settle financial demands owed to creditors without liquefying their other assets (Adam & Buckle, 2013).

Sufficient proportions of liquid assets assist firms to finance their activities and to invest in cases where they cannot obtain external funds. Firms with that high liquidity

can meet unforeseen liabilities and obligations that need to be settled (Liargovas & Skandalis, 2008).

2.3.4 Firm Size

Firm size determines by how much legal as well as financial elements affect an SACCO. Since large companies collect cheap capital and produce huge income, SACCO size is closely linked to capital adequacy (Amato & Burson, 2007). The book value of the bank's total assets is usually used to determine its size. Additionally ROA is positively associated with bank size showing that large banks can accumulate economies of scale hence reducing operational costs while increasing loan volumes (Amato & Burson, 2007). SACCO size is related to capital rations, according to Magweva and Marime (2016), and profitability rises with size.

Amato and Burson (2007) mentioned that a firm's size is dependent on the assets owned by the organization. It can be argued that the more the assets owned by an SACCO the more the investments it can make which generate bigger returns compared to smaller firms with less assets. Additionally, a larger firm can have more collateral which can be used as security for more credit facilities (Njoroge, 2014). Lee (2009) argued that the assets being controlled by an entity impacts profitability level of the firm from one period to another.

2.3.5 Capital Adequacy

Also called the capitalization ratio, the adequacy ratio shows how equity and total assets are related. It shows the ability of a bank to remain solvent by regulating risks. Berger and Humphrey (1991) in an investigation showed a negative relation between capital adequacy and performance. In imperfect capital markets, institutions with sufficient capital ought to reduce borrowing to back a specific asset class, hence lowering the predicted bankruptcy costs hence incur less financing costs.

A financial institution with sufficient capital signals the market that a superior performance is to be expected. The results of Magweva and Marime (2016) revealed that capital holdings are positively related to bank profitability, indicating that Greek banks are in a stable financial position. Also, Amato and Burson (2007) showed a positive causality between capital contributions and profitability.

2.4 Empirical Review

Local as well as global researches have determined the link between management efficiency and performance, the objectives, methodology and findings of these studies are discussed.

2.4.1 Global Studies

Adegbie et al. (2019) examined managerial efficiency and corporate financial performance of quoted Nigerian firms. Ex-post facto design was adopted for the study. The population covered 169 quoted firms as at 31st December 2017. Data were analyzed using descriptive and inferential statistics. Findings revealed that management efficiency has moderate explanatory power on variations in ROA but a weaker explanatory power on changes in Tobin Q. The study recommended that management of firms should strengthen their cost management strategies and apply cost-benefit analysis in their decisions for stakeholders' economic decisions.

Roman and Ihenetu (2020) examined management efficiency and banks' performance in Nigeria. The focus was to determine how efficient the banks' management in Nigeria can manage deposit, assets, capital and shareholders' funds to maximize returns for the shareholders. The researchers employed expost facto design. Granger causality was also used to determine the cause and the direction of the data. The result of the analysis revealed that loan deposit ratio and loan assets ratio had no significant

effect, loan capital ratio had a positive significant effect and loan shareholders fund ratio had a negativ

Liu, Jantan and Huang (2020) measures management efficiency of firms form IT industry with stochastic frontier method and investigates the relationship between firm management effectiveness and firm performance. The empirical result indicates that management efficiency positively relates with firm performance. This positive effect is stronger form IT firms. A 1% increase in management efficiency could promote firm financial performance for IT firms. Moreover, firm management efficiency is more important for technology firms' financial performance.

Ting Tebourbi, Lu and Kweh (2021) utilize mediation analysis and bootstrapping to analyze the mediating effect of capital structure on the association between managerial ability and firm performance. The dataset consists of 6384 firm-year observations from the Taiwanese electronics industry during 2005–2018. Our results indicate that low (high) levels of debt are likely observed in firms with CEOs with high (low) ability, managerial ability positively affects firm performance, and capital structure mediates the positive relationship between managerial ability and firm performance. Overall, the findings may have limited generalizability due to the specific sample characteristics and provide convincing support for the importance of capital structure as a mediator in the managerial ability-firm performance nexus.

Bhutta et al. (2021) empirically examines the impact of managerial ability on firm performance. Using the sample of 246 firms listed at Pakistan Stock Exchange during 2009 to 2017, this study finds that more able managers significantly increase the firm performance while less able managers significantly reduce the firm performance. These findings hold for accounting and market measures of firm performance as well as alternative measures of managerial ability. Further, they control for endogeneity

and cross-sectional variation issues using Fama-MacBeth method. Overall, they conclude that able ma

2.4.2 Local Studies

Wanjohi and Njeru (2016) examined how management efficiency affects the credit risk profile of deposit taking SACCOs in Kenya. Management efficiency is postulated by the level of earning assets to Total assets while credit risk is postulated by the level of Non-performing loans to Total assets. A causal research design was adopted upon a panel of all deposit taking SACCOs in the period 2011-2014. Descriptive and Regression analysis were used to establish the relationship between the variables. The study found out that management efficiency has a negative and statistically significant effect on the level of credit risk of Deposit taking SACCOs in Kenya.

Barus, Muturi, Kibati and Koima (2017) sought to evaluate the effect of management efficiency on financial performance of savings and credit societies in Kenya. The study employed an explanatory research design. The target population was 83 registered DT-SACCO's in Kenya. Census methodology was used in the study. Both primary and secondary sources of data were employed. Descriptive and inferential analysis was conducted to analyze the data. The data was presented using tables and graphs. Based on the findings the study concluded that management efficiency has no significant influence on the financial performance of savings and credit societies in Kenya.

Maina (2017) investigated the relationship between managerial controls and financial performance of Strategic Management Units (SMU) and Income Generating Units (IGU) of Student Welfare Authority (SWA) at the University of Nairobi. The agency theory, stakeholder's theory and institution theory anchored the study. The study adopted descriptive survey research design from the 11 SMUs and 3 IGUs of SWA at

UON were targeted. Census procedure was used to select the entire 11 SMUs and 3 IGUs of SWA at

Mutunga and Owino (2017) focused on management practices and financial performance of manufacturing firms in Kenya. Agency theory is used as the foundational theory. The research design was descriptive research design. Data was collected using a self-administered questionnaire, from a population of 180 manufacturing firms in Kenya. Descriptive statistics, correlation and regression techniques were used to analyze the data. Regression of coefficients results showed that financial performance of manufacturing firms and management practices are positively and significant related. The study concluded that there is a positive relationship between management practices and manufacturing firms' financial performance. The study recommends and management practices by adopting relevant leadership skills.

Momanyi, Githui and Omurwa (2021) conducted a research on managerial controllable factors and profitability of Kenyan banks. Secondary panel data for the period 2010-2019 was obtained and analysed where independent variables were operational efficiency, bank size (total assets) and while the depedent variable was profitability (ROA). The research findings indicated that bank size and operational efficiency jointly statistically affected profitability while efficiency on its own was not significantly influence ROA.

Aduda and Obondy (2021) conducted a literature review on how credit risk management impacts efficiency among SACCOs and to identify the knowledge gaps in the relationship between the two variables. From the empirical studies reviewed, credit risk management was found to influence financial performance but there is no concrete evidence on the relation that credit risk management has with efficiency of

SACCOs. The review further highlights research gaps in the area of credit risk management and effici

2.5 Summary of the Literature Review and Research Gaps

The theoretical reviews showed the predicted relation between management efficiency and the performance of financial institutions. Major influencers of performance have been discussed. From the reviewed studies, there is a knowledge gap that needs to be filled. From the studies reviewed, there are varied conclusions regarding the relation between management efficiency and performance. The differences from the studies can be explained on the basis of different operationalization of management efficiency by different researchers thereby indicating that findings are dependent on operationalization model.

At the conceptual level, the studies reviewed have studied different variables. The relationships tested varied from study to study. Due to different definitions and operationalisation, the findings differed and the conclusions obtained conflicted. Contextually, foreign, regional and local studies were identified and discussed. However, the majority of the studies reviewed were from foreign regions. This made it difficult to extrapolate findings to the Kenyan economy. Methodologically, data collection, sampling and data analysis methods differed. The results therefore obtained were inconclusive. All this leaves a study gap that this research aimed at filling.

2.6 Conceptual Framework

Displayed in figure 2.1 is the predicted relation between the variables. The predictor variable was management efficiency given by the ratio of interest income and dividends to total member deposits. Theoretically, it was hypothesized that more efficient managers leads to higher financial performance. The control variables are

asset quality given as the ratio of NPL to total loans, liquidity given by liquid assets to total assets, fir

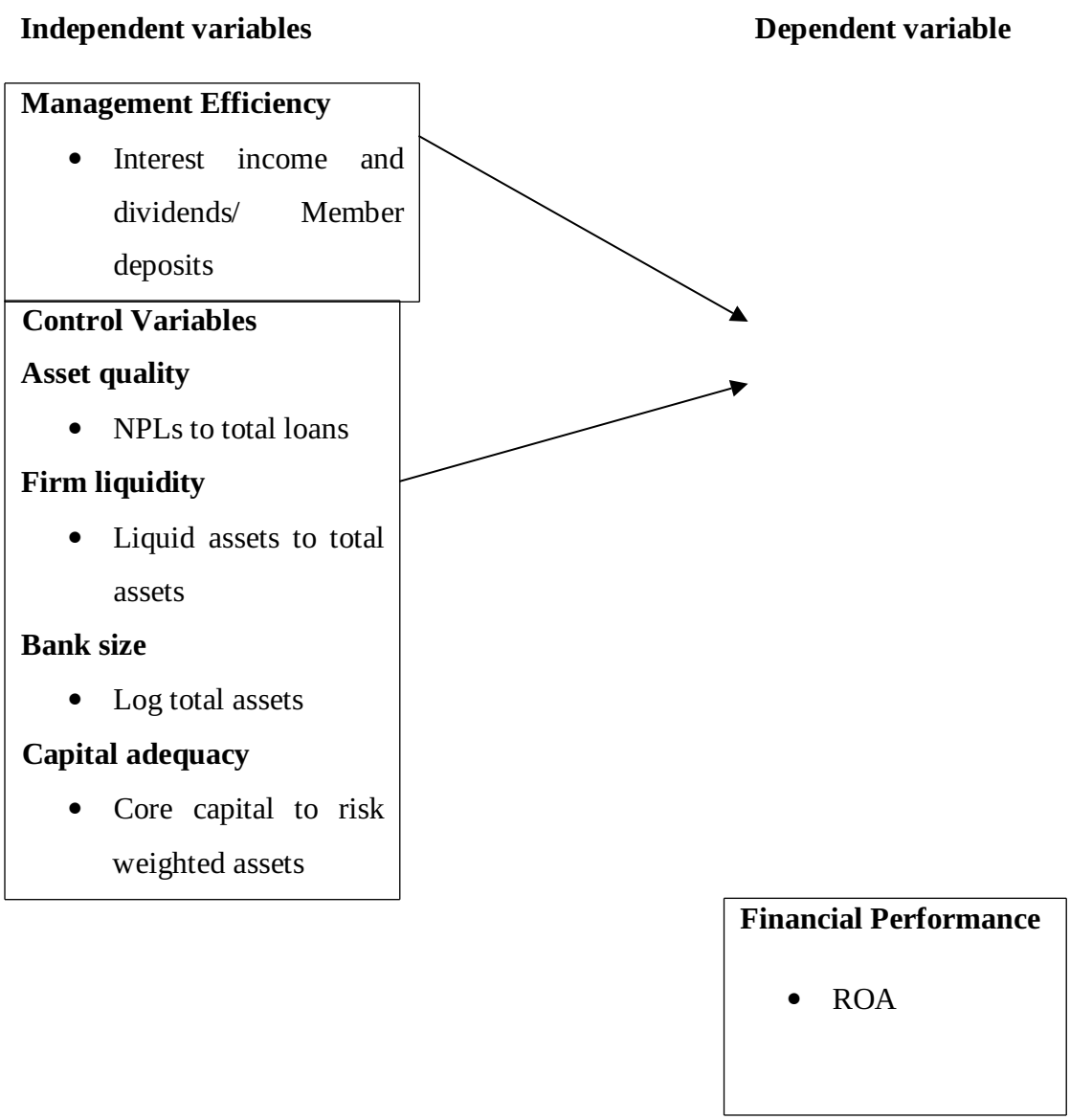

Figure 2.1: The Conceptual Model

Source: Researcher (2022)

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The chapter describes the approaches utilized in accomplishing the study objective which was to determine how management efficiency affects performance of DT SACCOs. In particular, the study highlighted the; the design, data collection, and analysis.

3.2 Research Design

A descriptive design was adopted to determine how management efficiency and performance of DT-SACCOs relate. This design was appropriate since the nature of the phenomena is of key interest to the researcher (Khan, 2008). It was also sufficient in defining the interrelationships of the phenomena. This design also validly and accurately represented the variables thereby giving sufficient responses to the study queries (Cooper & Schindler, 2008).

3.3 Population and Sample

A population is all observations from a collection of interest like events specified in

an investigation (Burns & Burns, 2008). The study population was the 175 deposit-taking SACCOs in

3.4 Data Collection

Secondary data was relied on in this investigation which was extracted from annual published financials of the DT-SACCOs from 2017 to 2021 and captured in data collection forms. The reports were extracted from the SASRA financial publications of the specific DT-SACCOs and individual DT-SACCOs reports. The specific data collected included net income, total assets, interest income, dividends, members deposits, total loans, total assets, net operating income, liquid assets, core capital, risk weighted assets.

3.5 Data Analysis

SPSS software version 24 was used to analyze the data. Tables and graphs presented the findings quantitatively. Descriptive statistics were employed in the calculation of measures of central tendency and dispersion and combined with standard deviation for every variable. Inferential statistics relied on correlation and regression. Correlation determined the magnitude of the relation between the study variables and a regression determined cause and effect among variables. A multivariate regression linearly determined the relation between dependent and independent variables.

3.5.1 Diagnostic Tests

The linear regression was based on a numerous conventions including linearity, no auto-correlation, no or little multi-collinearity, homoscedasticity and multivariate normality. The diagnostic tests to be performed are outlined in Table 3.1

Table 3.1: Diagnostic Tests

Test	Meaning	Statistical method	Interpretation	Diagnosis

Autocorrelation	Occurs when th[illegible]	Durbin-W[illegible]	Wh[illegible]	[illegible] Review model specifications
Multicollinearity	How closely related are the independent variables of the study	Variance Inflation Factors (VIF)	VIF less than 10 implies that there is no multicollnearity	Data that was causing Multicollinearity was adjusted using log transformation
Heteroscedasticity	When data lacks similar variance as assumed by standard linear regression model	Breusch Pagan Test Levene Test Normal P-P plots	Data split into high and low value. If data differ significantly, there is an element of heteroscedasticity	Non-linear transformation
Normality Test	When linear regression analysis for all variables is multivariate normal	Goodness of fit test Shapiro-Wilk test	Kolmogorov-Smirnov test prob.> 0.05. If the test is not substantial, the distribution is possibly normal.	Data that was not normally distributed was adjusted for using log transformation and non-linear log transformation.
Stationarity	a unit-root test to establish if the data was stationary	Levin-Lin Chu unit root test	A p value less than 0.05 implies that the data is stationary	Robust standard errors were utilized wherever data failed the test.

3.5.2 Analytical Model

The following equation was applicable:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon$$

Where: Y = financial performance given by net income to total assets

β_0 =y intercept of the regression equation.

β_1, β_2, β_3, β_4, β_5 =are the regression coefficients

X_1 = Management efficiency given by the ratio of interest income and dividends to member de

X_2 = Asset quality as measured by the ratio of NPLs to total loans on an annual basis

X_3 = Firm liquidity as measured by the ratio of liquid assets to total assets

X_4 = Firm size as measured by the natural logarithm of total assets

X_5 = Capital adequacy as given by the ratio of total core capital to risk weighted assets

ε =error term

3.5.3 Tests of Significance

Parametric tests determine the general model and variable's significance. The F-test determined the model's relevance and this was achieved using ANOVA while a t-test determined the relevance of every variable.

CHAPTER FOUR: DATA ANALYSIS RESULTS AND FINDINGS

4.1 Introduction

This chapter offers descriptive statistics and the results and interpretations of various tests namely; test of normality, Multicollinearity, heteroskedasticity tests, autocorrelation and stationarity test. The chapter also presents the results of Pearson correlation and regression analysis.

4.2 Descriptive Statistics

This section presents the descriptive findings from the collected data. The descriptive results include mean and standard deviation for every research variables. The analyzed data was obtained from individual DT-SACCOs annual reports for duration of 5 years (2017 to 2021). The number of observations is 630 (126*5) as 126 DT-SACCOs provided complete data for the 5 year period. The results are as shown in Table 4.1

Table 4.1: Descriptive Results

	N	Minimum	Maximum	Mean	Std. Deviation
ROA	630	.0015	.3650	.113229	.0879488
Management efficiency	630	.0074	3.2957	1.074641	.5371526
Asset quality	630	.0000	.5700	.091332	.0899685
Liquidity	630	1.0237	10.0893	2.357211	1.4580128
Firm size	630	6.0724	8.7303	7.773748	.5696414
Capital adequacy	630	.0227	1.9617	.261818	.2541563
Valid N (listwise)	630				

Source: Field data (2022)

4.3 Diagnostic Tests

As rationalised in chapter three, the researcher conducted diagnostic tests to ensure that the assumptions of Classic Linear Regression Model (CLRM) are not violated and to attain the appropriate models for probing in the significance that the CLRM hypotheses are infringed. As a result, pre-approximation and post-approximation assessments of the regression model were performed prior to processing. The multicollinearity test and unit root test were the pre-approximation tests used in these situations, whereas the normalcy test, test for heteroskedasticity, and test for autocorrelation were the post-estimation tests. These analyses were performed by the study to avoid having factual regression results.

4.3.1 Normality Test

The normality of data can be tested using a variety of methods. The most commonly utilized approaches include the Shapiro–Wilk test, Kolmogorov–Smirnov test, skewness, kurtosis, histogram, P–P Plot, box plot, Q–Q Plot, mean and standard deviation. The most extensively used normality tests are the Kolmogorov–Smirnov test and the Shapiro–Wilk test. The Shapiro–Wilk test is better for small sample sizes (n <50 samples), while it can also be used on more extensive samples selections, whereas the Kolmogorov–Smirnov test is better for n>50 samples. As a result, the study used the Kolmogorov–Smirnov test as the numerical method of determining normality. For both of the above tests, the null hypothesis says that the data are obtained from a normal distribution population. When P-value is below 0.05,null hypothesis is rejected and the data are said to be not normally distributed.

Table 4.2: Test for Normality

	Kolmogorov-Smirnov	P-value
ROA	0.796	0.075
Management efficiency	0.844	0.089
Asset quality	0.881	0.094
Liquidity	0.874	0.091
Firm size	0.892	0.101
Capital adequacy	0.923	0.120

Source: Research Conclusions (2022)

Evident in Table 4.2 results, all the study variables have a p value above 0.05 and therefore were normally distributed.

4.3.2 Multicollinearity Test

Multicollinearity transpires when the independent variables in a regression model are significantly linked. Multicollinearity was assessed using the VIF and tolerance indices. When the VIF value is above ten and the tolerance score is less than 0.2, multicollinearity is present, and the assumption is broken. The VIF values are less than 10, indicating no problem with multicollinearity.

Table 4.3: Multicollinearity

	Collinearity Statistics	
Variable	**Tolerance**	**VIF**
Management efficiency	0.504	1.984
Asset quality	0.687	1.456
Liquidity	0.697	1.434
Firm size	0.703	1.422
Capital adequacy	0.661	1.513

Source: Research Findings (2022)

4.3.3 Heteroskedasticity Test

The residual variance from the model must be constant and unrelated to the independent variable in li

Table 4.4: Heteroskedasticity Results

Breusch-Pagan / Cook-Weisberg test for heteroscedasticity		
chi2(1)	=	0.5329
Prob > chi2	=	0.3317

Source: Research Findings (2022)

As evident in Table 4.4 null hypothesis was not rejected since the p-value was 0.3317, which was statistically significant (p>0.05). As a result, the dataset had homoskedastic variances. Since the P-values of Breusch-Pagan's test for homogeneity of variances above 0.05. The test thus confirmed homogeneity of variance. The data can therefore be used to conduct panel regression analysis.

4.3.4 Autocorrelation Test

Serial correlation, also known as autocorrelation, makes the standard errors of coefficients appear to be less than in linear panel data models, resulting in higher R-squared and erroneous hypothesis testing Autocorrelation was verified via Durbin-Watson test. If the Durbin-Watson test results in a value of 2, the error terms of regression variables are uncorrelated (i.e. between 1 and 3). The nearer the figure to 2 is; the better. The outcomes are presented in Table 4.5.

Table 4.5: Test of Autocorrelation

Durbin Watson Statistic
2.036

Source: Research Findings (2022)

The Durbin-Watson statistic was 2.036, according to the findings in Table 4.5. The fact that the Durbin-Watson statistic was near to 2 demonstrates that the error terms of regression variables are uncorrelated.

4.3.5 Stationarity Test

The research variables were subjected to a panel data unit-root test to establish if the data was stationary. The unit root test was Levin-Lin Chu unit root test. At a standard statistical significance level of 5%, the test was compared to their corresponding p-values. In this test, the null hypothesis is that every panel has a unit root, and the alternative hypothesis is that at least one panel is stationary. The Levin-Lin Chu unit root test outcomes are listed in Table 4.6.

Table 4.6: Levin-Lin Chu unit-root test

Levin-Lin Chu unit-root test			
Variable	**Hypothesis**	**p value**	**Verdict**
Firm efficiency	Ho: Panels contain unit roots	0.0000	Reject Ho
Management efficiency	Ho: Panels contain unit roots	0.0000	Reject Ho
Asset quality	Ho: Panels contain unit roots	0.0000	Reject Ho
Liquidity	Ho: Panels contain unit roots	0.0000	Reject Ho
Firm size	Ho: Panels contain unit roots	0.0000	Reject Ho
Capital adequacy	Ho: Panels contain unit roots	0.0000	Reject Ho

Source: Research Findings (2022)

As demonstrated in Table 4.6, this test concludes that the data is stationary at a 5% level of statistical significance since the p-values all fall below 0.05.

4.3.6 Hausman Test

When using panel data, it is necessary to determine whether a fixed effect or random effect model is more desirable. For the purpose of choosing the best panel regression model, the Hausman specification test was used. In essence, a Hausman specification

test determines if the unique errors have a relationship to the regressors, with the null hypothesis bein

Table 4.7: Hausman Test Results

chi2(5)	P-Value
24.23	0.0002

Null Hypothesis: The appropriate model is Fixed Effects

Source: Research Findings (2022)

4.4 Correlation Results

To determine the degree and direction of link between each predictor variable and the response variable, correlation analysis was carried out. The correlation findings in Table 4.8 display correlation nature between the research variables in relation to magnitude and direction. The correlation results disclose management efficiency has a weak positive as well as significant link with ROA of DT-SACCOs in Kenya (r=0.141) at 5 percent significance level. The outcomes disclose that asset quality and ROA have a negative as well as significant correlation (r=-0.5677) at 5 % significance level. The relationship between liquidity and ROA was positive and significant (r= 0.5755) at 5 % significance level. The outcomes also reveal that both capital adequacy and size had positive as well as significant relation with ROA as depicted by p values below 0.05.

Table 4.8: Correlation Results

		ROA	Management efficiency	Asset quality	Liquidity	Firm size	Capital adequacy
ROA	Pearson Correlation	1					
	Sig. (2-tailed)						
Management efficiency	Pearson Correlation	.141**	1				
	Sig. (2-tailed)	.000					
Asset quality	Pearson Correlation	-.567**	-.072	1			

	Sig. (2-tailed)	.000	.071				
Liquidity	Pearson Correlation	.575**	.034	.115**	1		
	Sig. (2-tailed)	.000	.389	.004			
Firm size	Pearson Correlation	.585**	.095*	.131**	.225**	1	
	Sig. (2-tailed)	.000	.017	.001	.000		
Capital adequacy	Pearson Correlation	.467**	.035	.166**	.060	.023	1
	Sig. (2-tailed)	.000	.385	.000	.133	.568	

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
c. Listwise N=630

Source: Research Findings (2022)

4.5 Regression Results

To determine the extent to which ROA is described by the chosen variables, regression analysis was used. In Table 4.9, the regression's findings were displayed. From the conclusions as epitomized by the adjusted R^2, the studied independent variables explained variations of 0.5301 in ROA among DT-SACCOs in Kenya. This suggests that other not researched factors account for 46.99% of the variability in ROA among DT-SACCOs in Kenya, while the five variables account for 53.01% of those variations.

The data had a 0.000 significance level, according to Table 4.9's ANOVA results, which suggests that the model is the best choice for drawing conclusions about the variables.

Table 4.9: Regression Results

ROA	Coef.	Std. Err.	P>t
Management efficiency	0.097	0.012	0.101
Asset quality	-0.337*	0.015	0.000
Liquidity	0.178*	0.039	0.037
SACCO size	0.679*	0.013	0.000

Capital adequacy	0.858*	0.039	0.000
_cons	-0.327*	0.042	0.000
Model Summary			
R-squared	0.5301		
F(5, 624)	62.90		
Prob > F	0.0000		
Observations	630		
ID	126		

* p<0.05

Source: Research Findings (2022)

The coefficient of regression model was as below;

$$\mathbf{Y = -0.327 - 0.337X_1 - 0.178X_2 + 0.679X_3 + 0.858X_4}$$

Where:

Y = ROA X_1 = Asset quality; X_2=Liquidity X_3= SACCO size; X_4 = Capital adequacy

4.6 Discussion of Research Findings

The objective of this research was to establish the effect of management efficiency on ROA of DT-SACCOs in Kenya. The research applied a descriptive design whereas population was the 175 DT-SACCOs in Kenya. Complete data was obtained from 126 DT-SACCOs in Kenya and which were considered adequate for regression analysis. The research applied secondary data which was gotten from SASRA and individual DT-SACCO annual statements. The independent variable was management efficiency measured as the ratio of interest income and dividends to member deposits in a given year while the control variables were; asset quality, liquidity, firm size and capital adequacy. Both descriptive as well as inferential statistics were applied in analyzing the data. This section discusses the findings.

Multivariate regression outcomes revealed that the R square was 0.5301 implying that 53.01% of changes in ROA of DT-SACCOs are due to five variables alterations

selected for this study. This means that variables not considered explain 46.99% of changes in ROA.

The multivariate regression analysis further revealed that individually, management efficiency unveiled a positive though not statistically significant influence on ROA. Asset quality has a negative effect on ROA of DT-SACCOs (β=-0.337, p=0.017). Firm liquidity exhibited a positive and significant effect on ROA (β=0.178, p=0.043). The other control variables which were SACCO size and capital adequacy displayed a positive and significant ROA influence as shown by (β=0.679, p=0.011) and (β=0.858, p=0.006) respectively.

These conclusions concur with those of Barus, Muturi, Kibati and Koima (2017) who sought to evaluate the effect of management efficiency on financial performance of savings and credit societies in Kenya. The study employed an explanatory research design. The target population was 83 registered DT-SACCO's in Kenya. Census methodology was used in the study. Both primary and secondary sources of data were employed. Descriptive and inferential analysis was conducted to analyze the data. The data was presented using tables and graphs. Based on the findings the study concluded that management efficiency has no significant influence on the financial performance of savings and credit societies in Kenya.

The research findings also concur with Momanyi, Githui and Omurwa (2021) who conducted a research on managerial controllable factors and profitability of Kenyan banks. Secondary panel data for the period 2010-2019 was obtained and analysed where independent variables were operational efficiency, bank size (total assets) and while the depedent variable was profitability (ROA). The research findings indicated that bank size and operational efficiency jointly statistically affected profitability while efficiency on its own was not significantly influence ROA.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The key aim of the research was determining how management efficiency influences the ROA of DT-SACCOs in Kenya. This section includes a summary of the findings from the previous chapter as well as the conclusions and limitations of the study. Additionally, it makes recommendations for potential policy measures. The chapter provides recommendations for further research.

5.2 Summary of Findings

The objective of this research was to establish the effect of management efficiency on ROA of DT-SACCOs in Kenya. The research applied a descriptive design whereas population was the 175 DT-SACCOs in Kenya. Complete data was obtained from 126

DT-SACCOs in Kenya and which were considered adequate for regression analysis. The research app

The correlation results reveal that management efficiency has a weak positive as well as significant link with ROA of DT-SACCOs in Kenya. The outcomes disclose that asset quality and ROA have a negative as well as significant correlation. The relationship between liquidity and ROA was positive and significant. The outcomes also reveal that both capital adequacy and size had positive as well as significant relation with ROA as depicted by p values below 0.05.

Multivariate regression outcomes revealed that the R square was 0.5301 implying that 53.01% of changes in ROA of DT-SACCOs are due to five variables alterations selected for this study. This means that variables not considered explain 46.99% of changes in ROA. The overall model was also statistically significant as the p value was 0.000 that is below the 0.05 significance level. This implies that the overall model had the required goodness of fit.

The multivariate regression analysis further revealed that individually, management efficiency unveiled a positive though not statistically significant influence on ROA. Asset quality has a negative effect on ROA of DT-SACCOs (β=-0.337, p=0.017). Firm liquidity exhibited a positive and significant effect on ROA (β=0.178, p=0.043). The other control variables which were SACCO size and capital adequacy displayed a positive and significant ROA influence as shown by (β=0.679, p=0.011) and (β=0.858, p=0.006) respectively.

5.3 Conclusions

The research intention of the research was establishing correlation between management efficiency and Kenyan DT-SACCOs ROA. The conclusions indicated that management efficiency has no significant effect on ROA of SACCOs. The

findings designated that asset quality had a negative and significant effect on ROA. This may imply th

Additionally, the outcomes discovered that liquidity has a significant positive effect on ROA. This infers that firms with low liquid assets level compared to their assets end up having a lower ROA. This can be explained by the inability of illiquid firms of taking investment opportunities advantage whenever they arise. More, the research discovered that operating risk possess a positive impact on ROA although not substantial impact.

The research outcomes further depicted that DT-SACCO size owned a positive as well as significant influence on ROA which might mean that an increase in asset base of a DT-SACCO leads to enhanced ROA. This can be explained by the fact that bigger DT-SACCOs are likely to have developed structures to monitor the internal operations of a firm leading to better ROA. Bigger DT-SACCOs are also likely to have better governance structure which can also explain the high ROA associated with firm size.

The study conclusions revealed that capital adequacy had a positive as well as significant effect on ROA. This may mean that the DT-SACCOs that have adequate capital are able to meet their obligations when they fall due and are also able to take advantage of investment opportunities that might arise in the course of doing business and therefore high levels of ROA compared with firms that has less capital adequacy.

5.4 Recommendations for Policy and Practice

The study's results indicate that asset quality significantly and negatively affected ROA. Hence, the study recommends that DT-SACCO administrators endeavor to lower the amount of non-performing loans. This can be accomplished by developing efficient ways for managing asset quality that will allow the DT-SACCO to

discriminate between creditworthy and not credit-worthy borrowers.

Further, liquidity was discovered to possess a significant and positive impact on ROA. The research therefore commends that management of DT-SACCOs in Kenya should ensure that they do not over commit their assets by giving excess loans as this will likely lead to reduced ROA. The DT-SACCOs should come up with effective liquidity management strategies. Regulators should ensure that the DT-SACCOs do not led beyond a certain set limit of their asset base.

From the study findings, capital adequacy was found to enhance ROA of DT-SACCOs, this study recommends that DT-SACCOs should keep adequate capital levels to sustain their obligations when they fall due whereas simultaneously time enjoying short term investment chances which may arise. The policy makers should set a limit of the capital adequacy level that DT-SACCOs should have as too much capital adequacy is also disadvantageous as it comes with opportunity costs.

5.5 Limitations of the Study

The focus was on various factors which are thought to influence ROA of Kenyan DT-SACCOs. The study specifically examined five explanatory factors. Though, in certainty, there is presence of other variables probable to influence ROA of firms including internal like corporate governance attributes and organization culture whereas others are beyond the control of the firm like interest rates as well as political stability.

In this study, a five-year period from 2017 to 2021 was selected. There is no proof that comparable results will remain the same across a longer time frame. Moreover, it is impossible to predict if the same outcomes would persist until 2021. Given that additional time contains instances of big economic transitions like recessions and

booms, it is more dependable.

The quality of the data was the main restriction for this study. It is impossible to conclusively conclude that the study's findings accurately reflect the current reality. It has been presumed that the data utilized in the study are accurate. Due to the current conditions, there has also been a great deal of incoherence in the data measurement. The study made use of secondary data rather than primary data. Due to the limited availability of data, only some of the growth drivers have been considered.

The data analysis was performed using regression models. Because of the limitations associated with using the model, like inaccurate or erroneous findings resulting from a change in the variable value, the researchers would not be able to generalize the conclusions precisely. A regression model cannot be performed using the prior model after data is added to it.

5.6 Suggestions for Further Research

It has been suggested that several areas for advanced future research to be done on the basis of the tangible information gathered and the clarifying comprehension established in this research. First, other financial technology aspects influence firm ROA apart from management efficiency. More research can be conducted to determine and evaluate them. Additionally, other factors moderate, intervene, or mediate the relationship between management efficiency and firm ROA apart from SACCO size, asset quality, liquidity and capital adequacy. Further research can be done to identify and analyze them.

The current research scope was restricted to five years; more research can be done past five years to determine whether the results might persist. Thus, inherent future studies may use a wider time span, that can either support or criticize the current

research conclusions. The scope of the study was additionally constrained in terms of context where D

The research only used secondary data; alternate research may use primary data sources such in-depth questionnaires and structured interviews given to practitioners and stakeholders. These can then affirm or criticize the results of the current research. This study used multiple linear regression and correlation analysis; future research could use other analytic techniques such factor analysis, cluster analysis, granger causality, discriminant analysis, and descriptive statistics, among others.

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APPENDICES

Appendix I: Deposit Taking SACCOs in Kenya

1) NK Sacco Society Ltd
2) Acumen Sacco Society Ltd
3) Afya Sacco Society Ltd
4) Agro-Chem Sacco Society Ltd
5) Ainabkoi Sacco Society Ltd
6) Airports Sacco Society Ltd
7) Amica Sacco Society Ltd
8) Ammar Sacco Society Ltd
9) Ardhi Sacco Society Ltd
10) Asili Sacco Society Ltd
11) Azima Sacco Society Ltd
12) Bandari Sacco Society Ltd
13) Baraka Sacco Society Ltd
14) Baraton University Sacco Society Ltd
15) Biashara Sacco Society Ltd
16) Biashara Tosha Sacco Society Ltd
17) Bi-High Sacco Society Ltd
18) Bingwa Sacco Society Ltd
19) Boresha Sacco Society Ltd
20) Capital Sacco Society Ltd
21) Centenary Sacco Society Ltd
22) Chai Sacco Society Ltd
23) Chuna Sacco Society Ltd
24) Comoco Sacco Society Ltd

25) Cosmopolitan Sacco Society Ltd
26) County Sacco Society Ltd
27) Daima Sacco Society Ltd
28) Dhabiti Sacco Society Ltd
29) Dimkes Sacco Society Ltd
30) Dumisha Sacco Society Ltd
31) Eco-Pillar Sacco Society Ltd
32) Egerton Sacco Society Ltd
33) Elimu Sacco Society Ltd
34) Enea Sacco Society Ltd
35) Faridi Sacco Society Ltd
36) Fariji Sacco Society Ltd
37) Fortitude Sacco Society Ltd
38) Fortune Sacco Society Ltd
39) Fundilima Sacco Society Ltd
40) GDC Sacco Society Ltd
41) Golden Pillar Sacco Society Ltd
42) Good Faith Sacco Society Ltd
43) Goodhope Sacco Society Ltd
44) Goodway Sacco Society Ltd
45) Gusii Mwalimu Sacco Society Ltd
46) Harambee Sacco Society Ltd
47) Hazina Sacco Society Ltd
48) Ilkisonko Sacco Society Ltd
49) Imarika Sacco Society Ltd
50) Imarisha Sacco Society Ltd
51) Invest and Grow (IG) Sacco Society Ltd
52) Jacaranda Sacco Society Ltd
53) Jamii Sacco Society Ltd
54) Jitegemee Sacco Society Ltd
55) Joinas Sacco Society Ltd
56) Jumuika Sacco Society Ltd
57) Kencream Sacco Society Ltd
58) Kenpipe Sacco Society Ltd
59) Kenversity Sacco Society Ltd
60) Kenya Achievas Sacco Society Ltd
61) Kenya Bankers Sacco Society Ltd
62) Kenya Highlands Sacco Society Ltd
63) Kenya Midland Sacco Society Ltd
64) Kenya Police Sacco Society Ltd
65) Kimbilio Daima Sacco Society Ltd
66) Kimisitu Sacco Society Ltd
67) Kingdom Sacco Society Ltd
68) Kipsigis Edis Sacco Society Ltd
69) Kite Sacco Society Ltd
70) Kitui Teachers Sacco Society Ltd
71) Kolenge Tea Sacco Society Ltd
72) Koru Sacco Society Ltd
73) K-Pillar Sacco Society Ltd
74) K -Unity Sacco Society Ltd

75) Kwetu Sacco Society Ltd
76) Lainisha Sacco Society Ltd
77) Lamu Teachers Sacco Society Ltd
78) Lengo Sacco Society Ltd
79) Mafanikio Sacco Society Ltd
80) Magadi Sacco Society Ltd
81) Magereza Sacco Society Ltd
82) Maisha Bora Sacco Society Ltd
83) Mentor Sacco Society Ltd
84) Metropolitan National Sacco Society Ltd
85) MMH Sacco Society Ltd
86) Mombasa Port Sacco Society Ltd
87) Mudete Factory Tea Growers Sacco Society Ltd
88) Muki Sacco Society Ltd
89) Mwalimu National Sacco Society Ltd
90) Mwietheri Sacco Society Ltd
91) Mwito Sacco Society Ltd
92) Nacico Sacco Society Ltd
93) Nafaka Sacco Society Ltd
94) Nandi Farmers Sacco
95) Nanyuki Equator Sacco Society Ltd
96) Nation Sacco Society Ltd
97) Nawiri Sacco Society Ltd
98) Ndege Chai Sacco Society Ltd
99) Ndosha Sacco Society Ltd
100) New Forties Sacco Society Ltd
101) Nexus Sacco Society Ltd
102) Ng'arisha Sacco Society Ltd
103) Noble Sacco Society Ltd
104) NRS Sacco Society Ltd
105) NSSF Sacco Society Ltd
106) Nufaika Sacco Society Ltd
107) Nyala Vision Sacco Society Ltd
108) Nyambene Arimi Sacco Society Ltd
109) Nyamira Tea Farmers Sacco Society Ltd
110) Nyati Sacco Society Ltd
111) Ollin Sacco Society Ltd
112) Orient Sacco Society Ltd
113) Patnas Sacco Society Ltd
114) Prime Time Sacco
115) PUAN Sacco Society Ltd
116) Qwetu Sacco Society Ltd
117) Rachuonyo Teachers Sacco Society Ltd
118) Safaricom Sacco Society Ltd
119) Sheria Sacco Society Ltd
120) Shirika Deposit Taking Sacco Society Ltd
121) Shoppers Sacco Society Ltd
122) Simba Chai Sacco Society Ltd
123) Siraji Sacco Society Ltd
124) Skyline Sacco Society Ltd

125) Smart Champions Sacco Society Ltd
126) Smart - Life Sacco Society Ltd
127) Solution Sacco Society Ltd
128) Sotico Sacco Society Ltd
129) Southern Star Sacco Society Ltd
130) Stake Kenya Sacco Society Ltd
131) Stawisha Sacco Society Ltd
132) Stima Sacco Society Ltd
133) Suluhu Sacco Society Ltd
134) Supa Sacco Society Ltd
135) Tabasamu Sacco Society Ltd
136) Tabasuri Sacco Society Ltd
137) Tai Sacco Society Ltd
138) Taifa Sacco Society Ltd
139) Taqwa Sacco Society Ltd
140) Taraji Sacco Society Ltd
141) Telepost Sacco Society Ltd
142) Tembo Sacco Society Ltd
143) Tenhos Sacco Society Ltd
144) Thamani Sacco Society Ltd
145) The Apple Sacco Society Ltd
146) Times-U Sacco Society Ltd
147) Tower Sacco Society Ltd
148) Trans-Elite County Sacco Society Ltd
149) Trans Nation Sacco Society Ltd
150) Trans-Counties Sacco Society Ltd
151) Trans-National Times Sacco Society Ltd
152) Uchongaji Sacco Society Ltd
153) Ufanisi Sacco Society Ltd
154) Ukristo na Ufanisi wa Anglican Sacco Society Ltd
155) Ukulima Sacco Society Ltd
156) Unaitas Sacco Society Ltd
157) Uni-County Sacco Society Ltd
158) Unison Sacco Society Ltd
159) United Nations Sacco Society Ltd
160) Universal Traders Sacco Society Ltd
161) Ushuru Sacco Society Ltd
162) Vihiga County Farmers Sacco Society Ltd
163) Viktas Sacco Society Ltd
164) Vision Africa Sacco Society Ltd
165) Vision Point Sacco Society Ltd
166) Wakenya Pamoja Sacco Society Ltd
167) Wakulima Commercial Sacco Society Ltd
168) Wana-anga Sacco Society Ltd
169) Wananchi Sacco Society Ltd
170) Wanandege Sacco Society Ltd
171) Washa Sacco Society Ltd
172) Waumini Sacco Society Ltd
173) Wevarsity Sacco Society Ltd
174) Winas Sacco Society Ltd

175) Yetu Sacco Society Ltd

Source: SASRA (2021)

Appendix II: Research Data

DT-SACCO	Year	ROA	Management efficiency	Asset quality	Liquidity	Firm size	Capital adequacy
1	2017	0.0402	0.7526	0.1600	3.9703	8.2162	0.1723
1	2018	0.0415	0.7788	0.0600	3.9512	8.2177	0.1645
1	2019	0.2296	0.9003	0.1500	3.9318	8.2509	0.1528
1	2020	0.2144	1.2190	0.0400	3.9120	8.2695	0.1560
1	2021	0.1606	0.7812	0.0500	3.8918	8.3168	0.1844
2	2017	0.1440	1.5348	0.1400	3.9120	8.3379	0.1592
2	2018	0.1219	1.2537	0.1500	3.8918	8.4239	0.1639
2	2019	0.0957	1.8550	0.1200	3.8712	8.4141	0.1616
2	2020	0.2794	1.6321	0.0900	3.8501	8.4557	0.1578
2	2021	0.2788	3.2957	0.1100	3.8286	8.4859	0.1602
3	2017	0.1096	0.6206	0.0100	4.3944	8.2067	1.8796
3	2018	0.0593	0.6118	0.0200	4.3820	8.2879	1.9617
3	2019	0.2438	1.1138	0.0200	4.3694	8.3768	0.3053
3	2020	0.1236	1.0363	0.0400	4.3567	8.4253	0.3229
3	2021	0.1261	1.5372	0.0600	4.3438	8.4516	0.3466
4	2017	0.1169	1.4935	0.1300	3.1781	7.5576	0.1596
4	2018	0.0870	1.1013	0.1200	3.1355	7.6198	0.1840
4	2019	0.0850	0.7508	0.1300	3.0910	7.5878	0.1786
4	2020	0.0769	0.8794	0.1700	3.0445	7.5652	0.1803
4	2021	0.0621	1.1345	0.2200	2.9957	7.5406	0.1638
5	2017	0.0665	0.5897	0.0400	2.0794	8.0577	0.3941
5	2018	0.0515	0.6198	0.0500	1.9459	8.1238	0.4230

5	2019	0.0227	0.5994	0.0100	1.7918	8.1659	0.4574
5	2020	0.0227	0.7079	0.0100	1.6094	8.2286	0.5397
5	2021	0.2837	0.5240	0.0700	1.3863	8.3287	0.4392
6	2017	0.0015	1.8238	0.1000	3.5835	8.5767	0.2730
6	2018	0.0337	1.5769	0.0800	3.5553	8.6278	0.2832
6	2019	0.1402	1.1119	0.0200	3.5264	8.6514	0.2637
6	2020	0.0819	1.2749	0.3900	3.4965	8.6986	0.2555
6	2021	0.3061	1.3443	0.0600	3.4657	8.7303	0.2764
7	2017	0.1685	0.9830	0.0400	3.9703	8.0019	0.1791
7	2018	0.2919	1.0618	0.1500	3.9512	8.0506	0.1792
7	2019	0.2136	1.7404	0.3100	3.9318	8.0485	0.1845
7	2020	0.0041	1.2006	0.0200	3.9120	8.1428	0.1732
7	2021	0.0041	0.9407	0.1100	3.8918	8.1599	0.1573
8	2017	0.1179	1.3215	0.3500	3.9120	7.9815	0.1099
8	2018	0.2618	0.7600	0.1800	3.8918	8.0263	0.0939
8	2019	0.1030	0.6879	0.3900	3.8712	8.0767	0.0790
8	2020	0.1341	0.9920	0.1900	3.8501	8.1894	0.0509
8	2021	0.0918	1.0697	0.0500	3.8286	8.2824	0.0280
9	2017	0.0045	0.2677	0.1000	4.3944	8.0201	0.1883
9	2018	0.0527	0.3491	0.1100	4.3820	8.0438	0.1551
9	2019	0.0538	0.3323	0.1200	4.3694	7.9725	0.2285
9	2020	0.0737	0.2661	0.0400	4.3567	7.9744	0.1477
9	2021	0.0201	0.3119	0.0500	4.3438	7.9950	0.1451
10	2017	0.0475	1.1178	0.0200	3.1781	8.1877	0.2165
10	2018	0.0879	1.1099	0.0200	3.1355	8.2356	0.2126
10	2019	0.1244	0.9898	0.1900	3.0910	8.2709	0.2277

10	2020	0.0180	0.8495	0.0200	3.0445	8.3291	0.0227
10	2021	0.0180	1.0610	0.0300	2.9957	8.3508	0.1618
11	2017	0.1605	0.8533	0.0900	2.0794	8.3898	0.2345
11	2018	0.1071	0.9362	0.0900	1.9459	8.4802	0.2442
11	2019	0.0045	0.1414	0.1000	1.7918	8.5279	0.2508
11	2020	0.0225	0.1037	0.0400	1.6094	8.5719	0.2355
11	2021	0.0400	1.1535	0.0200	1.3863	8.6261	0.2456
12	2017	0.0397	0.2616	0.0200	2.3571	7.2060	0.2291
12	2018	0.0421	0.2229	0.0200	2.2968	7.1988	0.1463
12	2019	0.1185	0.2479	0.0300	2.6813	7.2236	0.1850
12	2020	0.0468	0.2867	0.0400	2.3480	7.3186	0.1901
12	2021	0.0662	0.2803	0.0300	2.6204	7.3549	0.2111
13	2017	0.1105	0.8533	0.0600	1.3164	7.7230	0.4230
13	2018	0.0800	0.9362	0.1900	1.1960	7.6766	0.4574
13	2019	0.0468	1.1535	0.1900	1.1739	7.5374	0.5397
13	2020	0.0759	0.5988	0.0200	1.2056	7.4993	0.7005
13	2021	0.2283	0.8328	0.0400	1.2276	7.4789	0.2990
14	2017	0.2214	0.9120	0.3000	1.0562	7.6874	0.3184
14	2018	0.3650	1.0407	0.2400	1.0962	7.7237	0.2496
14	2019	0.0561	0.6973	0.2000	1.1120	7.5611	0.1944
14	2020	0.0168	1.0418	0.1700	1.1601	7.6254	0.1599
14	2021	0.1243	0.9047	0.1400	1.1233	7.6188	0.1659
15	2017	0.1145	0.5927	0.0000	4.5106	8.2162	0.2120
15	2018	0.1364	1.1535	0.2000	6.2963	8.2177	0.2018
15	2019	0.0400	0.6937	0.0100	10.0893	8.2509	0.1966
15	2020	0.0199	0.7149	0.0200	4.2579	8.2695	0.2041

15	2021	0.0111	0.5761	0.1200	8.8431	8.3168	0.2041
16	2017	0.2872	1.1737	0.0200	1.1065	7.3921	0.2691
16	2018	0.0267	0.9834	0.0300	1.1464	7.3912	0.1441
16	2019	0.0035	1.3268	0.1300	1.3815	7.4269	0.2078
16	2020	0.1599	1.1912	0.3800	1.5359	7.4953	0.1986
16	2021	0.1599	1.2957	0.0100	1.4639	7.6089	0.1952
17	2017	0.1966	2.6058	0.0500	1.2832	7.7088	0.1125
17	2018	0.2632	1.9871	0.0500	1.1679	7.7925	0.1145
17	2019	0.0323	1.7572	0.0700	1.3048	7.7958	0.1399
17	2020	0.0706	1.5740	0.0500	1.1971	7.8087	0.1534
17	2021	0.1038	1.5548	0.0500	1.1606	7.7387	0.0911
18	2017	0.1004	1.3073	0.0700	1.5853	8.1416	0.2335
18	2018	0.0773	1.2215	0.0600	1.9464	8.2161	0.2649
18	2019	0.0718	2.6804	0.0500	1.0851	8.2482	0.2547
18	2020	0.0745	2.2625	0.0400	1.0237	8.2873	0.2387
18	2021	0.0365	0.6313	0.0300	1.4691	8.2934	0.2597
19	2017	0.0635	1.2513	0.2100	1.9836	7.0270	0.1712
19	2018	0.0277	1.0568	0.0500	1.3339	6.9998	0.1763
19	2019	0.0882	1.2442	0.0500	1.5404	6.9773	0.1904
19	2020	0.0327	0.9423	0.0800	1.2591	6.9368	0.2022
19	2021	0.0327	1.0481	0.0300	1.1154	6.9339	0.2275
20	2017	0.2284	1.0131	0.5700	4.1442	6.8581	0.1351
20	2018	0.3270	1.1560	0.5300	7.9538	6.8614	0.1577
20	2019	0.2227	1.5957	0.0800	8.4745	6.9607	0.1872
20	2020	0.2210	1.3150	0.0600	3.3451	7.0390	0.1620
20	2021	0.2283	1.0811	0.0000	1.9506	7.1179	0.1866

21	2017	0.2175	1.1535	0.0600	1.0966	8.3379	0.2022
21	2018	0.2715	0.7844	0.0700	1.4218	8.4239	0.3213
21	2019	0.2842	1.0194	0.0600	1.4858	8.4141	0.3911
21	2020	0.2461	0.8533	0.0400	1.7358	8.4557	0.1700
21	2021	0.2692	0.9362	0.1200	1.2374	8.4859	0.1534
22	2017	0.0826	1.1157	0.1300	1.9502	8.3379	0.3909
22	2018	0.1139	0.0074	0.1600	1.9346	8.4239	0.1813
22	2019	0.1465	1.2995	0.2000	1.9684	6.7611	0.1769
22	2020	0.1945	1.1102	0.2300	1.2242	6.7943	0.1700
22	2021	0.1736	0.8008	0.0200	1.6434	8.2879	0.1534
23	2017	0.2410	0.9872	0.0600	1.0320	8.2067	0.1885
23	2018	0.1590	0.7481	0.0600	1.9226	8.2879	0.2020
23	2019	0.0644	0.7565	0.1000	1.8973	8.3768	0.1815
23	2020	0.0604	0.7018	0.0800	1.1574	8.4253	0.1858
23	2021	0.0310	0.6975	0.1200	1.5021	8.4516	0.1793
24	2017	0.0279	0.6772	0.1600	1.4648	8.4859	0.2610
24	2018	0.0248	0.9922	0.1400	1.5627	8.3379	0.1625
24	2019	0.0139	0.8564	0.1100	1.4005	8.4239	0.2008
24	2020	0.0019	0.3208	0.1100	1.0634	6.0724	0.1933
24	2021	0.1050	1.1535	0.1700	1.6245	6.5049	0.1915
25	2017	0.0840	2.5763	0.0500	1.7402	7.5107	0.2101
25	2018	0.1331	2.2844	0.0100	4.3944	7.5376	0.1536
25	2019	0.1709	0.2538	0.0900	4.3820	7.5084	0.1801
25	2020	0.0574	0.2260	0.1000	4.3694	7.6403	0.1663
25	2021	0.1230	0.2058	0.0300	2.2050	7.6508	0.1955
26	2017	0.0887	0.8533	0.0500	2.5238	8.3898	0.1945

26	2018	0.0937	0.9362	0.0100	3.3740	8.4802	0.4270
26	2019	0.0986	0.7533	0.0900	2.8332	8.5279	0.3933
26	2020	0.0999	2.0736	0.0300	3.0200	8.5719	0.5708
26	2021	0.1514	0.8535	0.0500	4.4016	8.6261	0.4494
27	2017	0.0609	1.3268	0.0100	2.3280	7.6734	0.4576
27	2018	0.2966	1.1912	0.0700	1.7710	7.7973	0.3498
27	2019	0.2323	1.2957	0.0900	1.8952	7.6170	0.3869
27	2020	0.2298	2.6058	0.0700	2.1309	7.6754	0.3316
27	2021	0.1657	1.9871	0.0800	1.9554	7.6856	0.3093
28	2017	0.0105	1.7572	0.0100	1.2192	7.1251	0.1393
28	2018	0.0572	1.1535	0.0000	1.1561	7.0917	0.1399
28	2019	0.0125	1.1457	0.0800	1.1158	7.1023	0.0715
28	2020	0.0912	1.3058	0.0700	1.0780	7.1695	0.0542
28	2021	0.0185	1.5680	0.2500	1.5236	7.1649	0.0370
29	2017	0.1863	1.6418	0.1400	1.4882	7.4691	0.2104
29	2018	0.0950	1.4860	0.1600	1.2774	7.4211	0.2059
29	2019	0.1526	0.9118	0.0000	1.2997	7.4344	0.2304
29	2020	0.1072	0.7956	0.0100	1.1003	7.4408	0.2227
29	2021	0.0096	0.6188	0.0000	1.6298	7.4577	0.1869
30	2017	0.0175	1.0494	0.0300	1.5950	7.1018	0.2545
30	2018	0.0041	0.7956	0.0100	1.4871	7.0967	0.2412
30	2019	0.1415	0.6495	0.0300	1.2846	7.0904	0.2741
30	2020	0.1548	0.6850	0.0400	1.4099	7.1179	0.2946
30	2021	0.1681	0.8274	0.0300	1.0780	7.1249	0.2853
31	2017	0.0296	0.6214	0.0200	1.5236	7.1984	0.1676
31	2018	0.0382	1.2494	0.0400	1.4882	7.2791	0.1729

31	2019	0.0419	0.9985	0.0600	1.0983	7.3376	0.2216
31	2020	0.0275	1.4241	0.2300	1.0861	7.4162	0.2248
31	2021	0.0570	1.5200	0.0300	2.3685	7.4263	0.3729
32	2017	0.0402	0.5531	0.0300	2.2713	6.5049	0.2056
32	2018	0.0415	0.7350	0.1000	1.8378	7.5107	0.2468
32	2019	0.2296	0.5475	0.0300	2.3583	7.5376	0.2325
32	2020	0.2144	0.8323	0.0400	2.5221	7.5084	0.1646
32	2021	0.1606	1.2338	0.0400	1.3097	7.6403	0.1440
33	2017	0.1440	0.8533	0.1000	1.1747	7.6508	0.1723
33	2018	0.1219	0.9362	0.0000	1.1699	8.3898	0.1870
33	2019	0.0957	0.7038	0.0300	1.1666	8.4802	0.1812
33	2020	0.2794	1.5759	0.0800	1.1380	8.5279	0.1684
33	2021	0.2788	1.5392	0.0300	2.5641	8.5719	0.1723
34	2017	0.1096	2.2120	0.0000	1.0423	8.6261	0.1982
34	2018	0.0593	2.2265	0.0000	1.0590	7.6734	0.2116
34	2019	0.2438	2.2665	0.1100	1.1121	7.7973	0.2091
34	2020	0.1236	3.0110	0.1000	1.1251	7.6170	0.1852
34	2021	0.1261	1.2633	0.0900	1.0611	7.6754	0.1947
35	2017	0.1169	1.1535	0.1600	1.1587	7.6856	0.1071
35	2018	0.0870	1.0683	0.1900	1.1441	7.1251	0.1745
35	2019	0.0850	0.7225	0.2300	1.1447	7.0917	0.1627
35	2020	0.0769	0.5202	0.1900	1.0939	7.1023	0.1265
35	2021	0.0621	1.1515	0.2600	1.0332	7.1695	0.2201
36	2017	0.0665	0.9985	0.2700	1.2705	7.1649	0.2773
36	2018	0.0515	0.8278	0.2300	1.2776	7.4691	0.2164
36	2019	0.0227	0.8314	0.2200	1.1715	7.4211	0.2230

36	2020	0.0227	0.6253	0.0600	1.1658	7.4344	0.2908
36	2021	0.2837	0.9044	0.2300	1.5334	7.4408	0.2111
37	2017	0.0015	0.6952	0.1200	1.6234	7.4577	0.5862
37	2018	0.0337	0.7589	0.0500	1.6385	7.1018	0.2379
37	2019	0.1402	1.1507	0.0600	1.6048	7.0967	0.3868
37	2020	0.0819	0.4991	0.0500	1.5050	7.0904	0.3878
37	2021	0.3061	0.6157	0.0900	1.2653	7.1179	0.3316
38	2017	0.1685	0.9182	0.1300	1.2875	7.1249	0.2908
38	2018	0.2919	1.3433	0.1700	1.2781	7.1984	0.1723
38	2019	0.2136	1.6103	0.1200	1.2225	7.2791	0.2545
38	2020	0.0041	1.8041	0.0400	1.1691	7.3376	0.2274
38	2021	0.0041	1.6465	0.0300	1.1254	7.4162	0.2109
39	2017	0.1179	1.3569	0.0400	1.0996	7.4263	0.1592
39	2018	0.2618	0.5875	0.0498	1.0417	8.2161	0.1639
39	2019	0.1030	1.0541	0.0389	1.2396	8.2482	0.1616
39	2020	0.1341	1.5925	0.0387	2.2624	8.2873	0.1578
39	2021	0.0918	2.1825	0.0360	2.9326	8.2934	0.1602
40	2017	0.0045	1.6103	0.0284	3.5336	7.0270	1.8796
40	2018	0.0527	1.8041	0.0498	2.5000	6.9998	1.9617
40	2019	0.0538	0.8533	0.0389	3.1447	6.9773	0.3053
40	2020	0.0737	0.9362	0.0387	2.5063	6.9368	0.3229
40	2021	0.0201	1.1110	0.0360	2.5000	6.9339	0.3466
41	2017	0.0475	1.4241	0.0284	2.9851	6.8581	0.1596
41	2018	0.0879	1.5200	0.0449	3.0675	6.8614	0.1840
41	2019	0.1244	0.5531	0.0446	2.9586	6.9607	0.1786
41	2020	0.0180	0.7350	0.0471	2.6596	7.0390	0.1803

41	2021	0.0180	0.5475	0.0278	2.9674	7.1179	0.1638
42	2017	0.1605	0.8323	0.0374	2.1739	8.3379	0.3941
42	2018	0.1071	1.2338	0.0417	1.4728	8.4239	0.4230
42	2019	0.0045	0.8533	0.0414	2.4155	8.4141	0.4574
42	2020	0.0225	0.9362	0.0427	1.3569	8.4557	0.5397
42	2021	0.0400	0.7038	0.0386	1.8315	8.4859	0.4392
43	2017	0.0397	0.7526	0.1600	3.9703	8.2162	0.1723
43	2018	0.0421	0.7788	0.0600	3.9512	8.2177	0.1645
43	2019	0.1185	0.9003	0.1500	3.9318	8.2509	0.1528
43	2020	0.0468	1.2190	0.0400	3.9120	8.2695	0.1560
43	2021	0.0662	0.7812	0.0500	3.8918	8.3168	0.1844
44	2017	0.1105	1.5348	0.1400	3.9120	8.3379	0.1592
44	2018	0.0800	1.2537	0.1500	3.8918	8.4239	0.1639
44	2019	0.0468	1.8550	0.1200	3.8712	8.4141	0.1616
44	2020	0.0759	1.6321	0.0900	3.8501	8.4557	0.1578
44	2021	0.2283	3.2957	0.1100	3.8286	8.4859	0.1602
45	2017	0.2214	0.6206	0.0100	4.3944	8.2067	1.8796
45	2018	0.3650	0.6118	0.0200	4.3820	8.2879	1.9617
45	2019	0.0561	1.1138	0.0200	4.3694	8.3768	0.3053
45	2020	0.0168	1.0363	0.0400	4.3567	8.4253	0.3229
45	2021	0.1243	1.5372	0.0600	4.3438	8.4516	0.3466
46	2017	0.1145	1.4935	0.1300	3.1781	7.5576	0.1596
46	2018	0.1364	1.1013	0.1200	3.1355	7.6198	0.1840
46	2019	0.0400	0.7508	0.1300	3.0910	7.5878	0.1786
46	2020	0.0199	0.8794	0.1700	3.0445	7.5652	0.1803
46	2021	0.0111	1.1345	0.2200	2.9957	7.5406	0.1638

47	2017	0.2872	0.5897	0.0400	2.0794	8.0577	0.3941
47	2018	0.0267	0.6198	0.0500	1.9459	8.1238	0.4230
47	2019	0.0035	0.5994	0.0100	1.7918	8.1659	0.4574
47	2020	0.1599	0.7079	0.0100	1.6094	8.2286	0.5397
47	2021	0.1599	0.5240	0.0700	1.3863	8.3287	0.4392
48	2017	0.1966	1.8238	0.1000	3.5835	8.5767	0.2730
48	2018	0.2632	1.5769	0.0800	3.5553	8.6278	0.2832
48	2019	0.0323	1.1119	0.0200	3.5264	8.6514	0.2637
48	2020	0.0706	1.2749	0.3900	3.4965	8.6986	0.2555
48	2021	0.1038	1.3443	0.0600	3.4657	8.7303	0.2764
49	2017	0.1004	0.9830	0.0400	3.9703	8.0019	0.1791
49	2018	0.0773	1.0618	0.1500	3.9512	8.0506	0.1792
49	2019	0.0718	1.7404	0.3100	3.9318	8.0485	0.1845
49	2020	0.0745	1.2006	0.0200	3.9120	8.1428	0.1732
49	2021	0.0365	0.9407	0.1100	3.8918	8.1599	0.1573
50	2017	0.0635	1.3215	0.3500	3.9120	7.9815	0.1099
50	2018	0.0277	0.7600	0.1800	3.8918	8.0263	0.0939
50	2019	0.0882	0.6879	0.3900	3.8712	8.0767	0.0790
50	2020	0.0327	0.9920	0.1900	3.8501	8.1894	0.0509
50	2021	0.0327	1.0697	0.0500	3.8286	8.2824	0.0280
51	2017	0.2284	0.2677	0.1000	4.3944	8.0201	0.1883
51	2018	0.3270	0.3491	0.1100	4.3820	8.0438	0.1551
51	2019	0.2227	0.3323	0.1200	4.3694	7.9725	0.2285
51	2020	0.2210	0.2661	0.0400	4.3567	7.9744	0.1477
51	2021	0.2283	0.3119	0.0500	4.3438	7.9950	0.1451
52	2017	0.2175	1.1178	0.0200	3.1781	8.1877	0.2165

52	2018	0.2715	1.1099	0.0200	3.1355	8.2356	0.2126
52	2019	0.2842	0.9898	0.1900	3.0910	8.2709	0.2277
52	2020	0.2461	0.8495	0.0200	3.0445	8.3291	0.0227
52	2021	0.2692	1.0610	0.0300	2.9957	8.3508	0.1618
53	2017	0.3188	0.8533	0.0900	2.0794	8.3898	0.2345
53	2018	0.3282	0.9362	0.0900	1.9459	8.4802	0.2442
53	2019	0.3134	0.1414	0.1000	1.7918	8.5279	0.2508
53	2020	0.0600	0.1037	0.0400	1.6094	8.5719	0.2355
53	2021	0.0642	1.1535	0.0200	1.3863	8.6261	0.2456
54	2017	0.0383	0.2616	0.0200	2.3571	7.2060	0.2291
54	2018	0.0409	0.2229	0.0200	2.2968	7.1988	0.1463
54	2019	0.1052	0.2479	0.0300	2.6813	7.2236	0.1850
54	2020	0.1249	0.2867	0.0400	2.3480	7.3186	0.1901
54	2021	0.1203	0.2803	0.0300	2.6204	7.3549	0.2111
55	2017	0.2358	0.8533	0.0600	1.3164	7.7230	0.4230
55	2018	0.1874	0.9362	0.1900	1.1960	7.6766	0.4574
55	2019	0.1596	1.1535	0.1900	1.1739	7.5374	0.5397
55	2020	0.1253	0.5988	0.0200	1.2056	7.4993	0.7005
55	2021	0.1372	0.8328	0.0400	1.2276	7.4789	0.2990
56	2017	0.0661	0.9120	0.3000	1.0562	7.6874	0.3184
56	2018	0.0758	1.0407	0.2400	1.0962	7.7237	0.2496
56	2019	0.0722	0.6973	0.2000	1.1120	7.5611	0.1944
56	2020	0.0795	1.0418	0.1700	1.1601	7.6254	0.1599
56	2021	0.0795	0.9047	0.1400	1.1233	7.6188	0.1659
57	2017	0.0868	0.5927	0.0000	4.5106	8.2162	0.2120
57	2018	0.0940	1.1535	0.2000	6.2963	8.2177	0.2018

57	2019	0.0215	0.6937	0.0100	10.0893	8.2509	0.1966
57	2020	0.0961	0.7149	0.0200	4.2579	8.2695	0.2041
57	2021	0.0562	0.5761	0.1200	8.8431	8.3168	0.2041
58	2017	0.0812	1.1737	0.0200	1.1065	7.3921	0.2691
58	2018	0.0910	0.9834	0.0300	1.1464	7.3912	0.1441
58	2019	0.0507	1.3268	0.1300	1.3815	7.4269	0.2078
58	2020	0.0743	1.1912	0.3800	1.5359	7.4953	0.1986
58	2021	0.0581	1.2957	0.0100	1.4639	7.6089	0.1952
59	2017	0.0650	2.6058	0.0500	1.2832	7.7088	0.1125
59	2018	0.0540	1.9871	0.0500	1.1679	7.7925	0.1145
59	2019	0.0468	1.7572	0.0700	1.3048	7.7958	0.1399
59	2020	0.0138	1.5740	0.0500	1.1971	7.8087	0.1534
59	2021	0.0138	1.5548	0.0500	1.1606	7.7387	0.0911
60	2017	0.3482	1.3073	0.0700	1.5853	8.1416	0.2335
60	2018	0.2536	1.2215	0.0600	1.9464	8.2161	0.2649
60	2019	0.0833	2.6804	0.0500	1.0851	8.2482	0.2547
60	2020	0.0851	2.2625	0.0400	1.0237	8.2873	0.2387
60	2021	0.0991	0.6313	0.0300	1.4691	8.2934	0.2597
61	2017	0.2214	1.2513	0.2100	1.9836	7.0270	0.1712
61	2018	0.3650	1.0568	0.0500	1.3339	6.9998	0.1763
61	2019	0.0561	1.2442	0.0500	1.5404	6.9773	0.1904
61	2020	0.0168	0.9423	0.0800	1.2591	6.9368	0.2022
61	2021	0.1243	1.0481	0.0300	1.1154	6.9339	0.2275
62	2017	0.0912	1.0131	0.5700	4.1442	6.8581	0.1351
62	2018	0.1378	1.1560	0.5300	7.9538	6.8614	0.1577
62	2019	0.1111	1.5957	0.0800	8.4745	6.9607	0.1872

62	2020	0.0781	1.3150	0.0600	3.3451	7.0390	0.1620
62	2021	0.0672	1.0811	0.0000	1.9506	7.1179	0.1866
63	2017	0.0664	1.1535	0.0600	1.0966	8.3379	0.2022
63	2018	0.0664	0.7844	0.0700	1.4218	8.4239	0.3213
63	2019	0.0673	1.0194	0.0600	1.4858	8.4141	0.3911
63	2020	0.0547	0.8533	0.0400	1.7358	8.4557	0.1700
63	2021	0.0547	0.9362	0.1200	1.2374	8.4859	0.1534
64	2017	0.0402	1.1157	0.1300	1.9502	8.3379	0.3909
64	2018	0.0415	0.0074	0.1600	1.9346	8.4239	0.1813
64	2019	0.2296	1.2995	0.2000	1.9684	6.7611	0.1769
64	2020	0.2144	1.1102	0.2300	1.2242	6.7943	0.1700
64	2021	0.1606	0.8008	0.0200	1.6434	8.2879	0.1534
65	2017	0.1440	0.9872	0.0600	1.0320	8.2067	0.1885
65	2018	0.1219	0.7481	0.0600	1.9226	8.2879	0.2020
65	2019	0.0957	0.7565	0.1000	1.8973	8.3768	0.1815
65	2020	0.2794	0.7018	0.0800	1.1574	8.4253	0.1858
65	2021	0.2788	0.6975	0.1200	1.5021	8.4516	0.1793
66	2017	0.1096	0.6772	0.1600	1.4648	8.4859	0.2610
66	2018	0.0593	0.9922	0.1400	1.5627	8.3379	0.1625
66	2019	0.2438	0.8564	0.1100	1.4005	8.4239	0.2008
66	2020	0.1236	0.3208	0.1100	1.0634	6.0724	0.1933
66	2021	0.1261	1.1535	0.1700	1.6245	6.5049	0.1915
67	2017	0.1169	2.5763	0.0500	1.7402	7.5107	0.2101
67	2018	0.0870	2.2844	0.0100	4.3944	7.5376	0.1536
67	2019	0.0850	0.2538	0.0900	4.3820	7.5084	0.1801
67	2020	0.0769	0.2260	0.1000	4.3694	7.6403	0.1663

67	2021	0.0621	0.2058	0.0300	2.2050	7.6508	0.1955
68	2017	0.0665	0.8533	0.0500	2.5238	8.3898	0.1945
68	2018	0.0515	0.9362	0.0100	3.3740	8.4802	0.4270
68	2019	0.0227	0.7533	0.0900	2.8332	8.5279	0.3933
68	2020	0.0227	2.0736	0.0300	3.0200	8.5719	0.5708
68	2021	0.2837	0.8535	0.0500	4.4016	8.6261	0.4494
69	2017	0.0015	1.3268	0.0100	2.3280	7.6734	0.4576
69	2018	0.0337	1.1912	0.0700	1.7710	7.7973	0.3498
69	2019	0.1402	1.2957	0.0900	1.8952	7.6170	0.3869
69	2020	0.0819	2.6058	0.0700	2.1309	7.6754	0.3316
69	2021	0.3061	1.9871	0.0800	1.9554	7.6856	0.3093
70	2017	0.1685	1.7572	0.0100	1.2192	7.1251	0.1393
70	2018	0.2919	1.1535	0.0000	1.1561	7.0917	0.1399
70	2019	0.2136	1.1457	0.0800	1.1158	7.1023	0.0715
70	2020	0.0041	1.3058	0.0700	1.0780	7.1695	0.0542
70	2021	0.0041	1.5680	0.2500	1.5236	7.1649	0.0370
71	2017	0.1179	1.6418	0.1400	1.4882	7.4691	0.2104
71	2018	0.2618	1.4860	0.1600	1.2774	7.4211	0.2059
71	2019	0.1030	0.9118	0.0000	1.2997	7.4344	0.2304
71	2020	0.1341	0.7956	0.0100	1.1003	7.4408	0.2227
71	2021	0.0918	0.6188	0.0000	1.6298	7.4577	0.1869
72	2017	0.0045	1.0494	0.0300	1.5950	7.1018	0.2545
72	2018	0.0527	0.7956	0.0100	1.4871	7.0967	0.2412
72	2019	0.0538	0.6495	0.0300	1.2846	7.0904	0.2741
72	2020	0.0737	0.6850	0.0400	1.4099	7.1179	0.2946
72	2021	0.0201	0.8274	0.0300	1.0780	7.1249	0.2853

73	2017	0.0475	0.6214	0.0200	1.5236	7.1984	0.1676
73	2018	0.0879	1.2494	0.0400	1.4882	7.2791	0.1729
73	2019	0.1244	0.9985	0.0600	1.0983	7.3376	0.2216
73	2020	0.0180	1.4241	0.2300	1.0861	7.4162	0.2248
73	2021	0.0180	1.5200	0.0300	2.3685	7.4263	0.3729
74	2017	0.1605	0.5531	0.0300	2.2713	6.5049	0.2056
74	2018	0.1071	0.7350	0.1000	1.8378	7.5107	0.2468
74	2019	0.0045	0.5475	0.0300	2.3583	7.5376	0.2325
74	2020	0.0225	0.8323	0.0400	2.5221	7.5084	0.1646
74	2021	0.0400	1.2338	0.0400	1.3097	7.6403	0.1440
75	2017	0.0397	0.8533	0.1000	1.1747	7.6508	0.1723
75	2018	0.0421	0.9362	0.0000	1.1699	8.3898	0.1870
75	2019	0.1185	0.7038	0.0300	1.1666	8.4802	0.1812
75	2020	0.0468	1.5759	0.0800	1.1380	8.5279	0.1684
75	2021	0.0662	1.5392	0.0300	2.5641	8.5719	0.1723
76	2017	0.1105	2.2120	0.0000	1.0423	8.6261	0.1982
76	2018	0.0800	2.2265	0.0000	1.0590	7.6734	0.2116
76	2019	0.0468	2.2665	0.1100	1.1121	7.7973	0.2091
76	2020	0.0759	3.0110	0.1000	1.1251	7.6170	0.1852
76	2021	0.2283	1.2633	0.0900	1.0611	7.6754	0.1947
77	2017	0.2214	1.1535	0.1600	1.1587	7.6856	0.1071
77	2018	0.3650	1.0683	0.1900	1.1441	7.1251	0.1745
77	2019	0.0561	0.7225	0.2300	1.1447	7.0917	0.1627
77	2020	0.0168	0.5202	0.1900	1.0939	7.1023	0.1265
77	2021	0.1243	1.1515	0.2600	1.0332	7.1695	0.2201
78	2017	0.1145	0.9985	0.2700	1.2705	7.1649	0.2773

78	2018	0.1364	0.8278	0.2300	1.2776	7.4691	0.2164
78	2019	0.0400	0.8314	0.2200	1.1715	7.4211	0.2230
78	2020	0.0199	0.6253	0.0600	1.1658	7.4344	0.2908
78	2021	0.0111	0.9044	0.2300	1.5334	7.4408	0.2111
79	2017	0.2872	0.6952	0.1200	1.6234	7.4577	0.5862
79	2018	0.0267	0.7589	0.0500	1.6385	7.1018	0.2379
79	2019	0.0035	1.1507	0.0600	1.6048	7.0967	0.3868
79	2020	0.1599	0.4991	0.0500	1.5050	7.0904	0.3878
79	2021	0.1599	0.6157	0.0900	1.2653	7.1179	0.3316
80	2017	0.1966	0.9182	0.1300	1.2875	7.1249	0.2908
80	2018	0.2632	1.3433	0.1700	1.2781	7.1984	0.1723
80	2019	0.0323	1.6103	0.1200	1.2225	7.2791	0.2545
80	2020	0.0706	1.8041	0.0400	1.1691	7.3376	0.2274
80	2021	0.1038	1.6465	0.0300	1.1254	7.4162	0.2109
81	2017	0.1004	1.3569	0.0400	1.0996	7.4263	0.1592
81	2018	0.0773	0.5875	0.0498	1.0417	8.2161	0.1639
81	2019	0.0718	1.0541	0.0389	1.2396	8.2482	0.1616
81	2020	0.0745	1.5925	0.0387	2.2624	8.2873	0.1578
81	2021	0.0365	2.1825	0.0360	2.9326	8.2934	0.1602
82	2017	0.0635	1.6103	0.0284	3.5336	7.0270	1.8796
82	2018	0.0277	1.8041	0.0498	2.5000	6.9998	1.9617
82	2019	0.0882	0.8533	0.0389	3.1447	6.9773	0.3053
82	2020	0.0327	0.9362	0.0387	2.5063	6.9368	0.3229
82	2021	0.0327	1.1110	0.0360	2.5000	6.9339	0.3466
83	2017	0.2284	1.4241	0.0284	2.9851	6.8581	0.1596
83	2018	0.3270	1.5200	0.0449	3.0675	6.8614	0.1840

83	2019	0.2227	0.5531	0.0446	2.9586	6.9607	0.1786
83	2020	0.2210	0.7350	0.0471	2.6596	7.0390	0.1803
83	2021	0.2283	0.5475	0.0278	2.9674	7.1179	0.1638
84	2017	0.2175	0.8323	0.0374	2.1739	8.3379	0.3941
84	2018	0.2715	1.2338	0.0417	1.4728	8.4239	0.4230
84	2019	0.2842	0.8533	0.0414	2.4155	8.4141	0.4574
84	2020	0.2461	0.9362	0.0427	1.3569	8.4557	0.5397
84	2021	0.2692	0.7038	0.0386	1.8315	8.4859	0.4392
85	2017	0.0826	0.7526	0.1600	3.9703	8.2162	0.1723
85	2018	0.1139	0.7788	0.0600	3.9512	8.2177	0.1645
85	2019	0.1465	0.9003	0.1500	3.9318	8.2509	0.1528
85	2020	0.1945	1.2190	0.0400	3.9120	8.2695	0.1560
85	2021	0.1736	0.7812	0.0500	3.8918	8.3168	0.1844
86	2017	0.2410	1.5348	0.1400	3.9120	8.3379	0.1592
86	2018	0.1590	1.2537	0.1500	3.8918	8.4239	0.1639
86	2019	0.0644	1.8550	0.1200	3.8712	8.4141	0.1616
86	2020	0.0604	1.6321	0.0900	3.8501	8.4557	0.1578
86	2021	0.0310	3.2957	0.1100	3.8286	8.4859	0.1602
87	2017	0.0279	0.6206	0.0100	4.3944	8.2067	1.8796
87	2018	0.0248	0.6118	0.0200	4.3820	8.2879	1.9617
87	2019	0.0139	1.1138	0.0200	4.3694	8.3768	0.3053
87	2020	0.0019	1.0363	0.0400	4.3567	8.4253	0.3229
87	2021	0.1050	1.5372	0.0600	4.3438	8.4516	0.3466
88	2017	0.0840	1.4935	0.1300	3.1781	7.5576	0.1596
88	2018	0.1331	1.1013	0.1200	3.1355	7.6198	0.1840
88	2019	0.1709	0.7508	0.1300	3.0910	7.5878	0.1786

88	2020	0.0574	0.8794	0.1700	3.0445	7.5652	0.1803
88	2021	0.1230	1.1345	0.2200	2.9957	7.5406	0.1638
89	2017	0.0887	0.5897	0.0400	2.0794	8.0577	0.3941
89	2018	0.0937	0.6198	0.0500	1.9459	8.1238	0.4230
89	2019	0.0986	0.5994	0.0100	1.7918	8.1659	0.4574
89	2020	0.0999	0.7079	0.0100	1.6094	8.2286	0.5397
89	2021	0.1514	0.5240	0.0700	1.3863	8.3287	0.4392
90	2017	0.0609	1.8238	0.1000	3.5835	8.5767	0.2730
90	2018	0.2966	1.5769	0.0800	3.5553	8.6278	0.2832
90	2019	0.2323	1.1119	0.0200	3.5264	8.6514	0.2637
90	2020	0.2298	1.2749	0.3900	3.4965	8.6986	0.2555
90	2021	0.1657	1.3443	0.0600	3.4657	8.7303	0.2764
91	2017	0.0105	0.9830	0.0400	3.9703	8.0019	0.1791
91	2018	0.0572	1.0618	0.1500	3.9512	8.0506	0.1792
91	2019	0.0125	1.7404	0.3100	3.9318	8.0485	0.1845
91	2020	0.0912	1.2006	0.0200	3.9120	8.1428	0.1732
91	2021	0.0185	0.9407	0.1100	3.8918	8.1599	0.1573
92	2017	0.1863	1.3215	0.3500	3.9120	7.9815	0.1099
92	2018	0.0950	0.7600	0.1800	3.8918	8.0263	0.0939
92	2019	0.1526	0.6879	0.3900	3.8712	8.0767	0.0790
92	2020	0.1072	0.9920	0.1900	3.8501	8.1894	0.0509
92	2021	0.0096	1.0697	0.0500	3.8286	8.2824	0.0280
93	2017	0.0175	0.2677	0.1000	4.3944	8.0201	0.1883
93	2018	0.0041	0.3491	0.1100	4.3820	8.0438	0.1551
93	2019	0.1415	0.3323	0.1200	4.3694	7.9725	0.2285
93	2020	0.1548	0.2661	0.0400	4.3567	7.9744	0.1477

93	2021	0.1681	0.3119	0.0500	4.3438	7.9950	0.1451
94	2017	0.0296	1.1178	0.0200	3.1781	8.1877	0.2165
94	2018	0.0382	1.1099	0.0200	3.1355	8.2356	0.2126
94	2019	0.0419	0.9898	0.1900	3.0910	8.2709	0.2277
94	2020	0.0275	0.8495	0.0200	3.0445	8.3291	0.0227
94	2021	0.0570	1.0610	0.0300	2.9957	8.3508	0.1618
95	2017	0.0402	0.8533	0.0900	2.0794	8.3898	0.2345
95	2018	0.0415	0.9362	0.0900	1.9459	8.4802	0.2442
95	2019	0.2296	0.1414	0.1000	1.7918	8.5279	0.2508
95	2020	0.2144	0.1037	0.0400	1.6094	8.5719	0.2355
95	2021	0.1606	1.1535	0.0200	1.3863	8.6261	0.2456
96	2017	0.1440	0.2616	0.0200	2.3571	7.2060	0.2291
96	2018	0.1219	0.2229	0.0200	2.2968	7.1988	0.1463
96	2019	0.0957	0.2479	0.0300	2.6813	7.2236	0.1850
96	2020	0.2794	0.2867	0.0400	2.3480	7.3186	0.1901
96	2021	0.2788	0.2803	0.0300	2.6204	7.3549	0.2111
97	2017	0.1096	0.8533	0.0600	1.3164	7.7230	0.4230
97	2018	0.0593	0.9362	0.1900	1.1960	7.6766	0.4574
97	2019	0.2438	1.1535	0.1900	1.1739	7.5374	0.5397
97	2020	0.1236	0.5988	0.0200	1.2056	7.4993	0.7005
97	2021	0.1261	0.8328	0.0400	1.2276	7.4789	0.2990
98	2017	0.1169	0.9120	0.3000	1.0562	7.6874	0.3184
98	2018	0.0870	1.0407	0.2400	1.0962	7.7237	0.2496
98	2019	0.0850	0.6973	0.2000	1.1120	7.5611	0.1944
98	2020	0.0769	1.0418	0.1700	1.1601	7.6254	0.1599
98	2021	0.0621	0.9047	0.1400	1.1233	7.6188	0.1659

99	2017	0.0665	0.5927	0.0000	4.5106	8.2162	0.2120
99	2018	0.0515	1.1535	0.2000	6.2963	8.2177	0.2018
99	2019	0.0227	0.6937	0.0100	10.0893	8.2509	0.1966
99	2020	0.0227	0.7149	0.0200	4.2579	8.2695	0.2041
99	2021	0.2837	0.5761	0.1200	8.8431	8.3168	0.2041
100	2017	0.0015	1.1737	0.0200	1.1065	7.3921	0.2691
100	2018	0.0337	0.9834	0.0300	1.1464	7.3912	0.1441
100	2019	0.1402	1.3268	0.1300	1.3815	7.4269	0.2078
100	2020	0.0819	1.1912	0.3800	1.5359	7.4953	0.1986
100	2021	0.3061	1.2957	0.0100	1.4639	7.6089	0.1952
101	2017	0.1685	2.6058	0.0500	1.2832	7.7088	0.1125
101	2018	0.2919	1.9871	0.0500	1.1679	7.7925	0.1145
101	2019	0.2136	1.7572	0.0700	1.3048	7.7958	0.1399
101	2020	0.0041	1.5740	0.0500	1.1971	7.8087	0.1534
101	2021	0.0041	1.5548	0.0500	1.1606	7.7387	0.0911
102	2017	0.1179	1.3073	0.0700	1.5853	8.1416	0.2335
102	2018	0.2618	1.2215	0.0600	1.9464	8.2161	0.2649
102	2019	0.1030	2.6804	0.0500	1.0851	8.2482	0.2547
102	2020	0.1341	2.2625	0.0400	1.0237	8.2873	0.2387
102	2021	0.0918	0.6313	0.0300	1.4691	8.2934	0.2597
103	2017	0.0045	1.2513	0.2100	1.9836	7.0270	0.1712
103	2018	0.0527	1.0568	0.0500	1.3339	6.9998	0.1763
103	2019	0.0538	1.2442	0.0500	1.5404	6.9773	0.1904
103	2020	0.0737	0.9423	0.0800	1.2591	6.9368	0.2022
103	2021	0.0201	1.0481	0.0300	1.1154	6.9339	0.2275
104	2017	0.0475	1.0131	0.5700	4.1442	6.8581	0.1351

104	2018	0.0879	1.1560	0.5300	7.9538	6.8614	0.1577
104	2019	0.1244	1.5957	0.0800	8.4745	6.9607	0.1872
104	2020	0.0180	1.3150	0.0600	3.3451	7.0390	0.1620
104	2021	0.0180	1.0811	0.0000	1.9506	7.1179	0.1866
105	2017	0.1605	1.1535	0.0600	1.0966	8.3379	0.2022
105	2018	0.1071	0.7844	0.0700	1.4218	8.4239	0.3213
105	2019	0.0045	1.0194	0.0600	1.4858	8.4141	0.3911
105	2020	0.0225	0.8533	0.0400	1.7358	8.4557	0.1700
105	2021	0.0400	0.9362	0.1200	1.2374	8.4859	0.1534
106	2017	0.0397	1.1157	0.1300	1.9502	8.3379	0.3909
106	2018	0.0421	0.0074	0.1600	1.9346	8.4239	0.1813
106	2019	0.1185	1.2995	0.2000	1.9684	6.7611	0.1769
106	2020	0.0468	1.1102	0.2300	1.2242	6.7943	0.1700
106	2021	0.0662	0.8008	0.0200	1.6434	8.2879	0.1534
107	2017	0.1105	0.9872	0.0600	1.0320	8.2067	0.1885
107	2018	0.0800	0.7481	0.0600	1.9226	8.2879	0.2020
107	2019	0.0468	0.7565	0.1000	1.8973	8.3768	0.1815
107	2020	0.0759	0.7018	0.0800	1.1574	8.4253	0.1858
107	2021	0.2283	0.6975	0.1200	1.5021	8.4516	0.1793
108	2017	0.2214	0.6772	0.1600	1.4648	8.4859	0.2610
108	2018	0.3650	0.9922	0.1400	1.5627	8.3379	0.1625
108	2019	0.0561	0.8564	0.1100	1.4005	8.4239	0.2008
108	2020	0.0168	0.3208	0.1100	1.0634	6.0724	0.1933
108	2021	0.1243	1.1535	0.1700	1.6245	6.5049	0.1915
109	2017	0.1145	2.5763	0.0500	1.7402	7.5107	0.2101
109	2018	0.1364	2.2844	0.0100	4.3944	7.5376	0.1536

109	2019	0.0400	0.2538	0.0900	4.3820	7.5084	0.1801
109	2020	0.0199	0.2260	0.1000	4.3694	7.6403	0.1663
109	2021	0.0111	0.2058	0.0300	2.2050	7.6508	0.1955
110	2017	0.2872	0.8533	0.0500	2.5238	8.3898	0.1945
110	2018	0.0267	0.9362	0.0100	3.3740	8.4802	0.4270
110	2019	0.0035	0.7533	0.0900	2.8332	8.5279	0.3933
110	2020	0.1599	2.0736	0.0300	3.0200	8.5719	0.5708
110	2021	0.1599	0.8535	0.0500	4.4016	8.6261	0.4494
111	2017	0.1966	1.3268	0.0100	2.3280	7.6734	0.4576
111	2018	0.2632	1.1912	0.0700	1.7710	7.7973	0.3498
111	2019	0.0323	1.2957	0.0900	1.8952	7.6170	0.3869
111	2020	0.0706	2.6058	0.0700	2.1309	7.6754	0.3316
111	2021	0.1038	1.9871	0.0800	1.9554	7.6856	0.3093
112	2017	0.1004	1.7572	0.0100	1.2192	7.1251	0.1393
112	2018	0.0773	1.1535	0.0000	1.1561	7.0917	0.1399
112	2019	0.0718	1.1457	0.0800	1.1158	7.1023	0.0715
112	2020	0.0745	1.3058	0.0700	1.0780	7.1695	0.0542
112	2021	0.0365	1.5680	0.2500	1.5236	7.1649	0.0370
113	2017	0.0635	1.6418	0.1400	1.4882	7.4691	0.2104
113	2018	0.0277	1.4860	0.1600	1.2774	7.4211	0.2059
113	2019	0.0882	0.9118	0.0000	1.2997	7.4344	0.2304
113	2020	0.0327	0.7956	0.0100	1.1003	7.4408	0.2227
113	2021	0.0327	0.6188	0.0000	1.6298	7.4577	0.1869
114	2017	0.2284	1.0494	0.0300	1.5950	7.1018	0.2545
114	2018	0.3270	0.7956	0.0100	1.4871	7.0967	0.2412
114	2019	0.2227	0.6495	0.0300	1.2846	7.0904	0.2741

114	2020	0.2210	0.6850	0.0400	1.4099	7.1179	0.2946
114	2021	0.2283	0.8274	0.0300	1.0780	7.1249	0.2853
115	2017	0.2175	0.6214	0.0200	1.5236	7.1984	0.1676
115	2018	0.2715	1.2494	0.0400	1.4882	7.2791	0.1729
115	2019	0.2842	0.9985	0.0600	1.0983	7.3376	0.2216
115	2020	0.2461	1.4241	0.2300	1.0861	7.4162	0.2248
115	2021	0.2692	1.5200	0.0300	2.3685	7.4263	0.3729
116	2017	0.3188	0.5531	0.0300	2.2713	6.5049	0.2056
116	2018	0.3282	0.7350	0.1000	1.8378	7.5107	0.2468
116	2019	0.3134	0.5475	0.0300	2.3583	7.5376	0.2325
116	2020	0.0600	0.8323	0.0400	2.5221	7.5084	0.1646
116	2021	0.0642	1.2338	0.0400	1.3097	7.6403	0.1440
117	2017	0.0383	0.8533	0.1000	1.1747	7.6508	0.1723
117	2018	0.0409	0.9362	0.0000	1.1699	8.3898	0.1870
117	2019	0.1052	0.7038	0.0300	1.1666	8.4802	0.1812
117	2020	0.1249	1.5759	0.0800	1.1380	8.5279	0.1684
117	2021	0.1203	1.5392	0.0300	2.5641	8.5719	0.1723
118	2017	0.2358	2.2120	0.0000	1.0423	8.6261	0.1982
118	2018	0.1874	2.2265	0.0000	1.0590	7.6734	0.2116
118	2019	0.1596	2.2665	0.1100	1.1121	7.7973	0.2091
118	2020	0.1253	3.0110	0.1000	1.1251	7.6170	0.1852
118	2021	0.1372	1.2633	0.0900	1.0611	7.6754	0.1947
119	2017	0.0661	1.1535	0.1600	1.1587	7.6856	0.1071
119	2018	0.0758	1.0683	0.1900	1.1441	7.1251	0.1745
119	2019	0.0722	0.7225	0.2300	1.1447	7.0917	0.1627
119	2020	0.0795	0.5202	0.1900	1.0939	7.1023	0.1265

119	2021	0.0795	1.1515	0.2600	1.0332	7.1695	0.2201
120	2017	0.0868	0.9985	0.2700	1.2705	7.1649	0.2773
120	2018	0.0940	0.8278	0.2300	1.2776	7.4691	0.2164
120	2019	0.0215	0.8314	0.2200	1.1715	7.4211	0.2230
120	2020	0.0961	0.6253	0.0600	1.1658	7.4344	0.2908
120	2021	0.0562	0.9044	0.2300	1.5334	7.4408	0.2111
121	2017	0.0812	0.6952	0.1200	1.6234	7.4577	0.5862
121	2018	0.0910	0.7589	0.0500	1.6385	7.1018	0.2379
121	2019	0.0507	1.1507	0.0600	1.6048	7.0967	0.3868
121	2020	0.0743	0.4991	0.0500	1.5050	7.0904	0.3878
121	2021	0.0581	0.6157	0.0900	1.2653	7.1179	0.3316
122	2017	0.0650	0.9182	0.1300	1.2875	7.1249	0.2908
122	2018	0.0540	1.3433	0.1700	1.2781	7.1984	0.1723
122	2019	0.0468	1.6103	0.1200	1.2225	7.2791	0.2545
122	2020	0.0138	1.8041	0.0400	1.1691	7.3376	0.2274
122	2021	0.0138	1.6465	0.0300	1.1254	7.4162	0.2109
123	2017	0.3482	1.3569	0.0400	1.0996	7.4263	0.1592
123	2018	0.2536	0.5875	0.0498	1.0417	8.2161	0.1639
123	2019	0.0833	1.0541	0.0389	1.2396	8.2482	0.1616
123	2020	0.0851	1.5925	0.0387	2.2624	8.2873	0.1578
123	2021	0.0991	2.1825	0.0360	2.9326	8.2934	0.1602
124	2017	0.2214	1.6103	0.0284	3.5336	7.0270	1.8796
124	2018	0.3650	1.8041	0.0498	2.5000	6.9998	1.9617
124	2019	0.0561	0.8533	0.0389	3.1447	6.9773	0.3053
124	2020	0.0168	0.9362	0.0387	2.5063	6.9368	0.3229
124	2021	0.1243	1.1110	0.0360	2.5000	6.9339	0.3466

125	2017	0.0912	1.4241	0.0284	2.9851	6.8581	0.1596
125	2018	0.1378	1.5200	0.0449	3.0675	6.8614	0.1840
125	2019	0.1111	0.5531	0.0446	2.9586	6.9607	0.1786
125	2020	0.0781	0.7350	0.0471	2.6596	7.0390	0.1803
125	2021	0.0672	0.5475	0.0278	2.9674	7.1179	0.1638
126	2017	0.0664	0.8323	0.0374	2.1739	8.3379	0.3941
126	2018	0.0664	1.2338	0.0417	1.4728	8.4239	0.4230
126	2019	0.0673	0.8533	0.0414	2.4155	8.4141	0.4574
126	2020	0.0547	0.9362	0.0427	1.3569	8.4557	0.5397
126	2021	0.0547	0.7038	0.0386	1.8315	8.4859	0.4392