Fintech, Asset Portfolio Modeling and Financial Performance of Investment Firms in Kenya

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Abstract: The purpose of this study is to determine the influence of fintech asset portfolio modeling on the financial performance of investment firms in Kenya. The study was guided by capital asset pricing model. Both descriptive and explanatory research designs were employed in this study. The study population was 57 investment firms. Data was collected using questionnaires and an in-depth interview guide. The use of robo advice, online asset visualization, use of passive investment funds in managing investment portfolios and asset management services have positive and significant relationship with performance of investment firms. However, automated trading has a positive but insignificant with performance of investment firms. However, personal financial management is negatively and significantly related with performance of investment firms. The study concluded that fintech asset portfolio in the management assets enhance financial performance; however, the services remain underdeveloped in some investment firms. The study thus recommends for the use of fintech asset portfolio in the management firms assets. Robo-advisors may help create an opportunity for asset managers looking for cheaper alternatives to receive advice on how to manage assets.

Key words: Fintech asset portfolio modeling · Financial performance, Investment firms · Kenya

INTRODUCTION

The advancement in financial technology (fintech) services has Financial performance principally reflects business sector outcomes and results that shows overall financial health of the sector over a specific period of time. It indicates that how well an entity is utilizing its resources to maximize the shareholders wealth and profitability [1]. In other words, it is a financial action used in order to generate higher sales, profitability and worth of a business entity for its shareholders through managing its current and non-current assets, financing, equity, revenues and expenses. Its main purpose is to provide complete to the point information to shareholders and stakeholders to encourage them in making decisions. In the current business environment, financial performance of firms is affected by many factors including changes in technologies.

revolution of financial technology (fintech) services has impacted every aspect of financial services of investment firms [2]. Investment firms engage in analyzing, selecting, maintaining, protecting and evaluating the investment assets including financial assets with the objective of achieving set investment goals [3]. However, inefficiency classifying and trading assets of different portfolios characterizes most investment firms.

The asset management segment includes financial technologies that offer advice, disposal and management of assets and aggregated indicators of personal wealth. This segment is also divided into asset visualization, automated investment advice, personal financial management, social trading and robo advice. Social trading is a form of investment in which investors can observe, discuss and copy the investment strategies or portfolios of other members of a social network [4, 5]. Individual investors are supposed to benefit from the collective wisdom of a large number of traders. Depending on the business model of a social trading platform, users can be charged for spreads, order costs, or percentages of the amount invested.

The fintech asset portfolio modeling segment encompasses fintech services that provide investment advice, offering asset visualization services and asset management services [6]. This segment is also divided into asset visualization, personal financial management

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(PFM), social trading and robo-advice [7]. Through social trading an investor is able to monitor and discuss investment portfolios of other entities in the system [8] [5]. Technological assets enable simultaneous access to the business [9]. The robo-advice financial provides automated investment advice in order to make informed business decisions [4]. This is done by considering the level of an investor's resilience to risks [10]. Automated decisions minimize expenses on investment consultants. Through PFMs a customer is able to do asset visualization [11].

The asset management segment includes financial technologies that offer advice, disposal and management of assets and aggregated indicators of personal wealth. This segment is also divided into asset visualization, automated investment advice, personal financial management, social trading and robo advice. Social trading is a form of investment in which investors can observe, discuss and copy the investment strategies or portfolios of other members of a social network [4, 12]. Individual investors are supposed to benefit from the collective wisdom of a large number of traders. Depending on the business model of a social trading platform, users can be charged for spreads, order costs, or percentages of the amount invested.

The robo-advice financial management refers to portfolio management systems that provide algorithm-based and largely automated investment advice, sometimes also making investment decisions [4]. Robo advisers' algorithms are generally based on passive investing and diversification strategies [7]. They consider the investor's risk tolerance, the preferred duration of the investment, as well as other goals [10]. Robo-advice provides necessary information for the customers quickly while reducing workforce costs and costs the customers have to pay for hiring private consultants.

Robo-advisers aim to change the economics and scalability of providing advice, including to traditionally underserved segments. From a business perspective, financial institutions incur lower costs when delivering advice through automated tools because these tools require the employment of fewer people. Additionally, financial institutions offering robo-advice are able to access a wider range of clients that might opt for the use of online channels as opposed to face-to-face interaction or that may have smaller investment portfolios. This type of service also helps firms deliver a more standardized user experience to meet the growing and evolving demands of its consumers [13]. From an investor perspective, robo-advisers provide access to modern portfolio theory-based investing at lower cost and in smaller size than what was previously required. Investors also benefit from the more standardized, mobile-enabled user experience.

Investment firms provide a means through which small savers can pool funds to invest in a variety of financial instruments [14]. In Kenya, the establishment and licensing of Investment firms is done by the Capital Markets Authority (CMA) [15, 16]. These firms are registered as Collective Investment Schemes (CIS) each mandated to operate investment based on the license granted [17]. This study focused at the investment firms that manages asset portfolio for investment purposes.

Theoretical Framework: This paper was guided by capital asset pricing model (CAPM).Capital asset pricing model (CAPM) was postulated separately by [5, 18, 19] and [20] as an extension to the work by [21] on MVPT. The CAPM suggest that the effect of risk on prices is minimal when risk diversification is done by holding different portfolio [22]. Investors should be able to select various portfolios that maximize returns [23, 24]. The scholars in the late 90s, as reported by Business times Francisco (2018), led by [4], employed financial technology to implement theories on portfolio management and CAPM.

The CAPM is based on the idea that not all risks should affect asset prices [25]. In particular, a risk that can be diversified away when held along with other investments in a portfolio is, in a very real way, not a risk at all. The CAPM gives us insights about what kind of risk is related to return [26]. The Capital Asset Pricing Model (CAPM) is used to determine a theoretically appropriate required rate of return of an asset and thus the price could be also expected if firms can estimate the expected cash flows. Sharpe [5] model suggests that investors choose a portfolio that will minimize the variance of portfolio return, given a specific level of expected return, or maximize expected return, given a specific level of variance.

By extending the market portfolio model introduced initially by [27] CAPM states that investors are risk averse investors and will choose a portfolio by trading off between risk and return for one investment period. Therefore, investors will choose the efficient portfolios that minimize the variance of portfolio return, given specific level of expected return, or maximize expected return, given specific level of variance [28]. The model assumes that investors are efficient, risk averse and utility maximizing investors who select points that are located on

the efficient frontier (called the minimum variance frontier) and hence, the portfolio selected depends on investor's risk-return utility function [29]. Therefore, investors choose portfolios for only a single period of investment and focus on the mean and variance of their investment return [30]. The model is applicable to the study as it informs the quantification of possible risks before an investment firm chooses to integrate financial technology in its operations. The integration of financial technology in a firm's operations is associated with possible risks including collapse and incompatibility. The firm therefore must be in a position to identify the risks and possibly manage the risks associated with financial technology.

Investment firms are always involved in portfolio management. The model is applicable to the study by employing fintech in asset management in asset pricing decisions. Portfolio selection entails blending different assets (estate, cash and equities) in order to achieve organizational goals.

Empirical Review of Literature: This section reviews past studies on fintech asset portfolio modeling and financial performance of investment firms. In a study by [31] on the effects of financial technologies on financial services, it was established that financial technology has enabled the use of smart contracts in portfolio asset management. Financial technology provides financial advice, disposal and management of assets. However, the study focused on the effects of financial technologies on financial services and did not link up the effects brought by financial technologies on financial performance. The study contrast current study as it highlighted the effect of fintech services on financial performance. The current study uses mixed method research design contrasting the study that solely employed qualitative research methodology.

Using quantitative methodology, [32] established that fintech services lead to the improvement of firm performance by automating asset management processes. The data was gathered using a structured questionnaire and analysis using structural equation model. The current study mixes questionnaire and interview guide in collecting data and employs structural equation modeling and content analysis technique. In another study, [33] found that asset portfolio modeling through financial technology enhanced effective project selection decisions. However, the study relied only on comprehensive literature review to carry out the study. The study also did not link up asset portfolio modeling and financial performance.

While predicting assets behavior in financial modeling, [34] found that machine learning algorithms facilitate asset visualization in a firm. However, the study concluded that it is not possible to estimate a single model that produces useful results in asset financing model. The study did not also link asset visualization to overall financial performance of the firm. By employing qualitative research design, [32] found that investors need to allocate their assets in term of their tolerance of loss. However, the study did not precisely establish the effects brought by fintech asset portfolio modeling on financial performance. There is need therefore, to predict by measuring the effect of fintech services on financial performance and this is possible by employing quantitative technique.

Thakor [35] conducted a study on fintech and banking. Included in fintech are innovations in payment systems (including crypto currencies), credit markets (including P2P lending) and insurance, with Blockchain-assisted smart contracts playing a role. This paper has reviewed the emerging literature on fintech, with a focus on the interaction between fintech and banking. In the process, numerous issues have been examined with respect to P2P lending, crypto currencies and smart contracts. These issues have been explored in the context of four central questions. The conclusion is that P2P lenders will not replace banks anytime soon, but they will take some market share away from banks when banks are capital-constrained and for borrowers who do not have collateral to offer for secured loans. From the empirical studies critiqued, the study makes a hypothesis that; fintech asset portfolio modeling has no significant influence on performance of investment firms in Kenya. The specific null hypotheses tested are;

H_{01}: Robo advice has no significant influence on performance of investment firm in Kenya.

H_{02}: Online asset visualization has no significant influence on performance of investment firm in Kenya.

H_{03}: Automated trading has no significant influence on performance of investment firm in Kenya.

H_{04}: Passive investment funds have no significant influence on performance of investment firm in Kenya.

H_{05}: Asset management services have no significant influence on performance of investment firm in Kenya.

H_{06}: Personal financial management has no significant influence on performance of investment firm in Kenya.

This paper has been organized into sections. The sections include literature review, review of empirical literature, methodology, data analysis, results and interpretations. Conclusions and recommendations are also presented in this paper.

Research Methodology: The study employed descriptive and explanatory research designs. The target population was 57 investment firms that have integrated fintech in their business operations. The units of analyses were investment firms while the units of observation were the financial managers and managing directors. The study adopted census approach since the population under study was small. Therefore, all the 57 investment firms were included in the study as units of analysis.

Primary data were gathered using a structured questionnaires and in-depth interview guide. Qualitative data were analyzed using content analysis technique. Content analysis categorizes phrases, describe the logical structure of expressions and ascertain associations, connotations, denotations, elocutionary forces and other interpretations. Quantitative data was analyzed using inferential statistics specifically structural equation modeling. The structural equation modeling estimated was:

$$PIC = \alpha + \beta_1 QAPM_1 + \beta_2 APM_2 + \beta_3 APM_3 + \beta_4 APM_4 + \beta_5 APM_5 + \beta_6 APM_6 + \varepsilon$$

where;
PIC is performance of investment firms measured using levels of operational efficiency, client satisfaction and risk management as non-financial indicators of firm performance and return on assets (ROA) and return on equity (ROE) as financial indicators:

α is Constant in the equation; β_{1-6} are Beta coefficients

APM_1 is robo advice measured as the frequency use of robo advice in making informed investment decisions of the firm.

APM_2 is online asset visualization measured as the frequency use of fitech services in mapping value of assets.

APM_3 is automated trading measured as the amount of value of funds generated through online business transaction.

APM_4 is passive investment funds measured using market-weighted index or portfolio of assets traded.

APM_5 is asset management services measured through the number of platforms available to manage firm assets.

APM_6 is personal financial management measured as the frequency and value of funds managed through personal financial digital platform.

ε is error term.

RESULTS AND DISCUSSION

Demographics for the Respondents: The study sought to describe the profile information of the participants of the study. The profile information includes gender, level of education, position, work experience and department. This was inspired by the need to establish whether there exists any close relationship among participants' profile information, financial technology and performance of investment companies. The profile information of the participants is presented in Table 1.

The results in Table 1 indicate that majority 62.3% of financial managers were males while 37.7% were females. The results imply that majority of workers in the target investment companies were males. Gender disparity has been common at the work place where some organizations having more of particular gender compared to the other. In the past, women were less at the work places; however, the trend has changed with more working than before.

Further, level of education, majority 54.7% had bachelors level of education, 22.6% had masters, 11.3% while 11.3% had diploma. The study imply that investment companies employ first level graduates with other personnel being drawn from diploma colleges and advances level of education including masters and PhDs. Level of education describes the level of soft and technical skills required to enhance firm performance.

The study also found that majority 54.7% had worked in the company for 6-9 years, 20.8% for 10-13 years, 13.2% for over 14 years and 11.3% for less than 5 years. Years of work may determine the level of experience and expertise possessed by employees. Work experience may enhance the performance of investment companies. However, according to [39] work experience is negatively related to firm performance.

Structural Equation Model of Asset Portfolio Modeling and Performance of Investment Firms: The objective of the paper was to assess the influence of fintech asset portfolio modeling on the performance of investment firms in Kenya. The structural equation modeling results presented in Table 2 show that the influence of fintech

Table 1: Demographics for the respondents

Profile information of the participants	Frequency	Percent
Gender		
Male	33	62.3
Female	20	37.7
Level of education		
Diploma	6	11.3
Bachelors	29	54.7
Masters	12	22.6
PhD	6	11.3
Work experience		
Less than 5 years	6	11.3
6-9 years	29	54.7
10-13 years	11	20.8
Over 14 years	7	13.2

Table 2: Structural Equation Model of Asset Portfolio Modeling and Performance of Investment firms

		Variable	Estimate	S.E.	C.R.	P-value
APM1	→	Firm performance	0.207	0.079	2.616	0.009**
APM2	→	Firm performance	0.300	0.080	3.733	0.001**
APM3	→	Firm performance	0.099	0.076	1.304	0.192
APM4	→	Firm performance	0.239	0.081	2.964	0.003**
APM5	→	Firm performance	0.177	0.061	2.891	0.004**
APM6	→	Firm performance	-0.168	0.056	-2.988	0.003**
		Estimate				
Squared correlation		0.670				

**Significant at 0.05

Where: APM_1 is robo advice. APM_2 is online asset visualization. APM_3 is automated trading. APM_4 is passive investment funds. APM_5 is asset management services. APM_6 is personal financial management

$$Firm\ Performance = 0.128 + 0.207APM_1 + 0.300APM_2 + 0.099APM_3 + 0.239APM_4 + 0.177APM_5 - 0.168APM_6$$

asset portfolio modeling on performance of investment firms was significant ($R^2=0.670$, p<0.05), implying that 67.0 percent of variation in performance of investment firms is explained by fintech asset portfolio modeling. The measurement that robo advice making investment easier for fintech firms by providing automated investment advice is positively and significantly with performance of investment firms ($\beta=0.207$, P<0.05). The beta coefficient of 0.207 suggests that a unit change in the use of robo advice is associated with 0.207 unit change in performance of investment firms. Online asset visualization ($\beta=0.300$, P<0.05) and performance of investment firms have a positive and significant relationship implying that a unit change improvement in online asset visualization results with 0.300 unit change in performance of investment firms.

Automated trading has a positive but insignificant with performance of investment firms ($\beta=0.099$, P>0.05). Passive investment funds becoming more popular than traditionally in managing investment portfolios is positively and significantly related with performance of investment firms ($\beta=0.239$, P<0.05). Thus, a unit changes

improvement in online asset visualization results with 0.239 unit change in performance of investment firms. Further, the statement that fintech technology is helping the firm reduce management costs and offer asset management services to a larger group of customers at ease also has a positive and significant ($\beta=0.177$, P<0.05) relationship with performance of investment firms implying that a unit change in the reduction of management costs results with 0.177 unit change in performance of investment firms. Personal financial management is negatively and significantly related with performance of investment firms ($\beta=-0.168$, p<0.05). The beta coefficient of 0.168 suggests that a unit change reduction in personal financial management results to a unit reduction of the performance of investment firms by 0.168 units. In an interview with firm managing directors; one participant noted;

"...the use of asset visualization has spurred growth of investment firms. Through social trading, the firm is able to monitor growth of investment assets. The robo-advice financial provides automated

investment advice in order to make informed business decisions" Managing Director 1 [Key Informant, 2019]

The fintech asset portfolio modeling segment encompasses fintech services that provide investment advice, offering asset visualization services and asset management services. This segment is also divided into asset visualization, personal financial management (PFM), social trading and robo-advice. Asset managers should provide transparency of trade-offs between cost, risk and performance during the whole life of the asset. The traditional assets management has been criticized for non-transparent fee structure and conflicts of interest. Through social trading an investor is able to monitor and discuss investment portfolios of other entities in the system. Technological assets enable simultaneous access to the business. The robo-advice financial provides automated investment advice in order to make informed business decisions. Robo-Advisors engages individuals with digital tools featuring advanced customer experience, to guide them through a self- assessment process and shape their investment behavior towards rudimentary goal-based decision-making, conveniently supported by portfolio rebalancing techniques using trading algorithms based on passive investments and diversification strategies. Automated decisions minimize expenses on investment consultants. Through PFMs a customer is able to do asset visualization.

Fintech also offers a new approach to data management e sharing, offering the opportunity to improve efficiency afflicting the financial services industry. In this new architecture, all participants work from common datasets, in near real-time and supporting operations are either streamlined or made redundant. Faster interbank clearing and settlement, lower transaction costs, reduced counterparty risk and increased transparency are only a few examples of the possible benefits of such technology. Fintech can change the financial industry, including much of the fund industry, by facilitating disintermediation through greater transparency and tracking of transactions and assets records, which will certainly be the basis for further innovation and transformation. The results agree with [36] that financial technology provides financial advice, disposal and management of assets. The results are also in line with [37] established that fintech services lead to the improvement of firm performance by automating asset management processes. According to [33] found that asset portfolio modeling through financial technology enhanced effective project selection decisions. Abdullah

et al. [8] and Fan and Suh [38] noted that financial technology has been employed in asset management including unit trust.

CONCLUSIONS

Conclusions of the study are based on study objectives. The study concludes that fintech asset portfolio modeling is vital in the management of firm's investment assets. The use of robo advice in making investment decisions has a positive and significant relationship with performance of investment firms. Online asset visualization and performance of investment firms have a positive and significant relationship. Automated trading has a positive but insignificant with performance of investment firms. The use of passive investment funds in managing investment portfolios has a positive and significant relationship with performance of investment firms. Asset management services also have a positive and significant relationship with performance of investment firms. However, personal financial management is negatively and significantly related with performance of investment firms.

Financial technology is a key component of asset management, integral to many aspects of the investment process including trading, risk management, operations and client service. A robust asset management process requires specific fintech technologies that include automated investment advices, asset visualization and social trading. The use of proven investment and risk management systems provides significant benefits to the financial system. Integrated investment technology enhances the growth of investment assets, supports consistent investment workflows and enables timely communications with both internal functions and external parties. Fintech asset portfolio modeling supports asset managers in the decision making process, primarily by organizing up-to-date and critical data on portfolios including whether holdings comply with client stipulated investment guidelines, risk exposures and risk analytics. However, technology does not tell financial managers on what to do rather fintech asset portfolio modeling helps investment professionals measure their risks relative to the risk and return objectives specified by clients.

Implications of the Findings and Recommendations: In the study it was revealed that fintech asset portfolio modeling is vital in the management of firm's investment assets. Some of the fintech asset portfolio modeling included automated investment advices, asset visualization and social trading. The conclusion that

fintech asset portfolio modeling influences performance of investment firms adds to the postulation of Capital Asset Pricing Model. Capital Asset Pricing Model is a finance theory suggesting that the effect of risk on prices is minimal when risk diversification is done by holding different portfolio. Investors must able to select various portfolios that maximize returns. Investment firms are always involved in portfolio management and must be able to make proper asset pricing decisions for maximum investment returns.

The study revealed that asset portfolio management is one of the core functions of investment firms. Some of the firm's assets include financial assets, immovable assets and data. These assets are large and complex and thus must be kept and aligned with firm investment goals. The study thus recommends for the use of fintech asset portfolio in the management firms assets. Robo-advisors may help create an opportunity for asset managers looking for cheaper alternatives to receive advice on how to manage their assets. However, robo-advisory has been criticized for a number of inherent flaws. Robo advisory system allows the investor to give only restricted information related to their investment needs, but it ignores key information, e.g. monthly expense and other source of wealth. In addition, it focuses on superficial information therefore the human evaluates investment needs and circumstances in a better way than Robo-Advisor. Moreover, Paolo Sodini, the Co-founder of Advinans (Robo-Advisory company) in Sweden mentions that Robo part is significant, since it decreases the cost and increases work efficiency, but the advisory part still needs a transformation [4].

Successful asset management firms will adapt product management and marketing strategies to the mentality of this new generation of investors. The investment portfolios of asset management firms will need to be further adapted to socially responsible investment products. Investment firms may need to think through new ways to give their retail investors of this category access to alternative investments and asset classes beyond traditional fixed income and equities, as well as active strategies. As this technology is coming and will make fundamental changes to the asset management industry, investment firms may need to restructure their core processes, systems and asset management infrastructure.

This study established that fintech asset portfolio modeling has influenced the way businesses and commerce is conducted with several benefits. However, growth of fintech in Kenya has been marred with policy and regulatory barriers. The country lack necessary infrastructure and human capital to spur the growth of fintech asset portfolio modeling in the country. Policy recommendations need to be created by Ministry of Communication and technology in collaboration with Communication Authority of Kenya and investors to fintech infrastructural requirements. Institutions of higher learning institutions need to be equipped with sufficient capacity development in terms of training and fintech labs where innovation ideas are created and tested.

ACKNOWLEDGEMENTS

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