LITERATURE REVIEW AND COMPETITOR ANALYSIS

MScFE Capstone Project

Author(s) – email address

Lionel NDATIMANA- lionelserge2020@gmail.com

Eliezer NIYITEGEKA- niyitegekaeliezer@outlook.com

Christophe GATETE- gatetechristophe@gmail.com

17th September 2024

Contents

FINANCIAL MARKET CHARACTERISTICS ANALYSIS: A QUANTITATIVE STUDY OF VOLATILITY, LIQUIDITY AND CORRELATION

Github link: https://github.com/Lioneln25/Capstone-.git

Introduction

Financial markets show a range of statistical attributes like volatility, access to liquidity and asset correlation which are necessary for the decision- making processes of traders, analysts and regulators. Even with the infinite amount of financial data available, statistical tools are often not immensely used to get significant comprehensions from financial data. This is quite applicable when gauging volatility, trade volumes and asset correlations. This research plan to use statistical tactics to study financial features, thereby increasing risk assessment, market performance and forecasting.

Problem statement

Financial markets demonstrate challenging statistical physiognomies that are vital for investment schemes, risk control and policy construction. Market dynamics are usually characterized by volatility, liquidity and asset correlation. Regardless of the surplus of accessible financial data, a prominent difference occasionally exists between availability of data and the exploitation of demanding statistical procedures to obtain substantial insights. The issue comes from the disorganized organization up-to-date study, in which volatility, liquidity and correlations are commonly scrutinized individually, comprehension of how these market characteristics intermingle and influence processes for decision making. Both analysts and investors need a more cohesive approach to market analysis that takes into account the same effects of these crucial aspects. Developed methods are important to evaluate the effect of market volatility on liquidity and to control asset correlations for various advantages. The recent research inefficiently discovers these connections, making a hindrance for market players depend on comprehensive perceptions for effective risk assessment and optimization of portfolios. This research intends to fill this gap by using various statistical methods to examine financial market volatility, trading volume as a measure of liquidity and asset correlation within a unified approach. The aim is to detect ways and relationships that increase decision-making, stimulate market efficiency and produce actionable visions for risk management and trend analysis. This sequence will increase understanding of financial markets and give practical tactics for finding a way their details through analysis of joined mechanisms.

Literature Review

Specialists such as Lan and Tan (2007) and Yu and Huang (2004) have carried out research on the statistical physiognomies of stock market indexes and market volatility across many industries and economies. Lan and Tan (2007) carried out a survey of the statistical manner of stock markets in many economies, meanwhile Yu and Huang (2004) examined volatility through fractal proportions. To add on, foundational models that were developed by Engle (1982) on autoregressive conditional heteroscedasticity (ARCH) and Bollerslev's (1986) prolonged variant (GARCH) have been successful in interpreting volatility dynamics. Regardless of the progress shown, many limitations still continue in the recent study, mainly in studies that examine the same asset correlations, liquidity and volatility.

Mandelbrot (1963) was the earliest to accentuate the erratic variations in speculative pricing, showing that financial markets move from the tenets of normal distribution. French, Schwert and Stambaugh (1987) performed a deeper investigation of the connections between stock returns and volatility. The interactions of volatility, liquidity and correlations is under analysed, specifically regarding its importance for real-time market decision- making processes. Their research has increased the knowledge of volatility while also at the same time evolving the understanding of it. The disparities and configurations in liquidity will be disclosed.

Markowitz (1952) is certain that asset correlations imitate the homogeneous movement of dissimilar financial assets, therefore giving investors acumens into many different approaches. This study will give novel acumens into market efficacy and handling various portfolios (Fama & French, 1993).

Competitor Analysis

Several readings have focused on the individual analysis of market volatility, liquidity, and asset correlations to confront associated research questions. Jensen (1975) evaluated capital asset pricing, yielding relevant comprehensions on risk and portfolio organization. The Capital Asset Pricing Model (CAPM), suggested by Sharpe in 1964, explains the relationship between market risk and expected profit. Liu and Strong (2008) have finished research evaluating preferences in portfolio building related with decreasing ancient profit. These researches, while giving relevant data, unsuccessfully to contemporarily examine market features in a incorporated manner. This study main objective is to provide a thoroughly synopsis of market

dynamics by joining results from various statistical approaches. This differentiates it from the recent researches carried out.

Methodology

The past market indices, trade volumes and asset prices will be examined to gain the needed data for a far-reaching evaluation. Bollerslev (1986) struggles those statistical methods, including time-series analysis and GARCH models, will be used to examine volatility. The benefits of range will be studied by the analysis of asset correlations using correlation mediums, a tactic first presented by Markowitz (1952) in portfolio selection. To examine liquidity patterns, it is important to check changes in transaction volume over time and far ahead link these changes with volatility trends (Poon & Granger, 2003).

Results and Discussion

The research will show prominent outlines in market volatility and changes in liquidity that possibly will bring into line with times of increased market uncertainty (French, Schwert & Stambaugh, 1987). The instabilities and trends in liquidity will be discovered. Markowitz (1952) affirms that asset correlations show the co-movement of many financial apparatuses, henceforth offering investors with acumens on modifications techniques. This study will give perceptions into market efficiency and handling portfolios (Fama & French, 1993). These latest discoveries will show a relationship between volatility, liquidity and correlation.

Conclusion

This research increases understanding of financial market traits, involving volatility, liquidity and asset correlations. The research evaluates the bridge between the profusion of market data and its successful use in decision-making by fully utilizing erudite statistical methods. This study inspects the inequality. Engle (1982) proposes that coming study might construct upon these discoveries by examining the effect of outer economic weights on market features.

REFERENCES

Bollerslev, T. (1986, April). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics, 31*(3), 307-327. doi:https://doi.org/10.1016/0304-4076(86)90063-1

Engle, R. F. (1982, July). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation. *Econometrica, 50*(4), 987-1007. doi:https://doi.org/10.2307/1912773

Hunter, J. (2007). Matplotlib: A 2D graphics environment. *Computing in science & engineering, 9*(3), 90-95. doi:http://dx.doi.org/10.1109/MCSE.2007.55

Kenneth R. French, G.William Schwert, Robert F. Stambaugh. . (1987, September). Expected stock returns and volatility. *Journal of Financial Economics, 19*(1), 3-29. doi:https://doi.org/10.1016/0304-405X(87)90026-2

Lan, B. L. (2007). Statistical properties of stock market indices of different economies. *Physica A: Statistical Mechanics and its Applications, 375*(2), 605 - 611. doi:DOI: 10.1016/j.physa.2006.10.028

Mandelbrot, B. (1963). The Variation of Certain speculative prices. *The Journal of Business, 36*(4), 394-419. doi:DOI: 10.1086/294632

Markowitz, H. (1952, March). Portfolio Selection. *The Journal of Finance, 7*(1), 77-91. doi:https://doi.org/10.2307/2975974

Mckinney, W. (2011). pandas: a Foundational Python Library for Data Analysis and Statistics. *Python High Performance Science Computer, 14*(9). Retrieved from https://www.researchgate.net/publication/265194455_pandas_a_Foundational_Python _Library_for_Data_Analysis_and_Statistics

Poon, S. H. (2003). Forecasting volatility in financial markets: A review. *Journal of economic literature, 41*(1), 478-539. doi:DOI: 10.1257/002205103765762743

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The journal of finance, 19*(3), 4255-442. doi:https://doi.org/10.2307/2977928

Waskom, M. L. (2021). seaborn: statistical data visualization. *Journal of Open Source Software, 6*(60), 3021. doi: 10.21105/joss.03021

Yu, H. C. (2004). Statistical properties of volatility in fractal dimensions and probability distribution among six stock markets. *Applied Financial Economics, 14*(15), 1087-1095. doi:10.1080/0960310041233129769