

“Financial evaluation of Tadawul All Share Index (TASI) listed stocks using Capital Asset Pricing Model”

AUTHORS

Nisa Vinodkumar  <https://orcid.org/0000-0002-6867-3637>
Hadeel Khalid AlJasser

ARTICLE INFO

Nisa Vinodkumar and Hadeel Khalid AlJasser (2020). Financial evaluation of Tadawul All Share Index (TASI) listed stocks using Capital Asset Pricing Model. *Investment Management and Financial Innovations*, 17(2), 69-75.
doi:[10.21511/imfi.17\(2\).2020.06](https://doi.org/10.21511/imfi.17(2).2020.06)

DOI

[http://dx.doi.org/10.21511/imfi.17\(2\).2020.06](http://dx.doi.org/10.21511/imfi.17(2).2020.06)

RELEASED ON

Friday, 15 May 2020

RECEIVED ON

Saturday, 30 November 2019

ACCEPTED ON

Thursday, 07 May 2020

LICENSE



This work is licensed under a [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

JOURNAL

"Investment Management and Financial Innovations"

ISSN PRINT

1810-4967

ISSN ONLINE

1812-9358

PUBLISHER

LLC “Consulting Publishing Company “Business Perspectives”

FOUNDER

LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

32



NUMBER OF FIGURES

0



NUMBER OF TABLES

4

© The author(s) 2025. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 30th of November, 2019

Accepted on: 7th of May, 2020

Published on: 15th of May, 2020

© Nisa Vinodkumar, Hadeel Khalid Aljasser, 2020

Nisa Vinodkumar, Ph.D., Assistant Professor in Finance, College of Business Administration, Princess Nourah bint Abdulrahman University, Kingdom of Saudi Arabia (KSA). (Corresponding author)

Hadeel Khalid Aljasser, Lecturer in Finance, College of Business Administration, Princess Nourah bint Abdulrahman University, Kingdom of Saudi Arabia (KSA).



This is an Open Access article, distributed under the terms of the [Creative Commons Attribution 4.0 International](https://creativecommons.org/licenses/by/4.0/) license, which permits unrestricted re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

Conflict of interest statement:

Author(s) reported no conflict of interest

Nisa Vinodkumar (Kingdom of Saudi Arabia),
Hadeel Khalid Aljasser (Kingdom of Saudi Arabia)

FINANCIAL EVALUATION OF TADAWUL ALL SHARE INDEX (TASI) LISTED STOCKS USING CAPITAL ASSET PRICING MODEL

Abstract

The Kingdom of Saudi Arabia is strongly committed to stimulating savings culture in the local community by providing financial literacy in financial planning, investments, and budgeting. Inculcating the savings and investment behavior among the people will help materialize one of the elements of Saudi Vision 2030. Tadawul, being the most liquid stock market in the Middle East and North Africa, offers investors the ability to grow their capital with confidence through facilitating trading in different securities such as equities, debt instruments, and Exchange Traded Funds (ETFs). There is a great scope for investors to invest in the companies listed in Tadawul All Share Index (TASI) due to its strong economic fundamentals. The present study aims to apply the CAPM in Tadawul listed stocks, which will help in understanding the systematic and unsystematic risk associated with stocks, understanding their actual and theoretical return on stocks. The methodology adopted is the analysis of secondary data for all listed stocks in Tadawul using the Bloomberg terminal. The financial valuation includes elements like beta, alpha, correlation and standard deviation, expected return and actual return. The practical value obtained from the study will help investors go for undervalued stocks with lower beta, higher expected annual return, and lower systematic risks. Thus, the result shows the predicting power in KSA market and the scope for long-term investments by the investors to boost their savings and investment behavior and materialize one element of Vision 2030.

Keywords

financial savings, financial investment, financial literacy, financial evaluation, risk and return, beta, Capital Asset Pricing Model, savings culture, Saudi Vision 2030

JEL Classification

G10, G14

INTRODUCTION

Saudi Arabia's Vision 2030 is an important opportunity for its national and international financial community because it concerns creating a favorable economic environment for sustainable economic growth in the Kingdom of Saudi Arabia (KSA), which will fulfill the population's aspirations. One of the key pillars of the reform process is to develop the KSA capital markets to enable the economy to develop and diversify. The equity markets in KSA are already valued at USD 538 billion and are the largest in the region (Tadawul Annual Report, 2019). KSA's Capital Market Law seeks to enhance the Capital Market Authority's (CMA's) role in protecting the rights of investors through amendments. The CMA also prioritizes the review and continuous improvement of the regulatory environment based on their importance and impact on the growth and development of the capital market and its institutions. This approach will help the CMA achieve its vision for the Saudi capital market to become the leading market in the Middle East and rank among the top ten markets in the world.

The Saudi Stock Exchange, the central pillar of the Saudi economy, seeks to create a thriving economy by investing for the long term, and

diversification of income is vital to its sustainability. The Exchange's responsibility is to offer sound, efficient, and attractive capital market products and services that deliver superior value to market participants and stakeholders. The Saudi government focuses on the positive fundamentals of its economy and is ready to provide an unprecedented opportunity to investors who are willing to grow their assets. Specific regulations and initiatives are occasionally implemented by Saudi regulatory entities to enable all companies to go public and encourage its people to choose capital markets as one of their long-term investment avenues. The regulatory reforms in the KSA market have led to the inclusion of Saudi Arabia's stock market in the emerging market index of leading global indexes. This inclusion is expected to generate up to USD 17 billion of passive capital flows and USD 40 billion of active capital flows by 2020.

Thus, after reviewing previous studies done on Tadawul listed stocks, the researcher felt compelled to evaluate all stocks listed in Tadawul and understand the nature of their valuation in the market. Such an evaluation will help Tadawul and its investors identify undervalued stocks, their beta, their annual return, and their systematic risks, and then be capable of making investment decisions for investors, accordingly. This research aims to apply the CAPM in Tadawul listed stocks, which will help in understanding the systematic and unsystematic risk associated with stocks, understanding their actual and theoretical return on stocks. The data of all the companies listed in Tadawul were obtained using the Bloomberg terminal. The data were analyzed comparing the beta, alpha, correlation and standard deviation values, respectively. The result has been tabulated into undervalued and overvalued stocks. The result also shows the predicting power in KSA market and the scope for long-term investments by the investors to boost their savings and investment behavior.

The TASI of Kingdom of Saudi Arabia is heavily weighted towards the financial services and the energy sectors and as a whole, it provides the investors with fairly well rounded exposure to the country's economy. The Saudi government is actively working on diversification of its economy by promoting growth through privatization to make the country a very attractive long-term investment destination for local and international investors. The CAPM analysis for all the stocks listed in Tadawul will add value to the investors seeking to invest in the sectoral stocks listed in TASI. The information about the financial valuation of stocks listed in TASI will help investors pool their funds into this attractive destination, which aims to become a long-term sustainable economy in the world.

1. LITERATURE REVIEW

The CAPM is one of the fundamental and most influential concepts in modern finance that relates the expected returns of an asset with the beta value that serves as a measure of asset's non-diversifiable systematic risk (Zabarankin, Pavlikov, & Uryasev, 2013; Bodie, Kane, & Marcus, 2012). The risk-return relationship, types of risks associated with equities have all been researched well in academia with the introduction of CAPM (Reilly & Brown, 2003). Various types of risks like operation risk, financial risk, business risk, management risk, marketability risk, and events risk have been researched to understand the impact of diversification on returns (Gitman & Zutter, 2011). Among the past academic researches, the most famous and early papers were presented by researchers

who revealed in their studies that there is a significant relationship between beta and expected returns as per the CAPM (Sharpe, 1964; Black, 1972; Lyn & Zychowicz, 2004; Ramcharan, 2004).

The financial professionals and academics have extensively researched it in the context of global equity markets also. The validity of the CAPM has been extensively tested in developed markets and in Asian markets (Beach, 2011), and few studies in other emerging markets (Gitman & Zutter, 2011). Amenc and Le Sourd (2003) in the study had focused on the application of CAPM in the emerging capital markets and how its analyzed results would support the nature of higher risk (beta) and its association with higher returns, which is significant in the long run. Researchers have also pointed to the fact that the stock returns are

directly related to the book to market ratio (Barry, Goldreyer, Lockwood, & Rodriguez, 2002; Drew, Naughtonand, & Veeraraghavan, 2003). Shaker and Elgiziry (2014), on the other hand, focused on the applicability of the alternatives of asset pricing models in the stock markets. Bhatnagar and Ramlogan (2012) focused on the performance and evaluation of CAPM in developed economies and its application using multiple regression tools. The analyzed results from various researches have all focused on the presence of many factors that affected the volatility of returns due to their conditioning in stock exchanges. Al-Zubi and Salameh (2009) researched the correlation between systematic risk and expected return in their selected portfolio. The analyzed data showed that a well-diversified portfolio is a substitute for a market index, which makes beta a relevant tool to assess portfolio performance.

Wang and Di Iorio (2007) focused on the performance of cost of capital using CAPM. The study estimated the most important factors from business cycle and concluded on the application of its results using CAPM in the long run. The cross-sectional analysis of variation in the expected return of security as a function of three factors: market risk, firm size, and book to market ratio, were done by Fama in 2013. Shaker and Elgiziry (2014) focused on the applicability of the size and book-to-market equity and its effect on the risk premium, as well as the variations in beta. Reddy and Thomson (2011) investigated the CAPM and explained to what extent it is useful in providing a necessary base for financial modeling. Shams, Abshari, Kordlouie, Naghshineh, and Gholipour (2014) researched on how CAPM helps globally to enhance the savings of the corporates. All these focus on the goodness of CAPM from the perspective of firms' performance in the corporate sector of the developing economies.

Drew and Veeraraghavan (2001) highlighted the relative efficacy of CAPM to predict the returns in the selected contexts like consumer demand, inflation, interest rates, economic growth, and real estate. The result revealed a remarkable contribution to academic studies from different thought-provoking perspectives. Chen, Kan, and Anderson (2008) focused on the performance of the CAPM over other models. The results showed that CAPM

contributes to profitability and provides a better risk-return relationship. Eraslan (2013) focused on the applicability of CAPM in assessing the existence of a significant relationship during the periods of positive market risk premium only.

Studies have been conducted on the applicability of CAPM from the perspective of behavioral finance. Shams et al. (2014) focused on the challenges of applying asset pricing and valuation models from the perspective of practitioners in emerging capital markets. Ibbotson, Idzorek, Kaplan, and Xiong (2018) had reviewed the existing research volumes on financial literature that focused on behavioral finance. Their study revealed that market premiums and investments are based on something that is explained as unpopular. The risk-return perspective from the behavioral finance perspective has paved the way for the introduction of a new formal asset-pricing model called the popularity asset-pricing model (PAPM). PAPM extends the CAPM to include all types of preferences. It is a framework proposed by Ibbotson, Diermeier, and Siegel (Financial Analysts Journal, 1984). Ibbotson et al. (2018) focused on the term "popularity" as a factor that drives demand and explains anomalies in the stock market.

Neoclassical economics provides the rationality framework for efficient capital markets, while behavioral economics provides the framework for rational behavior with prospect theory. In classical finance, rational investors prefer stocks depending on market liquidity, favorable economic conditions, asset valuation, etc., while in behavioral finance, investors' preferences go beyond rational behavior like psychological and cognitive. Thus researches have shown that popularity represents all of the investors' preferences, from rational to irrational, and acts as a bridge between classical and behavioral finance. Thus, it unifies the driving factors, which have an impact on the price of a stock in the behavioral asset pricing world.

Thus, the literature review related to CAPM shows the broader perspective of its uses and where all it can be utilized. CAPM is considered an effective model to help understand the valuation of stocks into overvalued or undervalued. The literature sheds light on the applicability of CAPM from the emerging capital market perspective, academic

perspective, behavioral finance perspective, firm financial performance perspective, and classical v/s behavioral finance perspective. All these shed light on the relevance of CAPM to the present study, which is applied to all stocks listed in Tadawul (the Saudi Stock Market Index). The data for the same are collected from the Bloomberg database and have been analyzed using the Excel sheet.

2. AIMS

The present study intends to apply the CAPM in the stocks listed in TASI, which will help in understanding the systematic and unsystematic risk associated with stocks, their actual and theoretical return on stocks, and then classifying the analyzed results into overvalued and undervalued stocks. The objectives of the study include the following:

- 1) understanding the risk and return trade-off of all the stocks listed in TASI (2019 data);
- 2) the application of Capital Asset Pricing Model in determining the financial valuation of all listed stocks in TASI;
- 3) to classify the analyzed results into undervalued or overvalued category.

3. METHODS

The researchers used primary data and secondary data for extracting the data suitable for the computation of CAPM. The data were collected from Tadawul website, Bloomberg site, and were used for further analysis. The database of 189 companies listed in Tadawul was analyzed to find out the valuation of the stocks and then classify them into overvalued and undervalued stocks, respectively. The financial valuation of the stocks was done by extracting the financial data from the Excel sheet. The annual return of the stocks was computed in the Excel sheet. The opening and closing prices of the stocks for 2019 were taken as the base year to compute the historical return (actual return). The values of beta, standard deviation, and alpha were extracted from Bloomberg and tabulated in the Excel sheet to facilitate easy comparison across all

the listed securities. The expected return of each stock was computed using the CAPM. The beta value shows the systematic risk (uncontrollable) associated with the stocks. Standard deviation shows the unsystematic risks (controllable) associated with the stocks. Then, there is the comparison of actual return with the expected return for each of the listed securities. The stocks are said to be undervalued when the value of actual return is greater than the value of its expected return (computed using CAPM). The stocks are said to be overvalued when the value of actual return is lower than the value of its expected return (computed using CAPM). Theoretical perspective of undervalued and overvalued stocks, as explained during insecurity analysis and portfolio management, is that investors prefer undervalued stocks for investment (buying criteria), and the overvalued stocks are preferred to be sold in the market.

4. RESULTS

The computation of expected return for each of the 189 companies listed in Tadawul has been done, assessed, and analyzed to find out the number of undervalued and overvalued stocks.

Table 1. Valuation of stocks listed in Tadawul as of 2019

Number of stocks listed in Tadawul (2019)	Overvalued (number of companies)	Undervalued (number of companies)
189	148	41
Percentage	78%	22%

Table 1 shows the valuation of stock based on Capital Asset Pricing Model. The result of the analysis shows that 78% of stocks are overvalued compared to 22% of stocks, which are undervalued.

Beta (β) is a measure of a stock's volatility in relation to the market. The stock market has a beta of 1, and individual stocks are ranked according to how much they deviate from the market. As the concept of risk is hard to factor into stock analysis and valuation, Table 2 shows the stocks' price risk profile. It shows the measure of systematic risk attached to each company, the factors which are uncontrollable and beyond the control of company management.

Table 2. Beta (β) value of stocks listed in Tadawul as of 2019

Number of stocks with negative β	Number of stocks with β less than 0.5	Number of stocks with β from 0.5 to 0.9	Number of stocks with β equal to 1	Number of stocks with β greater than 1
6	53	104	9	17
3.17%	28.04%	55.02%	4.76%	8.99%

The analysis of the value of β shows that 3.17% of stocks listed in Tadawul have a negative beta, which shows the existence of other factors apart from the quantitative factors that contribute towards the pricing of stocks and their behavior. 28% of the stocks have a low volatility value for beta, 55% of the stocks with moderate volatility, and 13% of the remaining stocks with beta equal to and greater than one, which exhibits higher volatility.

Alpha measures the value of excess return on an investment relative to the return on a benchmark index. It is an indicator of investment performance. An alpha greater than zero means the stock outperformed. In modern financial markets where index funds are widely available for purchase, the value of alpha is used to judge the performance of mutual funds and similar investments. It is the mathematical estimate of the return based on the growth of earnings per share. A positive alpha of 1 means the stock has outperformed its benchmark index by 1 percent, and the negative alpha of 1 indicates an underperformance of 1 percent.

Correlation is the statistical relationship between two random variables that determine the degree to which a pair of variables are linearly related. Correlation coefficient formulae are used to find how strong a relationship is between the data. The formulae return a value between -1 and 1, where 1 indicates a strong positive relationship, -1 indicates a strong negative relationship, and 0 indicates no relationship at all.

The analysis of 189 companies listed in Tadawul and the relationship of individual stock return to stock market return shows the degree to which changes in the value of one variable (dependent) predicts the changes in another independent variable. The data analysis of the correlation value for 189 companies depicts the existence of positive but weak correlation between stock and stock market return for 80% of the stocks listed in Tadawul. 16.4% of the stocks have a moderate correlation with stock market returns.

5. DISCUSSION

The following are the inferences drawn from the analysis of financial valuation of TASI listed stocks referring to Tables 1 to 4, respectively.

Only 22 percent of the stocks are undervalued and are the suggested option for investors for designing their long-term investment strategy. The existence of riskier stocks has the potential to generate higher returns in the bull market and with strong economic and industry-focused indicators. The unsystematic risks of the selected stocks range from 0.33 to 11.228, which shows that the variation in the return from stocks is controllable. The SD of all the stocks is low, which means that the companies have an average rate of return. Around 2% of the stocks have outperformed with respect to the index performance, 25% of stocks with positive alpha are less than 5 %, and 70% of stocks listed in Tadawul have exhibited negative alpha. Thus, it shows how

Table 3. Alpha (α) value of stocks listed in Tadawul as of 2019

Number of stocks with negative α	Number of stocks with α less than 0.5	Number of stocks with α from 0.5 to 0.9	Number of stocks with α equal to 1	Number of stocks with α greater than 1
134	48	3	1	3
70.89%	25.39%	1.58%	0.529%	1.59%

Table 4. Correlation between stock returns and benchmark index returns as of 2019

Number of stocks with negative γ	Number of stocks with γ less than 0.5	Number of stocks with γ from 0.5 to 0.9	Number of stocks with γ equal to 1
6	152	31	0
3.17%	80.4%	16.4%	0

the active return on stock against the market index is considered to represent the market's movement as a whole. The analyzed table clearly shows the excess return of an investment relative to the return of a benchmark index, as depicted as the investment's alpha. It can be seen that 78% of the companies are overvalued, 55% of the stocks have moderate risk, and 14% of the stocks have high systematic risk. Only 31% of the companies have low risk. The analysis of the correlation between the stock and stock market shows that nearly 80% of the stock returns are positively correlated with the stock market return but are below average.

Thus, the analysis and interpretation of the financial valuation of all stocks listed in Tadawul shed light on the analysis of all the interrelated factors that determine the categorization of stock into undervalued or overvalued. The interpretation of alpha, beta, standard deviation, coefficient of correlation and return of the stock market, and the risk-free return for all the stocks listed in TASI has helped to understand the scope for long term investments in the stock market for the potential investors seeking better investment avenues in the Saudi Arabian Financial market.

CONCLUSION

Tadawul, the stock exchange of KSA, is in the process of becoming the partner to KSA's privatization and debt listing that encourages Saudi and GCC private companies to list. One of its strategic objectives is to build and operate a regional exchange platform across the value chain and to attract international and institutional investors by diversifying its investor base. The government is taking every step and focusing on various researches to boost savings and investment of its youth and women in the country. The results of the study undertaken on the stocks listed in Tadawul show that the prediction of stock prices can be made using this model. The valuation of stocks shows that KSA market is undervalued as there are only a few companies that have a significant effect on the results, also in terms of the purchasing power and availability of liquid cash with the people. There is a need to apply various modern pricing models at the micro and macro levels to understand the trends in the market and be able to generate benefits from the same. The efficiency of the KSA markets can also be tested using the Efficient Market Hypothesis and help improve the confidence of the investors towards certainty in the risk-adjusted return. The present research that focused on 189 companies listed in Tadawul aims to understand through analysis and present the behavior of risk and return in the stock market.

ACKNOWLEDGMENT

This research was funded by the Deanship of Scientific Research at Princess Nourah bint Abdulrahman University through the Fast-Track Research Funding Program.

REFERENCES

1. Al-Zubi, K. A., & Salameh, H. M. (2009). Tests of the Fama and French Three Factor Model in Jordan. *Sasin Journal of Management*, 15(1), 4-25. Retrieved from https://www.researchgate.net/publication/340580486_Tests_of_the_Fama_and_French_Three_Factor_Model_in_Jordan
2. Amenc, N., & Le Sourd, V. (2003). *Portfolio Theory and Performance Analysis*. John Wiley & Sons Ltd.
3. Barry, B., Goldreyer, E., Lockwood, L., & Rodriguez, M. (2002). Robustness of size and value effects in emerging equity markets, 1985–2000. *Emerging Markets Review*, 3(1), 1-30. [https://doi.org/10.1016/S1566-0141\(01\)00028-0](https://doi.org/10.1016/S1566-0141(01)00028-0)
4. Beach, S. L. (2011). Semivariance decomposition of country-level return. *International Review of Economics and Finance*, 20(4), 607-623. <https://doi.org/10.1016/j.iref.2011.01.004>
5. Bhatnagar, C. S., & Ramlogan, R. (2012). The capital asset pricing model versus the three factor model, A United Kingdom Perspective. *International Journal of Business and Social Research*, 2(1), 51-65.
6. Black, S. (1972). The Capital Asset Pricing Model: Some Empirical Tests. In Michael C. Jensen (Ed.), *Studies in the Theory of Capital Markets* (pp. 79-121). New York: Praeger.
7. Bodie, Z., Kane, A., & Marcus, A. J. (2012). *Essentials of Investments* (9th ed.). McGraw-Hill/Irwin.
8. Chen, J., Kan, K. L., & Anderson, H. (2007). Size, book/market ratio and risk factor returns: evidence from Retrieved from <https://thejournalof-business.org/index.php/site/article/view/204/203>

- China A-share market. *Managerial Finance*, 33(8), 574-594. <https://doi.org/10.1108/03074350710760304>
9. Diermeier, J. J., Ibbotson, R. G., & Siegel, L. B. (1984). The Supply of Capital Market Returns. *Financial Analysts Journal*, 40(2), 74-80. <https://doi.org/10.2469/faj.v40.n2.74>
 10. Drew, M. E., Naughtonand, T., & Veeraraghavan, M. (2003). Firm size, book-to-market equity and security returns: Evidence from the Shanghai Stock Exchange. *Australian Journal of Management*, 28(2), 119-139. Retrieved from <https://researchers.mq.edu.au/en/publications/firm-size-book-to-market-equity-and-security-returns-evidence-fro>
 11. Drew, M., & Veeraraghavan, M. (2001). Explaining the cross-section of stock returns in the Asian region. *International Quarterly Journal of Finance*, 205-222. Retrieved from <https://eprints.qut.edu.au/22158/>
 12. Eraslan, V. (2013). Fama and French Three-Factor Model: Evidence from Istanbul Stock Exchange. *Business and Economics Research Journal*, 4(2), 11-22. Retrieved from <https://www.berjournal.com/fama-and-french-three-factor-model-evidence-from-istanbul-stock-exchange>
 13. Fama, E. F., & French, K. R. (2004). The capital asset pricing model. *Journal of Economic Perspectives*, 18(3), 25-46. Retrieved from <https://pubs.aeaweb.org/doi/pdfplus/10.1257/0895330042162430>
 14. Fama, E. F., & French, K. R. (2013). *International Tests of a Five-Factor Asset Pricing Model* (Working Paper No. 2287202). Tuck School of Business, Dartmouth College, United States. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2622782
 15. Gitman, L. J., & Zutter, C. J. (2011). *Principles of Managerial Finance*. Prentice Hall.
 16. Hamid, Z., Hanif, A., Malook, S. S., & Wasimullah. (2012). Fama and French three factor model: Empirical evidence from financial market of Pakistan. *African Journal of Business Management*, 6(8), 2945-2950. Retrieved from <https://academicjournals.org/journal/AJBM/article-stat/3CA2C7E27825>
 17. Homsud, N., Wasunsakul, J., Phuangnark, S., & Joongpong, J. (2009). A study of Fama and French three factors model and capital asset pricing model in the Stock exchange of Thailand. *International Research Journal of Finance and Economics*, 25, 31-40. Retrieved from https://www.researchgate.net/publication/294628081_A_Study_of_Fama_and_French_Three_Factors_Model_and_Capital_Asset_Pricing_Model_in_the_Stock_Exchange_of_Thailand
 18. Ibbotson, R. G., Idzorek, T. M., Kaplan, P. D., & Xiong, J. X. (2018). *Popularity: A Bridge between Classical and Behavioral Finance* (163 p.). CFA Institute Research Foundation. Retrieved from <https://www.cfainstitute.org/-/media/documents/book/rf-publication/2018/popularity-bridge-between-classical-and-behavioral-finance.ashx>
 19. Khalafalla, A. M. (2014). Portfolio Formation; Empirical Evidence from Khartoum Stock Exchange. *International Academic Journal of Information Sciences and Project Management*, 1(3), 1-20. Retrieved from https://www.iajournals.org/articles/iajisp_m_v1_i3_1_20.pdf
 20. Lyn, E., & Zychowicz, E. (2004). Predicting stock returns in the developing markets of eastern Europe. *The Journal of Investing*, 13(2), 63-71.
 21. Rambaud, S. C., Pérez, J. G., Granero, M. A. S., & Segovia, J. E. T. (2005). Theory of portfolios: New considerations on classic models and the Capital Market Line. *European Journal of Operational Research*, 163(1), 276-283. <https://doi.org/10.1016/j.ejor.2013.03.024>
 22. Ramcharan, H. (2004). Returns and pricing in emerging markets. *The Journal of Investing*, 3(1), 45-55.
 23. Reddy, T. L., & Thomson, R. J. (2011). The capital asset pricing model: The case of South Africa. *South African Actuarial Journal*, 11, 43-84. <https://doi.org/10.4314/saaj.v11i1.2>
 24. Reilly, F., & Brown, K. (2003). *Investment analysis and portfolio management* (7th ed.). South-Western College Pub.
 25. Saudi Stock Exchange Tadawul. (n.d.). Retrieved from <http://www.tadawul.com.sa/>
 26. Shaker, M., & Elgiziry, K. (2014). Comparisons of Asset Pricing Models in the Egyptian Stock Market. *Accounting and Finance Research*, 3(4), 24-30. Retrieved from https://www.researchgate.net/publication/265601059_Comparisons_of_Asset_Pricing_Models_in_the_Egyptian_Stock_Market
 27. Shams, M., Abshari, L., Kordlouie, H., Naghshineh, N., & Gholipour, M. (2014). Studying the Relationship between Liquidity Risk and Market Risk with Non-Ordinary Return at Fama-French Three Factor Model at Tehran Stock Exchange. *International Business Research*, 7(2), 53-63. <https://doi.org/10.5539/ibr.v7n2p53>
 28. Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *Journal of Finance*, 19, 425-442.
 29. Tadawul Annual Report. (2019). Retrieved from <https://www.tadawul.com.sa/wps/portal/tadawul/markets/reports-%26-publications/periodical-publications>
 30. Wang, X. L., Shi, K., & Fan, H. X. (2006). Psychological mechanisms of investors in Chinese Stock Markets. *Journal of Economic Psychology*, 27(6), 762-780. <https://doi.org/10.1016/j.joep.2006.06.007>
 31. Wang, Y., & Di Iorio, A. (2007). The cross section of expected stock returns in the Chinese A-share market. *Global Finance Journal*, 17(3), 335-349. <https://doi.org/10.1016/j.gfj.2006.05.007>
 32. Zabaranin, M., Pavlikov, K., & Uryasev, S. (2013). Capital Asset Pricing Model (CAPM) with drawdown measure. *European Journal of Operational Research*, 234(2), 508-517. <https://doi.org/10.1016/j.ejor.2013.03.024>