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CEO Physical Activity Level and its Effect on Long Term Stock Performance

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Abstratct:

This study investigates whether a relationship exists between CEO physical activity levels and long-term stock performance of companies, inspired by the popular Deadlift ETF. Using a sample of S&P 100 companies that maintained the same CEO from January 2020 to January 2025, a multivariable regression analysis was carried out where the dependent variable was five-year CAGR and explanatory variables included CEO physical activity (a binary dummy variable), market capitalization, and price-to-book ratio as per the Fama-French model. CEO fitness levels were assessed via publicly available social media and interview data. Statistical tests for multicollinearity (VIF) and autocorrelation (Durbin-Watson) confirmed robustness of the model assumptions. However, regression results revealed that all predictor variables, including CEO physical activity, were statistically insignificant (p-values > 0.4), with an adjusted R-squared of -0.01239, suggesting minimal explanatory power. These findings led to a failure to reject the null hypothesis, indicating no meaningful correlation between CEO physical activity and stock performance. This study concludes that while fitness may contribute to personal executive well-being, it does not translate into superior stock returns.

Keywords: *CEO physical activity, Executive health, Corporate leadership wellness*

Introduction:

The CEO, widely accepted to be the driving force behind any business, typically responsible for the corporation's entire operations and reports directly to the chair and the board of directors. The CEO tends to provide overall direction and leadership for a company, setting both strategic goals and objectives for an organisation, and a CEO may be seen as the cornerstone of a company's success. It has been seen in various studies that exercise improves cognitive function both acutely and in the long term and in certain studies specifically in work environments has also been shown to improve executive function.

The working paper, "Does CEO Fitness Matter?" by Peter Limbach and Florian Sonnenburg, observed 9,500 firm-year observations from S&P 1500 companies spanning the years 2001 to 2011 to see how CEO fitness affects firm value. Fit CEOs are associated with a 4% to 10% increase in firm value, measured by Tobin's Q. This effect is particularly strong among older CEOs, those with longer tenure, and those facing high workloads. Furthermore, it found that CEOs who were "fit" tended to have higher stock returns. The authors argue that fitness improves cognitive function and stress management ability, which are invaluable in the context of being a CEO. This argument is further backed by the meta-analysis "Fitness Effects on the Cognitive Function of Older Adults: A Meta-Analytic Study—Revisited," by A. Kramer, S. Colcombe.

Other studies showed that, "physical exercise not only promotes next-day well-being but also enhances next-day in-role job performance and extra role organizational citizenship behaviour (OCB) by fostering positive affect and work engagement the following day," and stating, "Furthermore, these benefits of physical exercise are more evident on days when employees face high overall work demands (Study 1) and in particular on days with high-hindrance demands but on days with low-challenge demands (Study 2)." Additionally, its acute effects were studied in a meta-analysis involving 1177 participants across 28 studies, where it was stated, "our findings indicate that high-intensity cardiovascular exercise might be a viable alternative for eliciting acute cognitive gains," displaying the possible benefits of high intensity exercise on cognitive function and in tandem productivity and executive function.

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A relationship between CEOs activity levels and stock performance was anticipated and tested via DEAD, the Deadlift ETF. Created by Truflation, based on the idea "that CEOs who lift weights outperform those who don't on the S&P 500," according to its website. Generating extremely high levels of social media interest, the goal of the index is to "merge fitness, trends, finance, and corporate performance." This hypothetical portfolio has beaten the S&P500 by 40% or has 2.4x'd over the past 4 years. The ETF's portfolio is presented in the table below.

Ticker	***Name***	***Allocation (%)***
META	Meta Platforms Inc	12.5%
AMZN	Amazon.com Inc	12.5%
GS	Goldman Sachs Group Inc	12.5%
UBER	Uber Technologies Inc	12.5%
MSFT	Microsoft Corporation	12.5%
AAPL	Apple Inc	12.5%
BLK	Blackrock Inc	12.5%
NVDA	NVIDIA Corporation	12.5%

Though, there have been a variety of criticisms regarding the hypothetical ETF, namely:

1. The companies are largely from technology sectors (META, AMZN, MSFT, NVDA, AAPL) and financial services sectors (BLK, GS). The price levels of these sectors have generally increased through the course of the past few years and thus having stocks of companies solely from those sectors may mean that increasing price of the ETF may be a function of the sectors the stocks are from rather than the activity level of the CEOs.
2. The correlation versus causation argument has also been applied, where critics have suggested the creator of the ETF simply picked out high performing companies and found some corelation between the companies and thus achieves higher returns. This can be compared to a form of direct indexing.

This research paper aims to study the correlation between the activity level of S&P 500 CEOs and the long-term stock performance of their companies, comprising a large data set to avoid most of the issues that are seen in the Deadlift ETF.

Hypothesis:

The hypothesis for this study is a Null Hypothesis suggesting that there is no significant correlation between CEO physical activity and CAGR/Stock movements of a company.

Methodology:

This paper is going to study the correlation between CEO physical activity, measured by the dummy variable PHYSICAL and stock returns over a five-year period. The dependent variable in this analysis is the stock performance (CAGR across five years) and the explanatory variables are exercise performance, and by the Fama-French model, size (measured by the market capitalisation) and value (measured by the book to market capitalisation ratio). Thus, using the dependent and three explanatory variables, this paper will involve a multiple regression analysis along with econometrics to do the relationship analysis between CEO Physical activity and stock performance. This study involved S&P 100 companies, which haven't had a change in CEO from the period of January 1st 2020 to January 1st 2025.

The data involved in the aforementioned explanation will be collected from secondary sources. Financial data, including market capitalisation, CAGR, stock prices and market to book ratio will be collected from Yahoo Finance. The exercise score on the dummy variable PHYSICAL will be determined by thoroughly analysing CEO interviews and social media accounts (including Instagram, Facebook, LinkedIn, X/Twitter) to see the importance each

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CEO places on exercise. A rating of 1 on the dummy variable would only be assigned to those CEOs who participate in rigorous exercise multiple times a week and have been doing so for 3+ years. If the CEOs are seen to be doing low intensity exercise, like leisure walking or cycling they are allotted a 0. Furthermore, if a CEO doesn't mention exercise on social media or interviews, the CEO is given a score of 0, operating on the assumption that, in all likelihood, if exercise was a significant part of their life (they exercise multiple times a week and allocate significant time to it), they would be highly likely to mention it on social media accounts as well as in interviews.

Results and Analysis:

1. Test for Multicollinearity

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     mktcap         pbr factor(phys)
   1.238182    1.049588     1.230600
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The Variance Inflation Factor (VIF) results indicate that all predictor variables have VIF values close to 1, specifically 1.238 for market capitalization (mktcap), 1.049 for price-to-book ratio (pbr), and 1.230 for the dummy variable (phys). Since VIF values below 5 generally suggest low multicollinearity, we can conclude that the independent variables in the model are not highly correlated, reducing concerns about redundancy in the regression analysis.

2. Test for Autocorrelation

The Durbin-Watson (DW) test result, with a DW statistic of 1.9547 and a p-value of 0.4243, suggests that the residuals do not exhibit significant autocorrelation. Since the DW statistic is close to 2, it indicates that there is no strong evidence of positive or negative serial correlation in the errors.

3. Multi-Variable Regression:

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Residuals:
  Min      1Q  Median      3Q     Max
-801.31   -2.71   14.58   26.48   51.52

Coefficients:
  Estimate Std. Error t value Pr(>|t|)
(Intercept)   -20.04533   19.32822  -1.037    0.304
mktcap          0.01139    0.01831   0.622    0.536
pbr             0.27378    0.44960   0.609    0.545
factor(phys)1  24.78459   29.74892   0.833    0.408

Residual standard error: 106 on 60 degrees of freedom
Multiple R-squared:  0.03582,   Adjusted R-squared:  -0.01239
F-statistic: 0.743 on 3 and 60 DF,  p-value: 0.5306
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The multivariable regression analysis aimed to determine the impact of market capitalization (mktcap), price-to-book ratio (pbr), and CEO physical activity (factor(phys)) on a company's compounded annual growth rate (CAGR). The model yielded statistically insignificant results across all predictor variables, as indicated by high p-values (0.536 for mktcap, 0.545 for pbr, and 0.408 for factor(phys)1). The model's overall explanatory power was extremely low, with an R-squared of 0.03582 and an adjusted R-squared of -0.01239, suggesting that these predictors account for only a small fraction of the variation in CAGR. Furthermore, the F-statistic's p-value of 0.5306 indicated that the model as a whole was not statistically significant. Consequently, the analysis

concludes that there is no reliable relationship between market capitalization, price-to-book ratio, CEO physical activity, and CAGR within the analyzed dataset. Hence, our regression results suggest that we fail to reject our null hypothesis.

Conclusion:

The purpose of the paper in question was to find out whether there's a significant correlation between CEO physical exercise and stock performance, studying the returns and claims of the Deadlift ETF. To do so, data was collected from secondary sources, and the variables Market Capitalisation and Price to Book ratio were used along with the dummy variable *Phys* using the Fama-French model in a multivariable regression. Prior to the regression, the DW and VIF tests were conducted to study possible autocorrelation errors within the data, where it was found that all the independent variables were close to 1 in the VIF test, and the DW test resulted in 1.9547 with a p-value of 0.4243. The regression resulted in high p-values for the predictor variables, with the explanatory power being extremely low, showing an R-squared of 0.03582 and an adjusted R-squared of -0.01239.This research has thus allowed us to derive a conclusion that the physical activity of CEOs does not have a statistically significant effect on CAGR, suggesting that other factors may have a more profound impact on the same.

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