STOCK PRICE ANALYSIS REPORT

This report presents a comprehensive analysis of the stock price movements for Microsoft, Apple, and Tesla, in relation to the S&P 500 index. All analyses and visualizations have been conducted using Microsoft Excel. This includes regression analysis, correlation assessments, and an overview of each stock's volatility in comparison to the market.

DATA DESCRIPTION

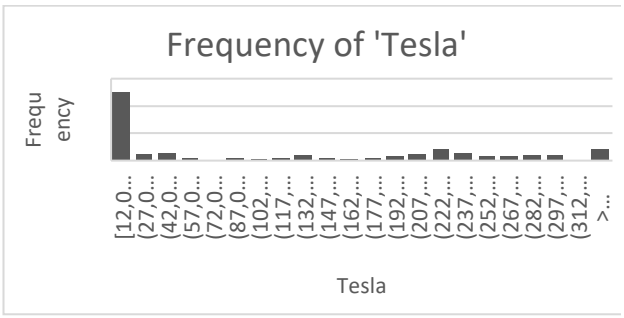
This stock price analysis draws on five years of daily stock data from Yahoo Finance, spanning 2018 to 2023, for Microsoft (MSFT), Apple (AAPL), and Tesla (TSLA), alongside the S&P 500 index as a comparative market benchmark. The dataset includes daily percentage changes for each company, labeled as MS%chng, App%chng, and Tesl%chng, providing a basis for evaluating stock volatility, market correlation, and the impact of wider economic trends on these prominent technologies and automotive firms.

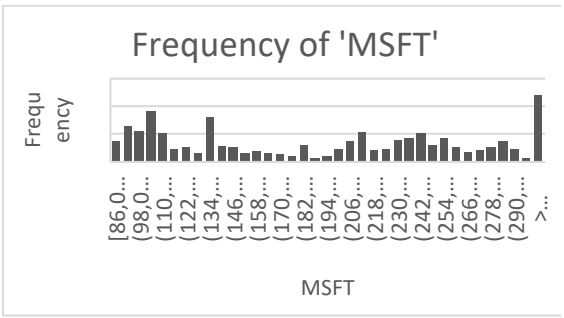
STATISTICAL SUMMARY

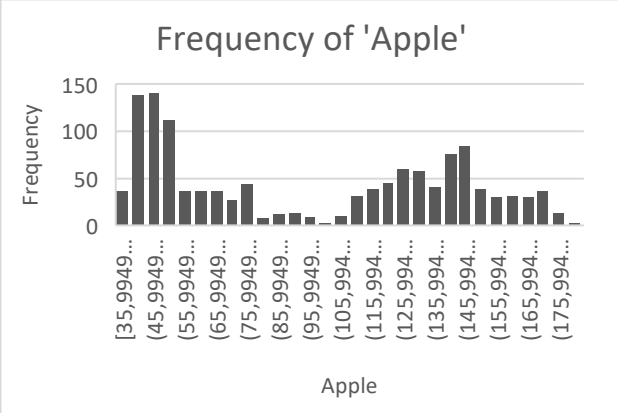
	MSFT	*Tesla*	*Apple*	*SP500*
Mean	194,4708998	131,8952112	98,57410424	3457,034092
Standard Error	2,076481441	3,27746698	1,29167174	18,64546377
Median	203,580002	96,573334	95,0874975	3294,67
Mode	95,139999	24	127,82	2832,41
Standard Deviation	74,23239641	117,1665796	46,17613562	666,5590312
Sample Variance	5510,448676	13728,00737	2132,235501	444300,9421
Kurtosis	-1,287957663	-1,257261138	-1,582037477	-1,297242885
Skewness	0,149832436	0,470592085	0,121834092	0,333240031
Range	258,559997	399,396668	146,635006	2513,8
Minimum	86,059998	12,073333	35,994999	2290,71
Maximum	344,619995	411,470001	182,630005	4804,51
Sum	248533,81	168562,0799	125977,7052	4418089,57
Count	1278	1278	1278	1278

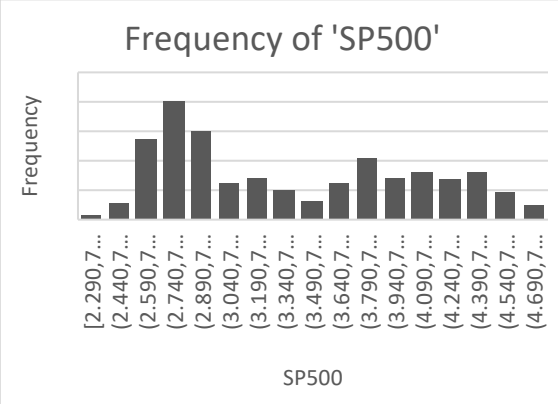
Based on these statistics: the mean values indicate the average stock price over the observed period, with MSFT having the highest mean stock price, followed by Tesla, Apple, and then the S&P 500 index. Standard deviation and range provide insights into the volatility of the stock prices, with Tesla showing the highest standard deviation, indicating it has the greatest price variability. Kurtosis and skewness offer details on the distribution shape of the stock prices, where negative kurtosis (platykurtic) suggests a flatter distribution than a normal distribution, and positive skewness indicates that the distribution tail is skewed towards higher values. The range, minimum, and maximum values give a sense of the spread and extremes of the stock prices during the period.

FREQUENCY DISTRIBUTION



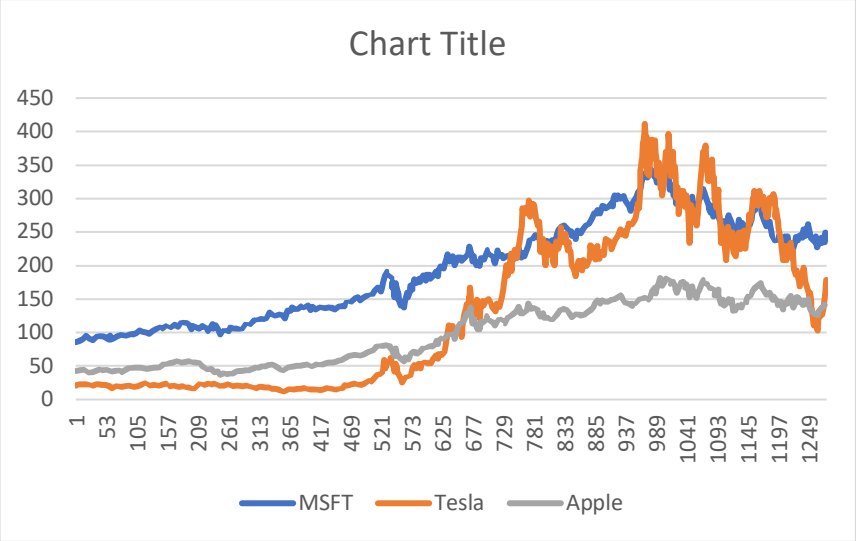






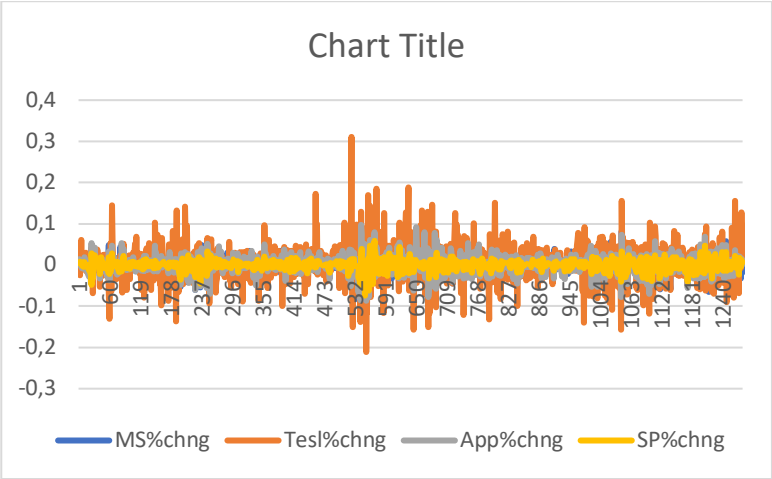
The histograms for Tesla, Microsoft (MSFT), Apple, and the S&P 500 showcase the distribution of their stock prices' frequency, revealing distinct volatility and behavior patterns. Tesla and MSFT exhibit a right-skewed distribution, indicating a concentration of lower prices with occasional spikes, hinting at potential high-return scenarios amidst greater price fluctuations. Apple's histogram shows a more symmetrical and concentrated distribution, suggesting steadier price behavior with less pronounced extremes. Meanwhile, the S&P 500's histogram, while also right-skewed, demonstrates a broader distribution reflective of its composite nature, implying overall market stability with a diverse range of price movements.

DATA TREND

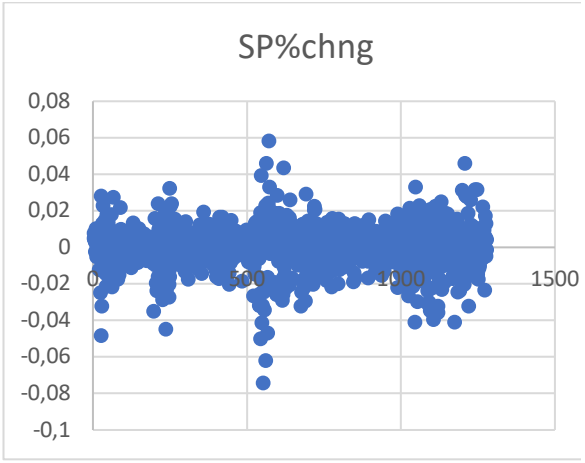


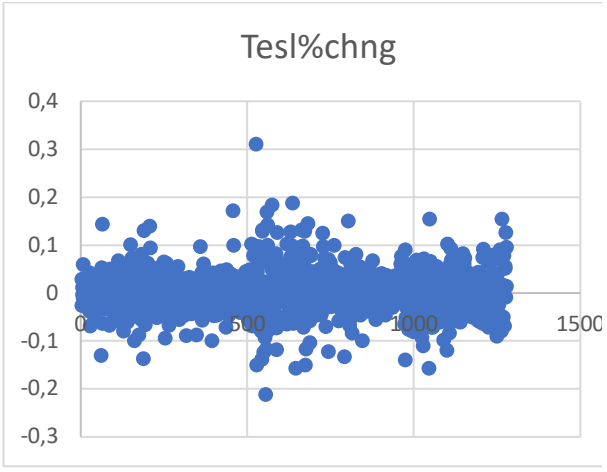
The chart reveals that Tesla experienced a significant surge in stock price, with pronounced peaks, indicative of high volatility and potential investor enthusiasm or market events driving rapid value changes. In contrast, Microsoft's stock price trend shows a steady and consistent upward trajectory, suggesting stable growth over the period. Apple's stock price appears to follow a more moderate path with less volatility than Tesla's but with some fluctuations, reflecting a blend of steady growth and market responsiveness. The chart illustrates the unique price behavior and volatility profiles of these major companies, which could be vital for investment strategy and risk assessment.

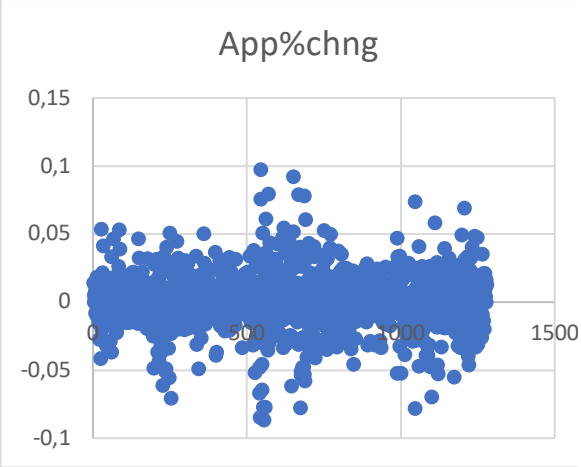
VOLATILITIES

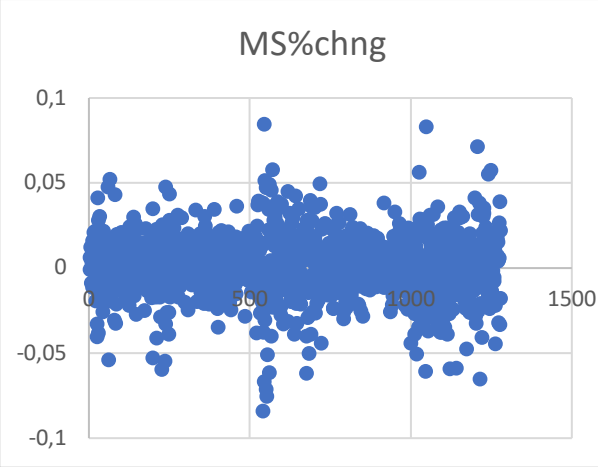


The line chart illustrates the daily percentage changes of Microsoft (MSFT), Tesla, and Apple's stock prices in comparison to the S&P 500 index, plotted over a certain time period. This kind of chart is particularly useful for analyzing the volatility and relative movement of individual stocks against a market benchmark. Here, Tesla's line indicates the most significant fluctuations, with sharp spikes that suggest a higher volatility or reaction to market news compared to Microsoft and Apple. Apple and Microsoft's percentage changes are less pronounced, displaying lesser volatility. The overlay with the S&P 500 index provides a backdrop to assess how these stocks move in tandem with or diverge from the overall market trends. Such visual comparison is key for investors who are looking to understand stock sensitivities to market movements for portfolio diversification and risk management.





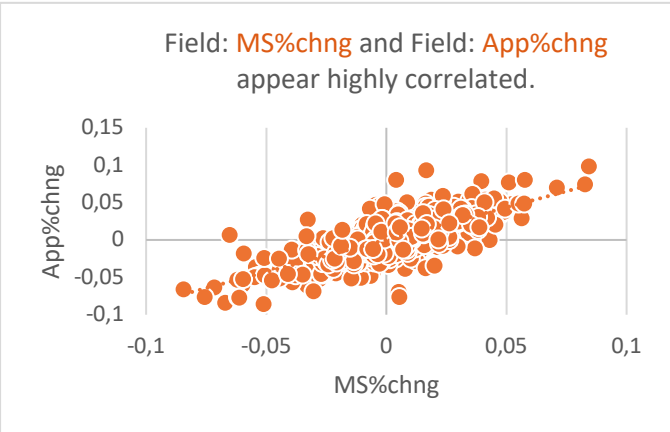




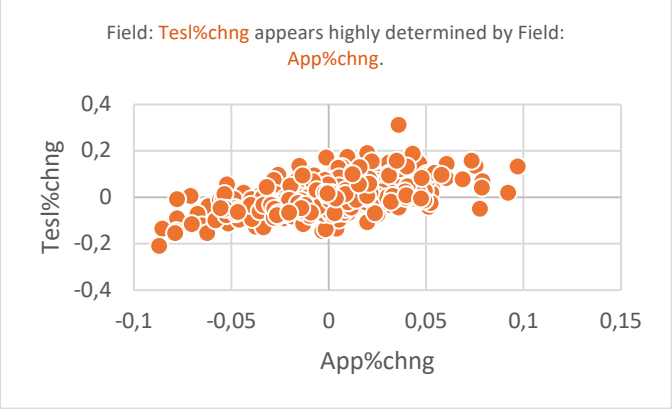
All plots are stationary. For the S&P 500, the scatter plot shows a clustering of changes between slight losses and gains, with a few outliers, indicating general market stability. Tesla's plot reveals a broader spread of daily changes, both positive and negative, highlighting its higher volatility. Apple's percentage changes are densely clustered around the zero line with fewer extreme values, suggesting less volatility. Microsoft's scatter plot also shows a tight cluster of daily changes with fewer outliers, indicating stability similar to Apple, albeit with slightly more spread which could imply a slightly higher volatility than Apple.

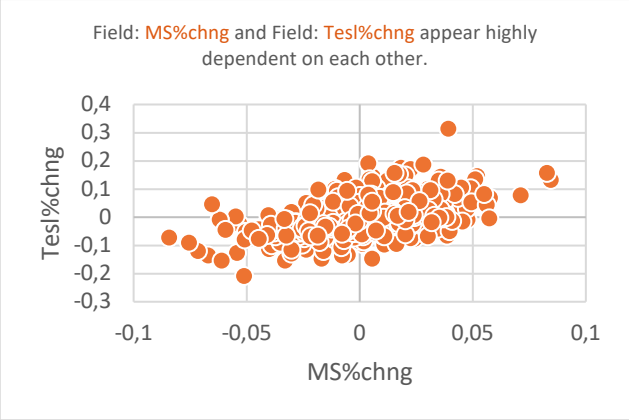
Together, these plots provide insights into the risk and stability of these stocks compared to the market, with Tesla showing the most potential for large swings in price, and Apple and Microsoft displaying characteristics of more stable investments. This information is valuable for portfolio construction and risk assessment in financial analysis.

RELATIONSHIP BETWEEN THE CHANGES IN STOCK PRICES



The scatter plot shows that the daily percentage changes in stock prices for Microsoft and Apple are closely related. When one goes up or down, the other tends to do the same. This pattern shows they often move together in the stock market.





The scatter plots illustrate that Tesla's daily stock price movements are notably aligned with the movements of both Apple and Microsoft, with the data trending upward on both charts. This alignment suggests that Tesla's stock price is influenced by the same factors affecting these tech giants, or perhaps market sentiment towards the tech sector as a whole. The consistent pattern across both comparisons indicates that Tesla shares a dependency on market behaviors that similarly impact Apple and Microsoft, highlighting a potential sector-wide influence on these companies' stock prices.

CAPITAL ASSET PRICING MODEL

The Capital Asset Pricing Model (CAPM) is a financial theory that describes the relationship between expected return and risk of investing in a security. It shows that the expected return on a security is equal to the risk-free return plus a risk premium, which is based on the beta of that security. Beta measures the tendency of the security's returns to respond to swings in the market, and the risk premium is a function of the risk of the market as a whole. CAPM is widely used to estimate the cost of equity and as a method for calculating expected returns for assets while factoring in the risk of those assets.

Coefficients	MS%chng	Tesl%chng	App%chng
SP%chng	1.2138	1.8183	1.3293

The text describes the beta values for Microsoft, Apple, and Tesla, all of which exceed 1, indicating that they are more volatile than the broader market. In risk assessment terms, Microsoft's beta of 1.2138 suggests it is the least volatile among the three, implying lower risk. Apple's beta of 1.3293 denotes moderate risk, indicating that its stock price is more reactive to market movements than Microsoft but less so than Tesla. Tesla's beta of 1.8183 is the highest, signaling that it is the most volatile and therefore the riskiest of the three stocks, with the potential for higher returns compensating for this increased risk. These beta values are essential for investors to understand the relative risk of these stocks in comparison to the market, aiding in portfolio diversification and risk management strategies.

Statistics	MSFT	Tesla	Apple
Multiple R	0.776704361	0.480587454	0.740385493
R Square	0.603269664	0.2309643	0.548170679
Adjusted R Square	0.602958747	0.230361608	0.547816581
Standard Error	0.011347965	0.038249725	0.0139131
Observations	1278.0	1278.0	1278.0

RELEVANT ANALYSIS:

1. Microsoft (MSFT) shows a strong positive correlation with the S&P 500 index, as evidenced by a correlation coefficient of approximately 0.7767. This suggests that Microsoft's stock price movements are closely related to the market.

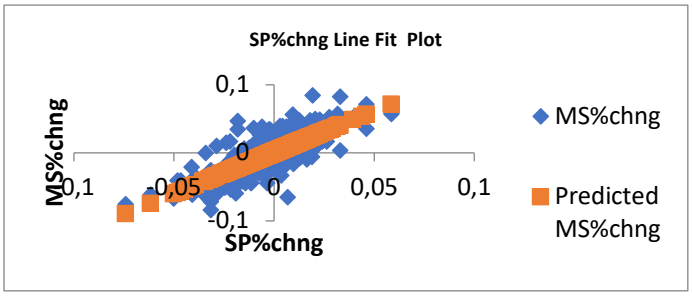
2. Tesla's stock shows a moderate positive correlation with the market. However, with an R Square of around 0.2309, Tesla's daily price movements are less influenced by the market compared to Microsoft and Apple.

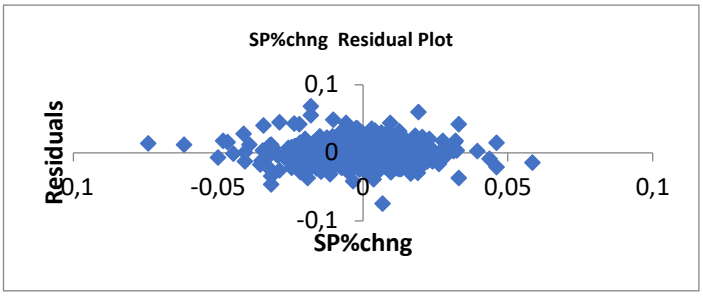
3. Apple also exhibits a strong correlation with the S&P 500 index, with an R Square value of about 0.5482, indicating over half of its price movement can be explained by market movements.

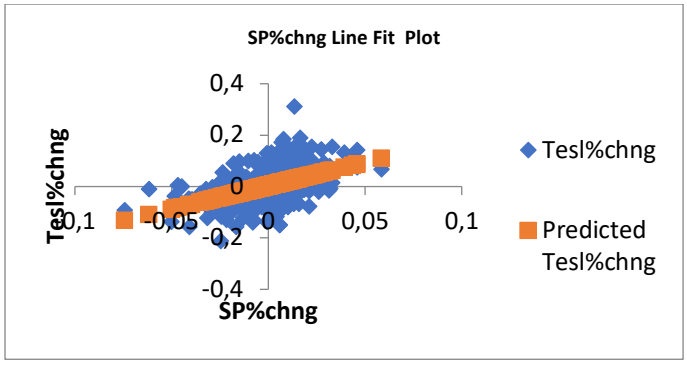
4. The regression analysis confirms the significance of the relationship between each company's stock price changes and the S&P 500, with p-values indicating strong statistical significance in all cases.

5. The risk assessment based on beta values indicates that Tesla is the most volatile among the three stocks. Microsoft and Apple, while also responsive to market changes, show less volatility compared to Tesla.

MODEL VISUALIZATION



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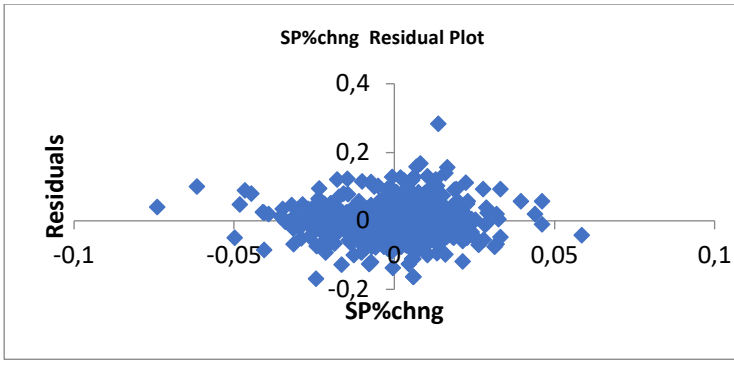
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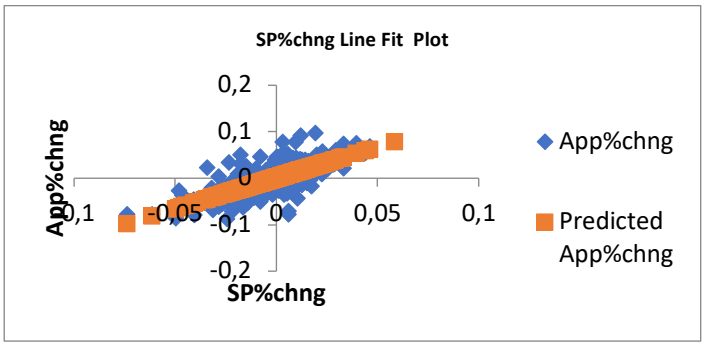
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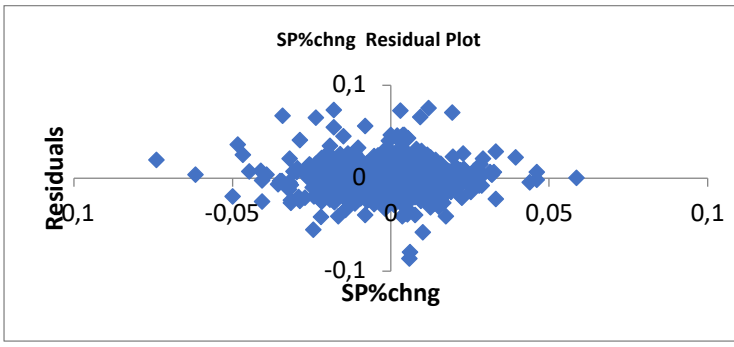
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