Lawrence Lee — ll679

S&P 500

On 22 September 2023, the S&P 500 closed at 4320.06. I predict that it will reach a value of 4745.89 on 31 December 2024, an upside of 9.86%. This value is derived from a multilinear and simple linear regression model based on three key drivers of equity markets over the next year.

Economic Recovery

The global economy has been characterised by high inflation and interest rates since 2022. However, data strongly indicates that we have passed an inflection point. Inflation in August in the US and UK was 3.7% and 6.7% respectively, far lower than their peaks. This has enabled both the Fed and Bank of England to hold rates in September. The consensus remains that the Fed rate will fall to 5.1% in late 2024.[1] At the same time, the OECD estimates that US inflation will be 2.56% in 2024, with a 1% real GDP growth rate.[2]

For our model, this means that from the most recent US GDP figure of 27.13T in July, one can expect a value of around 27.4T.[3] For the US Consumer Confidence Index (CCI) constructed by the OECD, we may assume a conservative value of 99 for December 2024, akin to Q3 and Q4 2020, given that the most recent value in August was 98.32.[4]

This is positive news for equity markets, since lower inflation and rates alongside higher real income result in improved consumer and investor confidence and discretionary spending that feed into corporate earnings. The lower yield on Treasury Bonds will also see more investors switching to stocks in search for higher returns. The net result is a higher value for the S&P 500.

Artificial Intelligence

Since the release of ChatGPT in November 2022, AI has noticeably changed the way many firms operate, as they seek to adopt AI into their services, or develop their own. As the supercomputers powering AI services require billions — if not trillions — of individual semiconductors, chip providers such as Nvidia have experienced record-breaking earnings releases, and have inspired others such as Arm to go public. Nvidia's share price alone has increased by 190.67% year to date as of 22 September 2023. Firms investing in AI have also faced positive market reception; for instance, Tesla's share price jumped 10% after the announcement of their Dojo supercomputer, which Morgan Stanley predicts will add as much as $500 billion to the company's market capitalisation.[5]

Whilst a lot of the excitement surrounding AI may be down to hype, it is here to stay. By offering new ideas and making existing processes more efficient, it gives investors more confidence in the prospects of companies utilising this technology to their advantage. Though the influence of AI does not explicitly enter our models, it helps justify our assumptions and the high return outputted by them below.

[1] https://www.schroders.com/en-lu/lu/professional/insights/fed-keeps-rates-steady-but-expects-policy-to-be-tighter-for-longer/
[2] https://www.oecd.org/economic-outlook/june-2023/
[3] https://ycharts.com/indicators/us_monthly_gdp
[4] https://data.oecd.org/leadind/consumer-confidence-index-cci.htm
[5] https://www.bloomberg.com/news/articles/2023-09-11/tesla-to-surge-thanks-to-dojo-supercomputer-morgan-stanley-says

Geopolitics

Recent cuts in oil production instituted by Saudi Arabia, Russia and OPEC+ members along with rising demand have resulted in the price of Brent crude oil reaching $95 per barrel, and it is expected to continue rising. This will inevitably frustrate efforts to calm inflation, and may partially offset the effects of falling inflation on the S&P 500. However, it also helps oil stocks, and we may see an increased push by the US for energy firms to produce more oil substitutes such as liquified natural gas.

Another important consideration involves the Russia-Ukraine war. The inception of the war negatively influenced both Russian stock markets directly, and the broader global equity market through the energy-price-led inflation and political uncertainty it caused. It is unclear how much longer the invasion will continue, but it will most likely extend until at least 2025 given the lack of progress made from both sides.

Regression Analysis

Using monthly figures for the S&P 500, US GDP, US inflation rate, Effective Federal Funds Rate (EFFR), US CCI and a dummy variable named "War" (where 1 indicates that Russia has invaded Ukraine at that time, and 0 if not) for each month between July 2020 and July 2023 inclusive, we obtain the following output:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.918527302
R Square	0.843692404
Adjusted R Square	0.818481502
Standard Error	165.8578228
Observations	37

$$
\begin{aligned}
S\&P\ 500 &= -25762.70245 \\
&- 86.81220814x_{Inflation\ Rate} \\
&- 338.0976253x_{EFFR} + 630.4805784x_{GDP} \\
&+ 159.3480005x_{CCI} - 386.067319x_{War}
\end{aligned}
$$

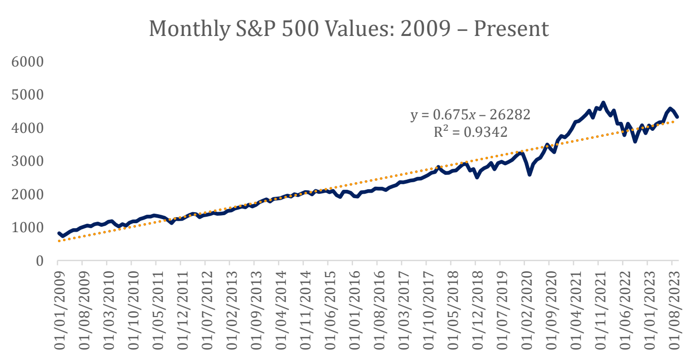
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	5	4602964.972	920592.9944	33.46537883	1.30474E-11
Residual	31	852773.3385	27508.81737		
Total	36	5455738.311			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-25762.70245	5931.58352	-4.343309399	0.000139524	-37860.2468	-13665.1581
Inflation Rate	-86.81220814	34.19287096	-2.538897896	0.016356877	-156.5490282	-17.07538806
EFFR	-338.0976253	59.08827615	-5.721907074	2.7127E-06	-458.6089591	-217.5862916
GDP	630.4805784	72.03353298	8.752598301	6.98037E-10	483.5672193	777.3939375
CCI	159.3480005	58.7044411	2.714411339	0.010748061	39.61950356	279.0764975
War	-386.0673189	145.252395	-2.657906734	0.012321129	-682.3115317	-89.8231061

Inflation Rate	**EFFR**	**GDP**	**CCI**	**War**	**S&P 500**
2.56	5.1	27.4	99	1	4955.312991

Using a simple linear regression for the monthly S&P 500 values between 2009 and 1 September 2023 gives us another way of predicting the S&P 500's value on 31 December 2024 based off returns over time.



Date	**Number**	**S&P 500**
31/12/2024	45657	4536.475

Averaging the result of these two methods gives us a final closing value of 4745.89.

Method 1	4955.31
Method 2	4536.48
Average	4745.89
Current	4320.06
Upside	9.86%