

Major Economic Indicators & Earnings Growth Correlation

GTSF Investments Committee | January 31, 2023



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Analysis Overview

Non-financial corporate business (NCB) is the earnings of all private and public entities with independent legal status (and close substitutes) that produce goods and non-financial services to the market.

For correlation calculation, the Pearson product-moment correlation coefficient of a dataset was chosen. This correlation calculation has four assumptions, being that the two variables compared are continuous, have a linear relationship, have no significant outliers, and are approximately normally distributed. The dataset contains data from January 1, 1959 to July 1, 2022, collected every three months on the first day of the month. The analysis was based on four key economic indicators, namely the Unemployment Rate, Real Gross Domestic Product, Personal Consumption Expenditures, and Industrial Production. Attached below are summary tables that present the correlation coefficients between non-financial corporate businesses and the aforementioned indicators. Furthermore, a review of the relationship between the 10-Year Treasury, real GDP and the S&P 500 Index is presented at the end to offer valuable insights into the correlation between these two critical financial factors.

Correlations Between Nonfinancial Corporate Business & ...	Correlation
Unemployment Rate	-0.0016
Real Gross Domestic Product	0.9802
Personal Consumption Expenditures	0.9858
Industrial Production	0.9414

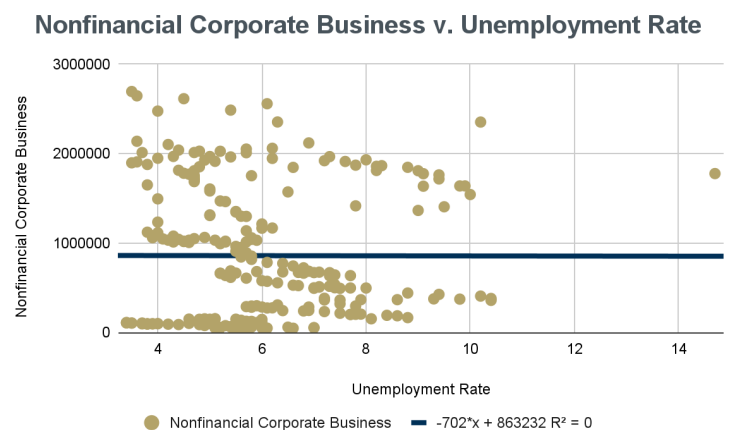
Correlations Between Percent Change in Nonfinancial Corporate Business & Percent Change in ...	Correlation
Unemployment Rate	0.1102
Real Gross Domestic Product	0.7554
Personal Consumption Expenditures	0.7428
Industrial Production	0.7614

Note: Percent Change Calculated by: (New - Old)/Old

Unemployment Rate

The unemployment rate represents the number of unemployed workers in the labor force as a percentage of the labor force. It is computed by the Bureau of Labor statistics every month from a survey of sixty thousand households.

Growth in the unemployment rate has a negligible negative correlation of -0.0016 with NCB. In contrast, the percentage change in the unemployment rate also has a weak positive correlation of 0.1102 with the percentage change in NCB. These correlations are evident by how scattered the scatter points are from the trendline. Hence, it can be inferred that while an increase in the unemployment rate may not have a significant direct impact on the performance of non-financial corporate businesses, it may still indirectly affect other factors that could eventually impact the performance of these businesses.



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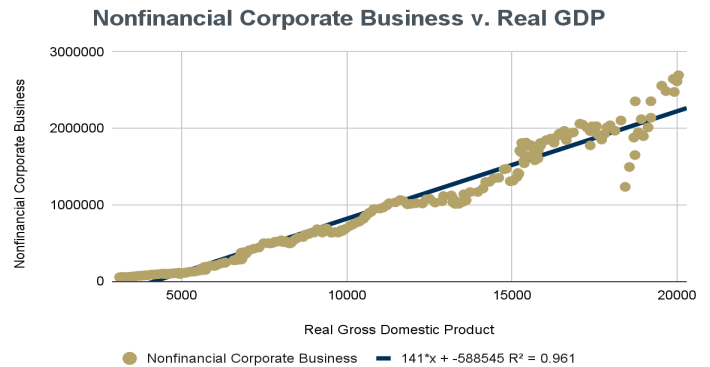


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Real Gross Domestic Product (rGDP)

Real Gross Domestic Product (rGDP) is the inflation adjusted total market value of all final goods and services newly produced by labor and property located in the United States.

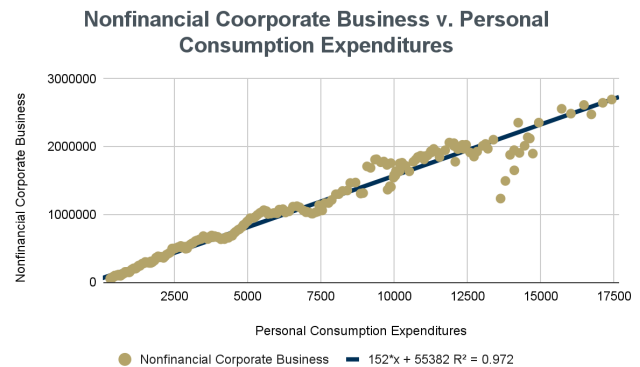
The data demonstrates a robust positive correlation between the growth of rGDP and that of NCB, with a correlation coefficient of 0.9802. Additionally, there is a strong positive correlation, with a correlation coefficient of 0.7554, between the percentage change in rGDP and the percentage change in NCB. These findings, depicted in the accompanying comparison graph, where the scatter points closely align with the trendline, provide a basis for the assertion that positive projections for GDP growth in 2023 could lead to corresponding positive outcomes for nonfinancial corporate businesses in terms of performance and earnings growth.



Personal Consumption Expenditure (PCE)

Personal consumption expenditure (PCE) measures the goods and services purchased by households and nonprofit institutions serving households resident in the United States. PCE also includes purchases by U.S. government civilian and military personnel stationed abroad.

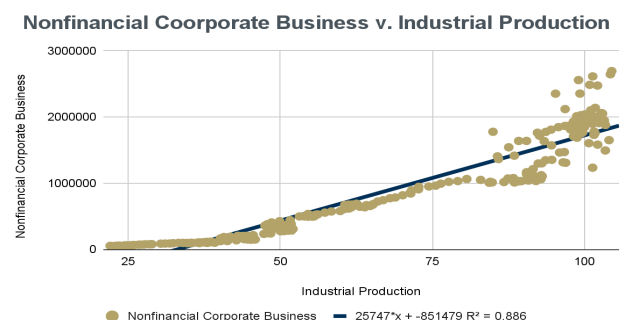
Growth in PCE has a highly positive correlation of 0.9858 with NCB. Percentage change in PCE also has a strong positive correlation of 0.7428 with the percentage change in NCB. Since PCE is the U.S. Federal Reserve's preferred measure of U.S. inflation, these correlations, seen in the graph to the right where scatter points align closely with the trendline, suggest that a decrease in PCE as the Fed works to combat inflation could lead to a corresponding decrease in NCB in terms of economic growth.



Industrial Production (IP)

The industrial production (IP) index measures the real output of all relevant establishments located in the United States, regardless of their ownership, but not those located in U.S. territories.

Growth in IP has a highly positive correlation of 0.9414 with NCB. Percentage change in IP also has a strong positive correlation of 0.7614 with the percentage change in NCB. As seen in the accompanying graph on the right where the scatter points closely align with the trendline, these correlations suggest that China's reopening and a decrease in supply shortages could lead to corresponding positive growth in nonfinancial corporate businesses as they gain more access to production resources.



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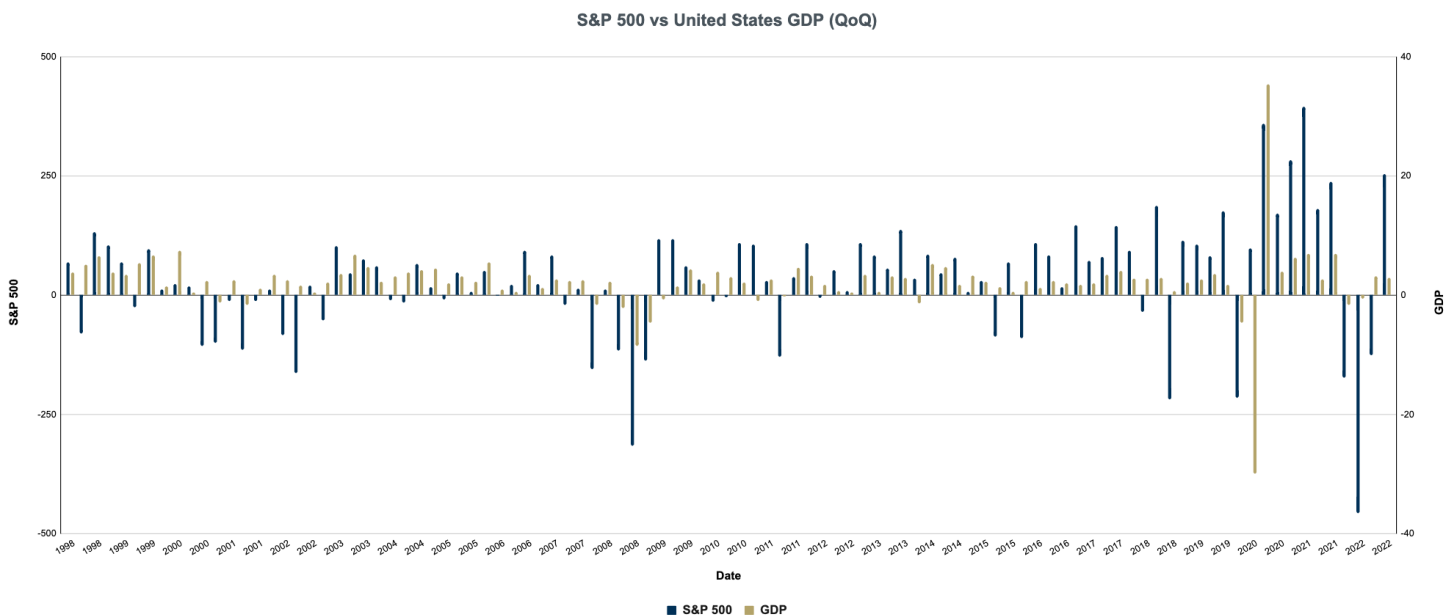
S&P 500 vs. rGDP & U.S. 10-Year Treasury

Here, the relationship between the major stock index in the United States (S&P 500) and two important economic indicators (real GDP and the 10-Year Treasury) are examined.

The graph at the bottom displays the quarterly performance of the S&P 500 (nominal values) and changes in the U.S. GDP on a quarterly basis. The correlation between the two factors is positive, with a coefficient of 0.40613. Although the correlation is not overly high, this positive correlation relationship suggests that a positive outlook on GDP by various banks can likely result in improved earnings and overall market performance.

Additionally, the long-term relationship between the S&P 500 and the 10-Year Treasury was also analyzed. A correlation coefficient between the performance of the S&P 500 and the quarterly change in the 10-Year Treasury yield was calculated to be -0.7782, indicating a negative correlation between the two factors over the long-term. This correlation aligns with economic theory, as high interest rates make financing operations more expensive for companies, leading to decreased consumer and business spending, and ultimately a decline in earnings and stock prices. Conversely, when interest rates are low, consumer and business spending increases due to the lower cost of borrowing, resulting in an upward trend in stock prices.

It is important to note that on a short-term scale, the S&P 500 and interest rates may move in the same direction, but over the long-term, they are negatively correlated. Lastly, this finding reinforces our previous argument in the "*BoJ Quarterly Update*" newsletter on how changes in the Japanese monetary policy can indirectly impact the performance of the stock market in the United States by affecting U.S. 10 Year Treasury.



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