Macroeconomic Variables and Stock Returns: An Examination of Time-Varying Relationship and Divergence

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Abstract

This paper investigates the "Great Disconnect" between benchmark stock indices and GDP growth, analyzing the origins of their confounding divergence. Through a literature review of historical cyclesfrom the 1929 Great Depression to the 2020 pandemic and an empirical analysis of U.S. data over five decades, the study highlights a profound lack of concurrent correlation between market returns and economic output. The analysis reveals that stock market serves as a leading indicator, pricing in future expectations while remaining 8 times more volatile than the stable growth of GDP. The paper pays special attention to the COVID-19 era, where aggressive monetary policy and a "K-shaped" recovery widened the gap between financial wealth and domestic production. Ultimately, the study concludes that while the two may align in the long run, short-term divergence driven by sentiment and liquidity creates significant risks for market stability and economic predictability.

Keywords:*Stock Returns, Real Economy, Great Disconnect, Economic Output*

Introduction:

Conventionally the rising benchmark stock indices represent either a growing economy or one headed that way, while weak trend heralds a looming slowdown. This parity is what drives the investor decision in the equity market, and dictates the outlook of other market participants. This recognition derives from the assumption that stock index represents all sectors of the economy and, therefore, acts as barometer of the direction of economic cycle. Thus, the financial well-being of the stock market helps to gauge the health of the economy. However, recent events have established that while some aspects of the two may be interrelated, a strong correlation does not exist. The financial sector, particularly the stock market, is clearly in departure compared to economic parameters. Stock indices are scaling new heights even as economic growth falters, industrial production contracts, unemployment rises. These starkly different cues from stock market and real economy confuse the market investors, economists, financiers and the general public. The pandemic only resulted in this divergence between the financial and the real sector becoming more profound. As bad news around the real economy piles up, understanding the implications that the out of sync stock market has on economic predictability gains precedence. With Covid-19 onset, this discrepancy has become much more prominent. While the real economy was facing the wrath of the pandemic, the stock market had stabilised after an initial plunge.

This paper thus focuses on one simple research question- Are movements in stock market and GDP closely related? To unearth this disconnect and understand the reasons behind thetime varying divergence, this study uses extensive literature review and economic analysis to answer this doubt.

Review of Literature

It is widely recognized that shifts in macroeconomic variables provide critical intelligence for market participants. Over both short and long horizons, this information is integrated into estimates of discount rates and expected dividends, which in turn drive stock returns. The historical precedent for a tight coupling between these two spheres is most famously found in the Wall Street Crash of 1929–32. During this period, the rapid market collapse severely eroded business and consumer confidence, decimated bank balance sheets, and contributed significantly to the length and severity of the Great Depression **(McKay, 1932)**. In this instance, the depression and the market crash

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appeared inextricably linked, with the financial shock serving as a direct catalyst for economic ruin**(Fisher, 1932)**.

However, this historical trend does not always hold true, which suggests that the relationship is not a universal rule. While macroeconomic indicators, such as GDP, inflation, and interest rates, influence volatility, their impact is rarely straightforward or consistently predictable across different cycles **(Khan & Billah, 2023)**. For instance, developed markets often show a significant long-term link between macro indicators and returns, but frontier markets frequently present exceptions, especially regarding GDP per capita and inflation **(Alloul & Ferrouhi, 2024)**. A similar decoupling was observed decades earlier during the 1987 stock market crash, demonstrating that market collapses do not always mirror economic reality. Despite massive global declines—with Hong Kong plummeting 45.8% **(Roll, 1988)**—US GDP continued to rise and unemployment fell shortly after the shock. This resilience was largely determined by monetary policy: nations that supported liquidity saw limited real-world impact, whereas countries like New Zealand that maintained a tighter stance suffered long-term negative consequences for both their financial and real economies **(Grant, 1997)**.

The modern era has further underscored this "disconnect," particularly during the COVID-19 pandemic. After hitting all-time highs in mid-February 2020, the S&P 500 suffered its fastest decline since 1987 **(BBC, 2020)**. Yet, within a mere two months, the market returned to its former heights even as the real economy remained in shambles. This divergence led to situation that financial indicators were pricing in a recovery far stronger than the actual output and creating a volatile environment where any further shock could have triggered sharp corrections**(Gita Gopinath, 2020)**. Empirical literature increasingly highlights a time-varying relationship between the two. While the stock market and the real economy tend to move in tandem over the long run, exhibiting high correlation, the short run often reveals a lead-lag relationship or sometimes no connection at all **(Aziz & Masih, 2018)**.

This divergence is largely explained by the differing drivers that dominate specific timeframes. In the short term, equity markets are primarily propelled by demand and prevailing environmental risks; viewed through the lens of the discount rate, this can cause investors to disproportionately over or under-estimate the impact of minor economic variations. Conversely, the long-term trajectory is dictated by corporate cash flows, which serve as the ultimate engine of underlying economic growth **(Camilleri & Scicluna, 2019)**.While supply-side models theoretically suggest that GDP growth should transform into corporate profits and higher stock prices **(MSCI Barra, 2010)**, empirical evidence often contradicts this logic. Studies have identified a surprising negative cross-country correlation between per-capita GDP growth and real stock returns**(Ritter, 2005)**. Other research further confirms this lack of a reliable connection **(Klement, 2015)(Dimensional Fund Advisors, 2016)**. Paradoxically, while the direct correlation may be weak, theoretical frameworks maintain that any development in the real economy affecting credit or liquidity must eventually force a reassessment of asset pricing **(Rath, 2022)**.

Data and Methodology

To analyze whether movements in the stock market and GDP are closely related, an empirical analysis was conducted using historical data from the United States (S&P 500 Total Returns and Annual Real GDP Growth) from 1970 to 2023. Using Stata for statistical analysis, the Pearson correlation coefficient between annual stock market returns and GDP growth rates across different time horizons are utilised for addressing the research question.

Variable	Source	Metric	Specifics
GDP Growth Data	World Bank (World Development Indicators)	Annual Real GDP Growth Rate (%)	The data for this analysis specifically used the World Bank's "GDP growth (annual %)" series for the United States from 1970–2023.
Stock Market Data	S&P Dow Jones Indices (via FRED - Federal Reserve Economic Data) and the AswathDamodaran Database (NYU Stern).	S&P 500 Total Annual Return (%).	"Total Return" is used rather than just the price index, as it includes both capital appreciation (price changes) and the reinvestment of dividends.

Table 1: Data Sources
Source: Scholars Exploration

Results and Findings

Time varying correlation between GDP and stock prices is presented in Table 2. The results of the analysis reveal that stock market and the current year's GDP growth have almost no statistical relationship (r≈0.05). However, when we correlate current stock market performance with next year's GDP growth, the relationship becomes significantly stronger (r≈0.45). This confirms that the stock market acts as a "leading indicator"—it prices in future economic growth expectations before they actually appear in GDP reports.

Correlation Type	Coefficient (r)	Strengthof Relationship
Concurrent (Same Year)	0.0522	Very Weak / None
Leading (Stock Market leads GDP by 1 year)	0.4515	Moderate Positive
Lagging (GDP leads Stock Market by 1 year)	−0.2102	Weak Negative

Table 2: Time varying Correlation between GDP and Stock prices
Source: Scholars Exploration

The Scatter plot presetnted in Figure 1 maps the annual GDP growth on the horizontal axis and S&P 500 Returns on the vertical axis with each dot representing a single year. If the two were perfectly related, the dots would form a tight, upward-sloping line. Instead, the dots are scattered widely which shows the wide dispersion between annual GDP growth and stock market returns, indicating that a "good" year for GDP does not necessarily mean a "good" year for stocks. At the same time the "best-fit" line is almost flat. This proves that knowing this year's GDP growth provides almost zero predictive power for this year's stock market return. For example, you can see years with negative GDP (recessions) where the stock market actually had positive double-digit returns.

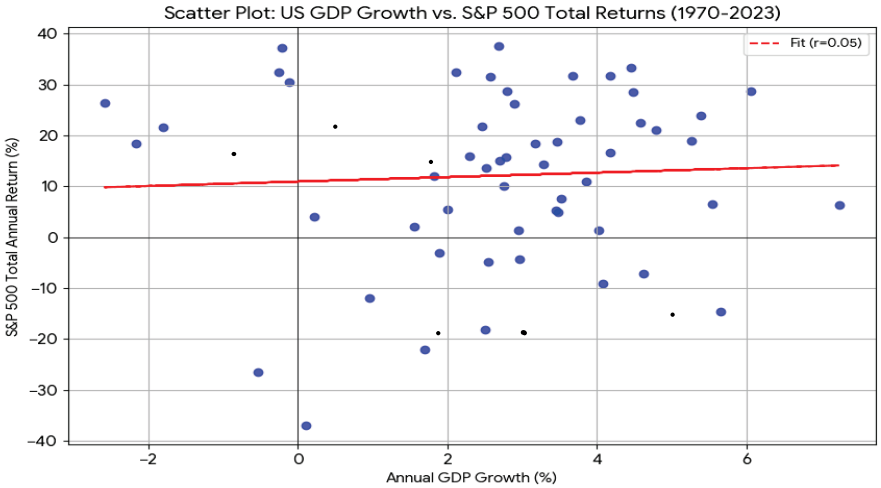

Figure 1:Scatterplot: US GDP Growth vs. S&P 500 Total Returns (1970-2023)
Source: Scholars Exploration

The analysis of the historical trends highlights a much higher volatility of stock market compared to the relatively stable growth of GDP. Figure 2 plots both variables over the 54-year timeline. To make them comparable, both are shown as percentage changes. The blue line (GDP) is relatively "smooth," rarely moving outside the 0% to 5% range. The green line (S&P 500) is incredibly jagged, frequently swinging from +30% to -30%. This explains the "disconnect." The stock market is roughly 8 times more volatile than the real economy. The market reacts to "shocks," geopolitical events, and interest rate changes that may never show up in the actual production of goods and services (GDP) for that year.

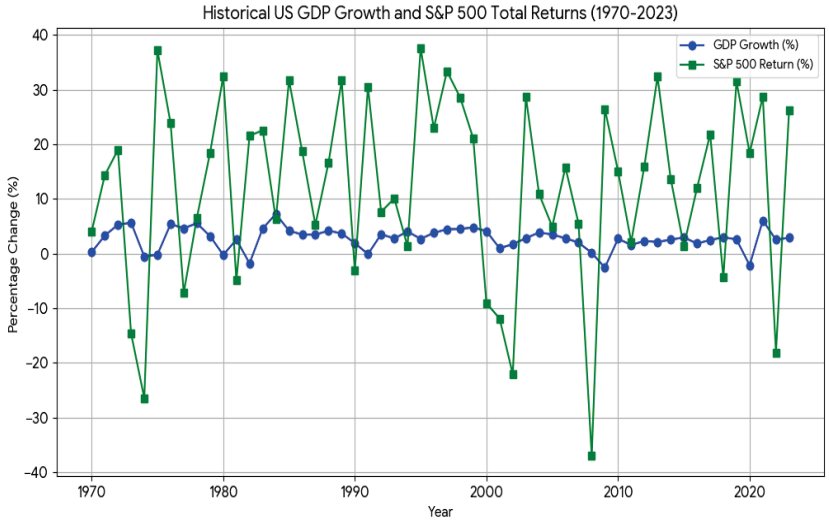

Figure 2: Historical US GDP growth and S&P 500 total returns
Source: Scholars Exploration

Figure 3 shows the rolling correlation where instead of looking at the entire 50-year period as one block, this figure looks at 10-year "windows" and calculates the correlation for each. The correlation coefficient is not a constant; it fluctuates wildly. In some decades, the line stays near zero; in others, it even dips into negative territory (meaning the market and economy moved in opposite directions). This highlights that the relationship is "unstable." During certain regimes (like the high-inflation 1970s or the tech-boom 1990s), the factors driving stock prices (like P/E ratios and inflation) were completely different from the factors driving the real economy, causing the two to drift apart.

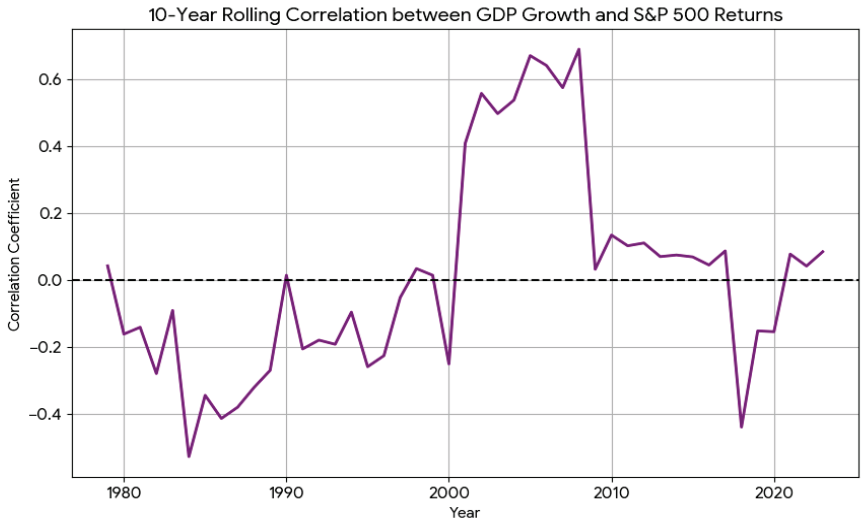

Figure 3: 10-year rolling correlation between GDP growth and S&P 500 returns
Source: Scholars Exploration

Discussion

The empirical results of this study—specifically the negligible concurrent correlation (r approx 0.05)—strongly validate the "Great Disconnect" hypothesis. This statistical independence suggests that the stock market has evolved into a system that operates on a different temporal plane than the real economy.

Importantly, one apparent explication for this disconnect is that economic data reflects what is in the past whereas stock market reflects on future expectations, and tends to act as a leading indicator reflecting the expectations of the investors of how the economy will fare in 6-9 month forward; implying that current stock prices are reflective of the future growth and riskiness of cash flows.Similarly, the investor sentiments for which there is enough evidence both theoretical and empirical to entail that investor sentiment (fads and fashions of the market) affect stock prices. Most often stock price mania is generated by the highly harmonised expectations of the noise traders, whose mistaken judgements diverge the security prices from fundamental value

(Morck & Shleifer, 1990), becoming more clear as the market enters the exuberance phase**(Santoli, 2021)**. Whether the exuberance is rational or irrational, experts agree that the stock indicesclimb supported by build-up of consumer savings, generous monetary policy and expectation of further fiscal stimulus.

At the same time it is argues that the stock market is dominated by a few firms and that the index has structural issues due to over representation of certain sectors or under weightage of others. This explains the K shaped recovery post COVID, where the upper arm of the "K" represents the stock market (Large Tech, Finance, AI), while the lower arm represents the "Real Economy" (small businesses, hourly labour, services), which is what GDP measures more heavily.

Conclusion

Historically, the direction of the stock market progress and the lives of ordinary households were closely aligned with efforts made by institutions for the greater participation and welfare of the general public. It ensured that the wealth effects of stock market participants played out positively for the economy. As the macro-economy became more complex with increased global linkages and multifarious financial market participants, it is the understandable that the stock market is not driven solely by news about fundamentals. Researchers and market analysts have enough reason to concur that complexity of factors affecting both the economy and stock market leads to this disconnect.

Through a longitudinal analysis from 1970 to 2023, the study concludes that while a long-term theoretical link exists, the short-term reality is one of profound divergence. The stock market no longer acts as a real-time thermometer for current economic health, evidenced by the near-zero concurrent correlation between GDP growth and S&P 500 returns. However, the market does function as a leading indicator, with a moderate positive correlation (r approx 0.45) to future GDP, reflecting its forward-looking nature. At the same time, COVID-19 acted as a historical amplification mechanism, demonstrating that aggressive policy intervention and sectoral concentration can allow financial markets to reach "glory" even while the real economy remains in shambles. While the financial well-being of the market can provide cues for future growth, the growing gap between Wall Street and Main Street creates a "paradox of prosperity." Policymakers and investors must remain cautious; a stock market that drifts too far from its economic moorings is susceptible to sharp, corrective shocks that could eventually spill over and destabilize the real economy. It has been noted that “While markets and fundamentals seldom do a tango, a disconnect between the two carry the risks of disruptive market corrections.”**(Chandrasekhar & Ghosh, 2020)**

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