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The Relationship Between Stock Returns and Economic Growth: Historical Patterns and Sectoral Dynamics

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ABSTRACT:

This study investigates the relationship between stock market returns and GDP growth in the long run, and how other factors affect stock performance. Research examines the impact of different macroeconomic factors, such as inflation, monetary policy, and technological progress. US stocks and economy have outperformed European stocks and economic growth over a decade. To find the reason for this, the study investigates whether investors should primarily focus on growing economies to get better returns. Furthermore, it examines how different sectors respond to economic growth and whether sector performance can be an indicator of future economic expansion or stock market returns. Economic theories suggest that efficient stock market prices reflect available information and expected future profits, which can be affected by economic conditions such as GDP growth and financial stability. However, studies have shown that this relationship is quite complicated, with evidence showing that stock markets and economic growth have only a weak correlation. The main findings of this study are i) Higher economic growth has not led to higher stock returns. ii) The general market trend can be predicted by sensitive sectors. iii) Markets were found to efficiently price stocks under different market areas, preventing excess returns.

KEYWORDS: Stock returns, GDP growth, long-run performance, market prediction

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TIIVISTELMÄ:

Tämä tutkimus tarkastelee osaketuottojen riippuvuutta talouden kasvuun pitkällä aikavälillä sekä kuinka muut tekijät vaikuttavat osakkeiden tuottoihin. Tutkimus arvioi myös muiden makrotaloudellisten tekijöiden, kuten inflaation, rahapolitiikan ja teknologisen kehityksen vaikutusta toteutuneisiin tuottoihin. Yhdysvaltojen osakkeet ja talouskasvu ovat tehneet merkittävää ylituottoa Eurooppaan verrattuna yli vuosikymmenen ajan. Tämän syyn selvittämiseksi, tutkimuksessa tutkitaan näiden korrelaatiota ja pitäisikö sijoittajan keskittyä kasvaviin talousalueisiin saavuttaakseen paremmat tuotot sijoituksilleen. Lisäksi arvioidaan eri toimialojen reagointia taloussuhdanteeseen ja sitä, voiko sijoittaja hyödyntää sitä arvioidessaan osakkeiden ja talouden tulevaa trendiä. Talousteorioiden mukaan markkinat hinnoittelevat tehokkaasti kaiken avoimen informaation osakkeiden hintoihin, mihin voi vaikuttaa esimerkiksi talouden tila, kuten talouden kasvu ja vakaus. Aiempi kirjallisuus kuitenkin osoittaa, että osaketuottojen korrelaatio talouden kasvuun on ollut vähäinen. Tutkimuksen päälöydöksiä ovat: i) Korkea talouden kasvu ei ole johtanut parempiin osaketuottoihin. ii) Tulevaa markkinatrendiä voidaan ennustaa tutkimalla suhdanneherkkiä toimialoja. iii) Markkinat hinnoittelevat osakkeiden eri maantieteelliset kasvuoletukset tehokkaasti, estäen ylituoton saavuttamisen.

AVAINSANAT: Osakkeet, talouskasvu, osaketuotot

Contents

Figures

1 Introduction

Stock markets typically price in expected returns and reflect the economic development of the region. Without exceptional circumstances, in long term, stock returns should rationally evolve in the same direction as the overall economy (Alexius & Spång, 2018, p. 110). Over the longer period, stock returns should correlate with general economic growth, and stock prices should tend towards mean reversion over the cycles. Since the financial crisis, U.S stocks and economic growth have clearly overperformed European ones.

According to classical finance theory, in an efficient market, all available information should already be in the stock prices, which should be equal to the discounted value of future cash flows (Fama, 1970). Generally, it is easier for a company to raise sales in growing economies, if costs do not grow at the same rate. Therefore, in a growing economy, local market companies' profits should grow, which eventually affects cash flows and then affects stock prices (Shiller, 2003, p. 83).

Historically, stocks have risen to unrealistic valuations multiple times, not being supported by fundamentals such as earnings growth or reliable expectations. There are theoretical reasons to expect a correlation between stocks and GDP growth because, in the long run stock market should reflect to real economy (Alexiues & Spång, 2018, p. 119). There has been discussion about whether economic productivity growth justifies higher valuations in the market. However, during the last century, fast-growing economy and productivity have not significantly correlated with returns (Ritter, 2005, p. 495). Instead, countries with the best growth expectations performed below average, which can be explained by a too high premium in pricing.

Investors are interested in future trends in the economy and stock markets. Certain sectors, such as consumer goods and materials, react quickly to changes in demand (Marfatia, 2023). These sectors predict a general trend, because those sectors are more

volatile and demand depends on how much consumers can spend in different market cycles, and correlates with purchasing power. Rising demand highers up material prices, showing how much companies are capable to pay for components. By following these sectors, investors can try to predict future economic developments and the likely direction of the total markets.

1.1 Purpose of the study

The purpose of this study is to examine the impact of economic growth on stock returns. More specifically, it explores whether economic growth has a positive effect on a region's market returns, or whether the markets have already accurately priced in the growth. The topic is relevant as US stocks and the economy have overperformed European ones over the last decade. Therefore, this is an interesting study for investors – if the growing economy offers better stock market returns, capital flows should aim for the best return. Hence, the first hypothesis is:

H1: Stock returns are higher in regions with growing GDP in the long run.

Second, certain sectors react more quickly to changes in the economy, making them useful for modeling the overall economic situation. By tracking the performance of these responsive sectors, investors could forecast general economic trends or the future direction of the markets. Hence, the second hypothesis is:

H2: Certain sectors respond more sensitively to changes in economic growth pace than others, making them useful indicators of future economic or stock market performance.

The hypotheses are based on previous studies between the stock market and GDP growth, especially focusing on the impact of a growing economy on stock returns and forecasts. In the past, developed countries have dominated in stock performance, but

growth possibilities are limited in the future. Therefore, the motivation is to examine whether investors should prioritise growing markets over others, and if it is possible to forecast market trends by using sensitive sectors as indicators.

1.2 Structure of the study

The purpose of the study and the hypotheses are introduced in the first chapter. Chapter two presents the theoretical background about stock markets' dynamics and pricing. Chapter three goes to a practical level, it uses the theoretical framework to examine the relationship between economic growth and stock market performance. The chapter shows how economic growth and other macroeconomic factors have influenced stock markets over longer time periods. It presents the results that have been found in studies on the relationship between economic growth and stock returns. In addition, the chapter examines how unexpected events, such as economic shocks, have affected market performance, as well as differences between sectors and the overall impact of economic changes. The fourth section analyses previous literature on the effects of economic growth on stock returns. The chapter discusses how various factors, such as technology, monetary policy, and shocks impact market performance. The last chapter is a conclusion, and it summarizes the key findings.

2 Stock Market Dynamics and Main Drivers

Changes in stock prices should reflect all available information (Fama, 1970). There are a couple of main drivers for the stock market, such as profit growth expectations, global demand, and price stability, including inflation and interest rates. These factors tend to have a correlation with economic growth. A positive trend in the real economy is reflected in investor confidence, which with upward pressure, drives prices higher (Jain, 2025, p. 21). On the other hand, this also attracts the attention of central banks, which aim to prevent the economy from overheating.

2.1 Efficient market theory

The theory of efficient markets (EMH) was developed by Eugene Fama (1970). According to the study, when markets are efficient, they quickly price in all public information. In efficient markets, there are many participants who try to maximise their profits and therefore reflect news in prices as soon as the information becomes public. Investors not only consider already public information, but also try to predict the future, which leads to a balanced consensus value, by the decisions of all investors in the market (Fama, 1970). Therefore, it should not be possible to beat the market index returns with only rational actions in the long term.

EMH includes three levels. The weakest form of market efficiency means that stock prices reflect all past information. The semi-strong form reflects all publicly available information immediately after it is released. This information can include information about a certain company or macro announcements such as inflation figures or interest rate changes. The strongest form refers to a situation where stock prices already reflects to insider information before it becomes public (Fama, 1970). The theory have some limitations which Fama have admitted, therefore EMH does not fully work in real life. Firstly, the theory assumes that all investors can trade without transaction costs. It also

assumes that all public information reaches investors at the same time, allowing investors to reach consensus about the correct price. However, this “fully reflect” assumption does not occur in reality, as information does not spread evenly, and all investors do not act rationally. Many professional investors have access to better information than individual investors, and transaction costs vary between different market participants.

2.2 Stock price modelling

In stock valuation, several different models have been used depending on the type of company being valued. For traditional value companies, there are models based on company fundamentals, such as paid dividends or free cash flow. The original idea of these dividend models was first introduced by John Burr Williams in 1938. According to his theory, the value of a stock can be modeled by its future dividends — in other words, the stock’s price should be equal to the net present value of the dividends it is expected to pay (Williams, 1938, p.57). Later, many models have been developed based on his framework, including the Gordon Growth Model (GGM) and the Free Cash Flow (DCF) model.

In his study, Gordon (1959) states that when purchasing a stock, an investor is buying both the dividends and earnings, only the dividends, or only the earnings. The model’s outcome depends on which variable was used, and the right stock price is equal to the discounted value of future returns. According to GGM, the stock price is influenced by the amount of the dividend, its annual growth rate, and the investor’s required rate of return (Gordon, 1959, pp. 100-101). GGM says that the fair value for an investor depends on the required rate of return as well as the equity risk premium. By lowering the required rate of return, a higher price can be justified for the stock. In contrast, the higher the expected annual dividend growth rate is, the more expensive the stock becomes. When estimating expected growth, the growth rate can be derived from

industry-specific factors and the company's size (Gordon, 1959, p. 100). The Gordon growth model determines the value of a stock based on its future dividends. In the formula, current stock price P depends on the current dividend D, when *k* is the investor's discount rate, and *g* is the expected dividend growth rate (Gordon & Shapiro, 1956, p. 105).

$$P = \frac{\mathrm{D}}{k - g}$$

In his later study, Gordon also presents a second pricing model, which includes how much profits are paid out as dividends and the retained earnings left in the company (Y– D) in the formula. Investors give higher value to current, reliable dividends than to uncertain future growth (Gordon, 1959, p. 103). The company's retained earnings remain invested in the business to grow future cash flows. However, the future is always more uncertain, and therefore future profits are worth less in present value. The model assumes that retained earnings grow at the same rate as the company has operated in the past. However, new investments always have risks, which is why paid dividends are seen as more valuable. This is especially true for large firms, where growth opportunities are limited and there are fewer profitable investment options available.

$$\mathrm{P} = a_0 + a_1 \mathrm{D} + a_2 \, (\mathrm{Y} - \mathrm{D})$$

2.3 Stock market phases

Stocks have been one of the most liquid and volatile assets, therefore if the stock market is efficient, it prices in new information quickly. Asset pricing theories suggest that the asset returns depend on with investors' expectations of total consumption (McMillan, A. 2021, p. 332). The study suggests that investors who believe the economic situation is getting worse, shift their money from stocks to bonds. The volatility risk of stocks can

be hedged by purchasing bonds with a specific maturity T (Naik & Uppal, 1994, p. 202). This shift, known as a “flight to safety”, increases more the attractiveness of bonds as stock market values decline due to the selling pressure.

Stock market sentiment is driven by investors’ beliefs and there can occur anomalies, to beat the market return, it is important for investor to understand when the market is out of it’s natural path (Daniel et al., 2002). Market sentiment can be modeled with a volatility index, which can be divided into two main emotions: fear and greed. Investors tend to feel fear when overall economic situation is getting worse or is predicted to be worse in the future (Duxbury et al., 2022). Therefore, negative news from the macroeconomy, like a decrease in GDP growth or negative interest announcements can cause unpredictable reactions in the stock market. Prices are also driven by noise trading, which means they do not always respond to facts but rather to rumors and herd behavior (Shleifer and Vishny, 2012). Therefore, markets overreact to news, but it is difficult for rational investors to take advantage of this because it is not possible to know when the market will correct itself.

Usually, stocks get their highest valuations before earnings reach their peak, which is because markets predict the upcoming economic cycle (Franz, 2010, p. 54). As their study finds, peaks and troughs during the last 80 years in the S&P 500 index, predicted recessions and expansions 85% of the time. As a median 6 to 8 months lead time for recessions and 4 months for expansions in the US economy. The study shows that the market can forecast future returns quite accurately, excluding unpredictable crises. The same thing happens with reaching peaks, usually peaks are reached a few months before earnings peaks.

Returns can influence stock market returns through the book-to-market equity ratio or improvements in profitability (Fama and French, 2015). Both factors depend on the overall economic cycle and the sentiment that is influenced by it. Changes in valuation can happen because of changes in the company or other external factors, such as

monetary policy. Stock valuation can change either due to changes in expected cash flows or indirectly through changes in the discount rate (Cieslak and Pang, 2021). Too positive economic development leads to interest rate hikes, which affect to the discount rate. According to the study, whether the stock return is positive or negative depends on whether the positive growth change has a greater impact on the company's profitability or on the risk-free rate (Cieslak and Pang, 2021).

2.3.1 Bull Market

Even though the terms bull and bear market do not have a clear definition in the literature, this study uses those terms for rising and declining markets. The commonly known definition of a bull market is a 20% increase from the previous bottom. However, Gonzalez et al. (2006) define it as the period between a trough and a peak, while there are persistently rising prices and stock returns are higher and last longer than usual. At this point, the positive trend tends to be strong enough that the upward movement can continue for months or even years. Maheu and McCurdy (2000) claim that due to high volatility, the biggest returns are in the beginning of a bull market, when market reactions are more aggressive. Also, Gonzalez et al. (2005) argue that the stock markets have been bullish 90% of the time, meaning that in stock declines, the slope is steeper and the duration is shorter.

High returns and rising prices attract new investors to the market, and increasing optimism leads to a rise in trading volume. Different market phases can be found with variable models like Markov-switching model, which identifies the bull and bear periods in the stock market. The model finds that stock returns are negatively correlated with volume in bear markets, and the correlation is positive in bull markets (Chen, 2012). This proves that high stock returns lead to higher trading volume, but evidence of high returns from high volume is weaker. The low trading volume during bear markets can be explained by investors' willingness not to sell their stocks when they are already losing

money. As a result, price increases from market bottoms are often a consequence of a drop in supply rather than a rise in demand. On the other hand, the high trading volumes seen at market bottoms in the model can be explained by panic selling (Chen, 2012).

In a bull market, market psychology is generally optimistic: the situation is quite similar to that with economic growth and inflation, a positive history feeds future expectations. Positive economic growth leads to low unemployment, which reflects in market expectations positivity, creating a self-reinforcing cycle (Jain, 2025, p. 20). According to market psychology, people get overconfident after some successful decisions, which makes them view themselves as more able to evaluate financial assets than they actually are, and therefore they underestimate their forecast error variance (Daniel et al., 2002).

During a bull market, investors get more confidence and therefore are willing to take more risks in their decisions. Investors also tend to be biased in their own decisions, giving different values to information depending on whether it is private information or public information (Daniel et al., 2002). Investors believe that valuation multiples can stay high, thinking valuations will not fall to normal. Jain's (2025) study suggests that a higher employment rate increases purchasing power, which boosts consumption and drives the market upward. Besides that, rising stock prices are often a consequence of rising expectations, such as an improvement in the economic situation or profitability

Even though Jain (2025) finds that bull markets are often linked to economic growth, however, since stocks forecast the future, an overly successful real economy can be seen as a problem. The economic cycle overheats, and the market looks for upcoming actions that should slow down the economy, such as interest rate hikes (Jain, 2025, p. 19). The study states that rising interest rates make alternative investments such as bonds more attractive, while at the same time, higher rates may weaken corporate earnings growth. Besides that, a higher interest rate affects to valuations by changing risk free rate, which

reinforces the negative correlation between stocks and bonds.

2.3.2 Bear market

Generally, a bear market is identified as a reverse action in the stock market to the bull scenario, where stock prices go down at least 20% from the latest peak. A bear markets differ from bull markets both economically and statistically, and the return variations can no longer be explained by a random walk theory (Gonzalez et al., 2006). A bear market can be defined as a downward trend from previous peaks to troughs, during which returns are consistently below average. As mentioned, most of the time bear market's duration is shorter, but the slope is steeper than in a bull market. Generally, bear markets are slightly more likely to have falling trading volume as opposed to rising volume (Gonzalez et al., 2005). This reflects behavioral finance, where investors are reluctant to sell at a loss and instead hope to break even. At the same time, trading volume can change widely, as some investors are forced to sell at the bottom to stop loses (Chen, 2012).

In the literature, the definitions of bull and bear markets are not entirely straightforward, with some defining declines and durations differently (Gonzalez et al., 2006). This complicates the distinction between a bear market and a regular market correction. After a long rise in the stock market, there can be smaller corrections in valuations, without it implying that the market sentiment has shifted to a bear market. Ball and French (2021) show that there have been short, unpredictable shocks in the market, like COVID in 2020, when the market dropped and also made a rebound, before economic numbers were even published. The S&P 500 dropped over 30% from its last peak, before the Q2 GDP announcement of -34%. After that rebounded up by 30% before the Q3 economic numbers could even be calculated (Ball & French, 2021). The recovery from market bottoms can take a very different amount of time depending on the cause of the bear market. While surprises cause a rapid decline, often leading to an overreaction followed by

an opposite correction, monetary policy moves are usually slower and do not trigger such strong volatility (Daniel et al., 2002).

2.4 The impact of monetary policy on stock markets

Monetary policy guides the real economy towards desired directions, aiming for stable growth. However, these decisions reflect on the stock market, influencing earnings and changes in risk-free interest rates (Laopodis, 2013). The direction of monetary policy depends on the state of the economy, with easy monetary policies during recessions and tightening policies during expansions. Many studies discuss the impact central banks have on the market – opinions range from ignoring market reactions to market-centered monetary policy. Rogalski and Vinso (1987) suggest that although the effects of monetary policy on the stock market are limited, the two still influence each other. While monetary policy should not be guided by movements in the stock market, the Federal Reserve should not ignore it, given the market's impact on overall economic activity (Rogalski & Vinso, 1987). The role of central banks in the stock market has grown in recent decades, as central banks have become a safety net in rescuing the economy during crises.

The central bank's interest rate reflects to level of the risk-free rate. The impact of interest rate changes on stock pricing can be modeled using Malkiel's (2003) formula. In the model, r is the required rate of return, D/P is the expected dividend yield, and g is the long-term growth rate. If we assume a risk premium of 6% and a risk-free rate of 2%, the required return r becomes 0.08. The market's average growth rate can be assumed to be around 7%. If the risk-free rate increases, the risk premium usually increases slightly too (Malkiel, 2003, p. 74). For example, if the risk-free rate rises by 2 percentage points, the risk premium might rise by 0.5 points. Then r becomes 0.105 (4% + 6.5%). If other variables stay the same, increasing r from 0.08 to 0.105 would mean that the stock price drops by 71.5%. However, in real life, this usually does not happen because rate hikes

are often a result of inflation, which can also increase growth and dividends, helping to neutralize the effect of a higher r.

$$r = \frac{D}{P} + g$$

Nowadays, central banks have multiple tools for executing their policy. In addition to traditional interest rate policy, central banks can influence liquidity through asset purchases (QE) and, if necessary, reduce liquidity by selling securities (QT) (Al-Jassar and Moosa, 2018). These transactions impact quite directly to stock valuations: by purchasing assets, central banks inject liquidity into the market, which drives up prices. As Congdon (2021) argue, stock markets react to changes in the money supply faster than the response in output, even though QE aims to increase economic activity and thereby production. This shows how strong the correlation is between monetary policy and the market, but from this perspective, it makes one wonder if QE and QT are the best ways to execute monetary policy.

As Al-Jassar and Moosa (2018) show, monetary policy affects industries in different ways, while interest rates impact company valuations, especially for growth companies, QE and QT have a more direct effect on bank stocks. Banks have tightened their lending policies during the crisis, but central banks' actions can affect their money supply. Although central banks lend money to banks in the form of QE, the banks have not lent the money out but have stored it on their balance sheets (Al-Jassar & Moosa, 2018). QE where central banks' money goes through banks, might not work properly if banks don't have to actually lend the money to customers.

An increase in interest rates raises companies' costs, reducing their profits and slowing down their willingness to invest. Besides slowing down growth, higher interest rates impact growth companies more significantly, not only due to their higher levels of debt but because of the discounting future cash flows with higher rate (Fama & French, 2015). This is one reason why growth stocks tend to perform worse than value stocks in recessions. As Fama and French (2015) with their HML factor model show, growth stocks with

a high book-to-market value tend to perform worse, especially in a tightening monetary policy environment, where money flows shift towards companies with lower valuations.

Overall, the results suggest that there is no clear, dynamic relationship between monetary policy and the stock market returns (Laopodis, 2013). As mentioned, monetary policy should guide the real economy, but support measures have a strong impact on liquidity, which is also reflected in stock markets. The primary task of central banks is to maintain price stability, but their decisions and communication have a significant impact on market behavior. Clear and consistent communication increases investor confidence, which often reflects positively on financial markets globally (Chebbi, 2018). These statements have a strong impact on market interest rate forecasts and market behavior. Therefore, especially Western markets are seen as more interesting for investors because of the stability the monetary policy brings to the region.

3 Stock returns forecasting with economic growth

As Fama's (1970) EHM and pricing models show, in a rational market environment, earnings growth or better expectations should lead into an increase in company valuations. However, economic growth affects different companies in varying ways. Cyclical companies are more strongly influenced by the business cycle, while defensive sectors, such as the pharmaceutical industry, are less dependent on economic activity (Jain, 2025, p. 20). This affects the sales of cyclical companies as consumption increases. Therefore, it is more meaningful to examine the development in index level in specific regions or countries, relative to the economic growth of that area over a selected period.

Just as stocks are valued using discounted cash flow, the same method can be applied to indexes. The market value should represent the discounted cash flows of all companies to the present moment. A decrease in profits or a shift of profits further into the future lowers the net value. Conversely, the value can increase if the required rate of return decreases, even if the actual profits do not change (McMillan, 2021, p. 333). The market risk premium should vary in line with the risk-free interest rate, as the risk-free rate rises also risk premiums (Malkiel, 2003, p. 74). Therefore, in a rational scenario, valuations should not change significantly unless there are major changes in earnings, expectations, or required returns.

When combining a low interest rate, good employment levels, rising demand, and over-optimism, markets tend to become overvalued (Jain, 2025, p.21). Even though stock prices should reflect to economic health, when considering stock market valuations, higher valuations mean worse future returns. Although GDP growth is not the main driver of stock market developments, growth can help listed companies reinvest their profits with better expected returns, which may lead to further economic growth. In contrast, valuations can also increase if individuals drive up company valuations with their savings, but these capital inflows do not indicate future profit growth for the company (Ritter, 2005).

3.1 A historical perspective on returns and growth

Historically, investors' cash flows between stocks and bonds have varied depending on market sentiment. During periods of economic growth, funds have shifted into stocks, causing bond values to decrease, while in times of crisis, the trend has been the opposite. Uncertainty makes stock risk premiums rise, which in turn raises bond values, as bonds serve as a hedge against the cash flow risk of stocks (Cieslak & Pang, 2021). When considering Western countries, the last 100 years have been very different in terms of economic growth compared to the current situation. As Jain (2024, pp. 17-20) claims, in the past, Western countries benefited from population growth, productivity improvements due to industrialization, and later globalization. Due to weaker price stability in history, higher inflation has led to higher interest rates (Congdon, 2020, p. 321).
On the other hand, in the past, economies were less well-managed, and cross-national central banks did not have the same level of control over economic policy.

When considering the historical returns of a specific stock market, the domestic consumption and economic conditions of the country played a more significant role. In the past, companies were often domestically oriented, and their performance was closely tied to the region's economic stability. Therefore, for listed companies, it was more critical that a country's economy perform positively (Alexius & Spång, 2018, p.122). However, with globalization, exports now mostly compensate for domestic economic downturns. Figure 2 illustrates the productivity growth, represented by GDP growth in Western countries in comparison to the return on capital in these regions. From this, we can observe that higher economic growth has not necessarily resulted in better capital returns, as markets have already priced in future growth, as seen in the case of Japan (Ritter, 2005, p. 494). It shows that investors were overly optimistic with Japanese future growth, and the market was pricing future returns too high. It is important to note that figure 2 measures productivity growth per capita, meaning the effect of population growth has been adjusted out.

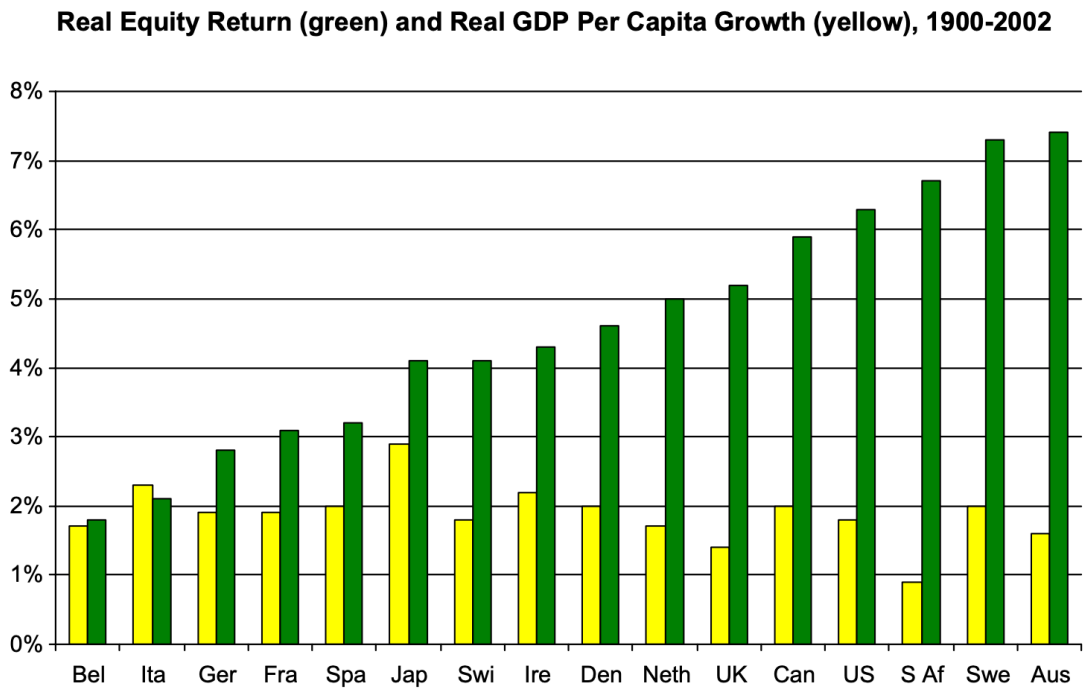

Figure 1. Annual real equity returns (dividends and capital gains) compared to annual GDP growth in developed countries between 1900-2002 (Ritter, 2005, p. 494).

This figure and correlation calculations in Ritter's study (2005, p. 495) show that over the past century, productivity growth did not mean better returns on assets. Ritter's calculations find a correlation of -0.37 with a p-value of 0.16, meaning a negative correlation between these two factors, but low p-value meaning there is no strong statistical evidence of this realtionship. Instead, the study shows that the four countries with the highest return on equity had the best real dividend per share growth during the period. In contrast, the countries with the weakest performance experienced a decline in inflation-adjusted dividends.

On the long term, stock valuations should develop in a similar line than the economy. Historically, there are several examples of how rapid growth has led to bubbles in valuations. As Jain (2025, p. 21) describes, this occurred, for example, during the dot-com bubble and the financial crisis. The period leading up to the crisis was several years of strong economic growth, which caused valuations to rise exponentially, anticipating that

the same growth would continue indefinitely. Eventually, the valuations collapsed, aligning with the growth rates of the real economy (Franch, 2010, p.56).

3.2 Changes in industries

As the previous chapter states, in history, higher productivity in economic growth has not meant higher returns on equity. Generally, markets price in overly high growth expectations, which inflate valuation multiples. However, as Alexius and Spång (2018) show, the figures from the 20th century may not necessarily be very comparable for forecasting the future, as industries have changed and the world has become a global market area for multinational companies. This affects stocks because, since foreign GDP follows different productivity trends, domestic and foreign stock prices exhibit different stochastic trends (Alexius & Spång, 2018, p. 117). Companies are no longer dependent on their home country's economic development, as a large portion of production is typically exported.

Different sectors respond to economic cycles in different ways. Stock returns can also be used to forecast economic growth. Over short periods, less than a year, the future trend of economic growth is best predicted by the automotive industry, the consumer sector and materials (Marfatia, 2023). These sectors typically respond first to changes in consumer purchasing power and therefore tend to lead broader economic developments. In contrast, the study finds, over a longer period, more than one year, future economic performance is best indicated by the banking and industrial sectors. The delayed response of the financial sector can be explained by the lag in monetary policy transmission, as a typical monetary policy shock affects economic growth with a delay of over a year. Slower reactions in the banking sector may be a consequence of people’s uncertainty of their economy, which is in line with Fuinhas et al. (2013) study, which examines how the banking sector and stock market predict and respond to economic developments. They find that the banking sector benefited more of economic growth

than stock markets generally. While it did not act as a driver of growth, the happened growth improved the profitability of the banking sector, by increasing the consumer credit supply. In a growing economy, customers have courage to invest, thereby increasing bank's loan portfolio and profits.

Marfatia (2023) highlights the impact of sectoral volatility on forecasting accuracy, the lower the volatility, the more accurately the sector predicts future developments. On the other hand, less volatile sectors such as healthcare and consumer staples are less sensitive to economic cycles, making them poor indicators for modeling overall economic demand. These segments, such as essential goods and services that consumers cannot easily be without, regardless of the economic situation (Marfatia, 2023). The study shows that stock market indices are not particularly reliable in forecasting economic developments. Instead, the highest predictive accuracy is found in more volatile sectors. Sector-specific movements often reflect shifts in economic demand, which may not be visible at the overall index level.

The impact of economic growth on different sectors can vary significantly. Zeira and Zaobi (2015) examine how technology has changed industries. As a result of technological advancement, improved productivity increases the profitability of new industries, thereby creating new jobs in these sectors. This encourages labor to shift from lower-productivity sectors toward more productive. The expansion of modern goods production leads to the emergence of new sectors, and these new industries also require different types of intermediate goods. As the study suggests, this transformation may lead to an increase to the size of individual sectors, although the total number of sectors may remain unchanged. The main loser in this process of technological efficiency improvement is typically basic industry, which produces intermediate goods that are easy to replace (Zeira and Zaobi, 2015).

4 Economic Growth and Stock Returns: Empirical Findings

Rationally functioning stock markets are priced based on future cash flows, where future growth is already reflected in stock prices. Price fluctuations without news are part of the nature of markets, but according to financial theories, efficient markets always price in all publicly available information (Fama, 1970). However, research shows conflicting results, as the stock returns in rapidly growing economies have not been the most profitable as a domestic stock market in the long term (Ritter, 2005, p. 495). The following sections compare previous studies conducted on this topic.

4.1 Macro-Economic factors

Generally, returns can be considered to develop over the long term in the same line as overall economic growth. Previous studies have shown that economic growth tends to have a positive relation to capital returns, but (Madsen et al., 2011) find the opposite result. In their study, they use three-variable model to investigate the relationship between real stock returns and per capita output growth, including technological progress and macro environment. Against previous literature, their model shows that the relationship between stock returns and economic growth is not clearly positive. The model applies that consumption drives expectations of future productivity, which increases uncertainty as the result is based on expectations. The model assumes that consumers follow macro data and that consumption is based on expected future productivity (Madsen et al., 2011). In contrast, Duffee (2023, p. 21) found the opposite result, showing that returns are strongly linked to current economic growth. However, no connection was found with expected future economic growth, which can be explained by consumers' expectations of a better future that limit current demand. The differences in Duffee's findings are explained by the comparison of current and future growth news. The weak effect of future news is explained by consumer flexibility, which leads the model to a different conclusion than model by Madsen et al. During periods of extraordinary high output volatility, Madsen et al. (2011) found that stock returns are more likely to be

positively correlated to economic growth. Their study suggests that economic growth depends on technological progress, whereas stock returns respond more to the risk-free interest rate and the risk premium. This can be explained with the finding that during periods of high volatility, shocks such as technological progress or improvements in profitability are more likely to be seen as permanent than in stable market conditions.

Besides more usual factors, equity market returns also depend on factors such as economic freedom, economic fitness, and market development (Chu et al., 2020). Economic fitness refers to a country's or a company's ability to develop and produce more profitable and advanced output. The result in the study was that the level of fitness has a positive, but statistically insignificant, relationship with returns. This is because fitness is already priced in and should not affect the changes of these prices anymore. In used modell, the GDP gap also works as an important variable, it measures the difference between a country's actual GDP and its theoretical maximum, under ideal conditions. In this case, it reflects a country's economic fitness, as it measures factors such as the employment situation. A negative GDP gap indicates that a country's per capita GDP is underperforming comparing to its fitness level. Therefore, the study's finding that countries with larger GDP gaps often achieve higher returns is logical. As increasing economic freedom and capital market development tend to correlate with such conditions. The effects of market freedom are described in Goldman Sachs' (2025) analysis. U.S. tariffs are said to raise the country's inflation, affecting consumers' purchase power the most. The impact has been seen especially in the valuations of U.S. markets, but also in European export companies. As the United States is Europe's largest export area, its economic restrictions significantly affect global markets.

Economic productivity often plays a key role in economic growth, especially in Western countries, since growth cannot rely on a growing population. Madsen et al. (2011) examined the impact of technological progress, adjusted to the balanced growth path, to stock returns. According to a study, during steady economic growth, technological breakthroughs increased returns only temporarily. The rise in earnings boosted the valuation of technology firms, attracting capital toward these companies. However, the

increased earnings quickly reached equilibrium due to the rising valuations. Their findings support Fama's EMH about balance in markets and how productivity growth affects to stock pricing. During periods of technological revolutions, there may be a negative relationship with returns, especially among firms that were not willing to invest in new technologies (Madsen et al., 2011). The model also does not account for other variables, so negative returns during periods of positive technological breakthrough may not necessarily be caused by the breakthrough itself, but rather by other simultaneous events that affect stock performance in general.

When considering the fundamentals of stock returns, profit growth is one of the key drivers. However, stock returns can also influence economic growth and capital flows. In their study, Fuinhas et al. (2013) define the financial system to be divided into two components: the banking system and the stock market. The study examines the impact of stock market development on economic performance in Europe, with a particular focus on the Portuguese market. Their study investigates the relationship between financial market returns and changes in real GDP. They concluded that stock returns drive economic growth, whereas the effect of economic growth on stock returns was only marginally significant. Although Fuinhas et al. (2013) found that stock returns seem to lead economic growth, but not the other way around, this result may be partly due to the short perspective of their model. The VAR model they used focuses on short-term relationship, which may show certain end come, because as Fama's (1970) EMH suggest, stock markets often respond quickly to new information, whereas changes in real GDP take more time to occur. Because of this difference in reaction speeds, the short-term relationship between these variables can appear one-sided.

Monetary policy has two types of effects on stock returns, predictable and stable policy creates economic stability, which increases market valuations in the long run. In the short term, positive central bank actions may lead to price increases and a positive market reaction (Chebbi, 2018). Used parameters in the study indicate that a positive monetary policy surprise has led to a decrease in domestic bond yields and an increase in

stock returns in the examined European markets. The results of the study show that stable monetary policy in the euro area reduces sovereign risk while increasing stock returns. There are also differing opinions about the effectiveness of central banks' monetary policy. If monetary policy is effective, it should influence economic growth rapidly through real yields (Duffee, 2023, p. 22). The study states that changes in interest rates take time to affect the economy, because consumers can choose to spend money later than now, which means that consumer spending should clearly increase when monetary policy is eased. However, this pattern is not observed in the model when the correlation was measured between used two variables: economic growth news and consumer shocks of patience. The problem with the model is with difficulty in separating future news from current news, which make it harder to analyze response time consumers have to news.

Companies with a large proportion of floating-rate debt have a stronger reaction to interest rate changes than those that hedge their loans (Gürkaynak et al., 2022). The study compares how companies with different balance sheets react to monetary policy announcements, focusing how reducing cash flow affects to debt rate. The results show that companies with more debt react more strongly to interest rate changes. The amount of debt is not only one that investors are interested in, but also the maturity of the debt affects how strongly they react to monetary policy changes. As the five-factor model shows, besides that rising interest rates increase financial costs, interest changes also affect valuation multiples by risk-free rate (Fama & French, 2015). When cash flow weakens, it directly reduces investment value, especially in companies that are already more sensitive to interest rate risk. Interest rate increases also lower the value of the balance sheet, because assets lose value more than liabilities (Gürkaynak et al., 2022). When cash flow goes down, companies often use their liquid assets, which lowers their equity. This weakens the company's equity ratio, and depending on the firm's capital structure, it may increase its vulnerability to future financing risk. A weakened balance sheet may jeopardize profit payouts and lead to limiting investments.

Oxman (2012) demonstrates in his study, that price inflation has no statistically significant relationship with stock market returns. Over a 40-year period, the used inflation measures show no statistically significant correlation with S&P 500. Depending on which measurement was used, inflation was found to affect dividend yield rates. A positive and significant relationship was found between the consumer price index (CPI) and dividend yield during the period 1966–1983, but not in the later period of 1984–2009. In contrast, no relationship was found between the Federal Reserve's preferred measure, the personal consumption expenditures (PCE) index, and dividend yield over the examined period. However, inflation was found to affect significantly on corporate risk premiums, although these were not directly related to actual stock returns in a statistically significant way (Oxman, 2012). The different results between CPI and PCE can be explained by their differences: CPI measures the price development of a consumer's "basket of goods", while PCE captures a broader range of consumption, which also makes it slower to react to inflation spikes. During the years 1966–1983, when CPI correlated with dividend yields, there were exceptionally strong inflation spikes, which PCE may not have had time to react.

4.2 The Impact of Shocks on Stock Market Returns

Shocks may be either positive or negative for markets and occur in varying ways, including monetary policy, technological advancement or inflation. In their study, Dzhumashev et al. (2011) state that the impact of economic growth on stock returns depends on the duration and persistence of shocks. In the modeling, forecasted output growth, stock returns, and changes in yields were compared. The analysis found that positive changes in yields had a positive effect on expected economic growth, whereas expectations about economic growth had no effect on interest rates.

Savor (2012) examines stock price reactions after the released information. Situations with a valuation drop without a particular reason, called "no-information" reactions

correlates often with overall high uncertainty, which can be explained with macroeconomic figures such as unwanted employment rate or inflation. The research reveals that investors tend to overreact to information related to market sentiment or liquidity, while underreacting to negative announcements about individual companies. In his study, Savor examines stock returns happened during a short 20-day period after the release of information. The findings indicate that price changes tend to overreact when they are not associated with any released information. After a positive price shock, prices rebounded, the 20-day abnormal return was −0.1% in cases where the movement was information-based, compared to −0.4% when no information was released. This shows that market efficiently corrects unjustified price increases, adjusting prices to reflect with fundaments. On the other hand, findings may make one consider if markets act efficiently in the first place, when there occur overreactions overall.

Investors rank companies based on interest rate risk, which is not influenced only by the current interest rate but also includes central bank forward guidance (Gürkaynak et al., 2022). The research finds that investors update their cash flow forecasts based on monetary policy news, which also causes stock prices to fluctuate. They divide surprises into two categories: surprises in policy rates and surprises in forward guidance. It is difficult to model forward guidance surprises because of the challenge of defining and measuring forward guidance surprises, as well as how these affect different sectors and for what duration. The market's reaction time to unexpected volatility often depends on the market trend and the reason of the volatility. In the beginning of uncertainty, investors were found to react slowly to unexpected volatility, which later led to overreactions (Lochstoer & Muir, 2022). Their study finds that stocks had excess returns after a volatility peak during one month after shock. In contrast, on a longer period, an increase in volatility that lasted over a six-month period had a negative effect on equity risk premiums and led to higher future volatility (Lochstoer & Muir, 2022).

Sharma and Narayan (2022) examine the impact of technological shocks on stock returns in the United States. Based on over a century of data, their findings suggest that

technological breakthroughs have occasionally predicted strong returns, particularly during two periods: 1920–1945 and 1995–2018. The study suggests that technological shocks typically influence stock returns over the long term and tend to have a stronger impact during periods of economic expansion. As technological progress is seen as a driver of productivity, rapidly advancing technology did raise earnings per unit of capital, but only for a short period (Madsen et al., 2011). They found in their study that technological progress had a quicker response in the market, but productivity growth was priced rapidly by the market.

As monetary policy should guide the real economy into the desired direction, (Chebbi, 2018) analyzes in his study how markets react to actions instead of expected policy moves. His analysis found that monetary policy shocks have not had a statistically significant impact on stock returns in Europe. Analysis measures unconventional monetary policy surprises, analysing changes in the long-term yields of German government bonds. The study's empirical findings show that, especially in the weaker economies of Europe, positive monetary policy surprises have led to a decline in government bond yields and higher stock returns. A monetary policy shock is defined as an unexpected change in the short-term risk-free rate or its expected path (Cieslak and Pang, 2021). According to their study, released information can trigger a risk-free rate shock in the markets at any time, not just right after central bank meetings. This can be seen as a consequence of market acting efficiently, and relevant news is also published continuously outside of central banks' meetings.

Unlike Chebbi (2018), who found that the effect of monetary policy shocks on stock returns in Europe was not significant. An opposing reaction in the stock market to monetary policy changes was observed in the United States, when Pflueger and Rinaldi (2022) modeled how the Fed's monetary policy influences stock returns. According to the study, negative economic news, such as monetary policy shocks, reduces consumption, which in turn leads investors to reduce their weight on risky assets. The study finds that the stock market have a negative and statistically significant interaction with monetary

shocks. The model shows that a one percentage point increase in the Fed's interest rate made stocks to fall by an average of -6.37%. In the model, the return was split into a risk-neutral part and a risk premium part. The results showed that 80% of the price change came from changes in the risk premium, and 20% came from changes in the discount rate for future earnings (Pflueger & Rinaldi, 2022). As monetary policy aims to maintain long-term market stability, its actions take more time to affect. Therefore, as Lochstoer and Muir (2022) find in their study, long duration of uncertainty increases risk premiums, which is in line with these findings.

Rahman's study (2025) found a positive stock market reaction to monetary expansion shocks in US stocks. Research found a general statistically significant relationship between monetary policy decisions and stock returns in the United States. The study shows that unconventional monetary policy actions, such as the expansion of the central bank's balance sheet, have a greater impact on stock returns than conventional actions, such as interest rate changes. An expansionary monetary policy shock that lowered the long-term interest rate by 25 basis points led to a 0,57% increase in stock returns under conventional monetary policy and a 2% increase under unconventional policy, in a five-week period. When comparing this to Pflueger and Rinaldi's (2022) findings about stock reactions to increasing interest rates in the US, we can see that stock reactions to tightening policy were more aggressive.

Inflation can arise as a result of another shock, such as a sudden change in consumption due to a crisis. While the direct effect of inflation may be limited on stock prices, the consequences of inflation can have a significant impact on returns. In their study, (Li et al., 2010) find that 7 out of 10 industries reacted negatively to unexpected inflation. The largest coefficient changes were observed in the consumer segment, but the most significant response came from the telecommunications sector. The study concluded that, generally industries respond negatively to RPI inflation announcements. These findings are in a line with Pflueger and Rinaldi (2022) study, which finds that the interaction coefficient between monetary policy shocks and stock market reactions

increases with cyclical sensitivity, being lowest for utilities and highest for the technology sector. The study also shows that stock prices behave in line with Fama (1970) EMH, returns respond to inflation news on the announcement day, with no reaction either before or after the release (Li et al., 2010). The study analyzed years when inflation in the UK was higher than the central bank's target. It found that during these high-inflation periods, inflation announcements did not affect stock returns. This shows that inflation seems to affect returns mostly when the economy is more stable. The researchers concluded that when inflation is already very high, the market expects high numbers in the near future, so they are already included in stock prices (Li et al., 2010). The same happened for slightly lower numbers than expected, since inflation was still high, so it did not affect on market.

5 Conclusion

This study examines the impact of different macroeconomic conditions on stock market returns. There are several studies on the relationship between economic growth and stock returns. Generally, the literature found correlation between returns and economic growth relatively weak. Even though stock returns are typically driven by improving earnings or expectations of higher future profits. There are several possible explanations for the low statistical significance of this relationship. First, efficient markets tend to price in expectations of future growth. In other words, markets with higher expected growth often have higher initial valuations compared to markets with modest growth expectations. Therefore, based on empirical evidence of recent studies, the first hypothesis is not supported. Secondly, regional economic growth often represents only a small portion of a multinational company's total sales. In addition, growth may come from specific sectors that do not significantly affect the earnings of publicly traded companies, meaning that the growth is not necessarily reflected in stock market returns.

Even though, the literature shows that the highest returns on capital have not occurred in the fastest-growing economies. Stock pricing is heavily influenced by the market cycle and interest rates, which is often connected to economic growth. Markets are forward-looking, anticipating future developments, therefore as studies show, the best returns are often realized at the early stages of a bull market. If investor tries to make excess return, to reach the best return, it is critical to find different market phases. As previous literature show, there are a couple of sectors investors can follow to find the general market trend. The consumer sector and materials were found to predict short term trend quite accurately. Also more volatile sectors predicted the most accurately future demand therefore second hypothesis is true.

As a conclusion, economic growth does support profits and therefore stock valuations, but it is not a reliable measurement for forecasting stock market performance. Investors and policymakers should not focus on economic growth when assessing market

expectations. Instead, on a short perspective, using other indicators such as sector dynamics and economic volatility gives a better view. While economic growth does influence markets, its correlation with stock returns is weak. Therefore, economic growth alone is a poor indicator for identifying outperforming markets. Literature show that investors value more security and balance, which is mainly dependent on the government and central banks. These findings show that there is no reason for investors to chase growing economies to invest in, to reach better returns.

Although the first hypothesis did not hold, there are still significant regional differences in returns in recent history, such as between the United States and Europe. US stocks have overperformed European stocks consistently from the financial crisis up to now. As both regions are part of the Western world, their political systems and market conditions are relatively similar. However, the U.S. has also experienced stronger economic growth during this period, but as this study shows, it does not explain the difference. Because the reason for this difference is unclear, further research could investigate the role of regulation on business growth, as well as the availability of financing for growth companies in Europe. Since these factors clearly differ between the growth markets in the United States and Europe.

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Appendices

Note: Translations from Finnish to English were supported by AI language models (GPT-4 and GPT-4o) developed by OpenAI. To ensure accuracy, the text has been edited and finalized by the author.