Determinants of Bond & Equity Yields: An Alternative Approach to Macroeconomic Growth Through a Keynesian Perspective

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This thesis is dedicated to my family for the upmost support they have given me throughout this journey.

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           This paper will research the volatility between bond and equity markets by focusing on the case of the United States to uncover a potential explanation for the cause of volatility. A macroeconomic approach will be taken for this research to uncover the causes for volatility in financial markets and the impacts of this volatility. Volatility within both financial markets is impacted investor uncertainty, inflation, and expectations. Market uncertainty and inflation expectations derive from rising bond yields which impact net present value calculations and expected profits through the presumed belief of rising interest rates. Higher interest rates make the cost of borrowing more expensive and thus impact expected profits when using net present value calculations. This presumption will impact equity markets by forcing investors to rebalance their portfolios away from equities.

           Contrary to the conventional wisdom, the US economy has expanded over the last decade with extremely low interest rates, low inflation, and a higher debt level. The neoclassical theory has failed to provide an explanation for this phenomenon. An alternative approach to the determination of bond and equity yields must be taken to try and answer these questions. The interest rate is not primarily determined by any increases or decreases in the nominal supply of money circulating through the economy. The US central bank incorporates an interest rate targeting regime by targeting the short-term interest rate of US treasury bonds and ~~s~~etting the long-term interest rate of US treasury bonds which is based upon Keynes’ conjecture. (Akram, 2020) Based upon Keynes’ theory of the interest rate, growth of equity markets is heavily impacted by any volatility within the bond markets. More specifically, a low interest rate environment allows for higher economic growth and shareholder profitability. Policy recommendations should encourage effective demand because of the beneficial impacts it has in supporting workers and shareholders. A wage-led framework can help reduce the inherent instability within the financial system by reducing the amount of credit exposure circulating throughout the economy. A zero-interest rate environment allows for capital to be allocated by increasing the purchase of capital assets which adds to employment and economic growth.

           The Biden administration is currently engaged in paradigm shifting economic policies in which bond and equity markets have reacted in a volatile manner based upon the perception or outcome of the administration's current economic policies. Due to the Covid 19 pandemic, it has forced the Trump and Biden administration to pass several stimulus packages which have provided income support for the large amounts of people unemployed and emergency liquidity in the form of forgivable and long-term loans for businesses that have been impacted by the pandemic. The Trump administration enacted The Tax Cuts and Jobs Act of 2017 which reduced the corporate tax rate to 21% and caused an increase in the budget deficit. Even though President Trump claimed to be a Republican, his economic policies pursued by his administration and himself contradicted the upheld beliefs of conservatives serving in congress. President Trump's economic policies caused equity markets to expand and grow and even argued for interest rates to stay at zero to sustain the stock market boom. The increasing amounts of trillion-dollar stimulus packages has caused volatility between bond and equity markets due to investor uncertainty of the future. The mainstream consensus has argued that the increasing federal deficit and national debt will lead to hyperinflation and can only be tamed by an increase of the interest rate. This argument has become questionable since the US government has enacted multiple trillion-dollar stimulus packages and it has not caused an uptick in interest rates and inflation. The Federal Reserve has even announced that it will keep interest rates near zero until the economy nears full employment. Bond and equity markets have reacted with rampant volatility due to the uncertainty, inflation expectations, and perception of how more stimulus packages impact the economy and financial markets. Sharp movements within US government treasury yields are drivers in market volatility and uncertainty. This paper will take an alternative approach in explaining what causes volatility between bond and equity markets and what key factors are driving the volatility. Alternative economic policy recommendations will also be researched in what drives economic growth and the role the Federal Reserve plays in this outcome.

# **CHAPTER 1: Determinants of Bond & Equity Yields**

This chapter will take an alternative approach in uncovering the mechanisms that drives market volatility during times of uncertainty. Volatility between bond and equity markets is caused by several factors which impact markets through shifts and adjustments of investment portfolios according to market sentiment and outlook of the overall economy. During a period of economic growth and a bull market, yields on equities are usually preferred over bonds. During periods of market uncertainty and negative sentiment of the overall economy, investors shift their portfolios to bonds because they are deemed less risk averse than stocks and other equities. In moments of economic turmoil, uncertainty affects markets in the form of changes in the liquidity preference of the investor and consumer within an economy. Investors sell off their equities and consumer confidence decrease as an economy enters a recession.

  Fiscal and monetary policy is used to steer the economy out of a recession or potentially avoid one. The perception of the actions from the Treasury and the Federal Reserve have been mostly dominated by the mainstream neoclassical theory in terms of fiscal sustainability. The presumed belief that higher fiscal deficits drive up the interest rate and will cause hyperinflation has become rather questionable in modern times. Over the last decade, the US economy has expanded with low interest rates, low inflation, and higher fiscal deficits. Large fiscal deficits are supposed to exert upward pressure on the interest rate and bond yields but that has not been the case for the United States. This has been completely against the conventional wisdom and more specifically, the Loanable Funds Theory of the interest rate. The mainstream theory has failed to provide an explanation for this phenomenon.

           In a modern economy, the central bank plays an important role in determining key variables that help stabilize the economy and promote economic growth. The Federal Reserve incorporates an interest rate targeting regime system by targeting policy rates like the overnight financing rate and the interest rate on bank reserves. (Akram, 2020) The overnight financing rate or the federal funds rate is extremely important to understand how the central bank achieves its policy objectives. To encourage banks in maintaining the required reserve balances, the central bank pays interest on its reserve balances in keeping the federal funds rate within its targeted band. (Fullwiler, 2004) The short-term interest rate closely follows the central bank policy rate and thus impacts the long-term interest rate as well. (Akram, 2020) The long-term interest rate follows the short-term interest rate very closely and seems highly correlated. There may be some variations when analyzing the long-term, short-term, and central bank policy rate, which are caused by volatility within a variety of macroeconomic indicators and other factors. (Akram, 2020) From the perspective of the investor, the outlook of the future is heavily dependent on current economic conditions. Based upon this realization, the short-term interest rate is one of the most important determinants of long-term interest rates and any changes to the long-term interest rate. (Akram, Das 2014) The short-term interest rate is also a strong indicator of economic sentiment through any increasing or decreasing fluctuations.

 An increase of the short-term rate usually indicates that rates are increasing before an economic contraction which is based upon any information coming from the central bank. If rates are seen to be decreasing, this can also indicate that the economy is weak, or growth is inadequate. It is extremely important for the investor to analyze the macroeconomic indicators that cause fluctuations within bond yields since they will usually tell a bigger story of the overall health of the economy.  These kinds of movements within the 10-year treasury yield have strong ramifications for overall market and economic sentiment. Inflation expectations will drive up bond yields which will have a negative impact on the prices of financial assets affecting real returns. (Kregel, 1998) Real returns will stay constant as the rise in bond yields will also impact long term government securities since market arbitrage will equilibrate the returns on any government security when pricing in inflation. (Kregel, 1998) Equities are more than likely impacted when these fluctuations occur. (Akram, 2017)

It is well noted that interest rates have been on a secular decline since the 1980s when interest rates and inflation were in double digits at the time. It is also worth noting that the 10-year U.S. Treasury yield has been on a decline since the 1980s and multiple theories have tried explaining the causes why this has happened. To explain this even further, the 10-year U.S. Treasury yield has usually declined around the time frame of the FOMC meetings held by the Federal Reserve. The FOMC is the main body of the Federal Reserve that is responsible for conducting monetary policy by the decisions made from its 12 members. (Hillenbrand) (Hillenbrand, 2020) Yields for both bond and equity markets are known to decline around the time frame when these meetings are held. (Hillenbrand, 2020) Through Hillenbrand’s research, investor expectations change around the days of the FOMC meetings by factoring in the returns for holding short-term treasury bonds. The returns for holding short-term treasury bonds were extremely high during these periods. Yields are prone to surge during periods of economic downturn but revert to their normal trend after the FOMC meetings are held (Hillenbrand, 2020) This is relevant to the determinants of bond yields because it provides evidence that the Federal Reserve controls the yield on the 10-year Treasury bond. The Federal Reserve allows the yield to float prior to the FOMC meetings. After announcing a rate cut, yields suddenly revert to their normal declining trend which is extremely interesting to note that the bond market does not determine the yield as the mainstream approach likes to conclude. Hillenbrand notices this trend by observing yield movements from a 3-day window of every FOMC meeting that was scheduled or unscheduled. He shows his results with the following graph below from his research. (Hillenbrand, 2020)

Chart

Description automatically generated

The first graph shows the actual 10-year treasury yield and the 10-year treasury yield around the days of the FOMC meetings. The blue line 10-year treasury yield illustrates the volatility that occurs in bond markets during times of an economic downturn or pessimistic views of the future. The red 10-year treasury yield shows the yield change around the FOMC meetings which shows its stable and on its usual trend line of decline. (Hillenbrand, 2020) Hillenbrand research tries to question why this happens and tries to find an answer for the movements related to the 10-year treasury yield. He questions whether changes in inflation or the investors “risk premia” change prior to these meetings. (Hillenbrand, 2020) The answer to this is through Akram’s research based upon Keynes’s theory of the interest. Akram finds that the central bank targets the short-term interest rate which essentially impacts the long-term interest rate. (Akram, 2020)One possible explanation for the sharp movements along the 10-year yield could be the potential returns for holding these bonds in times of economic downturns as Hillenbrand suggested. Bond investors can arbitrage this opportunity due to the volatility prior to the days of the FOMC meetings. The next section will try to derive the theory of the yield and how expectations play a part in the direction of equity growths and economic growth.

Equity markets grow based on expected profits or expectations. Expectations are what drives markets to grow or decline depending on the current or future outlook. Investors will usually prefer equities over bonds due to several reasons. On average, the return on equities and more specifically, the stock market has led to higher long-term returns when compared to bonds. The global bond market is significantly larger than equity markets and both are massive in size, which play an extremely important role in the economic health and growth of the economy.

           Expectations are assumptions made about the future and investors perform this when analyzing specific equities like stocks**.** According to Kregel, investors have a theory about what determines the price of a specific equity. Expectations are formed on the basis of their “theory” relative to alternative explanations made from other investors or analysts. (Kregel, 1998) The propositions are then made when the individual does not have perfect knowledge about a proposition, which allows for expectations to be formed as rational beliefs. (Kregel, 1998) Kregel also quotes Keynes by stating that it is impossible to determine a rational belief because what drives expectations are the animal spirits within the individual to determine their actions. (Kregel, 1998). The investor will then consider any relevant evidence to support their “theory” about the future which will increase the weight of the argument according to Kregel. Once the weight of the theory is significant enough, investors act on their proposition and make their move. (Kregel, 1998). Based upon Keynes’s and Kregel’s conjecture, expectations are extremely vulnerable to uncertainty. Expectations are based upon an individual’s theory about the future, but the reality is that nobody can know the future or outcomes of any investment decisions. Statistical probabilities can only go so far in assisting an investment decision but actors in an economy will usually rely on their gut feeling since perfect information is not possible and neither is the future certain. (Kregel, 1998). This concludes that expectations are extremely volatile and susceptible to optimistic or pessimistic views of the future which drives volatility within equity and bond markets. When equating expectations to investing in equities, any changes to expectations are changes to expected profits, which are derived from net present value calculations. If expected profits decrease, equities will decrease in value caused by a selloff in the market or a rebalance of a typical portfolio. Kregel also stated based upon Keynes’s theory, “The marginal efficiency of capital is of fundamental importance because it is mainly through this factor (much more than the rate of interest) that expectations of the future influence the present.” (Kregel,1998) (Keynes, 1936) The marginal efficiency of capital is the net rate of return that is expected from the purchase of additional capital assets. The MEC will be sensitive to any changes in inflation, inflation expectations, and the interest rate. This means that the MEC is extremely critical for growth of aggregate output and increased equity valuations since the return on investment must be sufficient for investors to act on their rational beliefs or pursue their “animal spirits”.

           In addition to determining what drives the yield on equities, the propensities to consume must be added to this proposition as a powerful driver of returns in equity markets. (Bernardo, 2016) Long-run returns in equity markets are determined by the principles of effective demand and not the result of an investor bearing risk for holding the asset. (Bernardo, 2016). To determine market valuations, Tobin’s Q can also be used. Tobin’s Q is the ratio between a company’s physical asset's market value and its replacement value. If the Q ratio of a company is larger than 1, it is deemed to be overvalued. Mainstream models have usually depicted Tobin’s Q of being absolute in terms that a company’s Q ratio can never be larger than 1 or always equal to 1. (Bernardo, 2016). Q values have maintained an upward trend which shows that the equity yields have been consistently higher than the company’s profit rates. Mainstream theory assumes that the profit rate of corporations is equal to the yield earned by shareholders, which is not true based on empirical studies. (Bernardo 2016) The determinants of the long-run equity yield are driven by the economic growth rate, which boosts equity returns through higher dividend yields and earnings growth of a firm. (Bernardo 2016) Many firms that pay dividends are extremely reluctant to reduce their current dividends even if the firm is going through financial struggles. Dividend returns are extremely important for long-run equity returns, which are extremely important for shareholders. The only negative offset from higher growth rates and their impacts on equity returns is that it causes a dilution effect on shareholder profitability. Since higher growth rates raises equity returns though higher dividend yields, it also increases the number of shares outstanding. This can cause valuation issues for shareholders, but it is extremely dependent on the number of shares outstanding relative to the dividend yield and earnings growth. (Bernardo, 2016) To end this section, it must be clear to understand the strongest determinant for equity returns is aggregate demand.

The next chapter will contain the statistical analysis through a series of F-Tests for the 10-year and 30-year US treasury security. It will also contain F-Tests for one year of data based on the 10-year treasury yield and returns for the S&P 500. The second F-Test that will be performed will be on 5 years of data for the 10-year treasury yield and 5 years of data for the S&P 500. To understand relationship between the 10-year treasury yield and the S&P 500, a covariance test will be performed to understand how the variables impact one another. Based off the results, a Keynesian approach will be taken to understand what this all means.

# **Chapter 2: A Statistical Analysis on U.S. Treasury Yields and the S&P 500**

An F-Test Two-Sample for Variances test was conducted to analyze the variances between the yields of the 10 year and 30-year government securities in chapter 2 of this research. The results are shared in the figure below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **F-Test Two-Sample for Variances** | | | | |
|  |  |  |  |  |
| **Descriptive Statistics** | | | | |
|  | **30-year treasury yield** | **10 year treasury yield** |  |  |
| *Sample size* | 251 | 251 |  |  |
| *Mean* | 0.1848 | -0.0811 |  |  |
| *Variance* | 0.0055 | 0.0209 |  |  |
| *Standard Deviation* | 0.0744 | 0.1447 |  |  |
| *Mean Standard Error* | 0.0047 | 0.0091 |  |  |
|  |  |  |  |  |
| **Ratio of variances Var[30 year treasury yield]/Var[Log of 10 year treasury yield]** | | | | |
| **F** | **0.2641** |  |  |  |
| *F Critical value* | 0.8118 |  |  |  |
| *F Critical value 2-tailed* | 0.7800 |  |  |  |
| *p-value 2-tailed (H1: F ≠ 1)* | 0.0000 | H1 Accepted |  |  |
| *p-value 1-tailed (H1: F > 1)* | 1.0000 | H1 Rejected |  |  |
| *p-value 1-tailed (H1: F < 1)* | 0.0000 | H1 Accepted |  |  |
|  |  |  |  |  |

           One year of data was used for the F test to analyze the variance between the 10 year and 30-year government securities based upon the year of 2020. The test was conducted to try and understand the variances between the two securities based upon 1 year of data. From the results of the test, it is conclusive that we can accept the null hypothesis that variances are equal. The alternative hypothesis is rejected in this matter since not all the variances are equal based from the results of the test. Since F<F critical, we must accept the null hypothesis. The F values are also less than zero, which shows low variability from the mean. The standard deviations for both government securities are less than 1, which indicate that they are very closely clustered around the mean of each security. The variance for both securities is also less than zero and very closely follow each other as stated by Akram. The results also imply that the Federal Reserve is very efficient at targeting the interest rate and fulfilling its policy objectives through yield curve control. The bond yields almost seem correlated, which can be seen through this scatter plot diagram in the figure below. The low variability can be seen through the scatter plot since most of the data points are very closely clustered together.

For an investor or laborer, changing views of the future can have a negative or positive impact on bond and equity markets in the present as stated by Kregel. Both markets will behave in different ways depending on the changes of expectations, risk, and uncertainty from the perception of the investor and laborer. (Kregel, 1998) To get a more statistical understanding of the behavior between both markets, a variance test was performed on 1 year of data for the 10-year government treasury bond and the S&P 500. The results are below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **F-Test Two-Sample for Variances** | | | | |
|  |  |  |  |  |
| **Descriptive Statistics** | | | | |
|  | **10 Year Treasury Yield (1YR)** | **S&P 500 (1YR)** |  |  |
| *Sample size* | 251 | 268 |  |  |
| *Mean* | -0.0485 | 3.5399 |  |  |
| *Variance* | 0.0221 | 0.0023 |  |  |
| *Standard Deviation* | 0.1486 | 0.0481 |  |  |
| *Mean Standard Error* | 0.0094 | 0.0029 |  |  |
|  |  |  |  |  |
| **Ratio of variances Var[10 year ]/Var[S&P ]** | | | | |
| **F** | **9.5372** |  |  |  |
| *F Critical value* | 1.2272 |  |  |  |
| *F Critical value 2-tailed* | 1.2763 |  |  |  |
| *p-value 2-tailed (H1: F ≠ 1)* | 0.0000 | H1 Accepted |  |  |
| *p-value 1-tailed (H1: F > 1)* | 0.0000 | H1 Accepted |  |  |
| *p-value 1-tailed (H1: F < 1)* | 1.0000 | H1 Rejected |  |  |
|  |  |  |  |  |
| **F [larger/smaller]** | | | | |
| **F** | **9.5372** |  |  |  |
| *F Critical value* | 1.2272 |  |  |  |
| *F Critical value 2-tailed* | 1.2763 |  |  |  |
| *H0 F=1 (5%)?* | Rejected |  |  |  |

The test was conducted to try and understand the variances between the 10-year treasury yield and the S&P 500. Based upon the results, it offers some important information worth mentioning. Since F>F critical, we must reject the null hypothesis that all variances are equal. We must accept the alternative hypothesis that all variances are not equal based on the results. For the 10-year mean, it is negative due to interest rates being reduced to almost 0% because of the COVID-19 pandemic. The variance for the 10-year treasury bond is higher than the variance of the S&P 500. This means that the 10-year bond yield has a bigger data spread than the returns on the S&P 500. The differences are minimal, but it is worth noting. When comparing both standard deviations, both variables have relatively low standard deviations which are below 1. It is worth noting that the standard deviation for the 10 year is higher than the standard deviation of the S&P 500. Possible reasons for the higher standard deviation on the 10-year treasury yield can be seen from macroeconomic factors concerning the current situation regarding the Covid-19 pandemic and the government's involvement. Recent changes in inflation expectations sent bond yields to levels before the pandemic which alarmed the market. The changes in inflation expectations were caused by concerns in the amount of deficit spending enacted by the US government to steer the economy away from a depression. Also, the Federal Reserve has made some changes to its monetary policy by allowing inflation to run above its 2% target and get the economy to full employment. Fundamental uncertainty caused markets to react in this manner, which is reflected by the F test above with the higher variance levels within the 10-year yield. To study this issue further, another F test was conducted but on 5 years of data for the S&P 500 and the 10-year treasury bond yield. The results are in the figure below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **F-Test Two-Sample for Variances** | | | | |
|  |  |  |  |  |
| **Descriptive Statistics** | | | | |
|  | **S&P 500 (5 YR)** | **10-year treasury 5 YR)** |  |  |
| *Sample size* | 1273 | 1250 |  |  |
| *Mean* | 3.4415 | 0.2566 |  |  |
| *Variance* | 0.0054 | 0.0425 |  |  |
| *Standard Deviation* | 0.0735 | 0.2063 |  |  |
| *Mean Standard Error* | 0.0021 | 0.0058 |  |  |
|  |  |  |  |  |
| **Ratio of variances Var[S&P 500 (5 YR)]/Var[10 year treasury 5 YR)]** | | | | |
| **F** | **0.1271** |  |  |  |
| *F Critical value* | 0.9115 |  |  |  |
| *F Critical value 2-tailed* | 0.8954 |  |  |  |
| *p-value 2-tailed (H1: F ≠ 1)* | 0.0000 | H1 Accepted |  |  |
| *p-value 1-tailed (H1: F > 1)* | 1.0000 | H1 Rejected |  |  |
| *p-value 1-tailed (H1: F < 1)* | 0.0000 | H1 Accepted |  |  |

           Based on the results, the mean for the S&P 500 over a 5-year span is relatively the same as for the sample of one year from the previous chart above. The variance for 1 year of data for the S&P 500 was 0.0023 and for 5 years it is 0.0054. Both variance levels are extremely low and even with more observations in the second F-test. The spread between the data is minimal based on the variance level for the returns on the S&P 500. The standard deviation is 0.0735 for the S&P 500. Since the standard deviation is less than 1, this means that the data points for the returns of the S&P 500 are still very closely clustered around the mean of the variable. When comparing the S&P 500 to the 10-year treasury yield, there is a slight difference. The variance level is still below 1 but higher than the S&P 500. One can conclude that bond yields have a slightly higher spread than the returns from the S&P 500 based upon a 5-year span of data. The standard deviation is 0.2063 which is less than 1. This also means that the data points are very closely clustered around the mean of the variable like the data from the S&P 500. F is less than F critical which concludes that we must accept the null hypothesis assuming equal variances from both variables and reject the alternative. The variances over a 5-year span are relatively equal based on the F values, which shows that the data spread between the two variables are almost the same.

To further understand the relation between the two variables, a covariance test was performed. The covariance estimate was -0.0063. Since the covariance is negative, this means that the variables move inversely of each other. As the returns of the S&P have increased over a 5-year span, the 10-year treasury yield has decreased on average. This can be a result of the low interest rate environment over the last decade in the United States, which has allowed for the stock market to exponentially grow based on the Dow Jones index. The returns on stocks have been more favorable, which also tie in with the theory of the yield based upon Bernardo’s research. Higher government deficits boost the marginal propensity to consume through the transmission mechanism of effective demand which increases the marginal efficiency of capital and satisfactory NPV calculations. This allows for the investor to pursue their “animal spirits” or rational beliefs. (Kregel, 1998). This is not to state that the bond market is not profitable since there are many investors who arbitrage between markets and will benefit even more in times of volatility.

# **Chapter 3: Policy Recommendations Based Upon a Keynesian Approach**

This chapter will research the past and current administration and how their policies have impacted bond and equity markets. Policy recommendations will be made based upon an in-depth analysis on what the last administration has done and the current administration as well. The two most important pieces of legislation passed by the Trump administration has been the Tax Cuts and Jobs Act of 2017 and the CARES act which stands for The Coronavirus Aid, Relief, and Economic Security Act. These two pieces of legislation had significant impacts in both markets which will be further researched in this chapter. The current Biden administration has recently passed The American Rescue Plan Act of 2021, which has been a continuation of on-going stimulus considering the severe economic impacts of the COVID-19 pandemic. The role of the Federal Reserve will also be taken into consideration since its decisions on monetary policy also have strong ramifications for bond and equity markets.

The Trump administration enacted many changes and reforms to the economic policies that were in place from the prior administration. For Donald J. Trump running as a republican and winning the election, his economic policies were more in line with progressive democrats than the conservative GOP majority in congress. Common concerns within the GOP are rising deficits, the national debt, and the size of government, which all increased during the Trump administration. President Trump has even criticized the Federal Reserve for raising interest rates during his administration and even demanded that they should be cut to zero, which is relatively Keynesian than the fiscal sustainability approach of the conservative GOP. In the oddity of these facts, the GOP supported most economic policies pursued by President Trump.

To discuss in further detail of President Trump’s rather Keynesian policies, the most Keynesian of them all was the Tax Cuts and Jobs Act of 2017 prior to the start of the COVID-19 pandemic. One of the most notable changes in the Tax Cuts and Jobs act of 2017 was the change in the corporate tax rate to 21%. The Trump administration promised that the tax cuts will help businesses reduce their tax burden in which they will be able to hire more workers and raise wages but that was not the case for the largest corporations in the United States. Tax rates slightly changed for individuals but had more of a positive impact for higher income earners since their wealth is derived in the form of investments in equities and bond portfolios. The largest corporations who also tend to be the largest employers engaged in share repurchases or stock buybacks after the Trump administration passed the Tax Cuts and Jobs Act of 2017.

The Tax Cuts and Jobs Act of 2017 had strong stimulating effects on overall equity markets with stock buybacks soaring after the legislation passed. As of today, the 5-year annual return based off the S&P 500 Buyback Index is 15.65%. It is also worth noting that the annualized returns have been higher in the S&P 500 Buyback Index than the S&P 500 index which shows the strong dominance of stock buybacks. The S&P 500 Buyback Index tracks the 100 companies within the S&P 500 with the highest buyback ratio in a 12-month period. This data is from S&P Global indices. The S&P 500 Buyback Index has more than doubled over the last 5 years, which shows it has been the most dominant form of corporate payout in the United States since 1997. (Zeng & Luk, 2020) The legislation allowed for government deficits to soar in which helped equity markets grow because of the stimulating effects of increasing marginal propensities to consume from investors and consumers. (Bernardo, 2016) Since stock buybacks are the main form of corporate payout for shareholders, shareholders were flushed with cash to reinvest in the stock market which drove up the yields on equities. The reduction in taxes increased disposable income for investors.

The COVID-19 pandemic brought the global economy to a complete halt with government lockdowns being enacted in almost every country around the globe. Bond and equity markets were struck with extreme uncertainty and negative expectations about the future. Due to the changes in expected profits from the government lockdowns, equities were completely sold off in the height of the pandemic. The Dow Jones crashed by approximately 10,000 points as the pandemic worsened in the month of March 2020. The Federal Reserve essentially reduced interest rates to 0% in response to the economic impacts of the pandemic. Government bond yields were also reduced to almost 0% as the Federal Reserve engaged in emergency purchases of US treasury securities and corporate bonds. The CARES act was passed which stands for The Coronavirus Aid, Relief, and Economic Security Act was passed by congress in response to the economic fallout of the COVID-19 pandemic. The bill was a $2.1 trillion dollar stimulus package that provided emergency liquidity to all businesses impacted by the pandemic, stimulus checks to all Americans that qualified, and additional unemployment benefits for workers that were laid off or lost income because of the pandemic. (Congress.gov CARES Act)

The stimulus package was successful in maintaining the US economy afloat with stimulus payments being sent to families in the United States and the increased unemployment benefits which provided additional income on top of the standard payment from unemployment. Consumption expenditures sharply increased with surging demand forcing many businesses to reopen. As Bernardo stated, the propensities to consume are powerful drivers of returns in equity markets due to increases in corporate sales and corporate earnings which stimulates investment. (Bernardo, 2016) The 2.1 trillion-dollar stimulus package boosted equity values drastically due to strong consumer spending caused by the increase in income and is reflected with the Dow Jones reaching new highs since the start of the pandemic. With increased optimism and positive outlook, expectations change with higher expected profits. Growth stocks resulted with the largest returns due to attractive net present value calculations since interest rates were near 0%.

For example, the INVESCO QQQ TRUST SERIES 1 ETF average annual return based off one year performance has returned an average of 55.36%. This specific ETF seeks investment results that generally correspond to the price and yield performance of the NASDAQ – 100 Index. Any investor who bought in to the stock market during the sell off at the start of the pandemic bought shares at an incredibly significant discount. The pandemic market crash was an obvious buying opportunity for the investor that anticipated the potential returns from the large stimulus package passed by congress. This analysis is based upon the Kalecki-Levy profits equation which is Investments + Dividends + Government Budget Balance + Household Sector Balance + Current Account Balance = Profits. Government Budget Balance + Household Sector Balance + Current Account Balance = Financial Profits. (Levy, Farnham, Rajan, 1997) The theoretical significance behind the Kalecki- Levy Profits equation is to understand the source of where profits come from by taking a macroeconomic perspective. The equation takes a direct flow-of-funds analysis instead of statistical approximations of reality, which does not involve advanced mathematics, unrealistic assumptions about human rationality, and assumptions about how firms, consumers and investors operate. (Levy, Farnham, Rajan 1997). The equation shows how government deficits can boost business profits by stimulating the domestic private sector of an economy. This relation can be seen through an analysis of the continuous stimulus packages passed after the pandemic began beginning with the Trump administration and into the Biden administration.

The Trump administration faced several hikes in the interest rate which he was not fond of due to the negative effects on equity growth, inflation fears and more specifically, the stock market. The reasons behind the rate hikes can be debatable, but this section will argue certain factors for the rate hikes during the Trump administration. Since President Trump inherited an expanding economy, The Federal Reserve was keen on keeping price stability and maximum sustainable employment, which is based upon the theoretical concept of the NAIRU. NAIRU is the acronym for the non-accelerated inflation rate of unemployment. This concept assumes that there is an equilibrium point between inflation and unemployment which must be targeted for price stability and maximum sustainable employment. To explain this further, Stephanie Kelton describes the NAIRU with the following quote, “The Fed subscribes to the idea that if it induces too much spending, the labor market will get too hot and unemployment will dip below its “natural” rate, causing inflation to accelerate.” (Kelton, Stephanie, 2020) Stephanie Kelton is trying to explain that if the Federal Reserve induces an increase in consumption expenditures through low interest rates, the economy can potentially overheat because of minimal unemployment and high aggregate demand. If unemployment gets too low, it can cause a labor shortage which can potentially lead to a wage spiral driving up prices and cause inflation.

As the unemployment rate decreased throughout the Trump presidency, the Federal Reserve increased interest rates multiple times starting in December 2015 and ended it in December 2018. This information can be found on the Federal Reserve’s website for the list of dates regarding the rate hikes. Potential reasons for the rate hikes were because of unemployment being near historic lows and the increased government deficits caused by the Tax Cuts and Jobs Act of 2017. The Tax Cuts and Jobs Act of 2017 was essentially a stimulus package of its own. Factoring these actions into the equation, inflation expectations were extremely high during the last interest rate hike in 2018. This is reflected by looking at the yields on the 10 Year US Treasury Bond in the last quarter of 2018. The 10 Year US Treasury Bond reached 3.15% in October 2018 and stayed close to almost 3% after that. Yields increase as bond prices fall due to the inverse relationship between the interest rate and bond prices. This signifies investors were selling off their treasury bonds in fear of inflation and inflation expectations based upon their pessimistic view of the future. (Kregel, 1998) The reality of this occurrence is that inflation was never an issue, and the inflation expectations were wrong. The Federal Reserve consistently missed its inflation target. Inflation usually hovered below its target which meant that the economy was never overheating or close to overheating.

One can conclude that markets are not great at pricing in inflation which can be explained by John Maynard Keynes’s theoretical concept of the Keynesian Beauty Pageant. (Keynes, 1936) Keynes uses a beauty contest as an analogy to explain the price fluctuations within markets. Investment decisions are driven by the expectations about what other investors think, rather than examining the fundamental profitability of an investment. Keynes believed that investment is determined by herd-like “animal spirits” of investors which is why markets are volatile. (Keynes, 1936) The contestants in this theoretical contest were more focused on trying to pick the “most beautiful” by analyzing what is the majority perception of beauty. Once the individual has an understanding what the majority perception of beauty is, their choice will be based upon what the majority think to win the prize. Keynes summarizes this concept with the following quote. “It is not a case of choosing those faces which, to the best of one’s judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth and higher degrees”. (Keynes, 1936)

Keynes’s concept can be applied to financial markets when you analyze how quick markets move in times of volatility. Trading strategies have even been created based on Keynes’s theory like “swing trading” which tries to capture short to medium term gains in a stock or any financial instrument over a period of a few days to several weeks through a technical analysis approach. Swing trading is essentially speculative trading since it really is focused on the herd-like “animal spirits” behavior of investors in financial markets. The “animal spirits” then react upon optimistic or relevant news of the security in interest. Multiple examples of this can be seen in financial markets with the recent phenomena of “meme” trading.

The Biden administration has continued ongoing support of additional stimulus considering the COVID-19 Pandemic by passing The American Rescue Plan Act of 2021 which was a $1.9 trillion economic stimulus bill passed by congress to aid the recovery from the devastating affects the pandemic. The bill provided additional stimulus to households in the form of checks which boosted incomes and savings. It also provided an extension in unemployment benefits since the pool of unemployed is still extremely large due to the lack of job creation, job reductions from closed businesses and weak effective demand. Financial markets have reacted with extreme volatility as questions began arising on how this will be paid for. The bill was paid the same way as all government initiatives and programs are paid for which is through an increase of fiscal deficits. Essentially, markets began to sell off in fear of inflation and inflation expectations. The most affected equities are growth stocks since net present value calculations are impacted when inflation expectations increase. This assumes that the Federal Reserve will have to raise interest rates to counteract the rising inflation just like the Federal Reserve did during the Volcker Shock of the 1980s. Other common misconceptions or arguments is that the Federal Reserve will cause the collapse of the US dollar if it keeps printing too much because of currency debasement and hyperinflation.

Inflation fears are seen through the yield of the 10-year US Treasury Bond. Since the start of 2021, it has reached a high of 1.74% in fear that the Federal Reserve will have to raise interest rates sooner than later due to current economic indicators like CPI data and the unemployment rate. Yields have drastically increased despite the direction of the federal reserve in keeping its policy rate at 0% to 0.25% for the next 2 to 3 years. The conventional wisdom of raising interest rates to stop inflation is based upon the flawed Loanable Funds theory in which the supply for loanable funds determines the interest rate. The reality is that the interest rate is a policy variable determined by the Federal Reserve and not by market forces or the supply for loanable funds. Basing monetary policy around this theory allows for the economy to never truly reach full employment because of inflation fears and lock people out of employment permanently. (Kelton, 2020)

Policy recommendations should be focused on reaching full employment and higher wages because it benefits both workers and investors through the effects of aggregate demand. When analyzing the impacts of the stimulus packages passed by congress, the stimulus and increased unemployment benefits have had a positive impact on the economy. Unfortunately, the stimulus checks and extended unemployment benefits will only be temporary because eventually the government will no longer choose to provide additional stimulus checks and continue the expanded unemployment benefits. To mimic the success of the legislations passed to keep the economy afloat during the pandemic; future legislative policies should be focused on increasing wages since they have remained stagnant over the last 4 decades which has possibly contributed to lackluster economic growth and more financial instability.

Strong wage growth moves pro-cyclically with all the macroeconomic indicators considered like GDP, investment, capacity utilization, and exports based upon the Neo-Kaleckian models. (Caldentey & Vernengo, 2013) In the case for the United States, the economy has grown but it has not been led by an increase in wages. Economic growth has been more debt-led than wage-led which can be seen how consumption expenditures have steadily grown while wages have not. One might question how can the economy grow with wages being stagnant? The answer to this can be seen through the increases of debt and household debt since the 1980s. (Caldenty & Vernengo, 2013) Debt has allowed for households to expand their consumption relative to their incomes remaining stagnant and lagging productivity growth. When analyzing this feature of the economy, this has contributed to more boom-and-bust cycles and has made them much worse when they do bust. Debt led economic growth has led to creation of asset backed securities through securitization of different types of contractual debt obligations like mortgages, auto loans, or credit card debt. These new securitized financial products are inherently risky which is a byproduct of the debt led economic expansion in the case of the United States. They are extremely profitable for the institutions that engineer these products but at the expense of a more fragile financial system.

Hyman Minsky’s financial instability hypothesis explains the shift from hedge units to Ponzi units in terms of the economy. (Minsky, 1992) Hedge financing units are actors in an economy that can meet their contractual obligations with their cash flows. Ponzi units do not have the cash flow from operations repay principle or interest on outstanding debt. (Minsky, 1992) These units will sell assets or borrow to pay off principle or interest which means they are essentially insolvent. Once the amount of credit circulating through the economy dries up and financial actors refuse to provide more credit, the financial system collapses. One can say that the dominating unit is currently Ponzi. (Minsky, 1992) The current financialization of the capitalist system has allowed for market actors that are not financial institutions be able to provide credit and participate in the debt led expansion which contributes to the inherent instability within the capitalist system. The financialization of the economic system has led to the creation of shadow banks or the shadow banking system. The shadow banking system is a money market funding of capital market lending which takes place out of the regular banking system and is not regulated like a regular bank. (Fisher, Bernardo, 2014) Quoted by Fisher and Bernardo, L. Randall Wray characterizes the financial system as highly leveraged funds seeking maximum total returns in an environment that systematically under-prices risk. (Bernardo, Fisher, 2014) The ever-expanding shadow banking system plays a big role into Hyman Minsky’s Financial Instability Hypothesis in which the economic downturns are not caused by some exogenous shock but rather endogenous.

By creating legislative policies in a way that regulates the creation of credit, maximum employment, and higher wages, the economy can begin to expand by a wage led expansion rather than debt or credit led. This will help in shifting market actors away from the Ponzi units that Minsky stated in The Financial Instability Hypothesis. In addition to reducing the financial instability, which is inherent within the capitalist system, wage-led growth will allow for larger economic expansions and favorable conditions for investors in terms of investment in equities. Since it is also now determined that the interest rate is ultimately set by the Federal Reserve by targeting specific policy rates such as the overnight financing rate and the interest rate on bank reserves; it is clear to say that the policy rate is a policy variable and not determined by market forces. The central bank should permanently keep interest rates at 0% which will increase the marginal efficiency of capital and help businesses. By keeping interest rates at 0%, it will relieve the pressures faced by low to middle class earners in paying high interest payments through whatever contractual obligations they may have. Interest payments does not contribute to economic growth but increased consumer spending on goods and services does.

# Conclusion

In the final analysis, this research refutes the conventional wisdom of bond yield determination. By using a variety of statistical analysis, it is clear to understand that the Federal Reserve determines the short-term bond yield through various methods which were discussed in the first chapter of this working paper. The interest rate is not determined by market pressures or the amount of loanable funds available but solely by the decisions of the Federal Reserve based upon various macroeconomic indicators. This essentially makes the interest rate a policy variable or policy choice that has strong ramifications for financial markets. Based upon this analysis, it is also clear to mention that volatility between bond and equity markets are mainly driven by expectations about the future, inflation, and inflation expectations. What drives this volatility is derived by how easily susceptible views about the future can be changed from the investor’s point of view. As John Maynard Keynes stated, volatility is mainly driven by the herd-like behavior of market participants trying to predict what other participants will do instead of an individual fundamental analysis on an investment. This is not to say that all actors behave in this manner but a majority of acters do.

In addition to uncovering bond yield determination and drivers of volatility between financial markets, it is also important to understand the theory of the equity yield and the economic implications it has on GDP growth. Returns on the stock market are heavily influenced by the principles of effective demand which is critical in understanding where these returns come from. Stock returns are strongly influenced by aggregate demand which leads to higher earnings growth and increased dividends. Strong aggregate demand signifies economic growth which is the main driver to the return on equities. Evidence of this relationship can be seen through the effects of the stimulus packages passed by congress to keep the economy afloat despite the negative effects the Coronavirus pandemic has caused on the economy. Equity markets soared with the passing of the stimulus packages and interest rates at 0%. The increased incomes and savings have led to strong consumer spending which has shortened the time frame of the recovery. By realizing the success of the stimulus packages passed by congress, future policy objectives should be focused on mimicking the best features of the stimulus package.

Future policy objectives should be focused on benefiting workers and the shareholder since they both play a fundamental role in the growth of the economy. Past administrations have only focused on helping the shareholder, which has ultimately led to stagnant growth. By taking an approach based on the works of Hyman Minsky, it is clear why growth has remained stagnant and potentially unequal when considering current rates of inequality. The economy has expanded through a debt-led framework which has profited through the increase of credit to households and financialization of the capitalist system. Instead of increasing wages to stimulate consumption expenditures, the financial institutions of the United States have focused on credit in driving consumption expenditures and essentially corporate profits. By providing more credit than higher wages to workers, financial institutions have been able to generate even more profit by securitizing the excess contractual obligations circulating throughout the economy. Through this securitization process, it has spread the risk and instability that is inherent within the capitalist system. Debt led growth causes boom and bust cycles to be more frequent and essentially globally catastrophic for the global economy. A more wage-led approach can reduce the boom-bust cycles by shifting the financial actors away from the Ponzi units which is based on Hyman Minsky’s financial instability hypothesis.

For a more stable wage-led approach, policy objectives should implement ways to increase incomes which is essentially increasing the wage. Since increasing the wage is both beneficial for the worker and shareholder, the interest rate should be permanently set to 0% since it is after all a policy variable set by the Federal Reserve. This is both again beneficial for the shareholder and worker. Inflationary pressures that may derive from this approach should be handled in a different way than the mainstream approach which is relied upon the raising interest rate to stop inflation. It is not to say that increasing interest rates is not effective in reducing inflationary pressures, but it is the most brute way in doing so which impacts low to middle-class earners the most. There are potential alternative ways to handle inflationary pressures and these alternative methods should be considered and further researched as the financial system evolves.

This research summarizes the determinants of bond yields and the drivers of volatility between bond and equity markets. Policy recommendations were made by analyzing legislations that have impacted financial markets from previous and current administrations. This topic demands further research since it is relevant to current matters. Due to the relevance of this topic, further research can develop new possible ways to undertake some of the fundamental issues at hand that impact the economy and society today.