

The Impact of Economic Policy Uncertainty on Government Bond Pricing

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<p>Abstract</p> <p>This study examines the impact of economic policy uncertainty (EPU), encompassing fiscal policy uncertainty, monetary policy uncertainty, trade policy uncertainty, and inflation uncertainty, on government bond prices and bond market behavior. Through empirical analysis, the study identifies significant positive relationships among the variables elucidating the intricate dynamics shaping bond pricing amidst policy uncertainty. Government bond prices are crucial in determining economic stability and financial system stability. Therefore, the topic was selected to analyze how policy uncertainty influences government bond prices. Here the study focuses on the U.S. bond market, particularly with 10-year yield.</p> <p>The findings underscore the pivotal role of economic policy uncertainty in determining government bond prices. This impact is due to investor risk aversion, and market volatility. The impact of these factors has been varied over time with the changes in the economic state. This emphasizes the need for the timely adoption of risk-adaptive strategies.</p> <p>Regression analyses demonstrated statistically significant relationships between policy uncertainty dimensions and bond market dynamics, emphasizing the relevance of these factors in shaping financial market behavior.</p> <p>Future studies could also examine the effectiveness of policy interventions and risk management strategies in mitigating the impact of uncertainty on bond prices. Additionally, expanding the scope to consider other financial instruments and factors influencing their behavior would enhance future studies.</p> <p>While recognizing limitations associated with reliance on historical data, quantitative methods, and government bond prices, future studies can overcome these limitations to further advance our understanding of the complex relationship between policy uncertainty and bond market dynamics.</p>	
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1. INTRODUCTION

1.1. Background Statement

The global financial crisis recorded in 2008 marked a turning point in the financial landscape, highlighting the requirement for proper guidelines and control for financial markets. During this era, it was highlighted how the economic policy uncertainty (EPU) significantly impacted the behavior of the financial market instruments such as securities, and bonds (Baker, Bloom & Davis, 2016). Economic Policy Uncertainty refers to the lack of clarity and unpredictability regarding government actions which might affect the financial market and economic decisions. Soon after the crisis, economic organizations and financial authorities realized the importance of having a proper mechanism system for the financial markets and securing both investors and investors. In response to the financial crisis, most governments have taken unconventional policies to prevent such a crisis in the future. Furthermore, timely revision of policies and guidelines was encouraged by the economists as precautionary measures to the crisis. In this dynamic financial market, uncertainty and the continuous changes to the policies were a big challenge for Economic policymakers and investors to predict the market condition and maintain the financial health of the market (Bloom, 2014). Given that the EPU has emerged as a critical factor influencing the financial markets and has reaped substantial attention in the academic literature. The relationship between government bond pricing and Economic Policy Uncertainty can be recognized as an important area of study that has gained eminence in recent years.

Baker et al. (2016), developed an index to measure and analyze the economic policy uncertainty called Economic Policy Uncertainty Index. This provides a comprehensive measure that imitates the uncertainty of fiscal, monetary, and trade policies of the financial market. Therefore, this index was commonly used for empirical investigations to examine the influence of policy uncertainty on financial markets. The studies conducted by D'Amico, Farka, and Veronesi (2019), also focused on the impact of policy uncertainty on the bond yields. In their research, it has been highlighted that the increased uncertainty is related to the increased risk premiums. This of course in return influences the government bond prices. Additionally, research by Pastor and Veronesi (2013), brings together the concept of time-varying risk aversion. This provides great insight as to how the investor's risk perceptions are intertwined with the economic policy uncertainty and its subsequent effect on the government bond price (Pinho & Barradas, 2021).

Based on this ground, this research provides an in-depth analysis of the policy uncertainty and its impact on the bond prices. This research differentiates from previous research as the study simultaneously analyzes the multiple dimensions of policy uncertainty and their collective impact on government bond prices. Specific aspects of policy uncertainty such as economic policy uncertainty, fiscal policy uncertainty, monetary policy uncertainty, and inflation uncertainty are

also considered. By analyzing various research articles in this field, major factors were recognized as the individual variables of the study. Hence the study will provide a wider insight into the relationship between policy uncertainties and the valuation of government bonds, contributing valuable implications for investors, regulatory and authority policymakers, and market participants in steering the complexities of contemporary financial markets.

1.2. Rational for the study

The primary objective of the study is to analyze the effect of economic policy uncertainty on bond pricing. To do an in-depth analysis of economic uncertainty, specific areas in the economy such as monetary policy uncertainty, fiscal policy uncertainty, and inflation policy uncertainty were considered in the study. In today's dynamic business environment, it is very important to consider how economic uncertainty impacts bond prices as the policies are continually changing, and the rules and regulations are also changing to safeguard investors. For example, during periods of heightened fiscal policy uncertainty, such as disputes over government debt ceilings, bond prices tend to vary significantly as investors reconsider risk. The findings of the study will be useful not only for academics but also for policyholders to make effective decisions to improve risk management, strengthen the financial markets in terms of security and compliance, and guide investors.

1.3. Research Questions

This study focuses on key research questions aimed at finding the relationship between Economic Policy Uncertainty (EPU) and government bond pricing. Hence the research questions explore the primary impact of EPU on the risk premium of government bonds. Accordingly, research questions can be summarized as follows.

- How does Economic Policy Uncertainty affect the bond return?
- How do the various dimensions of economic policy uncertainty, such as fiscal, monetary, and trade policy uncertainty, individually contribute to fluctuations in government bond pricing?
- How do the central bank policies and interventions interrelate with the Economic Policy Uncertainty to influence the government bond prices?

1.4. Hypothesis

Fluctuations in economic policy uncertainty have a significant impact on bond pricing- The relationship between economic policy uncertainty and bond prices has been discussed by previous researchers such as Bloom (2020), The Economic Policy Uncertainty Index is vital for quantifying the degree of uncertainty level

in the economic policies where the research use this variable to predict the behavior of bond pricing.

Fluctuations in the Fiscal Policy Uncertainty have a significant impact on the bond pricing- The research conducted by D'Amico et al., (2019) stated that the fiscal policy uncertainty has a significant positive impact on the bond pricing dynamics. Especially the influence of the increased risk premiums in bond markets was discussed by the researchers. Since the risk premium has a greater impact on government bond prices, findings from the existing literature have a notable impact on bond pricing. The changes to the fiscal policies are continually done by the unstable countries where the economic uncertainty is high. Hence the level of monetary policy uncertainty affects the behavior of the bond market also (D'Amico et al., 2019).

Fluctuations in the Monetary Policy Uncertainty have a significant impact on the bond pricing- Colacito, Engle, and Ghysels (2019), stated that the monetary policy uncertainty and bond pricing behavior are interrelated. Their empirical analysis found that monetary policy uncertainty is significantly influencing shaping risk perceptions and risk premiums in bond markets. The monetary policies introduced by the central bank of the country may be a preview of the economic well-being. Hence the changes in the monetary policy significantly influence the bond market dynamic (Colacito et al., 2019).

Fluctuations in Trade Policy Uncertainty contribute to having a significant impact on bond pricing and trade policy uncertainty is directly affected by investor risk aversion where the fluctuation in trade policy uncertainty impacts bond pricing behavior. The Research by Pastor and Veronesi (2013) stated that the bond pricing dynamics are closely related to trade policy uncertainties.

Fluctuations in Inflation Uncertainty have a significant impact on the bond prices of government bonds- Bloom's research examined how fluctuations in the inflation uncertainty impact the adjustments in inflation expectations and real interest rates where the behavior of the inflation situation impacts government bond prices (Bloom, 2009). The inflation rates are automatically changed with references to economic uncertainty, financial market uncertainty, currency fluctuations, etc. Therefore, the behavior of the inflation rates says whether the economy is going well or not, and therefore, the bond prices also change in line with that (Pastor & Veronesi, 2013).

1.5. Limitations of the study

While the study aims to offer valuable insights into the relationship between Economic Policy Uncertainty and government bond pricing, there are several limitations attached to the study. Recognizing and acknowledging these limitations are needed for the betterment of this field as future researchers can account for these limitations and avoid them. Firstly, depending on the historical data is one of the key limitations of the study as it does not account for unexpected events or policy shifts. Secondly, the analysis primarily depends on the quantitative methods and the lack of consideration of the qualitative factors is another limitation of the study. In this regard, expert opinion, and policy analysis must be done to enhance the quality of the study. Furthermore, the study assumes that policy uncertainty considered in this study is the primary factor for deciding government bond prices. However, other factors also play a key role in deciding bond prices. Therefore, it is necessary to consider these limitations when interpreting the results. Finally, future research can consider these aspects and do more comprehensive research to eliminate the limitations to have better results.

2. THEORETICAL FRAMEWORK

The unavailability of static policies has always been an issue for the financial market, given its impact on government bonds and the general interest rates of a country (Loannidis & Ka, 2021). This issue has been extensively discussed by many researchers (Bloom, 2016; Loannidis & Ka, 2021; D'Amico et al., 2019). This area of the report focuses on exploring the current research and the identified facts on the relationship between policy uncertainty and the prices of government bonds.

The exploration begins with a clear definition of policy uncertainty, the factors impacting it, and the dimensions of the same, resulting in the areas of uncertainty. Then it moves towards the existing research which has been conducted in the same area and has highlighted the relationship between the policy uncertainty and how it affects the pricing policy of the government-issued bonds. Accessing the existing knowledge on this area will enable the readers of this research to lay out the nature at which the research is conducted as well as it sets the background on which this research is conducted.

2.1. Theories of Bond pricing

I. Expectations Theory

According to this theory, market participants' expectations of future short-term interest rates drive long-term bond interest rates. Uncertainty over economic policies might affect these expectations in the context of EPU, which can cause swings in the price of long-term bonds. Studies by Campbell and Shiller (1991), shed light on how expectations are impacted by uncertainty and how bond pricing dynamics are impacted as a result.

According to this theory, long-term bond prices are determined based on the expectation of market participants about the bond interest rates which are to be set in the short term. Theory suggests that uncertainty about economic activities like economic policy uncertainty will have a significant impact on the expectations of the market participants and thereby will have an impact on the long-term bond prices.

The Expectations Theory is a valuable framework for gaining knowledge on how economic policy uncertainty influences bond pricing. Since it is directly associated with the research that is conducted the use of theory is more important. One of the key objectives of the study is to determine the relationship between EPU and government bond pricing. Therefore, the expectation theory is related to the study.

II. Term Structure Theory

Bond yields and maturity are the main concerns that the term structure models consider. These models take into account things like risk aversion and interest rate volatility. Bond prices may be impacted when EPU rises because it can enhance uncertainty about future interest rates and yield volatility. In keeping with this, Diebold and Li (2006), illustrate how macroeconomic uncertainty influences yield curve dynamics.

Concerning this theory, it considers the relationship between bond yields and maturity. The theory says that the relationship is based on risk aversion and interest rate volatility. Therefore, theory suggests that economic policy uncertainty can enhance the uncertainty about future interest rate behavior and thereby affect the bond yield volatility.

Term Structure Theory considers the relationship between EPU and yield curve dynamics. Therefore, this theory is also important to investigate the Impact of Economic Policy Uncertainty on Government Bond Pricing. It highlighted how the bond yields are changing over the period which comprises both economic downturn and upwards.

III. Flight-to-Quality Theory

Investors frequently go for safe-haven assets during times of high uncertainty, such as government bonds. This increases demand and affects bond prices. According to the Flight-to-Quality theory, EPU can encourage flight-to-quality behavior, which hurts bond prices due to market uncertainty. Research that has already been done by Baele, Bekaert, Inghelbrecht, and Wei (2004), offers empirical support for these phenomena during times of economic uncertainty.

According to the Flight-to-Quality Theory, it says that during periods of high uncertainty, investors consider safe-haven assets as there is less risk involved with such assets. Accordingly, most of the time, investors consider assets such as government bonds. When the demand for government bonds increases, prices of such assets automatically increase.

IV. The Risk Premium Theory

This theory states that bond yields are made up of a risk-free rate component as well as a risk premium that pays investors to assume credit and liquidity risks. Uncertainty regarding economic policy can increase the perceived risks attached to government bonds, causing changes in risk premiums, and thus impacting bond prices. Ludvigson and Ng's (2009) research illuminates how economic uncertainty impacts.

As per the Risk Premium Theory, bond yields comprise a risk premium component. This additional return compensates the investors for accepting the credit and liquidity risks. Economic policy uncertainty can increase the perceived risks associated with government bonds. This results in changing the risk premiums and thus impacting the government bond prices.

2.2. Use of Theories to Interpret the Results

Incorporating these theories into the study makes it easier to conduct the research and enter into a conclusion on the Impact of Economic Policy Uncertainty on Government Bond Pricing. As an example, if the study can find a significant relationship between EPU and bond prices, the researcher can go back to these theories and understand the base factors and mechanisms that direct this relationship. Further, findings can be compared with each theory to assess which theory is more suitable and aligned with the findings. If in any case, the finding deviates from the theories, a critical review can be done as to why certain theories may not fully explain the result.

Accordingly, a thorough understanding of bond pricing theories not only strengthens the theoretical framework of the study but also enhances its ability to interpret the research findings about EPU. Therefore, using the theories will make it possible to do a nuanced analysis of the relationship between EPU and government bond pricing. Finally, this will contribute to the advancement of knowledge in this field.

2.3. Mechanism

The analysis process of the relationship between economic policy uncertainty and government bond pricing is information asymmetry and the time-varying risk aversion model. With reference to Information asymmetry, refers to the scenario where one party in a transaction possesses more or superior information compared to the other party. Regarding this context, economic policy decisions are often complex and involve intricate details that may not be readily available to the market participants. Therefore, asymmetrical information can lead to discrepancies in market perceptions and valuations of government bonds. Previous research, such as studies by Baker et al. (2016), has presented that increased policy uncertainty strengthens this asymmetry, impacting bond market behavior.

Concerning the time-varying risk aversion model, which involves a framework for understanding how the investors' attitudes towards risk evolve over the period in response to economic policy uncertainty. This model can be formulated as $U(C_t) = \beta E_t[U(C_{t+1})] (1+r_{t+1})$. Here the C_t refers to the marginal consumption at any time. r_{t+1} referred for return on investment. This model acknowledges the fact that the risk preferences of the investors are not stable, and they vary based on the market conditions and based on the perceived level of uncertainty. With reference to the period where the heightened economic policy uncertainty, investors may exhibit increased aversion to risk, impacting modification of the bond investment strategies and pricing decisions.

As mentioned above, these two mechanisms are really important for investors' perceptions where their understanding of information asymmetry and time-varying risk aversion influence the decision-making process. This is crucial for formulating effective risk management strategies and guiding investment decisions in an uncertain economic landscape. These mechanisms normally create negative relationships where increased information asymmetry and increased time-varying risk impact investors to charge high yields thus lowering the bond prices.

2.4. Definition and Dimensions of Policy Uncertainty

Policy uncertainty can be simply defined as the trust in the policy being lost. This can happen due to various factors, the general factor being the government not having a static policy on the government debts which over time had deviated from the policy reforms. As defined by Baker et al. (2016), economic policy uncertainty (EPU) is directly related to the uncertainties in monetary, fiscal, and trade policies. Subsequent research has also built on this foundation where they have extended the EPU to be the result of collective uncertainties in policies such as monetary policy uncertainty, fiscal policy uncertainty, inflation uncertainty, trade policy uncertainty, etc. (Baker et al., 2016).

2.5. Economic Policy Uncertainty

The majority of the current literature on economic policy uncertainty has indicated that there is a negative relationship between economic policy uncertainty and bond prices. That is, whenever the economic policies are stable, the investors have trust in the government, where the bond prices reflect that trust increased prices, whereas whenever the government's policies are not reliable, it is reflected in the reduced and fluctuating government bond prices (Baker et al., 2016). Further, the structure of the risk-to-return tradeoff is also an important factor that decides the impact of EPU on bond pricing via its impact on the yield curve (Colacito et al., 2019).

Identifying and measuring the EPU remains one of the critical factors for any investor in deciding their investments. The unavailability of a common solution to define such is one of the main challenges faced by a general investor (Bae, Oztekin, & Tan, 2008). Thus, for this purpose, Baker et al. (2016), established an index that was able to capture the factors impacting the EPU such as fiscal, trade policies, inflation, etc. Named as "Seminal Economic Policy Uncertainty Index", this index has helped many investors to observe the movements in the EPU, where they could decide the amount of risk they are willing to undertake. To illustrate different movements, EPU over time will be included. Subsequent researchers such as D'Amico et al. (2019), and Colacito et al., (2019), further enhanced the same model by incorporating more factors where the model was able to capture the investor preferences and amount of the risk, they are willing to take in factoring the market expectation. This inception of market uncertainty

is also aligned with the time-varying risk aversion which was a model supported by Pastor and Veronesi (2013).

A comprehensive analysis conducted by Ashraf and Shen (2019), has identified that one standard deviation in the EPU leads to a 21.84 basis points increase in the average interest rates of the country. This research conducted on the data collected from 17 countries over the period from 1998 to 2012 has paved the way for the EPU to be materialized where the impact of the same towards the interest rates was justified and base assumptions were introduced which can be utilized for the forecasts. Just when the country's interest rates are increasing, it results in the prices of the bonds also increasing, since the investors will demand more of the high-yielding bonds (Ashraf & Shen, 2019; Baker et al., 2016).

The general behavior of any bond despite its launching source is directly linked to its reliability and the return generated via the bond. The general returns generated on the bonds are directly linked to the interest rates prevailing in the market at the time of launch and the uncertainty in the market. Different research has been conducted in this area which has resulted in identifying a negative relationship between those two variables (Brogaard & Detzel, 2015).

Whenever the market interest rates are high, it triggers the risk aversion of the investors, who seek safe investment methods such as bond investments. Whenever such instances take place, the demand for the bonds increases, which results in a reduced price. This reduction in the pricing also impacts inflation negatively, where the money in circulation within the economy is limited since the government can buy back the money in the market in bond terms. Thus, it results in economic stability as well (D'Amico et al., 2019; Colacito et al., 2019). In general, EPU increases the risk aversion of the investor pushing them to be risk-free by investing in the government (Bloom, 2014).

Whenever a country's economic policy is uncertain, the best risk-averse method available for the investors to invest becomes government-issued securities. However, there can be multifaceted scenarios and contingency plans in place when making such investments in the face of an economic crisis (Cerra & Venturi, 2019). Research has explored the impact of EPU in the face of fiscal, monetary, and trade policy uncertainties and has identified that out of all, the EPU remains the key challenge for any economy to be controlled. Though what is studied and seen is the impact those EPU have on the bond prices, its practical and actual underpinning on risk is huge, especially given the role of the policy decision towards making the whole economy a success (Bloom, 2020).

2.6. Fiscal Policy Uncertainty (FPU)

Another factor affecting the finance market demand conditions is the fiscal policy. The fiscal policy is simply how the government raises money via taxing the public. It directly impacts the risk premiums the investors are willing to take and the amount of government budget deficit impacting the costs of sovereign bonds. The positive coefficient in relations to the FPU identified in the research conducted by Raddatz and Schmukler (2018), signifies that the uncertainty in the future influences the investor behavior which directly impacts of the demand of the government bonds. This in return impacts the prices of the government bonds.

In times of the investors seeking risk premiums upon their investments, the FPU heavily factors in the stability of the government fiscal policies and how well the established fiscal systems can support the generated government revenues. While the researcher notes that past performance is not an indicator of future performance, the behavior of the government and its fiscal policy illustrates areas of concern for investors who seek better returns on their investments. Thus, in times where there are tight fiscal policies, which enables the government to raise the taxes, the investor tax burden also rises and results in the demand for the bonds being low (Hollmayr & Matthes, 2015).

However, in some countries, the government bonds are exclusive for taxes, in order to make them more attractive. In such countries, the behavior of the investors will be widely varying and mostly will be favorable at times of increased taxes. Overall, this behavior of the investors is directly related to the FPU which is governing the demand for government bonds, thereby decides the prices of the bonds. This aligns with the previous research finding on the impact of macroeconomic policies on the financial markets, where intelligent investors will study comprehensively the market behavior in terms of fiscal policy, supporting their investment decisions (Hollmayr & Matthes, 2015).

2.7. Monetary Policy Uncertainty (MPU)

The monetary policy of a country refers to the policy-based actions taken by the Central Bank of the country to maintain its financial health. Raddatz and Schmukler (2018), have identified that there is a direct relationship between a country's monetary policy and how the government's debt is behaved. They have identified that whenever the government needs additional funding for its projects, they issue government bonds, resulting in a reduction of money in circulation. This in return has generated a cyclical effect on treasury bond pricing (Raddatz & Schmukler, 2018).

Whenever investors fear that the country's monetary policy may not be strong in the coming years, they lose trust in the government's bonds since the future is uncertain. This results in the demand for government bonds to be reduced, which results in the prices of the bonds being reduced (Mishkin, 2011). Thus, the MPU

has a direct negative relation with the bond prices. This finding is aligned with the other findings on the same area of study, where it was noted that the policies followed by the government have a direct impact on the dynamics of the financial markets, where it impacts the investor's decision-making and the market demand conditions (Jerow & Wolff, 2022).

Cieslak, Garcia, and Herrera (2017) conducted comprehensive research on how monetary policy shocks are leading to reduced bond pricing. The findings of their study resulted in an important aspect of the behavior of the central banks. As the policy designers and the supportive government bodies, the central banks should strike the correct monetary policies to maintain a balance between a country's interest rates as well as the bond prices. Any deviation from such will have negative impacts on the economy of the country and ultimately on the government in power (Cieslak et al., 2017).

Li, Tang, and Xiang (2020), have emphasized the government's role in guiding the monetary policy, taking the prime example of how the policy decisions are empowered in China, which has resulted in overall economic growth. They have also identified a strong positive relationship between the MPU and the prices of the bonds, where whenever the investors lose their trust in the policies, the demand conditions have reduced resulting in reduced prices for government bonds (Li et al., 2020).

2.8. Trade Policy Uncertainty (TPU)

The trade policy of a country defines how the government manages its international trade by effectively managing the agreements and policies allowing and restricting international trade activities. The trade policy, depending on its nature, is mainly of two faces, where open trade policies allow the countries to freely trade with other countries without much restrictions from their governments. The closed trade policy requires the government's permission for local traders to engage in international trade. The governments have many methods of controlling trade including exchange rate adjustments, barriers to entry and exit, taxes limiting trade, etc. (Handley & Limao, 2022).

TPU directly links to the economy of a country. Caldara, Iacoviello, Molligo, Prestipino, and Raffo (2020), have identified the negative impact a TPU can have on a country's economy. As per them, whenever there are TPUs, the investors fear the uncertainty and do not get involved in business deals. This limits the economic activities within the country which shrinks the economy. Whenever the economies are shrunk, it has a direct impact on the government expenditure, which results in the government bond prices being reduced. However, continued uncertainty in the trade policies can have long-term implications for the country's economy where the suffering may continue for years after normalization (Caldara et al., 2020).

Bianconi, Esposito, and Sammon (2021), have explored the impact of TPU on the prices and returns of different investments including the government-backed bonds. To quantify the risk premium associated with the TPU, they exploited a quasi-experimental variation model about the TPUs experienced by the USA from 1990 to 2010. The results of this analysis indicated that the TPU impacts the returns of the investments within a range of 3.6% to 6.2% depending on the type of investment and the uncertainty related. The ultimate effect of this has been identified as the larger investors being able to continue their investments while the small and medium investors have faced challenges. In terms of the government bonds, this risk position continued and whenever the investors lost their trust in the government, it resulted in bond prices decreasing (Bianconi et al., 2021).

2.9. Inflation Uncertainty

Inflation refers to the incremental increase in the general prices of commodities. Inflation is among the main reasons why some countries fail and why some countries succeed in economic growth (Stapleton & Subrahmanyam, 2001). Government bonds are an effective tool utilized by central banks around the world to control inflation and guide the economy toward its destination. Unlike the other policy uncertainties, inflation is quick to fix the solutions thereby addressing the issue more frequently and providing solutions (Stapleton & Subrahmanyam, 2001).

Accordingly, previous studies have identified a strong negative relationship between the inflation and the prices of the government bonds. That is, whenever the inflation is high, the prices of the treasury bonds are low, which attracts more investors towards purchasing the government bonds given the inflationary situation and the assurance provided by the government. This results in the money in circulation being reduced since the investments are made, which pushes inflation down. On the other hand, the government is also able to address inflation as well as fulfill its funding requirements (Cashin, Mohaddes, Raissi & Raissi, 2014).

Overall, it was identified that uncertainty in policies forces investors to evaluate their investments. Given that the majority of the investors will make sure that their investments are safe at hard times, the policy uncertainties force the investors to refrain from investing in government bonds, which results in the demand for the bonds decreasing where the prices are also reduced. However, whenever the policies are stable and provide stability to the economy, investments are attracted when the government bond prices are increased (Litterman & Scheinkman, 2011).

3. DATA AND METHODOLOGY

3.1. Research Data

Types of Data for the Study- The secondary data will be used to conduct the study. The secondary data is already available as it was previously collected and is available for analysis. The major source for this research is the economic uncertainty indexes which are publicly available on different websites. Based on the nature of the topic and its context, the primary data cannot be used. Due to this reason, only secondary data was used for the study. Accordingly, reputable sources were used to draw insights into the relationship between economic policy uncertainty and government bond pricing.

Sources of Data- As mentioned in the above section, the researcher has used secondary data. In line with that the primary sources of data for this study include reputable economic databases and indices. In addition to that financial databases such as the Federal Reserve Bank of St. Louis, Bloomberg, and Thomson Reuters are also used to collect the data. The indexes were chosen due to their reliability and availability, as they provide comprehensive measures reflecting the uncertainty levels in various aspect.

Uncertainty The Economic Policy Uncertainty Index, Monetary Policy Uncertainty Index, the Trade Policy Uncertainty Index, and the Fiscal Policy Uncertainty Index were sourced from the websites mentioned in the references.¹ These indices have been developed based on the proven method. Some indices have been provided monthly and quarterly indices (economic policy uncertainty index, monetary policy uncertainty index, and trade policy uncertainty index). For the comparable purpose, data has been annualized and average yearly data were considered.

Bond rates data on US bond rates was taken from the form reputable financial databases such as the Federal Reserve Bank of St. Louis, Bloomberg, and Thomson Reuters. Since this study focused on the yields of US Treasury bonds with a 10-year yield, data from the above sources were considered for the analysis.

Reliability of the Data- Only reliable sources were considered for data collection as reliability must be maintained throughout the study. Accordingly, data was collected from the websites mentioned in the references. These websites are considered reliable sources as those are more reputed sources and most of the academic research in this area was considered based on the data available in these websites.

Furthermore, the frequency of use of these indexes for studies is also high. Therefore, it can be concluded that the reliability of the data sources is high. To further strengthen the reliability, rigorous validation processes were

¹ Web Link: <https://www.policyuncertainty.com/>

implemented. In addition to Data consistency checks, a cross-verification check was performed by considering the data from multiple sources.

3.2. Research Method

There are two research approaches quantitative research method and qualitative research method. Some of the researchers, use mixed methods to accommodate both aspects of the study. In response to the research question considered here the quantitative methodology was used to systematically analyze the impact of Economic Policy Uncertainty on the government bond pricing. It was believed that the use of econometric models and statistical techniques would enable to quantification of the relationship between the independent variables such as Fiscal Policy Uncertainty, Monetary Policy Uncertainty, Trade Policy Uncertainty, and Inflation Uncertainty, and the dependent variable of government bond prices.

Regression analysis, coefficient analysis, covariance analysis, multiple regression analysis, and VAR analysis were conducted to analyze the data to validate the hypothesis developed. The results of each analysis have been presented in the data analysis section. Based on the nature of the coefficient, regression, R square value, significant level, and intercept, the relationship between independent variables and dependent variables was given in detail.

The use of the quantitative method enables for rigorous examination of the numerical associations and provides empirical evidence to support the hypotheses, offering valuable insights to access the relationship between the variables.

3.3. Sample and Population

The selected period for the study is 2000-2023 which covers two decades and various economic ups and downturns. Therefore, it was believed that a more reliable and realistic period had been selected for the analysis.

3.4. Analysis of variables

Based on the literature review done, there are five independent variables were recognized as main contributors to the bond market behavior. Accordingly, the relationship between independent variables and dependent variables can be explained as follows.

$$Y=B_0+B_1(EPU)+B_2(FPU)+B_3(MPU)+B_4(TPU)+B_5(IPU)+B_6(GDP)+B_7(UI)$$

Where,

EPU= Economic policy uncertainty

FPU= Fiscal policy uncertainty

MPU= Monetary policy uncertainty

TPU= Trade policy uncertainty

IPU= Inflation Policy uncertainty

GDP= Gross domestic production
 UI = Unemployment index

Here the control variables are also considered into account as those factors also have an impact on the bond prices. These estimation equations are designed to empirically test the relationship between various types of economic policy uncertainties and government bond yields.

In below tables, the use of independent variables for similar studies were analyzed including the expected nature of relationship.

Table 1-Independent variables

Independent Factors	Previous Authors	Expected Nature of Relationship
Economic Policy Uncertainty	Baker et al., (2016),D'Amico, Farka, and Veronesi (2019), Pastor and Veronesi (2013)	Positive
Fiscal Policy Uncertainty	Raddatz and Schukler (2018), Hollmayr & Matthes (2015)	Positive
Monetary Policy Uncertainty	Cieslak et al., (2017), Li et al., (2020)	Positive
Trade Policy Uncertainty	Caldara et al. (2020), Bianconi et al. (2021)	Positive
Inflation Uncertainty	Stapleton & Subrahmanyam (2001); Bloom (2014)	Positive

In addition to the main independent variables that are considered in the study, it is essential to consider potential control variables that may affect the relationship between uncertainty and bond pricing. Therefore, these control variables include macroeconomic indicators such as GDP growth rate, and inflation rate, financial market variables such as stock market performance, and interest rates, and geopolitical factors such as political instability, and global economic trends. Taking those control variables into consideration is important for better analysis through mitigation of potential confounding factors.

A descriptive analysis of the data has been performed and the result is given below.

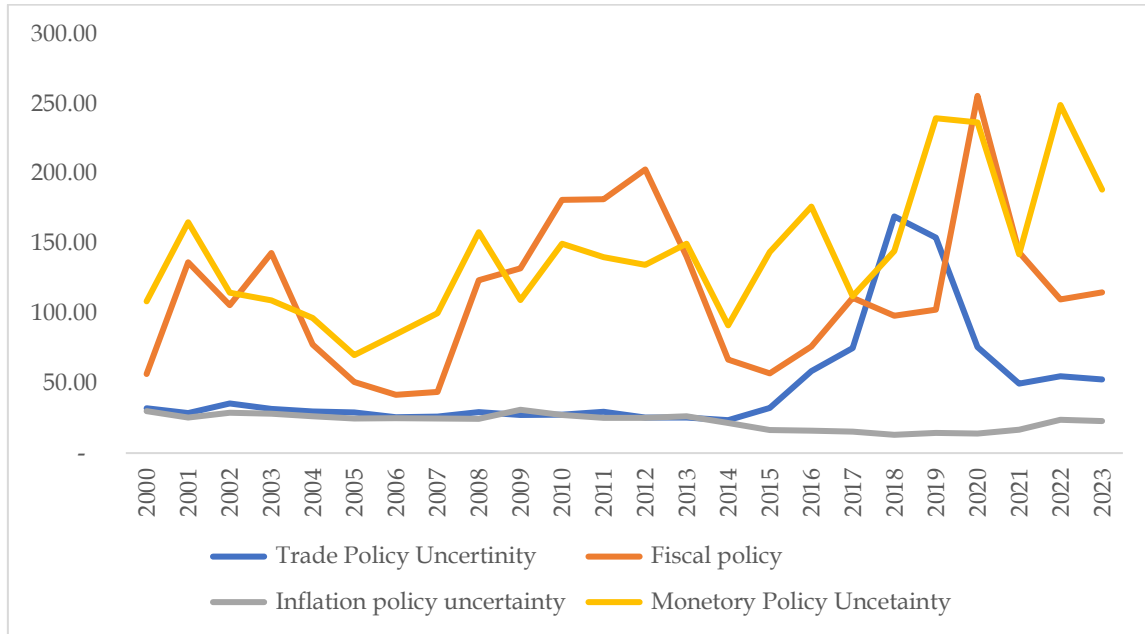
Table 2-Descriptive Analysis

	Uncertainty index	TPI	Fiscal PI	Inflation PI	MPI	BONDYIELD
N						
Valid	24	24	24	24	24	24
Missing	0	0	0	0	0	0
Mean	21,079	48	115	23	142	3
Median	20,314	31	111	25	141	3
Mode	9275.00a	23.57a	41.70a	13.08a	70.15a	2
Std. Deviation	7,207	38	54	5	48	1
Variance	51,946,848	1,472	2,894	30	2,348	2
Skewness	1	2	1	(1)	1	0
Std. Error of Skewness	0	0	0	0	0	0
Minimum	9,275	24	42	13	70	1
Maximum	40648.58	169.41	255.72	31	249.18	6.03

a. Multiple modes exist. The smallest value is shown-The mode is not unique in this dataset due to multiple values having the highest frequency of occurrence.

According to the table provided, the mean values for UI (Unemployment Index), TPI (Trade Policy Index), Fiscal Policy Index, Inflation Policy Index, and Monetary Policy Index are 21, 079, 48, 115, 23, and 142 respectively. Referring to the year 2008, during which the Great Recession was reported, and the year 2020, when the COVID-19 pandemic had a significant impact (Baldwin & di Mauro, 2020), the indices have been analyzed in the graph below.

Figure 1 Analysis of key index over the time series



As clearly shown in the above picture, all the uncertainty indexes were very high in 2020, when the COVID-19 pandemic had a significant impact on economic activities and the financial market. This increase is almost above the mean indexes of the period. Given the minimum indexes, the indexes recorded in 2007 and 2008 were also above the minimum level. Hence, it is clear that periods reporting an economic and financial crisis have higher uncertainty levels.

Table 3-Minimum and Maximum Indexes and recorded years

	Uncertainty Index	Trade Policy Uncertainty	Fiscal policy	Inflation policy uncertainty	Monetary Policy Uncertainty
Minimum	9,275	24	42	13	70
Minimum-Year	2000	2014	2006	2018	2005
Maximum	40,649	169	256	31	249
Maximum -Year	2019	2018	2020	2009	2020

As shown in the above table, the maximum indexes were recorded during the periods of 2009, 2018, 2019, and 2020. These periods experienced economic downturns due to various reasons, including the COVID-19 pandemic and the economic recession of 2007-2008. The minimum indexes were recorded in 2000, 2005-2006, and 2014, during which there were no significant economic downturns.

4. RESULTS AND ANALYSIS

4.1. Regression Analysis

Being a statistical technique, regression analysis is used to inspect the relationship between a dependent variable and one or more independent variables. Here the relationship between different policy uncertainties and government bond prices will be analyzed under regression analysis.

H1: Variations in economic policy uncertainty have a significant impact on the bond pricing.

Based on the regression result between the variation in economic policy uncertainty and the bond pricing, the relationship between these two variables can be explained. As per the analysis outcome, the regression is 0.6347 and it shows that the strong relationship is there between the economic policy uncertainty and the government bond prices. This means that when the economic policy uncertainty increases, there will be a corresponding increase in government bond prices. The moderate correlation says that there is a moderate positive relationship between these two variables. The value of 0.4029 R square values says that more than 40% variation in the government bond pricing can be explained through this variable and therefore, economic uncertainty is one of the key variables which determine the government bond prices.

The adjusted R square values show a more accurate reflection of the model's fitness to explain the relationship. Since the adjusted R square value is 0.3757, it says that model is suitable to explain the impact of economic uncertainty on government bond prices. Further, standard error of 1.01 says that there will be 1.01 deviation in observed prices and predicted government prices. In conclusion, the model summary says that there is a significant, moderate positive relationship between government bond prices and economic uncertainty.

Table 4-Regression Result-Economic Policy Uncertainty and Bond Pricing

	Values	P value	<i>t value</i>
R value	0.63	0.00	
Constant	5.64	0.00	8.60
Coefficients	0.00	0.00	-3.85

The result shows a significant relationship between economic policy uncertainty and government bond prices. The very low p-value, 0.0009 shows that there is a significant relationship between the variables. The result says that variation in government bond prices can easily be explained by economic uncertainty and hence the economic policy uncertainty significantly contributes to the government bond prices.

The coefficient outcome shows the relationship between the dependent variable, bond pricing, and the independent variable, Economic Policy Uncertainty. The

intercept of 5.6403 says the predicted bond price when the economic uncertainty level is zero. The relationship is statistically significant at the level of t-statistic of 8.602. Since the p-value is very less than 0.05 level, it says that there is a significant relationship between these two variables. Further, the coefficient for Economic Policy Uncertainty is 0.0001, and it is statistically significant at (t-statistic of -3.8526, p-value of 0.0009) revealing that when the Economic Policy Uncertainty increases, there is a corresponding positive impact on the bond pricing.

The 0.304 beta says that the relationship is moderate in strength as it is below the 0.5 level. Accordingly, the relationship between economic policy uncertainty and government bond pricing can be estimated as $5.64 - 0.000$ (economic policy uncertainty). In summary, the results say that the Economic Policy Uncertainty has a statistically significant positive impact on the bond pricing, providing valuable insights about the government bond price behavior.

The regression result between the economic policy uncertainty and the behavior of government bond prices is analyzed using the regression result. As per the result, regression results support the evidence of the association between these two variables as the analysis concluded that there is a significant, positive correlation between the two variables. Hence the null hypothesis is rejected as it is false to say there is no significant relationship between economic policy uncertainty and government bond prices. Hence the alternative hypothesis can be accepted as there is a significant relationship between the two variables under consideration here. The outcome of the analysis is in line with the expectation as per the literature review done. Accordingly, the highest economic policy uncertainty is leading for government bond prices to increase as the risk is very high when there is no economic policy stability. The interpret result provides a robust starting point for bond pricing as it provides significantly high value. Hence the result is supportive, saying that there is a significant relationship between economic policy uncertainty and the government bond prices hence economic policy uncertainty is a reliable and major variable for determining the government bond prices.

H2: Variations in Fiscal Policy Uncertainty have a significant impact on bond pricing.

As per the regression result between the fiscal policy uncertainty and the government bond prices shows a moderate result as the R-value is 0.51. R square value is 0.26 and that indicates that only 26% of the variation in the government bond prices can be explained from this variable. The standard error of 1.13 reveals that the expected bond prices and the recorded bond prices are varied with 1.13 of standard error. The modest relationship between the variation in fiscal policy uncertainty and the government bond prices says that when there is an increase in fiscal policy uncertainty, a correspondence increase can be seen in the government bond prices.

Table 5-Regression Analysis-Fiscal Policy Uncertainty and Bond prices

	Values	P value	<i>t value</i>
R value	0.51	0.01	
Constant	4.65	0.00	8.38
Coefficients	-0.01	0.01	-2.79

The regression results are insightful for analysis of the statistical significance of the regression model examining the impact of changes in the Fiscal Policy Uncertainty on government bond pricing. As per the regression result it is 0.51 and this shows the variability in the government bond prices in return for the fiscal policy uncertainty. Further, the significant value is below 0.05 which is the 95% confidence level, overall analysis supports the existence of the statistically significant relationship between the variables under consideration. In conclusion, the results between the fiscal policy uncertainty and the variation in the government bond prices are statistically significant. Accordingly, this provides supportive evidence to the alternative hypothesis as there is a significant relationship between fiscal policy uncertainty and the government bond prices.

As per the coefficient result between the fiscal policy uncertainty and the government bond prices it is clear that there is a significant relationship. The intercept of 4.65 says that the government bond prices when there is no fiscal policy uncertainty. In other words, it says the government bond prices when there is 100% stability in the fiscal policy. Further, t-statistic of 8.38 and a p-value of 0.0000, shows a robust baseline for the bond prices. The coefficient for the Fiscal Policy Uncertainty is 0.0044, and its statistical significance (t-statistic of 2.79, p-value of 0.01) shows that the variations in the Fiscal Policy Uncertainty have a significant and positive impact on the bond pricing. The Beta of 0.506 indicates a moderate strength of the relationship. In conclusion, it can be said that Fiscal Policy Uncertainty and the government bond prices has a statistically significant positive relationship. Therefore, the result supports the alternative hypothesis. Accordingly, fiscal policy uncertainty is a major pricing dynamics of government bonds.

The analysis shows compelling evidence supporting the hypothesis that variations in Fiscal Policy Uncertainty have a significant impact on the government bond pricing. As per the coefficient table, there is a significant and positive relationship between the variables with a coefficient of -0.01. This shows increased fiscal policy uncertainty leading to the increased government bond prices to accommodate the increased risk portfolio. The beta of 0.506 implies a level of moderate strength of this impact to the dependent variable. Furthermore, the ANOVA results confirm the statistical significance of the regression model, showcasing a significant contribution of Fiscal Policy Uncertainty in explaining the variance in the government bond pricing. In conclusion, it can be said that the findings of the study support the alternative hypothesis and reject the null

hypothesis that there is no significant relationship between fiscal policy uncertainty and government bond prices.

H3: Monetary Policy Uncertainty significantly influences the bond pricing of government bonds.

The third variable which is under consideration is the monetary policy uncertainty. In this section, it's going to be analyzed the impact of monetary policy uncertainty on government bond prices. Having analyzed the model summary, it can be concluded that there is a moderate correlation between the two variables as the R-value is 0.4792.

This moderate positive relationship says that the increase in the monetary policy leads to an increase in the government bond prices to accommodate the return for the increased risk associated with increased monetary policy uncertainty. Furthermore, the R squared value is 0.2296 and it shows that a 22% variation in the government bond prices can be explained by the monetary policy uncertainty.

The result shows a standard error of the estimate, at 1.1581, this indicates an average deviation of observed bond prices from the predicted bond prices based on the model. Since the explanatory power of the model is moderate, it shows a less robust impact between the variables even though there is a significant relationship.

Table 6-Regression Analysis-Monitory Policy Uncertainty and Bond Prices

	Values	P value	<i>t value</i>
R value	0.48	0.02	
Constant	5.06	0.00	6.77
Coefficients	-0.01	0.02	-2.56

According to the regression result shown above, 8.7941 of the regression result is shown between the monetary policy uncertainty. This shows the variability in bond pricing attributed to Monetary Policy Uncertainty. Since the significance level is less than 0.5, this says that there is a significant relationship between monetary policy uncertainty and the government bond prices. In general, the relationship between these two variables is significant which form a robust baseline for these two variables to be correlated with each other. Hence the outcome of the study says that monetary policy uncertainty is one of the key variables which determine the government bond prices.

The intercept between the monetary policy uncertainty and the government bond prices is 5.0622. This is the level of government bond prices when the monetary policy uncertainty is zero. In other words, the intercept of 5.05 represents the level of government bond prices when there is a 100% stability in the monetary policies. The model is significant with a t-statistic of 6.7675 and a p-value of 0.0000. Hence this provides a robust baseline for the government bond prices. The coefficient for Monetary Policy Uncertainty is 0.0050, and its statistical significance with a t-statistic of 2.5607 and a p-value of 0.0178. accordingly,

variation in monetary policy uncertainty strongly affects the government bond prices and there will be a positive relationship between two variables. The Beta of 0.704 indicates a strong positive relationship. The relationship between monetary policy uncertainty and government bond pricing can be explained as 5.06-0.01 (monetary policy uncertainty). In conclusion, it can be seen between these two variables. Accordingly, in the alternative hypothesis statement, there is a significant relationship between monetary policy uncertainty and government bond prices.

The regression result between the monetary policy uncertainty and the government bond prices is very strong to say that there is a strong positive relationship between the monetary policy uncertainty and the bond prices. Hence monetary policy uncertainty is one of the key variables that determine the behavior of the government bond prices. Having more than 0.7 beta value also supported the evidence for this as it recognizes monetary policy uncertainty as one of the key contributors to government bond prices. Therefore, monetary policy uncertainty significantly contributes to the development and variation in government bond prices.

H4: Trade Policy Uncertainty contributes significantly to fluctuations in the bond prices of government bond yields.

Trade Policy Uncertainty and the bond price variation show a modest level of explanatory power as the R-value is 0.341. Since the R-value is below 0.5 but still positive says that there is a weak positive relationship between the independent variable and the dependent variable. With an R-square value of 0.1161, the model explains approximately 11.61% of the variation in government bond prices because of the Trade Policy Uncertainty.

As per the analysis the standard error of the estimate remained at 1.2405 and it says the average deviation of observed bond prices from the predicted values by the model is moderate. Hence this modest relationship says that there is a less impact on government bond prices even though the model is statistically significant.

Table 7-Regression Result -Trade Policy Uncertainty and Bond prices

	Values	P value	<i>t value</i>
R-value	0.34	0.01	
Constant	3.79	0.00	9.24
Coefficients	-0.01	0.01	-1.70

With reference to the regression result, given above F-statistic of 2.8891, along with the p-value of 0.0103, shows that the model is statistically significant at the 95% confidence level. This says that the relationship between trade policy uncertainty and government bond prices is strongly correlated with each other. This suggests that the relationship between Trade Policy Uncertainty and bond pricing is statistically significant. The Total section provides the overall

variability in bond pricing. In summary, the results indicate that the model examining the relationship between Trade Policy Uncertainty and bond pricing is statistically significant, providing evidence for the hypothesis that the variation in trade policy uncertainty has a notable impact on the pricing dynamics of government bonds.

The intercept shows the estimated bond pricing when Trade Policy Uncertainty is zero. In other words, it's the price level of the bond when there is no trade policy uncertainty. The summary is statistically significant with a t-statistic of 9.2446 and a p-value of 0.0000. When it comes to the coefficient for Trade Policy Uncertainty is 0.0067, and its statistical significance at the level of t-statistic of 1.6997 and the p-value of 0.0103. This reveals that the fluctuations in the Trade Policy Uncertainty have a significant and positive impact on the government bond pricing. The beta of 0.309 indicates a moderate positive relationship. The relationship between trade policy uncertainty and government bond pricing can be explained as 3.79-0.01 (Trade policy uncertainty). In conclusion, the corrected results support the hypothesis that Trade Policy Uncertainty has a significant and statistically significant impact on government bond prices. This provides empirical evidence that strengthens the understanding of how the trade policy uncertainties impact the valuation of government bonds.

The result of the coefficient analysis provides compelling evidence that supports the hypothesis that Trade Policy Uncertainty has a significant impact on the government bond prices. As per the results, which says the regression model is statistically significant, with an F-statistic of 2.8891 and a p-value of 0.0103. The result clearly shows that the variations in the Trade Policy Uncertainty contribute significantly to the determination of bond pricing. The coefficient table further strengthens this conclusion, since the intercept is robust and statistically significant, and the coefficient for Trade Policy Uncertainty shows significance with a p-value of 0.0103. Hence, it can be concluded that the fluctuations in Trade Policy Uncertainty have a notable and positive influence on the government bond pricing. The less beta value which is 0.309 says a moderate positive relationship between the variables.

H5: Fluctuations in Inflation Uncertainty have a significant impact on the bond prices of government bonds.

Inflation Uncertainty and government bond prices show a substantial level of explanatory power since the R-square value is less than 0.5. This implies that the model accounts for 46% of the variation in the government bond prices.

Having, an R value of 0.6839 says that there is a strong positive correlation between the inflation uncertainty and the government bond prices. This implies that the increased inflationary uncertainty shows an upward trend in the government bond price. Further, the standard error of 0.9785, shows the average deviation of observed bond prices from the predicted bond prices by the model. Considering all these figures, it can be concluded that the model shows a robust

relationship between Inflation Uncertainty and government bond prices. This indicates that the fluctuations in the inflation uncertainty significantly affect the government bond prices.

Table 8-Regression Result-Inflation Policy Uncertainty and Bond Prices

	Values	P value	<i>t value</i>
R-value	0.68	0.00	
Constant	-0.45	0.00	-0.51
Coefficients	0.16	0.00	4.30

As per the regression result received for the inflationary uncertainty and the government bond prices representing the explained variability in bond pricing related to the Inflation Uncertainty. Having a 17.66 of regression result at the level of $P=0.000032$ says that the model is statistically significant. Furthermore, the F-statistic of 18.4525, along with its associated p-value of 0.00032, indicates that the model is highly significant providing evidence about the relationship between Inflation Uncertainty and bond pricing. As per the regression result, it can be concluded that inflationary uncertainty is a significant factor in determining the government bond prices. This provides strong evidence for the hypothesis that the variation in the inflation uncertainty significantly impact on the pricing dynamics of government bonds.

Coefficient for the Inflation Uncertainty is 0.1608 and this is statistically significant at the level of t-statistic of 4.2956 and the p-value of 0.0003. This implies that the changes in the Inflation Uncertainty have a significant and positive impact on determining the government bond prices. Furthermore, the Beta of 0.402 implies a moderate positive relationship between the variables under consideration. However, intercept is negative and its lack of significant and robust nature due to the lower value. The relationship can be explained as $-0.45+0.16(\text{inflation policy uncertainty})$. In conclusion it can be summarized that the fluctuations in inflation uncertainty significantly and positively influence on the behavior of the government bond prices

With reference to the null hypothesis that the Inflation Uncertainty does not have an impact on the government bond prices can be rejected as there is no evidence to prove that. Alternatively, the alternative hypothesis can be accepted as there are proven result to say that these two variables are statistically and significantly related with each other. The regression model is statistically significant as indicated by the highly significant F-statistic of 18.4525 and the p-value of 0.00032.

The coefficient for Inflation Uncertainty is 0.1608 showcasing a statistical significance with the t-statistic of 4.2956 and the p-value of 0.0003. This result shows that the Inflation Uncertainty has a notable and positive impact on the pricing dynamics of government bonds. Additionally, Beta of 0.402 reinforces this, showing a moderate positive relationship between

the independent and dependent variable. Despite the intercept's lack of significance, due to its negative value, the overall empirical findings robustly confirm the alternative hypothesis that variations in Inflation Uncertainty significantly impact on the government bond prices.

4.2. Multiple Regression Analysis

The multiple regression analysis reveals important information about the relationship between different economic policy uncertainties and how those uncertainties affect the government bond prices.

Table 9-Multiple Regression Analysis

	Coefficients	t Stat	P-value
(Constant)	1.63	1.07	0.30
Uncertainty index	0.00	-1.79	0.09
TPI	0.01	2.43	0.03
Fiscal PI	0.00	-0.47	0.64
Inflation PI	0.23	6.59	0.00
MPI	0.00	-0.92	0.37
Unemployment	-0.35	-2.82	0.01
GDP	-0.11	-0.78	0.45

The high R-squared value of 0.940 indicates that the overall regression model fits the data well, implying that the independent variables in the model can account for roughly 94% of the variance in the dependent variable. The model's robustness is further supported by the modified R-squared value of 0.884, which takes the number of predictors into consideration.

Furthermore, with a positive coefficient of 0.23, inflation policy uncertainty is shown to be a substantial predictor of bond pricing. This suggests that higher bond prices are correlated with higher levels of inflation policy uncertainty. The formula for the regression analysis based on the multiple regression analysis is as follows.

$$\text{Bond Return} = 1.631 - 0.00005\text{EPU} + 0.0118\text{TPI} + 0.0036\text{MPI} - 0.00210\text{FPI} + 0.2306\text{IPU} - 0.1060(\text{GDP}) - 0.3466(\text{UI}) + \epsilon$$

Where

- EPU=Economic Policy Uncertainty
- TPI=Trade Policy Uncertainty Index
- MPI=Monetary Policy Uncertainty Index
- FPI=Fiscal Policy Uncertainty
- IPU=Inflation Policy Uncertainty
- GDP= Gross Domestic Production
- UI= Unemployment Index

The relationship between the independent variables—the Economic Policy Uncertainty Index, Trade Policy, Monetary, Fiscal, and Inflation Policy uncertainties, control variables and expected bond price, is represented by this formula. Each independent variable's coefficient represents the degree and direction of that variable's influence on the dependent variable.

4.3. VAR analysis

Every variable in the system is represented in a VAR analysis as a linear function of both its historical values and the historical values of every other variable in the system. The VAR model is ideal for forecasting as it offers a framework in which the historical values of variables affect their current values. The relationships between the variables in VAR models can be investigated using a variety of analytical techniques, including impulse response and scenario analysis. The impulse response approach is used in this thesis. In empirical analysis, it has advantages and disadvantages like any other model. Because the VAR model can capture interactions between multiple variables at once, it is more flexible. Every variable in the model is regressed using its own lagged values (Benati & Surico, 2009).

Table 10-VAR analysis

Economic Policy Uncertainty	Coefficients	Standard Error	t Stat	P-value
Intercept	9,224.48	6,128.35	1.51	0.15
Lag 1	0.39	0.23	1.66	0.11
Lag 2	-0.07	0.25	-0.26	0.80
Lag 3	0.26	0.22	1.19	0.25
<i>Trade Policy Uncertainty</i>				
Intercept	15.25	10.39	1.47	0.16
Lag 1	1.11	0.24	4.64	0.00
Lag 2	-0.58	0.33	-1.76	0.10
Lag 3	0.17	0.24	0.73	0.48
<i>Fiscal Policy Uncertainty</i>				
Intercept	85.94	33.09	2.60	0.02
Lag 1	0.53	0.23	2.28	0.04
Lag 2	-0.02	0.26	-0.09	0.93
Lag 3	-0.25	0.22	-1.10	0.29
<i>Monetary Policy Uncertainty</i>				
Intercept	30.58	38.93	0.79	0.44
Lag 1	0.30	0.22	1.39	0.18
Lag 2	0.06	0.26	0.25	0.81
Lag 3	0.46	0.25	1.85	0.08
<i>Inflation Policy Uncertainty</i>				
Intercept	4.17	2.98	1.40	0.18

Lag 1	0.97	0.23	4.26	0.00
Lag 2	-0.20	0.33	-0.62	0.54
Lag 3	0.03	0.25	0.14	0.89

The dependent variables in each section of the VAR analysis consider the different policy uncertainties. The variables have been included in the VAR analysis separately in the estimation model, and controls have been discussed alongside the economic significance of the coefficients, particularly those that are significant.

Economic policy uncertainty- With reference to the coefficient values at Lag 1, Lag 2, and Lag 3 it those are not statistically significant as the P values are higher than 0.05. therefore, this says that the model that the economic policy uncertainty may not have a statistically significant impact on government bond pricing.

Trade policy uncertainty- As per the model regression p-value of 0.0005, shows that that the regression model is statistically significant at the 5% level. The further analysis says that the coefficient at Lag 1 is 1.1084. this says that one unit increase in the trade policy uncertainty result to increase 1.1084 unit of bond prices. As per the p value, this coefficient is statistically significant at the 5% level. Further analysis in to Lag 2 and Lag 3 shows that trade policy uncertainty at lags 2 and 3 do not have a significant impact on the bond prices.

Fiscal policy uncertainty- A intercept of 85.9429 suggests that when all independent variables are zero, expected value of the bond price is approximately 85.9. The coefficient at the Lag 1 is 0.529. This says that one unit increase in the fiscal policy uncertainty leads to increase 0.52 of bond prices. This coefficient is statistically significant at the 5% level. However, coefficient at Lags 2 and 3 are not statistically significant at the 5% level, saying that second and third lags of fiscal policy uncertainty may not have impact on the bond prices.

Monetary policy uncertainty -About the VAR analysis conducted for monetary policy uncertainty it can be seen a positive impact on the bond prices as the regression value and R square value is greater than 0.5. Having further analysis of the VAR model, it can be noted that only Lag 3 has a significant impact on the bond prices. Lag 1 and lag 2 of the monetary policy uncertainty may not have a significant impact on the government bond prices.

Inflation policy uncertainty - Based on the VAR analysis results for the inflation policy uncertainty index as an independent variable impacting government bond prices it can be noted that inflation policy uncertainty has a significant impact on the bond prices. With the strong positive correlation coefficient and high R square value, it is clear that the inflation uncertainty index is a good measure for evaluating bond prices.

Having further analysis of Lag 1, a coefficient of 0.9707 suggests that a one-unit increase in the inflation policy uncertainty index leads to an increase in the bond

prices nearly by one unit. However, Lag 2 and 3 coefficients are not statistically significant as their p-values are higher than 0.05. This implies that the variables at lag 2 and lag 3 may not have a significant impact on bond pricing. In summary, the analysis indicates that the Bond prices are positively impacted by both fiscal and inflation policy uncertainty at lag 1. This effect is statistically significant as the p-values are less than 0.05 level.

Bond prices are positively impacted by trade policy uncertainty at lag 1, which is also statistically significant. Based on the provided study, other variables and lags do not have statistically significant effects on bond prices. These results suggest that the price of government bonds may be impacted in the near run by some policy uncertainties, particularly those about trade, fiscal, and inflation policies. To fully grasp the dynamics and ramifications of these interactions, more investigation and study might be required.

5. Discussion

The 2008 financial crisis was a leading point for economic organizations to establish constant and robust financial and economic policies. Economic Policy Uncertainty (EPU) has emerged as a critical factor shaping the financial markets with significant implications for government bond prices. Being one of the key factors that determine government bond prices, the Economic Policy Uncertainty and its impact on government bond prices has been analyzed by various scholars. Accordingly, the economic policy uncertainty index, introduced by Baker et al. (2016), provides valuable insight and measures to do a comprehensive analysis of the relationship between the EPU and the bond prices.

According to the regression analysis performed for economic policy uncertainty and the bond prices, it was revealed that there is a significant impact on the government bond pricing. Additionally, the model summary explains that 40% of the variance in the government bond prices can be explained through economic policy uncertainty and therefore, it was recognized as one of the key factors that determine the bond prices. Furthermore, the statistically significant F-statistic with 14.84 at the p-value of 0.0009 again reconfirms the robustness of the relationship between economic policy uncertainty and government bond prices. As per the coefficient table, again it further emphasizes the significance of EPU, with a negative coefficient which is in the level of -0.0001 and at the p-value of 0.0009. This shows an increase in EPU is related to a decrease in bond prices. This aligns with findings from previous studies such as D'Amico et al. (2019) and Colacito et al. (2019). Hence the finding highlights the impact of policy uncertainty on risk premiums and bond yields.

The outcome of the research findings shows the relevance of economic policy uncertainty in guiding investor behavior. Risk management strategies, and policy policy-making processes must be done with reference to this behavior. Normally investors tend to demand high price premiums in periods of economic uncertainty in return for the advance risk that they have taken in the volatile period.

The literature and the outcome of the study suggest the interconnectedness of economic policy uncertainty and financial markets. The concept of time-varying risk aversion introduced by Pastor and Veronesi (2013), delivers a theoretical foundation for understanding as to how the investors' perceptions of risk are interwoven with the economic policy uncertainty, and finally influencing bond pricing.

Without limiting the behavior of economic policy uncertainty, the study goes beyond fiscal policy uncertainty to analyze its impact on government bond pricing. The Fiscal Policy Uncertainty (FPU) and the government bond pricing are interrelated as the outcome suggests. The model summary between these two variables shows cast statistically significant regression relationship with an R-square value of 0.2614. furthermore, the ANOVA table supports this outcome

with an F-statistic of 7.7862 at the p-value of 0.0107, indicating the model's significance.

The coefficient table gives further insights into the relationship as it gives the outcome of a positive coefficient for Fiscal Policy Uncertainty with a coefficient of 0.0044 at the p-value of 0.0107. This suggests that an increase in the Fiscal Policy uncertainty is directly associated with an increase in government bond prices. This finding of the coefficient analysis is further supported by the model summary insight. Fiscal policy uncertainty can lead to uncertainty regarding future economic conditions thereby influencing investor behavior. This in return ultimately impacts the government bond prices.

The outcome of the analysis is in line with the evidence of the existing literature too. The study conducted by Raddatz and Schmukler (2018), also stated that fiscal policy uncertainty can have a significant impact on the financial markets and therefore, it has an effect on the risk premiums and the cost of borrowing. This discussion highlights the importance of considering another aspect of policy uncertainty, such as fiscal policy, in understanding the complex relationship with bond prices.

The relationship between Monetary Policy Uncertainty (MPU) and government bond prices is also a topic with which economic scholars were mostly concerned. Hence, this study also focused on analyzing the relationship between monetary policy uncertainty and government bond prices. The results indicate that the model is significant with the R-square value of 0.2296. This result is further supported by the ANOVA table which provides a F-statistic of 6.5573 at the p-value of 0.0178. This shows the model's overall significance (Ehrmann & Zaman, 2020).

With reference the confident tables, it shows a positive coefficient for the monetary policy uncertainty. The results imply that the increase in monetary policy uncertainty increases the bond prices as these two variables are correlated with each other. The coefficient of 0.0050 at the p-value of 0.0178 indicates that increases in monetary policy significantly increase the government bond prices at a higher rate. The monetary policies are mainly taken by the central banks and hence the decisions taken by the central banks are reviewed by the investors. Hence the outcome of the study is consistent with the idea that the central bank policies have a significant impact on the government bond prices (Fang & Miller, 2019).

The studies conducted by Cieslak et al. (2017) and Dudley (2014), highlighted the impact of monetary policy shocks on the bond prices and its yields. The discussion underlines the complex relationship between the central bank policies and, monetary policy uncertainty, and the pricing dynamics of government bonds. Hence, the study outcome supports for the existing literature.

With reference to the Trade Policy Uncertainty, the study investigates its specific impact on government bond prices. As per the result received for the model

summary, it indicates statistical significance, with an R-square value of 0.1161. In contrast to the model summary, the ANOVA table suggests that the model's overall significance is at the marginal level as the F-statistic is 2.8891 at the p-value of 0.1033.

In terms of the coefficient tables, shows a positive coefficient for the trade policy uncertainty as the coefficient is 0.0067 and the p-value is 0.1033. This result implies that the increased level of trade policy uncertainty leads to increased government bond prices. However, the model is marginally significant. Trade policy uncertainty influences investor perceptions, risk analysis, and thereby on bond prices.

The finding of the study supports the existing literature. The study conducted by Bloom (2014), emphasizes the role of policy uncertainty in deciding economic policies. The marginal significance received from the ANOVA table shows that trade policy uncertainty contributes to variation in bond prices, however, the impact will be less compared to other dimensions of the policy uncertainty.

The fifth variable that is considered for the analysis is Inflation Uncertainty. As per the research outcome, there is a significant relationship between inflation uncertainty and government bond prices. With reference to the model summary, it shows statistical significance, with an R-square value of 0.4677. This says that more than 46% of the variation in government bond prices can be easily explained through inflation uncertainty. The outcome of the ANOVA table supports this result with an F-statistic of 18.4525 at the p-value of 0.00032. This implies the model's overall significance level.

The coefficient table also provides critical insights into the relationship between two variables. As per that coefficient of 0.0374 shows that the inflation uncertainty can influence the bond prices. This says that increased inflationary risk impacts increasing government bond prices. The result is the same as the previously taken result from the ANOVA table that uncertainty in inflation expectations can influence investor behavior and impact bond prices.

The finding of the study is consistent with the research conducted by Ang, Bekaert, and Wei (2007), which highlights the role of inflation uncertainty in determining risk premiums and bond yields of government bonds. The significance in the ANOVA table emphasizes the significance of considering inflation uncertainty as a crucial factor influencing government bond prices (Arias & Lopez-Silanes, 2012).

In combining the research findings, the outcome of the study contributes to the broader understanding of the relationship between the policy uncertainty dimensions and government bond prices. With reference to the case, it has been considered that economic policy uncertainty, fiscal policy uncertainty, monetary policy uncertainty, inflationary uncertainty, and their impact on government bond prices were deeply considered. The evidence of the study reveals that while overall economic policy uncertainty provides a significant impact on bond prices,

other aspects such as fiscal policy uncertainty, monetary policy uncertainty, trade policy uncertainty, and inflation uncertainty also contribute to the behavior of the bond prices.

The findings of the study also have a significant implication for investors, policymakers, and financial institutions for them to make practical decisions. Accordingly, recognizing the impact of various policy uncertainties must be important for an informed decision-making process. Furthermore, this is very important for them to implement effective strategic management strategies, adapt risk management strategies, and navigate the financial markets with greater precision. Policymakers have a good insight as to how various policy uncertainties impact government bond prices and can make effective policy decisions to manage market expectations and keep the market stable.

Furthermore, the outcome of the study contributes to the growing landscape of the literature where interconnectedness between policy uncertainty and financial markets is considered. The articles written by Bloom (2014), and Baker et al. (2016), provided the foundation for understanding the broader impact of the policy uncertainty on the economic outcomes. Since the study deeply considered various dimensions of policy uncertainties, it will add more value to the existing literature.

Though the study provides more benefit to the various stakeholders, it's required to identify the limitations attached to the study. Accordingly, reliance on historical data may limit the generalizability of the findings of unexpected events. Furthermore, the use of data for situations in which the data was not captured is problematic as the study does not account for such situations. Furthermore, the study adopts a quantitative method. Therefore, certain qualitative aspects that are influencing market behavior may not be fully addressed by this study. Hence future studies could explore these aspects in greater detail to enhance the comprehensiveness of this area.

In conclusion, the study advances the sympathy of the relationship between policy uncertainty and government bond prices, considering various aspects of policy uncertainties such as economic policy uncertainty, fiscal policy uncertainty, monetary policy uncertainty, trade policy uncertainty, and inflation uncertainty. The findings of the study contribute to the ongoing dialogue on the complexities of financial markets, providing a foundation for future research and practical applications in circumnavigating the developing landscape of economic uncertainties.

6. Conclusion

In summary, this research evaluated the effect of economic policy uncertainty in terms of fiscal policy uncertainty, monetary policy uncertainty, trade policy uncertainty, and inflation uncertainty on government bond prices. The study was considered based on the 10-year treasury bond yielding the USA market. As per the empirical analysis, it was revealed that there are significant relationships between the variables. Therefore, it was highlighted that these factors have a significant impact on government bond prices.

The findings of the study highlighted the importance of considering the multifaceted nature of policy uncertainty in understanding bond market dynamics and its impact on government bond pricing behavior. Among the factors considered in the study, economic policy uncertainty is considered a prominent factor in influencing bond prices. Apart from that fiscal policy uncertainty, monetary policy uncertainty, and trade policy uncertainty have a significant impact on the bond market dynamics.

Moving forward, a few aspects must be considered by future studies. Among those aspects, considering different aspects of policy uncertainty on the bond prices could provide deeper knowledge into their combined impact. Furthermore, examining the influence of qualitative factors, like investor sentiment and their perceptions, and market psychology will provide a more comprehensive understanding of bond pricing dynamics. Hence, rather than relying on the quantitative factors, qualitative factors may have been considered for the study.

The study has a few limitations inherent in trusting solely on historical data and quantitative methods. Therefore, future studies may benefit from incorporating qualitative analyses. Furthermore, considering real-time market dynamics is important for capturing unexpected events and shifts in investor behavior more accurately.

Future research activities will benefit if the research scope could be expanded so that it can include a broader range of financial instruments beyond government bonds. There are various financial instruments such as corporate bonds or equities. Therefore, broadening the research to assess the impact of various economic uncertainties on those instruments' behavior will improve the research. In addition to that, evaluating the impact of policy uncertainties on bond markets in different economic contexts and geopolitical contexts could enhance the robustness of the research. In addition to that, the effectiveness of policy interferences and risk management strategies in reducing the effect of uncertainty on bond prices could provide practical knowledge for economic

policymakers and financial market partisans to make informed and effective decisions.

Despite its contributions to the body of literature, and for economic policymakers, this study has several drawbacks that could be acknowledged. Among them, depending on the historical data is the main limitation as it limits the generalizability of findings to future market contexts. Because depending on the historical data will not capture policy shifts and unplanned events. In addition to the quantitative nature of the study which considers the qualitative factors that affect the market behavior, the qualitative factors must also be considered for future studies highlighting the importance of further exploration through mixed methods approaches.

Furthermore, the study focused on US government bond prices. Therefore, the result limits its applicability to other financial markets. Accordingly, future studies must address these limitations by adopting a more comprehensive approach including, diverse financial markets, qualitative data, and real-time data. Which will enhance the robustness and applicability of research findings.

In conclusion, this study contributes to a greater understanding of the complex relationship between economic policy uncertainty and government bond prices, placing the base for future research activities and informing decision-making processes in financial markets. By considering the research limitations and taking necessary actions to avoid those, researchers could further advance the research output to recognize the bond market behavior in the face of uncertainty.

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8. Use of AI

In enhancing the quality and formality of this research report, Artificial Intelligence (AI) has been instrumental. Acknowledging both its benefits and limitations, AI tools were employed to rectify grammatical errors and refine the overall quality of the document. By utilizing AI features, particularly those designed for linguistic analysis and formalization, the report has been significantly improved. This integration of AI not only ensured the formality of the content but also enhanced its readability and professionalism.