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Economic Policy Uncertainty, Financial Leverage, and Corporate Investment: Evidence from U.S. Firms

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Abstract: This paper examines the effect of economic policy uncertainty (EPU) on firm-level investment and corporate financial leverage. The panel data of 1072 firms traded on the New York Stock Exchange (NYSE), New York Stock Exchange Market (NYSE MKT) (formerly known as American Stock Exchange—AMEX), or NASDAQ over the period 2012–2021 was analyzed using the fixed-effect model. The empirical results show that the financial leverage of a firm is negatively affected by EPU. Additionally, EPU depresses firms' investment decisions and debt financing. Our results are robust when alternative measures of our main variables are used.

Keywords: economic policy uncertainty (EPU); financial leverage; capital structure; corporate investment

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1. Introduction

Several major challenges have emerged in recent years, creating political and economic uncertainty on a global scale. These challenges began with the financial crisis in 2008, continued with the Arab Spring in the Middle East area in 2011, the election of Donald Trump in the U.S., the vote for the UK's exit from the European Union (Brexit) in 2016, and ended with the COVID-19 crisis, a threat on a global scale. Many scholars have argued that policy uncertainties have always played a critical role in shaping economic outcomes and affect different corporate policies (Javadi et al. 2021; Al-Thaqeb and Algharabali 2019; Akron et al. 2020; Jiang et al. 2022; Debata and Mahakud 2018). Among these corporate policies, capital structure policy has increasingly attracted research interest (Im et al. 2020; Li and Qiu 2018; Jiang et al. 2022; Tran 2021; Datta et al. 2019; Drobetz et al. 2018; Bradley et al. 2016; Zhang et al. 2015; Pan et al. 2019; Khoo and Cheung 2021; Bajaj et al. 2021; Schwarz and Dalmácio 2020).

Understanding the effect of economic policy uncertainty on corporate capital structure is important, because financing decisions are vital for the survival and value of companies (Tekin 2021). According to Naik and Reddy (2021), various indicators show that economic policy uncertainty affects corporate liquidity. This includes uncertainty regarding expansionary monetary policy announcements (Fernández-Amador et al. 2013), financial transaction tax (Hvozdyk and Rustanov 2016), policies announced by government and financial institutions (Syamala et al. 2017), and announcements relating to monetary policy, interest rates, and gross domestic product (Ekinci et al. 2019). According to the trade-off theory, any deviation in leverage from the target (optimal) capital structure can reduce a firm's value (Haddad and Lotfaliei 2019). However, firms rebalance their leverage only when the benefits of adjustment outweigh its costs (Nguyen et al. 2021). Furthermore, Brennan and Kraft (2018) provide empirical evidence that financing decisions depend not only on the current level of profitability and financial structure but also on expectations for future levels of profitability. Kotcharin and Maneenop (2018) suggest that macroeconomic conditions, including economic policy uncertainty, play a significant role in determining the leverage

decisions of shipping firms. This is because economic policy uncertainty affects oil expenses, which can then impact corporate liquidity and working capital (Syed and Bouri 2022a).

However, the corporate finance literature remains relatively scant when it comes to the effects of economic policy uncertainty on corporate financial leverage (Pan et al. 2019; Schwarz and Dalmácio 2020; Zhang et al. 2015). Moreover, Istiak and Serletis (2020) argue that the current literature does not provide a sufficient explanation for the dynamic empirical relationship between contemporary macroeconomic risk/uncertainty indicators and financial leverage, and most previous studies focus on the theoretical framework of this relationship. In the same vein, Qiu and Li (2017) argue that the empirical research on the relationship between economic policy uncertainty and corporate financial leverage in the U.S. market is limited. Furthermore, Li and Qiu (2018) state that investigating the effect of economic policy uncertainty on the capital structure and considering the dynamics of capital structure decisions in a developed markets such as the U.S would yield an insight into the relative importance of economic policy uncertainty versus firm characteristics in affecting corporate financing policies. The effect of EPU on stock market volatility is relatively large in the U.S. (Ma et al. 2022). Therefore, there is a need to examine the nexus between economic policy uncertainty and corporate financing jointly and comprehensively. Consequently, this research attempts to contribute to addressing this gap in the literature by investigating the relationship between economic policy uncertainty and corporate financial leverage dynamics in the U.S. market. We, specifically, attempt to explore the following research questions:

(1) Does economic policy uncertainty affect financial leverage?
(2) Does economic policy uncertainty affect the dynamics of firm-level capital structure decisions?
(3) What is the relationship between economic policy uncertainty and corporate investment?

These questions are motivated by the fact that Economic Policy Uncertainty (EPU) may influence financial leverage and investment decisions, and in different ways. Wang et al. (2014) show that when the degree of economic policy uncertainty is higher, firms stand to lower their investment levels. Thus, we would expect that the relationship between EPU and financial leverage could be a consequence of the EPU's effect on corporate investment levels. Moreover, directing these questions to the U.S. market could offer important additions to the literature. The United States provides a distinctive platform to explore the interaction between economic policy uncertainty and corporate financing decisions. The U.S. economy has experienced significant levels of economic uncertainty in the last two decades. Events such as 9/11, the Stimulus Debate, the subprime financial crisis, the Debt Ceiling Dispute, the Fiscal Cliff, the Government Shutdown, the election of Donald Trump, and Trade War with China, the COVID-19 pandemic (Akron et al. 2020), among others, increase the appeal of this topic to academicians and all market participants. Recent empirical studies have started to examine the effect of EPU on financial leverage, though focusing on the responses of corporate investment decisions to government policy uncertainty. In this case, firms would adjust their capital structure accordingly, and their demand for external debt financing will be reduced, consequently, debt ratios should be lower during periods of higher EPU (Li and Qiu 2018). Gulen and Ion (2016) document a strong negative relationship between firm-level capital investment and the aggregate level of uncertainty. As the results are still mixed as to whether economic policy uncertainty positively or negatively affects the finance leverage of US firms, the current study could contribute to a more precise understanding of this nexus.

The rest of this paper is structured as follows: Section 2 reviews the literature and hypotheses, Section 3 describes the methodology employed; Section 4 presents and discusses the results, Section 5 demonstrates the robustness of the results, and Section 6 concludes the paper.

2. Literature Review and Hypotheses Development

Recent research demonstrates that the relationship between policy uncertainty and corporate financial decisions has attracted an increasing amount of interest from academics (Im et al. 2020; Li and Qiu 2018; Jiang et al. 2022; Tran 2021). The following section analyses the literature and develops the research hypotheses regarding the effect of EPU on corporate financial leverage and investment levels.

2.1. Economic Policy Uncertainty and Corporate Financial Leverage

There are competing reasons as to why EPU may be related to a firm's capital structure. Market Timing literature suggests that high economic policy uncertainty leads to an equity risk premium (Pástor and Veronesi 2013), which increases the cost of equity financing, depresses stock prices, and reduces seasoned equity offerings (SEOs) activities (Baker and Wurgler 2002; Çolak et al. 2017; Schwarz and Dalmácio 2020). Hence, firms prefer to lever up their capital structure to reduce the increasing cost of equity capital during these uncertain times and to avoid diluting equity ownership. (Pástor and Veronesi 2012; Brogaard and Detzel 2015; and Kelly et al. 2016) document empirical evidence consistent with the market timing effect of capital structure. Moreover, firms may increase financial leverage to boost earnings and increase returns to equity in a deteriorating investment environment (Brennan and Kraft 2018).

Empirical studies document that the prevalence of economic policy uncertainty should be considered for several firms' activities. (Obenpong Kwabi et al. 2022) suggest that EPU has several implications for the cost of capital and a firm's future cash flow. Demir and Ersan (2017), argue that firms prefer to hold more cash when economic uncertainty increases. Wang et al. (2014) examine Chinese listed firms and report that they are inclined to hold more cash and decrease their investment during periods of high economic uncertainty characterized by the scarcity of financing. In the same area of research, Tran (2019) provides empirical evidence across 18 international markets that economic policy uncertainty is negatively associated with corporate risk-taking activities.

Regarding the effect of EPU on financial leverage, the evidence is scant, and little attention has been paid to this issue (Schwarz and Dalmácio 2020; Bajaj et al. 2021; Pan et al. 2019; Zhang et al. 2015). However, a few studies record that businesses' earnings projections become more volatile when EPU rises. Thus, companies must rely on non-internal sources of funding if they are to ensure their continued existence during times of economic instability (see Schwarz and Dalmácio 2020; Bajaj et al. 2021). On the other hand, an opposing strand of literature contends that corporate financial leverage tends to decrease when economic uncertainty increases. For instance, (Zhang et al. 2015) analyze the effect of economic policy uncertainty on Chinese firms' capital structure, and show that they tend to lower their leverage ratios as the degree of economic policy uncertainty increases. Similarly, (Pan et al. 2019) demonstrate that policy uncertainty is negatively associated with debt maturity and corporate leverage. (Bradley et al. 2016) report that a significant level of policy uncertainty leads to a high cost of debt and low corporate financial leverage.

The extant literature proposes two potential channels through which economic policy uncertainty may decrease corporate financial leverage: supply effect hypothesis and demand effect hypothesis. The supply effect hypothesis contends that economic policy uncertainty leads to a higher cost of debt financing due to the increase information asymmetry between a firm and its creditors as well as the volatility of the firm's future cash, which would build up its default risk (Zhang et al. 2015). As a result, financial institutions require an uncertainty risk premium, which gets larger as uncertainty soars (Gong et al. 2018). The extra debt burden impairs the stability and growth of firms. Under such circumstances, firms may seek greatly needed financial flexibility by lowering their financial leverage ratios (*supply effect*) (Pan et al. 2019). Gong et al. (2018), based on data from 19 economies over 2000–2015, support this hypothesis by reporting a positive and significant relationship between economic uncertainty and loan spreads.

The demand effect hypothesis suggests that increasing policy uncertainty would pressure firms to be more conservative about investment decisions, hence, reduce their financing needs and debt levels. It is argued that firms prefer to hold more cash (Demir and Ersan 2017) and engage less in risk-taking activities (Tran 2019) when economic uncertainty increases. Akron et al. (2020) document that corporate investment policies are negatively affected by economic policy uncertainty, which is reflected in conservative behavior of firms during periods of elevated economic policy uncertainty. Hence, this conservative behavior is mirrored in the low proportion of debt in the firm's capital structure, which supports the view of a negative relationship between economic policy uncertainty and corporate financial leverage. These arguments pave the way for the following opposing hypothesis:

Hypothesis 1. *Corporate finance leverage is negatively associated with economic policy uncertainty.*

2.2. Economic Policy Uncertainty and Corporate Investment

On the one hand, the relationship between corporate investment and uncertainty has been the subject of inconclusive research (Wang et al. 2014). Economic theories of investment under uncertainty suggest that entrepreneurs have the ability to recognize and seize investment opportunities in uncertainty and make profits through resource integration (Knight 1964; Hartman 1972; Abel and Blanchard 1986). This may suggest that uncertainty is a source of corporate profit. On the other hand, other scholars have suggested that the greater the degree of uncertainty, the higher the return on waiting for future investments, and consequently the higher the value placed on the option of waiting; as a result, businesses limit their spending on current investments (Wang et al. 2014).

Emerging research has supported the latter idea, and indicates that economic policy uncertainty has a negative impact on company investment decisions. For example, Gulen and Ion (2016) provide evidence that is widely cited as being consistent with the idea that EPU has a detrimental effect on corporate investment decisions of firms listed in the US market. Similarly, Julio and Yook (2012) report evidence that uncertainty leads firms to reduce investment expenditures. Moreover, Chen et al. (2020) examine the impact of economic policy uncertainty (EPU) on capital investment by Australian firms, and report that EPU has a persistent and negative effect (up to four years) on capital investment by Australian Stock Exchange (ASX) listed firms. Morikawa (2016) argues that uncertainty over economic policies substantially reduces the expected sales growth rate of Japanese companies. Based on these research findings, we suggest the hypothesis below:

Hypothesis 2. *Corporate investment is negatively associated with economic policy uncertainty.*

Based on our discussion, it is apparent that the corporate finance literature is inconclusive about the impact of economic policy uncertainty on corporate financial leverage. The extant literature does not conclusively demonstrate whether high economic policy uncertainty drives firms to exhibit risk averse behavior by lowering the level of corporate financial leverage or to increase their reliance on the debt market as an alternative to temporary and costly equity financing. In the light of the inconclusive previous research, the impact of EPU on corporate financial leverage merits further investigation.

3. Methodology

3.1. Data and Sampling

The objective of this research is to examine the relationship between economic policy uncertainty and corporate financial leverage within the context of the U.S. as a developed market. Thus, we collected data for 1072 firms traded on the NYSE, NYSE MKT (formerly known as AMEX), or NASDAQ over the period 2012–2021. Following prior related literature, banks and financial institutions were excluded from the analysis due to their special financial structures, accounting methods, and corporate governance (Li and Qiu 2018;

Schwarz and Dalmácio 2020; Im et al. 2020). We also follow prior strategies in corporate finance literature (i.e., Tran (2019)) and winsorized all the corporate-level variables at the 2% to mitigate the influence of extreme outliers. The final sample used in our empirical analysis consists of 5958 firm-year observations. Furthermore, we obtain corporate-level data from the Thomson Reuters Eikon database, and we use the economic policy uncertainty (EPU) index developed by Baker et al. (2016). EPU data constructed and published on their website by Baker Bloom and Davis[1]. Table 1 provides detailed descriptive statistics of the final sample used in this research, while Table 2 presents the correlation matrix and variance inflation factors.

Table 1. Descriptive statistics and variable definitions.

Panel A: Summary Statistics						
	Observations	**Mean**	**Median**	**Standard Deviation**	**Min**	**Max**
Blev	7950	0.217	0.210	0.175	0.000	0.916
Mlev	7950	0.134	0.106	0.132	0.000	0.804
Long-Term Debt (LTD)	7950	0.195	0.181	0.169	0.000	0.904
Investment	5958	0.042	0.027	0.052	0.000	1.178
Investment*	5958	0.057	0.033	0.110	0.000	4.460
lnEPU	7950	5.047	5.032	0.312	4.527	5.788
$\text{lnEPU}_{\text{news}}$	7950	4.716	4.690	0.410	4.233	5.716
Profitability	7950	0.078	0.060	0.073	0.001	0.824
Tangibility	7950	0.546	0.561	0.210	0.001	0.996
MTB	7950	2.397	1.773	2.189	0.129	45.322
Liquidity	7950	2.562	2.069	1.667	0.145	10.000
Firm Size (FSize)	7950	21.391	21.465	2.139	13.823	28.696
Panel B: Variable definition						
Blev	The ratio of total debt to book value of total assets.					
Mlev	The ratio of total debt to the summation of total debt plus the equity market capitalization.					
LTD	The ratio of long-term debt to book value of total debt.					
Investment	The ratio of capital expenditures to the lagged total assets.					
Investment*	The ratio of capital expenditures to the lagged total revenues.					
lnEPU	The natural logarithms transformation for the calculated annual average of the EPU index.					
$\text{lnEPU}_{\text{news}}$	The natural logarithms transformation for the calculated annual average of the news-based policy uncertainty index.					
Profitability	The ratio of total pre-tax profit to total assets.					
Tangibility	The ratio of Property, Plant and Equipment (PPE) to total assets.					
MTB	The ratio of market value of assets to book value of assets.					
Liquidity	The ratio of current assets to current liabilities.					
FSize	The natural logarithm of firm's total assets.					

Note: The sample covers the period 2012–2021 and includes data for 1072 nonfinancial firms traded on the NYSE, NYSE MKT (formerly known as AMEX), or NASDAQ.

Table 2. Correlation matrix and variance inflation factors.

	Blev	**Mlev**	**LTD**	**Investment**	**Investment***	**lnEPU**	**lnEPU$_{news}$**	**Profitability**	**Tangibility**	**MTB**	**Liquidity**	**FSize**	**VIF**
Blev	1.000												
Mlev	0.822 ***	1.000											
LTD	0.967 ***	0.779 ***	1.000										
Investment	0.082 ***	0.132 ***	0.072 ***	1.000									
Investment*	0.124 ***	0.163 ***	0.121 ***	0.758 ***	1.000								
lnEPU	0.018 *	−0.015 *	0.023 **	−0.040 ***	0.002	1.000							1.020
lnEPU$_{news}$	−0.014 *	−0.032 ***	−0.011 *	−0.042 ***	−0.001	0.911 ***	1.000						1.200
Profitability	−0.196 ***	−0.295 ***	−0.198 ***	0.072 ***	−0.002	0.034 ***	0.035 ***	1.000					1.210
Tangibility	0.502 ***	0.456 ***	0.518 ***	0.200 ***	0.247 ***	0.045 ***	0.016	−0.20 7 ***	1.000				1.440
MTB	−0.140 ***	−0.362 ***	−0.134 ***	−0.010	−0.017	0.123 ***	0.102 ***	0.382 ***	−0.180 ***	1.000			1.390
Liquidity	−0.356 ***	−0.324 ***	−0.301 ***	−0.061 ***	−0.042 ***	−0.014	0.001	0.199 ***	−0.454 ***	0.149 ***	1.000		1.300
FSize	0.225 ***	−0.073 ***	0.263 ***	−0.051 ***	0.045 ***	0.074 ***	0.047 ***	0.086 ***	0.301 ***	0.312 ***	−0.195 ***	1.000	1.310

Note: This table presents pair-wise correlation matrix and variance inflation factors (VIFs). Asterisks indicate significance at 10% (*), 5% (**), and 1% (***).

3.2. Variable Construction

The following section presents all the variables used in this study. Our dependent and independent variables are, respectively, corporate financial leverage and economic policy uncertainty (EPU). Moreover, to hedge against any potential biases resulting from the differences in firms' unique characteristics, firm-level control variables were included in the analysis.

3.2.1. Dependent Variables

We follow Schwarz and Dalmácio (2020) and Graham et al. (2015) and measure corporate financial leverage using two main indicators. We calculate a company's book leverage by dividing its total debt by its total book value of assets (Blev), and we calculate a company's market leverage by dividing its total debt by its total debt plus the market capitalization of its equity (Mlev).

3.2.2. Independent Variables

Following Akron et al. (2020), we use the natural logarithms transformation for the calculated annual average of the EPU index (LnEPU). Since its introduction in 2013 by Baker et al. (2016), the EPU index has replaced traditional measures such as dispersion in analyst forecasts, stock market volatility, and geopolitical risks, and become the main proxy used to capture economic uncertainty (Gozgor et al. 2019). The overall EPU index is composed of three components. The first one accounts for the frequency of country newspaper articles that include terms related to policy uncertainty. The second one measures uncertainty about future changes in the tax code. The third component uses dispersion in economic forecasts of the Corruption Perception Index (CPI) and government spending as proxies for uncertainty about fiscal and monetary policy (Gulen and Ion 2016). In general, the EPU index captures the uncertainty surrounding all players in the economy, including policymakers and decision-makers, and alternative courses of action and their potential effects.[2]

It should be noted that we also use another measure of economic policy uncertainty index, which is based on news ($LnEPU_{news}$) for robustness analysis (Drobetz et al. 2018).

3.2.3. Control Variables

Mindful of the impact that firm-specific effects may have on the results, we control for the following variables:

- Profitability (Profitability): Profitability reduces default risk and increases a firm's capacity to raise debt. We measure a firm's profitability using Return on Assets (ROA), calculated as total pre-tax profit scaled by total assets (Dang et al. 2014).
- Tangibility (Tangibility): Tangibility is measured by the ratio of property, plant, and equipment (PPE) to total assets (Schwarz and Dalmácio 2020).
- Market-to-book ratio (MTB): measured as the ratio between assets' market value and assets' book value (Nguyen et al. 2022). This ratio has been widely used in prior literature to account for firms' growth opportunities (Schwarz and Dalmácio 2020). Growth firms are in a better position to honor their debt obligations, which enhances their capacity to use financial leverage (Jabbouri and Naili 2019). Sales growth rate is the proxy used to account for growth opportunities (Amess et al. 2015).
- Liquidity (Liquidity): Firms with better liquidity are in a better position to honor their debt obligations. The current ratio, computed as the ratio of current assets to current liabilities, is used as a proxy for liquidity (Wahba 2014).
- Firm size (FSzie): we use the natural logarithm of total assets to account for the differences in size between sample firms (Bajaj et al. 2020). Larger firms have a higher capacity to use financial leverage given their asset base and established cash flow.

Please refer to Table 1 for details on variable definitions.

3.3. Descriptive Statistics and Correlation Matrix

Table 1 provides summary statistics of our data, including the observations, mean, median, standard deviation, minimum, and the maximum. Firms in our sample have an average book leverage ratio of 0.217 and an average market leverage ratio of 0.134. It can be also noted that most of the financial leverage for these firms are in the long-term debt format, as it forms an average of 0.195 for the entire sample. Investment ratios for these firms show an average of approximately 0.05. The overall EPU index shows an annual average of 5.047, while the news-based EPU index has an annual average of 4.716. Firms in our sample represent relatively different sizes, as the median is 21.465 using the natural logarithms of the firm's market capitalization. Descriptive statistics also show that our sample has a relatively high market-to-book ratio and liquidity (an average of 2.397 and 2.562, respectively), average profitability (an average of 0.078 ROA), and relatively average tangibility (with an annual average of 0.546).

Table 2 reports on the pairwise correlation matrix and variance inflation factor for the variables used in our analysis. As reported, independent variables in our model are all significantly correlated with the dependent variables, which may initially highlight the importance of including these variables in our regression analyses. Moreover, the results revealed in Table 2 suggest that multi-collinearity will not be a serious problem for our empirical analysis, as none of the correlation coefficients among independent variables are larger than the 0.80 threshold. This is also confirmed by the VIF results, which are all smaller than two, as suggested by Gujarati and Porter (2008). It should also be noted that at this stage, the correlation coefficients of the lnEPU suggest a positive impact; however, this has changed in further analyses, perhaps, due to controlling endogeneity issues in our empirical models.

4. Empirical Findings

Previous studies applied the standard linear Granger causality test to predict jumps in equity markets; however, it is contended that the linear model is misspecified (Bouri et al. 2020). To examine the impact of the economic policy uncertainty on corporate financial leverage and on corporate investment, we applied the dynamic Fixed-Effect model based on the Hausman test results. Fixed-effects estimation is the standard estimation technique in the literature (Gozgor et al. 2019), as it is used to address the problem of endogeneity because unreported results show the presence of heteroscedasticity and autocorrelation in OLS and fixed-effects estimations (Iqbal et al. 2020). Using the fixed effects model is justifiable due to several advantages this method has over other traditional models. The fixed-effects panel regression approach considers geographical variables, natural endowments, and other fundamental elements that vary between nations but not over time (Anton and Afloarei Nucu 2020). The Hausman test was applied to determine if a fixed-effects panel data estimate was suitable. The test findings (a *p*-value of a random cross-section = 0.000 $\leq \alpha$ (5%)) indicate that the fixed-effect model would be the most consistent, and the inferences drawn from the results will be credible. Several previous studies have used the fixed-effect model as an appropriate method to examine panel data regressions (Karaman et al. 2020; Almustafa and Kalash 2022; Almustafa 2022). Our baseline model takes the following form, using the following equations:

$$leverage_{i,t} = Y_0 + Y_{t-1} + \beta EPU_{i,t} + \delta X_{i,t} + \vartheta_t + \epsilon_{i,t} \quad (1)$$

$$Investment_{i,t} = Y_0 + Y_{t-1} + \beta EPU_{i,t} + \delta X_{i,t} + \vartheta_t + \epsilon_{i,t} \quad (2)$$

In Equation (1) leverage is our dependent variable, which takes three formats (Blev, Mlev, LTD, $Blev_{t+1,}$ $Mlev_{t+1,}$ and LTD_{t+1}). In both equations Y_{t-1} is our dependent variable in its lag format. In Equation (2), Investment is our dependent variable in its two forms (Investment and Investment*).[3] In both equations, $X_{i,t}$ is a vector of firm-level control variables (including: profitability, tangibility, market-to-book ratio, liquidity, and firm

size).[4] The subscripts i and t represent the cross-sectional and the time dimension of our data, respectively. Finally, ϑ_t is the time-fixed effect and $\epsilon_{i,t}$ is the error term in both models.

5. Results and Discussion

5.1. The Effect of Economic Policy Uncertainty on Firms' Current Financial Leverage Levels

Table 3 reports the baseline regression estimations of Equation (1) for two financial leverage measures as the dependent variables. The results of the book leverage ratio as the dependent variable are reported in column (1), while the results of market leverage as the dependent variable are reported in column (2). All results imply that economic policy uncertainty (LnEPU) has a significant negative impact at the 1% level on both forms of corporate financial leverage (Blev and Mlev). To analyze the magnitude of these effects, we find that a 1% increase in the EPU index (LnEPU) results in a 0.014 percent decrease in book leverage (Blev) and a 0.011 percent decrease in market leverage (Mlev). These results are consistent with prior findings related to US evidence. For example, our results are in line with those obtained by Li and Qiu (2018). Our results are in line with the supply effect hypothesis, indicating that economic uncertainty increases the level of information asymmetry between creditors and firms, which would lower the level of debt financing (Zhang et al. 2015; Gong et al. 2018). Our findings also support the demand effect hypothesis, which denotes that economic policy uncertainty coerces firms to adopt more conservative investment strategies, thereby cutting their debt financing needs (Tran 2019; Akron et al. 2020).

Table 3. Estimation results of the relationship between EPU and corporate financial leverage.

	(1)	**(2)**
	Blev b/(t)	Mlev b/(t)
lnEPU	−0.014 *** (−4.060)	−0.011 *** (−4.431)
$Blev_{t-1}$	0.470 *** (21.377)	
$Mlev_{t-1}$		0.332 *** (13.492)
Profitability	−0.226 *** (−6.961)	−0.131 *** (−5.622)
Tangibility	0.184 *** (7.258)	0.202 *** (10.248)
MTB	0.000 (0.165)	0.001 * (1.797)
Liquidity	0.000 (0.093)	0.004 *** (3.280)
FSize	−0.008 ** (−2.169)	−0.044 *** (−7.195)
Intercept	−3.187 *** (−2.872)	−8.453 *** (−6.504)
# of observations	5958	5958
R-squared	0.347	0.375
F-statistic	140.503 ***	114.695 ***
# of firms	1072	1072
Firm effect	Yes	Yes
Year effect	Yes	Yes

Note: This table provides empirical estimations of Equation (1) of the relationship between economic policy uncertainty and corporate financial leverage using the fixed-effect estimator. Variables are as defined in Table 1. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***), respectively.

On the other hand, our findings are contrary to the results reported by Bajaj et al. (2021), Lee et al. (2017), and Schwarz and Dalmácio (2020), which lend empirical support to the market timing theory in the emerging markets. This theory suggests that heightened

economic policy uncertainty may increase the cost of equity by reducing stock prices and increasing equity risk premiums, which may justify the need for cheaper sources of funds (debt) during periods of high economic uncertainty (Pástor and Veronesi 2013). Evidence from emerging markets suggests that another potential explanation for the positive relationship between corporate financial leverage and economic uncertainty is that firms may attempt to boost earnings and increase returns to equity holders by increasing their leverage levels (Brennan and Kraft 2018). However, Li and Qiu (2018) argue that the results on the relationship between EPU and capital structure obtained in emerging markets may not apply to a developed market, such as the US.

Among the controls, the results obtained were in line with prior related research. Lagged dependent variables have a significant positive effect on corporate financial leverage. Profitability has a significant negative impact on the current firm's financial leverage, proxied by both book and market leverage. Firms with higher profitability may depend more on internal sources of funds rather than external (de Jong et al. 2008; and Bajaj et al. 2021). Tangibility has been found to have a significant positive effect on financial leverage in general. The firm's physical capital has important implications for its financial ability and its potential to cover losses and liabilities. MTB and liquidity have positive effects, while firm size has a significant negative effect (Brav 2009).

5.2. Does the Economic Policy Uncertainty Explain Firm's Capital Structure Dynamics

In this section, we reconduct our empirical analysis by replacing the dependent variable in Equation (1), financial leverage proxied by Blev and Mlev, by taking the lead financial leverage variables ($Blev_{t+1}$ and $Mlev_{t+1}$), to examine the extent of the effects of EPU in shaping a firm's capital structure and report the results in Table 4. Interestingly, the results presented in columns (1) and (2) of Table 4 suggest that the current EPU has a stronger effect in determining a firm's future financial leverage levels. Specifically, a 1% increase in EPU would lead firms to decrease their financial leverage levels by almost 0.04% for the next year. This evidence confirms the results obtained by Schwarz and Dalmácio (2020), suggesting that economic policy uncertainty plays an important role in impacting corporate leverage levels. Firms tend to lower their leverage ratios when policy uncertainty increases (Pan et al. 2019).

5.3. Further Analysis Suggests That Policy Uncertainty Leads to a Deterioration in Corporate Investment Behavior

One important objective of this research is to further investigate the effect of EPU on corporate investment levels. As stated earlier, prior related literature provided justification regarding the negative relationship between EPU and corporate financial leverage that EPU may distort corporate investment (Drobetz et al. 2018), which in turn may reduce the demand for external financing. Gulen and Ion (2016) provide evidence that policy uncertainty can depress corporate investment by inducing precautionary delays due to investment irreversibility.

Table 5 provides the findings of the baseline regressions in Equation (2) for two alternative measures of corporate investment, respectively. The results indicate that both corporate investment measures were negatively associated with EPU. Furthermore, we replace our main variable of economic policy uncertainty (LnEPU) with an alternative news-based economic policy uncertainty index ($lnEPU_{news}$), and results remain unchanged. These results are consistent with the findings of Drobetz et al. (2018), Kang et al. (2014), and Gulen and Ion (2016), among others, as they suggest that higher EPU would depress corporate investments. These results are important as they may provide a basis for justification for the negative relationship obtained earlier between EPU and corporate financial leverage. Fama and French (2002) stated that firms may adjust their debt policies to accommodate the short-term variations in investments, and that their demand for external debt financing will be reduced. Consequently, debt ratios should be lower during periods of higher EPU (Li and Qiu 2018). With regards to the controls, profitability, tangibility, and MTB have a significant positive impact on corporate investment.

Table 4. Economic policy uncertainty and the dynamics of corporate financing.

	(1)	(2)
	$Blev_{t+1}$ b/(t)	$Mlev_{t+1}$ b/(t)
lnEPU	−0.039 ***	−0.035 ***
	(−9.064)	(−10.910)
Profitability	−0.074 **	−0.074 **
	(−2.116)	(−2.520)
Tangibility	0.155 ***	0.137 ***
	(5.336)	(6.837)
MTB	0.004 **	0.003
	(2.079)	(1.152)
Liquidity	0.000	0.004 **
	(0.064)	(2.212)
FSize	−0.008	−0.019 ***
	(−1.447)	(−4.319)
Intercept	−11.697 ***	−8.903 ***
	(−6.561)	(−5.934)
# of Observations	5995	5995
R-squared	0.064	0.073
F-statistic	21.022 ***	28.501 ***
# of firms	1079	1079
Firm effect	Yes	Yes
Year effect	Yes	Yes

Note: This table reports FE estimations of Equation (1) with the dependent variables (*Blev and Mlev*) being replaced by ($Blev_{t+1}$ and $Mlev_{t+1}$) in separate models. Variables are as defined in Table 1. Asterisks indicate significance at 5% (**), and 1% (***), respectively.

Table 5. The relationship between EPU and corporate investment.

	(1)	(2)	(3)	(4)
	Investment b/(t)	Investment b/(t)	$Investment^{*}$ b/(t)	$Investment^{*}$ b/(t)
lnEPU	−0.006 ***		−0.011 ***	
	(−5.108)		(−6.735)	
$lnEPU_{news}$		−0.005 ***		−0.007 ***
		(−5.531)		(−5.991)
$Investment_{t-1}$	0.217 ***	0.215 ***		
	(4.813)	(4.801)		
$Investment^{*}_{t-1}$			0.070	0.069
			(1.460)	(1.448)
Profitability	0.042 ***	0.041 ***	0.006	0.007
	(3.101)	(3.044)	(0.358)	(0.374)
Tangibility	0.022 ***	0.020 ***	0.031 ***	0.029 ***
	(2.938)	(2.744)	(2.901)	(2.683)
MTB	0.002 ***	0.002 ***	0.001 **	0.001 **
	(3.626)	(3.593)	(2.168)	(2.117)
Liquidity	−0.001	−0.001	−0.001	−0.001
	(−0.818)	(−0.888)	(−0.707)	(−0.839)
FSize	−0.003	−0.002	0.002	0.003
	(−1.276)	(−1.065)	(1.033)	(1.286)
Intercept	0.696	0.837	−1.535 *	−0.782
	(1.118)	(1.406)	(−1.794)	(−0.962)
# of Observations	4669	4669	4669	4669
R-squared	0.104	0.105	0.142	0.140
F statistic	18.337 ***	18.859 ***	9.704 ***	8.707 ***
# of firms	923	923	923	923
Firm effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes

Note: This table reports FE estimations of Equation (2) with the dependent variables of alternative corporate investment ratios. This table also includes an alternative EPU measure to ensure the robustness of our main models. Variables are as defined in Table 1. Asterisks indicate significance at 10% (*), 5% (**), and 1% (***), respectively.

5.4. Robustness Checks

To check the robustness and consistency of our main results presented in Tables 3 and 4, we re-estimated Equation (1) with an alternative economic policy uncertainty index. In particular, we followed Gulen and Ion's (2016) guide, conducted the analysis using the news-based uncertainty index provided by Baker et al. (2016), and reported the results in Tables 6 and 7. Furthermore, following Wang et al.'s (2014) and Phan et al.'s (2018) guides, we used the one-year lagged EPU index (EPU and EPUnews) to check whether the EPU index can serve as a predictor of corporate financial leverage and reported the results in Table 8.

Table 6. Robustness checks.

	(1)	**(2)**	**(3)**	**(4)**
	Blev b/(t)	$Blev_{t+1}$ b/(t)	Mlev b/(t)	$Mlev_{t+1}$ b/(t)
$lnEPU_{News}$	−0.010 *** (−4.942)	−0.032 *** (−6.502)	−0.008 *** (−4.333)	−0.015 *** (−4.347)
$Blev_{t-1}$	0.464 *** (20.990)			
$Mlev_{t-1}$			0.329 *** (13.487)	
Profitability	−0.218 *** (−6.726)	−0.047 (−1.182)	−0.124 *** (−5.506)	−0.037 (−1.302)
Tangibility	0.178 *** (7.072)	0.127 *** (3.837)	0.197 *** (10.091)	0.121 *** (5.389)
MTB	−0.000 (−0.081)	0.002 (0.983)	0.001 (1.514)	0.000 (0.013)
Liquidity	−0.000 (−0.229)	0.001 (0.352)	0.004 *** (2.997)	0.004 ** (2.018)
FSize	−0.006 * (−1.683)	−0.008 (−1.403)	−0.043 *** (−7.098)	−0.023 *** (−4.713)
Intercept	−1.663 * (−1.704)	0.229 (0.141)	−7.181 *** (−6.271)	−0.501 (−0.359)
Number of observations	5958	4692	5958	4692
R-squared	0.348	0.336	0.377	0.356
F statistic	147.048 ***	10.769 ***	126.468 ***	18.223 ***
Number of clusters	1072	928	1072	928
Firm effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes

Note: This table presents the estimations of the relationship between economic policy uncertainty and corporate financial leverage using FE, with alternative EPU measures, namely, ($lnEPU_{News}$). Variables are as defined in Table 1. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***), respectively.

Generally, the strong effects of the economic policy uncertainty on corporate financial leverage presented earlier still hold. In short, considering the strong impact of economic policy uncertainty on corporate financial leverage decisions, we obtained consistent results that a rising level of uncertainty in economic policy would cause a company to reduce its leverage capital as a result of a reduction in investments and profitability.

Table 7. Robustness checks.

	(1)	**(2)**	**(3)**	**(4)**
	LTD b/(t)	LTD_{t+1} b/(t)	LTD b/(t)	LTD_{t+1} b/(t)
lnEPU	−0.017 *** (−4.899)	−0.035 *** (−8.192)		
$lnEPU_{News}$			−0.013 *** (−5.775)	−0.021 *** (−7.939)
LTD_{t-1}	0.415 *** (16.627)		0.413 *** (16.502)	
Profitability	−0.196 *** (−4.708)	−0.078 ** (−2.295)	−0.198 *** (−4.745)	−0.081 ** (−2.381)
Tangibility	0.285 *** (11.084)	0.146 *** (5.232)	0.282 *** (10.981)	0.142 *** (5.108)
MTB	0.002 (1.227)	0.006 *** (2.779)	0.002 (1.227)	0.006 *** (2.763)
Liquidity	0.015 *** (6.709)	0.000 (0.013)	0.015 *** (6.681)	−0.000 (−0.035)
FSize	−0.010 *** (−2.661)	−0.006 (−1.169)	−0.009 ** (−2.421)	−0.005 (−0.999)
Intercept	−5.440 *** (−4.531)	−11.902 *** (−6.783)	−4.762 *** (−4.238)	−8.411 *** (−5.363)
Number of observations	5958	5958	5958	5958
R-squared	0.315	0.367	0.316	0.366
F statistic	126.324 ***	20.731 ***	127.241 ***	20.090 ***
Number of clusters	1072	1079	1072	1079
Firm effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes

Note: This table presents the estimations of the relationship between economic policy uncertainty and corporate financial leverage dynamics using FE regression, with alternative EPU measures, namely, ($lnEPU_{News}$), and alternative financial leverage variables. Variables are as defined in Table 1. Asterisks indicate significance at 5% (**) and 1% (***), respectively.

Table 8. Robustness checks: EPU and financial leverage: lagged effects.

	(1) Blev b/(t)	(2) Blev b/(t)	(3) Mlev b/(t)	(4) Mlev b/(t)	(5) LTD b/(t)	(6) LTD b/(t)	(7) $Blev_{t+1}$ b/(t)	(8) $Blev_{t+1}$ b/(t)	(9) $Mlev_{t+1}$ b/(t)	(10) $Mlev_{t+1}$ b/(t)	(11) LTD_{t+1} b/(t)	(12) LTD_{t+1} b/(t)
$lnEPU_{t-1}$	−0.019 ***		−0.016 ***		−0.016 ***		−0.037 ***		−0.010 **		−0.033 ***	
	(−5.494)		(−5.282)		(−4.700)		(−6.063)		(−2.223)		(−5.416)	
$lnEPU_{News\ t-1}$		−0.010 ***		−0.008 ***		−0.009 ***		−0.032 ***		−0.015 ***		−0.028 ***
		(−4.942)		(−4.333)		(−4.164)		(−6.502)		(−4.347)		(−5.750)
$Blev_{t-1}$	0.464 ***	0.464 ***										
	(21.046)	(20.990)										
$Mlev_{t-1}$			0.331 ***	0.329 ***								
			(13.544)	(13.487)								
LTD_{t-1}					0.410 ***	0.410 ***						
					(16.397)	(16.382)						
Profitability	−0.220 ***	−0.218 ***	−0.126 ***	−0.124 ***	−0.188 ***	−0.186 ***	−0.051	−0.047	−0.037	−0.037	−0.051	−0.047
	(−6.789)	(−6.726)	(−5.586)	(−5.506)	(−4.540)	(−4.492)	(−1.289)	(−1.182)	(−1.276)	(−1.302)	(−1.328)	(−1.230)
Tangibility	0.177 ***	0.178 ***	0.196 ***	0.197 ***	0.278 ***	0.280 ***	0.127 ***	0.127 ***	0.123 ***	0.121 ***	0.113 ***	0.113 ***
	(7.010)	(7.072)	(9.999)	(10.091)	(10.789)	(10.851)	(3.835)	(3.837)	(5.464)	(5.389)	(3.558)	(3.563)
MTB	−0.000	−0.000	0.001	0.001	0.001	0.001	0.002	0.002	−0.000	0.000	0.003 **	0.003 **
	(−0.077)	(−0.081)	(1.516)	(1.514)	(0.966)	(0.964)	(0.967)	(0.983)	(−0.001)	(0.013)	(2.429)	(2.438)
Liquidity	−0.000	−0.000	0.004 ***	0.004 ***	0.015 ***	0.015 ***	0.001	0.001	0.004 **	0.004 **	0.001	0.001
	(−0.211)	(−0.229)	(3.009)	(2.997)	(6.482)	(6.478)	(0.380)	(0.352)	(2.040)	(2.018)	(0.506)	(0.480)
FSize	−0.005	−0.006 *	−0.042 ***	−0.043 ***	−0.008 **	−0.009 **	−0.007	−0.008	−0.024 ***	−0.023 ***	−0.007	−0.008
	(−1.503)	(−1.683)	(−7.025)	(−7.098)	(−2.184)	(−2.337)	(−1.199)	(−1.403)	(−4.733)	(−4.713)	(−1.175)	(−1.361)
Intercept	−3.468 ***	−1.663 *	−8.753 ***	−7.181 ***	−4.752 ***	−3.170 ***	−4.143 **	0.229	−2.143	−0.501	−5.612 ***	−1.769
	(−3.088)	(−1.704)	(−7.984)	(−6.271)	(−3.943)	(−2.971)	(−2.455)	(0.141)	(−1.531)	(−0.359)	(−3.388)	(−1.103)
# of obs.	5958	5958	5958	5958	5958	5958	4692	4692	4692	4692	4692	4692
R-squared	0.349	0.348	0.379	0.377	0.315	0.315	0.334	0.336	0.352	0.356	0.331	0.333
F statistic	146.221 ***	147.048 ***	129.785 ***	126.468 ***	129.577 ***	129.349 ***	10.663 ***	10.769 ***	17.104 ***	18.223 ***	9.805 ***	9.761 ***
# of firms	1072	1072	1072	1072	1072	1072	928	928	928	928	928	928
Firm effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents the estimations of the relationship between economic policy uncertainty and corporate financial leverage dynamics using FE regression, using the lagged EPU measures. Variables are defined in Table 1. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***), respectively.

6. Conclusions

Motivated by the growing number of studies on the consequential effect of economic policy uncertainty on corporate-level decisions and the lack of empirical studies on its effect on corporate financial decisions, this research attempts to address this gap in the literature by analyzing the effects of economic policy uncertainty on the financing decisions of U.S. firms.

Based on a sample of 1072 nonfinancial firms traded on the NYSE, NYSE MKT (formerly known as AMEX), or NASDAQ over the period 2012–2021, this study investigates the impact of EPU on corporate financial leverage and investment levels. Our panel regression analysis suggests that economic policy uncertainty has a significant negative impact on firms' financial leverage. Therefore, the first hypothesis is accepted. Moreover, consistent with our arguments, we find that economic policy uncertainty has a determining effect on corporate levels of investments. This research provides substantial evidence that rising economic policy uncertainty causes firms to make more conservative debt-financing choices. We conduct additional analyses and find that the effect of economic policy uncertainty on corporate leverage persists across different financial leverage dynamics (i.e., leverage_{t-1}, and leverage_{t+1}). Our analyses show that economic policy uncertainty has a significant role in predicting future corporate financial leverage levels. Specifically, the negative relationship becomes stronger in its magnitude if one allows for future rather than current firm's capital structure choices. The results are robust to changes in our dependent and independent variables' measurements.

It is shown that the second hypothesis is also accepted. Our results are in line with the notion that aggregate uncertainty is associated with lower investments in the real sector (Kang et al. 2014; Akron et al. 2020; Wang et al. 2014), and in turn, debt ratios should be lower during periods of higher economic policy uncertainty. On the other hand, these findings support the notion of Li and Qiu (2018) that the evidence obtained by examining the nexus between economic policy uncertainty and capital structure choices in developing markets may not be applicable to a developed market, such as the U.S. For instance, Schwarz and Dalmácio (2020) report evidence from Brazil that economic policy uncertainty deteriorates the equity financing environment, suggesting positive links between economic policy uncertainty and financial leverage. Furthermore, Bajaj et al. (2021) examined the Indian context as an emerging market and argued that during times of high economic uncertainty, firms were opting for external sources (as a cheaper source of funds) due to the uncertainty of their expected earnings and cash flows. Our findings are consistent with the supply effect hypothesis, which states that higher levels of economic uncertainty led to greater information asymmetry between creditors and enterprises, resulting in lower levels of loan financing (Zhang et al. 2015; Gong et al. 2018). Our results also lend credence to the "demand effect hypothesis," which states that when faced with economic policy uncertainty, businesses are compelled to adopt more conservative investment strategies and, as a result, reduce their reliance on debt financing (Tran 2019; Akron et al. 2020).

Our study brings new insights to the ongoing debate on capital structure and contributes to enriching a recent stream of literature on economic policy uncertainty. All of these findings are intended to greatly enrich our analyses pertaining to Li and Qiu (2018) and Kang et al. (2014). Moreover, we provide additional analysis to examine whether economic policy uncertainty can predict corporate financial leverage. Our research findings show that economic policy uncertainty plays an important role in corporate leveraging future decisions. Our results are robust to alternative economic policy uncertainty.

There are some limitations to this study relating to financial leverage. This study investigates how financial leverage is impacted by policy uncertainty without considering the efficiency of the financing process or how firms access finance (Ashraf et al. 2022). Additionally, in terms of investment, this study focuses on corporate investment decisions, which are impacted by EPU. Actually, the public investment decisions could moderate the effect of EPU on the financial leverage of a firm (He et al. 2022). Future studies can apply other methods based on quantile regression to examine how different quantiles of economic

policy uncertainty affect different quantiles of capital structure. Atsalakis et al. (2021) stated that the effects of economic policy uncertainty vary depending on the quantiles examined and, in this case, the scale of uncertainty and the specific phase of economic policy uncertainty that a firm is experiencing. Additionally, an ARDL approach could be applied to distinguish between the impacts of economic policy uncertainty in the short term and the long term (Syed and Bouri 2022b).

It is important for policymakers to maintain economic policies with transparency and stability to support investment. When uncertainty in economic policy occurs, banks and financial institutions can consider reducing loan rates for firms. This action provides working capital and cash flow, as well as increasing the liquidity of firms.

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Notes

1 EPU data is downloaded from http://www.policyuncertainty.com (accessed on 20 December 2022).

2 Higher values represent higher economic uncertainty.

3 For more details regarding variables definitions and measurements please refer to Table 1.

4 Control variables have been considered in line with prior literature (see for example; Li and Qiu (2018); Schwarz and Dalmácio (2020)).

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