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Firms' Sustainability: Does Economic Policy Uncertainty Affect Internal Control?

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Abstract: This paper studies whether economic policy uncertainty (EPU) influences internal control (IC). Exploiting EPU as an exogenous shock and using unique internal control index data at the firm level from China, we can make causal inferences about the EPU effect on IC, and provide new insight into firms' sustainability. Our results show that firms tend to cope with higher EPU by improving IC, indicating their efforts to ensure sustainability development. We also find that this trend is intensified for firms localized in regions with a lower marketization degree, state-owned firms, or firms with fewer analysts following. Further analyses show that EPU significantly reduces the internal control auditing fees, hence backing up the association between EPU and IC. Unlike the previous literature, this paper shows the important role of internal control for firms in coping with EPU, which is of crucial significance to how firms seek to adhere to sustainable development and how economic policy works best.

1. Introduction

Firms' sustainability differs when the outside degree of economic policy uncertainty is different. As far as firms are concerned, given the high risk and more principal–agent costs conveyed by economic policy uncertainty, higher uncertainty around the economic policy indicates that it is harder for the firm to survive and grow sustainably. In particular, economic or political shocks can elicit significant reactions from the real economy, such as investment curtailment [1], deferring investments [2], increasing the cost of external financing [3], or making it easier to fall into financial distress [4], which have increased the difficulty of sustainable development for firms. However, there is little empirical research on the efforts firms make to deal with this uncertainty, especially from the perspective of firm system construction. Our study proposes a link between economic policy uncertainty and internal control to explore how firms handle the challenges of developing sustainably from the perspective of firm system construction.

Specifically, we address this question by using a Chinese dataset of public firms listed on the Shanghai and Shenzhen stock exchanges. In our view, this task is particularly attractive and difficult in China. On the one hand, China is a unique market in which test the impact of policy uncertainty because it is still regarded as in transition, shifting from a planned economy to a market-based economy. During this period, firms in China have had to face unprecedented economic policy challenges. On the other hand, sustainable development may be particularly difficult in emerging markets like China, where firms' growth is known to hampered by principal–agent problems and poor management [5].

Sustainable development requires the economy to transform from high-speed to high-quality growth. For firms, the intrinsic demand for sustainable development is closely related to the objectives

of internal control, specifically: ensuring achievement of an organization's objectives in terms of operational effectiveness and efficiency, reliable financial reporting, compliance with applicable laws and regulations, and safeguarding of assets [6], which serve as the foundation for ensuring the sustainable and steady development of firms. Better internal control promises to effectively guard against operation risks [7] and solve agency problems [8] caused by information asymmetry, thereby promoting a more effective allocation of resources.

A large body of literature has examined the influence factors of internal control, most of them focusing on the influence of the firm-level factors upon internal control [9–11], with few directly examining the influence of factors outside firms upon internal control. However, it is necessary to consider the influence of macro factors upon internal control, since the internal control serves as the medium bridging macro-economic policy and micro governance behavior. To this end, this paper attempts to examine the influence of economic policy uncertainty upon internal control.

Increasing economic policy uncertainty means that the economic policy, such as monetary, fiscal, regulatory, and trade affairs, might change, thereby indicating increasing risk in the external environment [12]. On one hand, the change in risk may increase losses and the difficulty of developing sustainably, forcing managers to put more efforts into improving operational efficiency, avoiding penalties like salary cuts or dismissal for poor performance, and ultimately improving the willingness of management to carry out internal control. On the other hand, the impact of uncertainty increases the difficulties of firm operation risk evaluation and problem solving, hence making internal control more difficult. Moreover, it may also influence internal control because of the principal–agent cost between controlling shareholders and minority shareholders, shareholders, and managers. In addition, in environments with weak investor protection, it is possible that the internal control is captured by management and controlling shareholders, and is therefore ineffective. Hence, it remains an empirical issue to be verified how economic policy uncertainty influences internal control.

We begin our empirical analysis by measuring the two main variables. To measure economic policy uncertainty, we resort to Baker et al. [13], in which they develop a new index of economic policy uncertainty (EPU) for the USA. Their EPU index has been shown to be a good proxy of real economic policy uncertainty. Following similar logic and methodologies, they then constructed EPU indexes for Europe, Canada, China, and India. For our study, we adopt their China index to proxy the economic policy uncertainty. To measure internal control in China, we use the "Internal Control Index of Chinese Listed Companies" constructed and released by Chen et al. [14], which comprehensively evaluates and quantitatively measures a firm's internal control, based on the Internal Control Integrated Framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO). The COSO framework was identified by the Securities and Exchange Commission (SEC) Release No. 33-8810 as being suitable for management to assess the effectiveness of the company's ICFR [15]. (In the same release, SEC also cited the Guidance on Assessing Control published by the Canadian Institute of Chartered Accountants ("CoCo") and the report published by the Institute of Chartered Accountants in England & Wales Internal Control: Guidance for Directors on the Combined Code (known as the Turnbull Report) as examples of other suitable frameworks that issuers could choose in evaluating internal control effectiveness. SEC encourages companies to examine and select a framework that may be useful in their own circumstances; the SEC also encourages the further development of existing and alternative frameworks.)

The COSO framework defined internal control as a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in four categories: (1) effectiveness and efficiency of operations, (2) reliability of financial reporting, (3) compliance with applicable laws and regulations, and (4) safeguarding of assets. (The first three categories are contained in the 1992 original COSO report and the fourth category, "safe guarding of assets," is added in the 1994 COSO addendum to the Reporting to External Parties volume of the COSO report.) The internal control index that we use encompasses the full set of internal controls pertaining to the aforementioned four categories in the COSO report. Because we

are assessing firms' sustainability, we treat the internal control as the micro foundation for ensuring sustainable and steady development of firms; adapting it to accommodate unique Chinese conditions, we use this internal control index, which is based on the COSO framework, to measure internal control quality. In other words, the method can better measure internal control quality and suit our situation. This index has been validated and used widely in internal control research [16–19].

Using a panel of publicly listed Chinese firms from 2007 to 2015, we conducted empirical tests on the association between economic policy uncertainty and internal control. Results reveal that internal control of firms are significantly enhanced when outside economic policies are more uncertain, suggesting that, in order to deal with the impact of economic policy uncertainty for firms developing sustainably, managers are more motivated to improve the internal control. It also indicates that, due to the impact of economic policy uncertainty, the benefit of improving internal control outweighs the cost. After considering the marketization degree, nature of property rights and analyst following, it is discovered that the influence of economic policy uncertainty upon internal control is more obvious in state-owned firms and regions with more analysts following and relatively low marketization. Further verification shows that the managers indeed enhance internal control when the uncertainty is relatively high, so the corresponding internal control auditing cost lowers accordingly. Hence, we have empirically verified the association between economic uncertainty and internal control cost to prove the main hypothesis, and the result of empirical verification also verifies our expectation, i.e., the internal control cost is relatively high in the context of economic policy uncertainty.

This paper makes the following contributions. Firstly, most of the existing literature starts with the angle of company traits or governance and discusses the influence of factors inside firms upon internal control. Although this area of research is abundant, there are two problems with it, including little consideration of the influence of macro factors upon internal control, and regarding internal control as more of a restraint upon financial reporting rather than as a risk prevention decision influencing a firm's operational strategy and sustainable development. The external macro environment is the foundation and precondition for developmental decision-making by firms, so it has a serious influence upon internal control decision-making. It is by utilizing the exogenous variable of economic policy uncertainty that this paper explores the influence of external environmental uncertainty upon internal control of firms, analyzing the association between the two from the angle of information supply and demand changes caused by external risk and information asymmetry, and thereby enriching the research on internal control and partially making up for internal control research's lack of macro vision.

Moreover, the existing literature has also studied the influence of economic policy uncertainty upon macro-economic development [20], tax avoidance [21], investment [2], corporate financing [22], financial risk [23], etc. These studies mainly focus on the influence of discontinuous external turmoil caused by economic policy uncertainty upon a firm's financial decision-making or the financial market. However, our study shows that firms tend to increase internal control when economic policy uncertainty is high. In terms of firm behavior, this raises a more fundamental issue for firms' sustainable development, i.e., whether economic policy uncertainty influences firm system construction, or, in other words, will firms try to seek system dividends to ensure the sustainability of development when external uncertainty increases? This study also pushes forward the research on economic policy uncertainty, providing more complete evidence on economic policy uncertainty and firm behavior.

The rest of this paper is arranged as follows: the second part is the theoretical background, the third part gives the hypothesis, the fourth part explains the research design, the fifth part reports the empirical results, and the sixth part gives our research conclusions.

2. Theoretical Background

The main question asked by this paper is whether economic policy uncertainty will affect the internal control of firms, so we examined the theoretical background from the two aspects of the influence of economic policy uncertainty upon firm decision-making and the influence factors of internal control. Both are discussed against the background of firms' sustainable development.

2.1. Sustainability and Coping Behaviors: Economic Policy Uncertainty and Firm Decision-Making

Government economic policies, such as monetary, fiscal, regulatory, and trade affairs, shape the environment in which the market economy operates [24]. Economic policy uncertainty mainly comes from the uncertainty caused by government policy variations [25], uncertainty of implementation, as well as uncertainty of policy guidance and intensity [26]. Since the global financial crisis in 2008, governments around the world have generally adjusted their economic policies in response to the downturn and volatility of the macroeconomic environment. For example, the Chinese government controls the supply of financial assets through monetary policy, stimulates investment through its fiscal policy, and promotes regional economic development through regional revitalization plans (e.g., the Beijing-Tianjin-Hebei coordinated development plan). However, the unpredictability, opacity, and ambiguity in the process of economic policy-making all lead to economic policy uncertainty. The International Monetary Fund repeatedly mentioned economic policy uncertainty in the World Economic Outlook issued in 2012, holding that the uncertainty of economic policy since 2007 has reached the highest level in history. Under the influence of economic policy uncertainty, firms cannot develop sustainably; specifically, the investment, employment and consumption of enterprises and households have all witnessed a decrease, which is also an important reason for the slow recovery of the world economy. For market players, the increased unpredictability, un-opacity, and ambiguity will increase the systematic risk and lower their sustainable development ability [27,28]. Firms are the most important players in the market economy as well as an important medium for the implementation of macroeconomic policy, so economic policy uncertainty does affect firms' sustainable development ability and their coping behaviors. Existing research mainly concentrates on the influence of economic policy uncertainty upon investment decision-making, financing decision-making, cash holding, innovative performance, and risk taking. Among them, Xu et al. [4] discussed the influence of economic policy uncertainty from the angle of cash holding, finding out that economic policy uncertainty increased uncertainty in future cash flow, so that firms would have to hold more cash assets; and the association between economic policy uncertainty and cash holding becomes more sensitive for firms with a serious agency problem. Bradley et al. [22] discussed the influence of uncertainty from the angle of firm financing behavior, suggesting that when economic policy was highly uncertain, creditors would become more prudent and curtail loans, while firms would be faced with higher external financing costs for information asymmetry, indicating bad news for sustained funding. In terms of the firm's risk behavior, economic policy uncertainty would increase the market risk faced by firms [12], hence lowering firm innovative efficiency and deferring development [29,30], which forces firms to cut down on investment expenses [2]. Therefore, when policy uncertainty is high, firms can adopt strategies for risk hedging, such as lowering the probability of variation in senior management [31]; or raise their risk-taking level to take advantage of the opportunities brought by economic policy uncertainty for strengthening themselves [32,33].

2.2. Micro Foundation of Sustainability: Influence Factors of Internal Control

Internal control serves as the foundation for sustainable and steady development of firms. Based on the COSO framework, Chinese firms' internal control objectives ensure the achievement of an organization's objectives in terms of operational effectiveness and efficiency, reliable financial reporting, compliance with applicable laws and regulations, and safeguarding of assets, so internal control has been endowed with public expectations for firms' sustainability in China. Firms are the place where internal control is exercised, so their internal factors will naturally become the key points scholars pay attention to, including the influence of firm traits and company governance upon internal control. Among them, Ge et al. [9] discussed the influence factors of internal control from the angle of firm traits, discovering that the probability of disclosing major internal control defects was positively correlated with company business complexity and accounting firm scale, and negatively correlated with company scale and profitability. Ashbaugh-Skaife et al. [34] started from the angle of firm traits and argued that internal control defects were positively correlated with business complexity, organizational structure

variation, independent auditors' resignation frequency, and resources for internal control construction. Doyle, Ge, and MaVay [10] claimed that traits like small company scale, poor financial status, complex businesses, rapid growth speed, and reorganization were decisive factors in major internal control defects. The above research discusses the influence factors of internal control from the angle of firm traits. In terms of company governance, Krishnan [35] revealed that the independence of the auditing committee and the number of members with financial skills were significantly negatively correlated with the probability of internal control defects.

We found that the influence factors of internal control are numerous, such as firm business complexity and firm scale, but as to the role of macro factors in internal control we still lack necessary knowledge. Macroeconomic policy and economic environment fluctuations are important background for micro firm behavior, and economic policy uncertainty will profoundly influence the sustainability and coping behavior of firms. Compared with firm financial decision-making or development strategies like cash holding, investment, and risk taking, the decision-making at the level of firm system turns out to be a more fundamental issue. Moreover, internal control construction serves as an important means for firms to seek system dividends to ensure development sustainability. As for how economic policy uncertainty affects internal control, the existing literature has not provided sufficient empirical evidence, but this will be a major theme of our research.

3. Hypotheses

This paper attempts to test the influence of economic policy uncertainty upon firm internal control for the purpose of sustainability, and the moderate effect of the influence under three dimensions including marketization degree, nature of property rights, and channels analyst following. The Logical relationship diagram of these associations is shown in Figure 1.
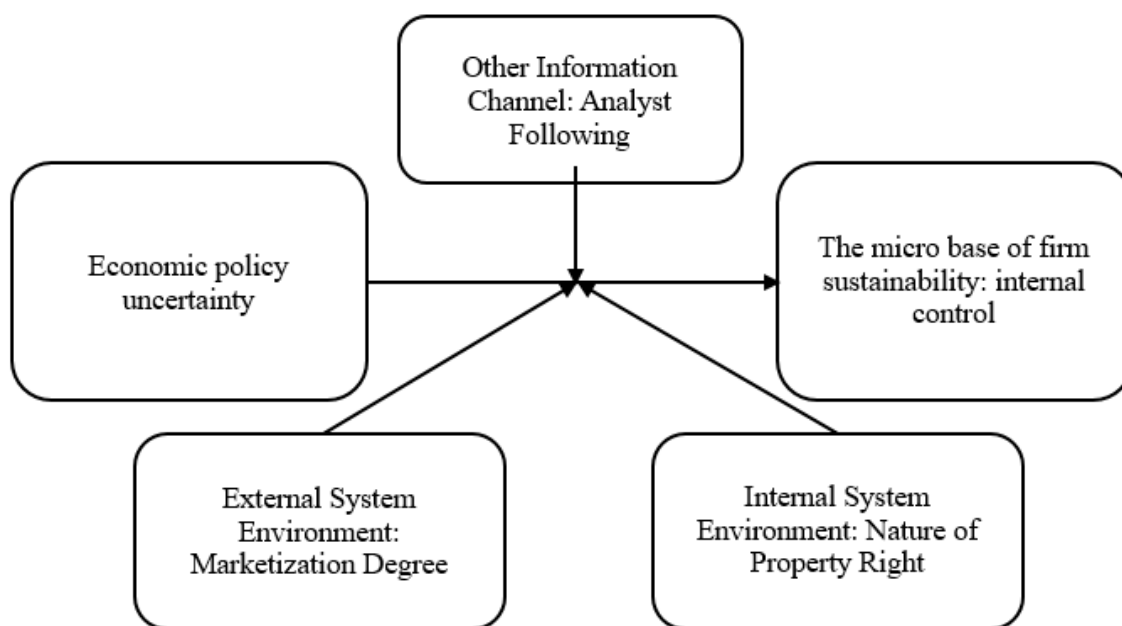
Figure 1. The framework of this study.

3.1. For the Purpose of Sustainability: Economic Policy Uncertainty and Internal Control

For the purpose of sustainability, the influence of economic policy uncertainty upon firm internal control may work in the following ways. First, economic policy uncertainty may arise from macroeconomic changes and variations in implementation, not only making it difficult to accurately estimate the current yield of firms but also increasing firm investment and operational risks, thereby leading to a larger probability of loss or even bankruptcy. All of these are bad news for firms' sustainable

development. In order to grow sustainably, when the external environment is unstable and future development unclear, management will be motivated to adjust policy to cope with them, such as cutting down investment expenses [1,36] or increasing cash holding [37,38]. Compared with financial decisions like investment, financing, or cash holding, internal control is more direct and effective for coping with systematic risks. The aim of internal control construction and implementation lies in increasing the firm risk prevention level and promoting sustainable development. As expected from the internal control objective, a lot of studies have already demonstrated that internal control can indeed realize risk prevention and the improvement of operational efficiency, such as restraining inefficient investment [39], optimizing capital structure [40], and lowering the cost of debt [41]. Hence, when economic policy uncertainty is relatively high, management will be more motivated to construct and perfect internal control systems by seeking dividends from the basic system and promoting the improvement of internal control from the bottom up, so as to better cope with the uncertainty and develop sustainably.

On the other hand, economic policy uncertainty also means implicitness and ambiguity of external information. Research has demonstrated that uncertainty increases the information asymmetry between firm internal management and information users. For example, high uncertainty increases firm debt costs, including bank loans and municipal bonds [3,22,42]; governor election inhibits the IPO of firms [43]; and general election encourages accounting conservatism [44,45]. In other words, reduced external explicit information produces negative agency cost benefit, and investors will reiterate requirements for high-quality information. Meanwhile, high-quality internal control can effectively improve firm operations and financial transparency. For example, in terms of financial information, high-quality internal control improves accrual quality [10] and accounting information conservatism [46], and gives more information [47]; in terms of better communication, it can promote sufficient and effective dialogue among internal staff, and dialogue between firms, the government, and customers [6]. Meanwhile, high-quality internal control can attract more renowned auditors and analysts [48,49] to provide another information source for investors. In addition, the existing literature has already shown that internal control significantly lowers information asymmetry between managers and investors, hence reducing the capital cost [41]. Faced with worse information asymmetry caused by uncertainty and increasing demand for investor information, firms see increased benefits and decreased capital costs due to implementing high-quality internal control. Therefore, management will be more motivated to perfect the internal control for the purpose of growing sustainably.

Based on the above analysis, it is believed that economic policy uncertainty will enhance the behaviors of the management in constructing and perfecting internal control. Therefore, we propose Hypothesis 1 (H1).

Hypothesis 1 (H1). *In a situation where other conditions are the same, higher economic policy uncertainty leads to better micro foundation of the firms' sustainability, the internal control.*

3.2. Moderate Effect: The Influence of Economic Policy Uncertainty upon Internal Control under Different Conditions

Given that the analysis of this paper depends on firm risk prevention and high-quality information demand, the influence of economic policy uncertainty upon internal control in firms varies because of differences in system environment and information channel among individual firms. This paper conducts an analysis from the three aspects of external marketization degree, nature of internal property rights, and analyst follow-up, and proposes research hypotheses.

3.2.1. External System Environment: Marketization Degree

Economic policy uncertainty influences firm internal control as a whole, but the influence varies in terms of degree for firms in places with different marketization degrees. In other words, the association

between economic policy uncertainty and the basis of firm sustainability, internal control, is moderated by the external system environment, the marketization degree.

For firms localized in regions with lower market development because of slow marketization, low investor protection level and lax supervision means investors' demand for high-quality information is higher [50]. In this kind of environment, it is urgent to ease the agency problem, and firms are more motivated to implement high-quality internal control to ensure the sustainable development of firms and build up the confidence of investors. Moreover, in regions with a low marketization degree, the corporate governance of firms tends to be poor [51], and the promotion space of internal control generally is large. For firms in regions with higher market development because of a high marketization degree, the promotion effect of risk prevention by internal control is not so obvious because of the self-regulating effect of the market, so the willingness of firms to enhance internal control is not as intensive as in regions with a low marketization degree. Therefore, we hold that the influence of economic policy uncertainty upon internal control varies between regions with a high marketization degree and those with a low marketization degree.

Hypothesis 2a (H2a). *The association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the external system environment, the marketization degree. Compared to firms in regions with higher market development, the influence of upon internal control is higher for firms in regions with a lower market development.*

3.2.2. Internal System Environment: Nature of Property Rights

The association between economic policy uncertainty and the basis of firm sustainability, internal control, is moderated by the internal system environment, the nature of property rights.

State-owned firms enjoy preferential treatment in terms of the element market, product market, and capital market [52,53]. The natural relationships between state-owned firms and the government enable them to better capture the changes in external economic policy, and the advantage of ready information helps them to execute perfect internal control in a timely manner. On the other hand, given that state-owned firms depend on government resources and policy support, the discontinuity and inconsistency of external policy can have a large influence. Non-state-owned firms do not have as many information channels, policy support, and ties as state-owned ones, and they are "self-reliant", so they may have lower sensitivity to economic policy uncertainty. Research shows that, compared with non-state-owned firms, state-owned firms have more ties with the government, so they have more channels through which to get loans [54]. When external policy changes, state-owned firms may need to re-build channels, so the bank loan will drop significantly [55], and state-owned firms always have lower risk-taking behaviors [56,57], demonstrating that state-owned firms can be more sensitive than non-state-owned firms in facing variations in external economic policy. Besides, since state-owned firms are often subject to soft budget constraints for undertaking the social burdens of maintaining employment and providing public goods; the "affectionate" hand of government can help them to implement sound internal control. However, non-state-owned firms do not have this soft budget constraint, and the government does not give them much assistance with implementing internal control and sustainable development. So, non-state-owned firms generally have lower sensitivity to policy uncertainty. Therefore, it is believed that the influence of economic policy uncertainty upon internal control varies between state-owned and private firms.

Hypothesis 2b (H2b). *The association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the internal system environment, the nature of property rights. Compared to non-state-owned firms, the influence of economic policy uncertainty upon internal control is higher for state-owned firms.*

3.2.3. Other Information Channels: Analyst Following

The association between economic policy uncertainty and the base of firm sustainability, internal control, is moderated by the other information channel, the analyst following.

According to disclosure theory [58], in a balanced state, the difference in costs and benefits related to information collection and disclosure leads to a difference in information environment (degree of information asymmetry). In the absence of corresponding incentives, a firm's information disclosure activities will adapt to the current information environment and remain stable under normal circumstances [59,60]. Chang et al. [61] show that information environment differences are the determinants of whether earnings management can mislead investors. One of the objectives of internal control is to ensure the authenticity, accuracy, and integrity of disclosed information. Therefore, the information environment faced by firms will affect the response of internal control construction to economic policy uncertainty.

The number of analysts following reflects the degree of information demand, and is an important part of the firms' information environment. When the number of analysts following is larger and the source of investor information wider, firms will be less motivated to lower information asymmetry by designing and implementing a better internal control system. When the number of analysts is smaller, the outside information environment is worse and may lose investors' confidence. In order to develop sustainably and healthy, firms need to seek out other channels to maintain the integrity of information disclosure, and implementing a better internal control system is one of the most important and effective ways. In other words, as one kind of important external governance mechanism, analyst following can partially replace the role of internal control. Research shows that analyst following can lower the scale of significant earnings management and the probability of reporting meager profit [62–64], thus indirectly verifying the supervision and governance role of analyst following in firms. Therefore, it is believed that the influence of economic policy uncertainty varies with the number of analysts following.

Based on the above analyses, we hypothesize the following:

Hypothesis 2c (H2c). *The association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the other information channel, the analyst following. Compared to firms with more analysts following, the influence of economic policy uncertainty upon internal control is more prominent for firms with fewer analysts following.*

4. Research Design

4.1. Sample and Data

We used panel data to test our hypotheses. Since our internal control index is firm-year index, we conduct a firm-year panel data. Our sample period is from 2007 to 2015, since 2007 is the initial year for which the internal control index is constructed. Therefore, our initial sample consists of all A-share firms listed on the Shanghai and Shenzhen Stock Exchange for the period from 2007 to the year for which the latest data are available, 2015. We then exclude financial firms and observations with missing data. Finally, we obtain 19,456 firm-year observations for public firms in China.

We obtained data, including on Chinese economic policy uncertainty, internal control, and financial statements, from the following databases. (1) The Chinese economic policy uncertainty index (hereinafter referred to as BBD), formulated by Baker et al. [13], was adopted for measuring Chinese economic policy uncertainty, and built based on the author's text analysis of the *South China Morning Post*. To be specific, through searching for keywords like "China", "economy", and "uncertainty", subsets involving specific policy issues were further identified, including "expense", "budget", and "interest rate". Moreover, target articles containing the above two conditions were re-checked with the method of composite filtration. Finally, based on the above filtration conditions, the number of articles concerning Chinese economic policy uncertainty published in the *South China*

Morning Post every month was calculated. Then this was divided by the total number of reports in the newspaper every month, and standardization processing was conducted with 100 as the average benchmark to obtain the economic policy uncertainty index every month. Since we need yearly data, we calculated three means to process the BBD data into yearly data, including arithmetic average, standard deviation weight average, and weighted average, in which the weight for 1–12 months is 1–12, respectively. These three different ways to measure economic policy uncertainty are important in our panel, and improved the quality and robustness of our panel data. BBD could continuously depict the economic policy uncertainty at every time point, and enabled us to comprehensively and accurately see its influence on the economy. Rao et al. [31] matched the BBD trend from 2000 to 2013 with important historical events in China, finding out that the BBD index coincided with important events in China and directly demonstrating that this index soundly reflects Chinese economic policy uncertainty. Meanwhile, this BBD index has also been widely applied in recent research [65–68]. (2) The firm-year internal control index score by Chen et al. [14] was adopted to measure the internal control data in this paper. This index was formulated on the basis of COSO components—control environment, risk assessment, control activities, information and communication, and monitoring—as the five first-level criteria in internal control. These five elements advocated in the COSO framework optimize the internal control structure and system, integrate different views on internal controls, and create a consensus platform and conceptual framework to evaluate internal control quality. Under each level, there is a sequence of sub-level criteria. For example, the first-level criterion, Control Environment, can be further divided into six second-level criteria: corporate governance, internal auditing, human resources, employee quality, social responsibility, and corporate culture. Our final index has four levels of evaluation criteria, consisting of five first-level criteria, 24 second-level criteria, 43 third-level criteria, and 144 fourth-level criteria. In addition, the scores for first-level criteria of control environment, control activities, and information and communication will be deducted by a pre-specified percentage if a firm receives regulatory penalties or media exposure for violating the accounting rules or securities laws, or if a firm experiences major accidents of operational safety, environmental pollution, or product recalls. Then, the internal control index we use was obtained through weighting in accordance with AHP and the variation coefficient method. This method and the methodology of the internal control index have also been widely used in recent research [7,16–18,69,70].

Different regions in China are moving towards a market-based economy at different paces [51]. We consider different market development conditions by using the NERI (National Economic Research Institute of China) marketization indexes [71]; the index has also been employed by Firth et al. [72] and Wang et al. [65]. Other relevant financial data came from CSMAR and RESSET databases. The CSMAR (China Stock Market and Accounting Research) database is designed and developed by GTA Information Technology, one of the major providers of Chinese data. CSMAR is a comprehensive database for Chinese business research. CSMAR covers data about the Chinese stock market, financial statements, and corporate governance of Chinese listed firms. RESSET is a vendor that specializes in providing financial information and service products in China, and supplies the data needed in empirical research and investment analysis in economics, finance, and accounting.

4.2. Empirical Models

Our first hypothesis is concerned with whether economic policy uncertainty will affect internal control and how it works for the purpose of sustainability. While mandatory disclosure under SOX404 places a limitation on getting more information on internal control, it measures such weaknesses by dummy variable or an aggregate summary. Chen et al. [14] constructed a better measurement of internal control, a continuous method that can comprehensively and quantitatively measure the internal control quality, including for the years lacking internal control regulations in China (2007–2011). Since the Basic Standards of Enterprise Internal Controls—dubbed the Chinese version of SOX 404—became effective for such firms on 1 January 2012, using this unique data could allow us to make more observations available and give us more insight into the association between economic

policy uncertainty and internal control. We used this unique internal control index to test Hypothesis 1, and built the following basic model on the basis of relevant literature [10,31,65]:

$$IC = \beta_0 + \beta_1 PolicyUncertainty + \Sigma ControlVariables + \varepsilon, \quad (1)$$

where IC is the internal control index. A larger value of IC indicates higher firm-year internal control quality. EPU is the economic policy uncertainty index. Given that the BBD provided by Baker et al. [13] offers monthly data, we construct an annual economic policy uncertainty index through the following means: EPU_1 is the arithmetic average of the 12-month BBD index that year divided by 100; EPU_2 is the average of the 12-month BBD index standard deviation weight divided by 100, in which monthly weight demands that the calculation of standard deviation of every month be arranged from small to large (1–12); EPU_3 is the weighted average of the 12-month BBD index divided by 100, and the weight for 1–12 months is respectively 1–12. A larger value of EPU_1 (EPU_2, EPU_3) indicates higher economic policy uncertainty that year. Following Doyle et al. [10], Leone [73], Wang et al. [65], Zhang et al. [7], and Rao et al. [31], we control 10 firm-specific characteristics, including firm size (SIZE), firm age (Lage), return on equity (ROE), sales growth (Growth), foreign sales (Export), auditor firm (Big4), firm business segments (Bsegment), mergers and acquisitions (MA), restructuring (RSTR), and financial leverage (Lev); and two corporate governance characteristics, including board independence (Ind) and size of board (BSIZE). The Industry dummy is included to control for the industry fixed effect. According to Hypothesis 1, when economic policy uncertainty is higher, the demand for enterprises to implement internal control will rise. Hypothesis 1 is supported if $\beta_1 > 0$.

To further explore the relationship between economic policy uncertainty and internal control, we capture the three conditioning effects that may moderate the association between economic policy uncertainty and internal control, including marketization condition, nature of property rights, and analyst following; we add three interaction terms to Equation (1). To test Hypotheses 2a–c, we run the following three regressions:

$$IC = \beta_0 + \beta_1 PolicyUncertainty + \beta_2 MKT \\ + \beta_3 PolicyUncertainty \times MKT + \Sigma ControlVariables + \varepsilon \quad (2)$$

$$IC = \beta_0 + \beta_1 PolicyUncertainty + \beta_2 SOE \\ + \beta_3 PolicyUncertainty \times SOE + \Sigma ControlVariables + \varepsilon \quad (3)$$

$$IC = \beta_0 + \beta_1 PolicyUncertainty + \beta_2 AF \\ + \beta_3 PolicyUncertainty \times AF + \Sigma ControlVariables + \varepsilon, \quad (4)$$

where MTK, SOE, and AF represent three other conditions faced by firms. As mentioned previously, these variables stand for market development degree, nature of property rights, and analyst following, respectively. Market development degree (MTK) is the NERI (National Economic Research Institute of China) marketization index [71]; the index has also been employed by Firth et al. [72] and Wang et al. [65]. The measurement of the MTIK is the total score in marketization process in the province or region where the firm is located. Nature of property right (SOE) is an indicator variable that takes a value of 1 if a firm is state-owned for the fiscal year, and 0 otherwise; it comes from the CSMAR database. Analyst following (AF) is the number of analysts following a firm. The CSMAR analyst sub-database provides the names of analysts following the firms yearly, so we can calculate the firm-year number of analysts based on their names. These moderate variables have improved the quality of our panel data. Hypotheses 2c are the development result of Hypothesis 1, so other major variables and control variables in Equations (2)–(4) are set to be the same as Equation (1). According to Hypotheses 2a–c, the coefficient of *PolicyUncertainty* × *MKT* and *PolicyUncertainty* × *AF* is significantly negative, and that of *PolicyUncertainty* × *SOE* is significantly positive.

All of the variables in Equations (1) and (2) are defined in Appendix A. To mitigate the potential effect of outliers, we winsorize the continuous variables at the 1% and 99% level.

5. Empirical Results

5.1. Descriptive Statistics

Table 1 presents descriptive statistics for all variables in our regression sample of our hypotheses. Macro-level and firm-level variables are shown in Panels A and B, respectively. As shown in Panel A, the mean values of EPU_1, EPU_2, and EPU_3 are 1.507, 1.552, and 1.572, respectively, and the standard deviations are 0.482, 0.482, and 0.543, respectively, indicating that the fluctuations in Chinese economic uncertainty are obvious. In Panel B, in terms of internal control performance, the mean of IC, our test variable, is 41.94, with a minimum of 17.12 and a maximum of 66.24. The mean value of IC reaches not even half of the total score of 100, with the minimum being around 17, indicating a wide variance of internal control quality, so there is room for improvement. As for market development, the nature of property rights, and analyst following, the mean of market development is 7.403, suggesting imbalanced development; state-owned firms account for 44.5%; the mean of analyst following is 8.057, indicating a relatively wide variance. After winsorization, the descriptive statistical distribution of other variables is within a reasonable range.

Table 1. Descriptive statistics. (**A**): **Panel A:** Macro level; (**B**): **Panel B:** Firm level; (**C**): **Panel C:** Main variables correlation matrix.

Variable	N	Mean	Median	StdDev	Min	Max
EPU_1	19,456	1.507	1.276	0.482	0.822	2.444
EPU_2	19,456	1.552	1.313	0.482	0.836	2.430
EPU_3	19,456	1.572	1.351	0.543	0.880	2.437

(A)

Variable	N	Mean	Median	StdDev	Min	Max
IC	19,456	41.936	42.540	10.130	17.116	66.237
Size	19,456	21.851	21.659	1.407	18.847	26.895
Roe	19,456	0.066	0.072	0.159	−0.863	0.649
Growth	19,456	0.199	0.093	0.604	−0.668	4.502
Export	19,456	0.622	1.000	0.485	0.000	1.000
Big4	19,456	0.0630	0.000	0.243	0.000	1.000
Bsegment	19,456	3.315	3.000	2.572	1.000	26.000
MA	19,456	0.423	0.000	0.494	0.000	1.000
RSTR	19,456	0.557	1.000	0.497	0.000	1.000
Lage	19,456	2.007	2.303	0.877	0.000	3.258
BSIZE	19,456	10.25	9.000	2.704	5.000	19.000
Ind	19,456	36.483	33.333	8.371	0.000	58.333
Lev	19,456	0.466	0.459	0.242	0.045	1.353
MKT	19,456	7.403	7.620	1.697	−0.300	9.950
SOE	19,456	0.445	0.000	0.497	0.000	1.000
AF	19,456	8.057	4.000	9.208	0.000	80.000

(B)

	1	2	3	4	5
1 IC		0.196 ***	0.229 ***	0.185 ***	0.372 ***
2 EPU_1	0.177 ***		0.985 ***	0.912 ***	0.051 ***
3 EPU_2	0.191 ***	0.997 ***		0.927 ***	0.064 ***
4 EPU_3	0.167 ***	0.960 ***	0.972 ***		0.031 ***
5 Size	0.429 ***	0.033 ***	0.038 ***	0.032 ***	
6 Lage	−0.004	−0.026 ***	−0.023 ***	−0.038 ***	0.214 ***
7 Big4	0.208 ***	−0.00300	−0.00400	−0.00300	0.447 ***
8 Roe	0.075 ***	−0.027 ***	−0.030 ***	−0.025 ***	0.103 ***

(C)

This table reports descriptive statistics for listed firms in China from 2007 to 2015. It contains 19,456 firm-year observations. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th. Panel C is bounded by diagonal lines, the lower triangle is Pearson correlation matrix, and the upper is Spearman correlation matrix. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%.

A correlation coefficient matrix is presented in panel C of Table 1. It can be seen that the correlation coefficient of most variables is below 0.5, showing that there is no serious multicollinearity among the variables. Panel C is bounded by diagonal lines; the lower triangle is Pearson correlation matrix, and the upper is Spearman correlation matrix. No matter whether it is a Pearson correlation matrix or a Spearman correlation matrix, IC is significantly positively correlated with EPU_1, EPU_2, and EPU_3, which is consistent with the prediction of Hypothesis 1. However, the results are just the relationships between two variables, without adding other control variables. On the basis of introducing control variables in the following, a stricter regression test is conducted.

5.2. Main Results

5.2.1. For the Purpose of Sustainability: Economic Policy Uncertainty and Internal Control

As mentioned previously, internal control is a useful measure for firms to effectively guard against operational risks and solve agency problems caused by information asymmetry. When economic policy uncertainty is high and firms have difficulties with growing sustainably, managers have a strong incentive to seek out effective measures for firms' steady development, that is, improving internal control quality.

Our key results are the regression coefficients of test variables, EPU_1 (EPU_2, EPU_3), which are shown in Table 2. It can be seen that the coefficients of EPU_1, EPU_2 and EPU_3 is 2.880, 3.083 and 2.366, respectively. And they are all significantly positive, because the T-values are 33.92, 36.05, and 33.42, respectively, all of which are significant at the 1% level in each tail of the sample distribution. These results indicate that no matter whether we use the arithmetic average, standard deviation weight, or simple weight of BBD index to calculate the value of economic policy uncertainty, economic policy uncertainty and internal control are significantly positively correlated. These results suggest that high economic policy uncertainty improves the willingness of firms' management to enhance the construction of internal control, thus improving the internal control quality. These findings, estimated from Equation (1), support Hypothesis 1. They show that, when economic policy uncertainty is high, enterprises often respond to the impact of policy uncertainty by improving the quality of internal control. With respect to the control variables, we find that internal control is significantly positively correlated with the characteristic variables covering firm size, firm operation performance, firm age, overseas sales, and restructuring, and the company governance variables covering size of board and board independence, indicating that the internal control of companies with abundant resources and strong profitability is relatively high and hence consistent with the resource base theory. Financial leverage and internal control are significantly negatively correlated, indicating that it is more difficult to improve internal control for firms with high financial risk. Growth and internal control are significantly negatively correlated, indicating that over-rapid growth leads to untimely perfection of internal control. Consistent with previous studies, the number of business segments and internal control are negatively correlated, demonstrating that a larger number of business segments can lead to more complexity of internal control and ultimately difficulty in achieving improvement. All these factors indicate that our results are relatively reliable.

Table 2. For the purpose of sustainability: economic policy uncertainty and internal control.

Dependent Variable	IC		
EPU_1	2.880 ***		
	(33.92)		
EPU_2		3.083 ***	
		(36.05)	
EPU_3			2.366 ***
			(33.42)
Size	3.477 ***	3.460 ***	3.482 ***
	(33.67)	(33.52)	(33.67)

Table 2. *Cont.*

Dependent Variable	IC		
Lage	0.305 **	0.298 **	0.322 **
	(2.37)	(2.32)	(2.50)
Big4	0.539	0.556	0.529
	(0.96)	(0.99)	(0.94)
Roe	1.409 ***	1.461 ***	1.399 ***
	(2.76)	(2.86)	(2.73)
Bsegment	−0.334 ***	−0.328 ***	−0.339 ***
	(−7.80)	(−7.68)	(−7.92)
Export	0.764 ***	0.766 ***	0.765 ***
	(2.94)	(2.95)	(2.94)
MA	−0.181	−0.184	−0.180
	(−1.25)	(−1.27)	(−1.24)
RSTR	0.408 ***	0.390 ***	0.438 ***
	(2.78)	(2.66)	(2.98)
Growth	−1.023 ***	−1.015 ***	−1.062 ***
	(−9.30)	(−9.24)	(−9.64)
BSIZE	0.216 ***	0.213 ***	0.216 ***
	(5.82)	(5.75)	(5.82)
Ind	0.046 ***	0.045 ***	0.045 ***
	(4.09)	(4.01)	(4.05)
Lev	−8.896 ***	−8.822 ***	−8.921 ***
	3.477 ***	3.460 ***	3.482 ***
_cons	−38.187 ***	−38.231 ***	−37.669 ***
	(−16.61)	(−16.66)	(−16.37)
Industry	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.290	0.293	0.287
F	142.65	150.29	140.06

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

5.2.2. Under Different Conditions: Economic Policy Uncertainty and Internal Control

External system environment: marketization degree. As supported by the empirical results for internal control, we know that firms can perceive this uncertainty and tend to improve internal control when the outside economic policy uncertainty is high and firms experience more difficulties with developing sustainably. In addition, we expect that internal control can be improved even with low market developing provinces, state-owned firms, and low analyst following, and thus moderate the shock to these firms to guarantee their sustainability. In this section, we conduct three moderate tests to see whether the association between economic policy uncertainty and internal control is different under different conditions.

The first part is Hypothesis 2a, which predicts the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the external system environment, the marketization degree. Compared to firms in regions with higher market development, the influence upon internal control is higher for firms in regions with lower market development. We estimate Equation (2) and report the empirical results in Table 3. In a context where there is a difference in the marketization process, the coefficients of EPU_1, EPU_2, and EPU_3 are 8.268, 8.355, and 6.272, respectively. They are all significantly positive because the T-values are 19.87, 20.25, and 18.52, respectively, all of which are significant at the 1% level in each tail of the sample distribution. The coefficients of EPU_1×MKT, EPU_2×MKT, and EPU_3×MKT are −0.757, −0.748, and −0.557, respectively. They are all significantly negative because the T-values are −14.22, −14.08, and −12.67, respectively, all of which are significant at the 1% level in each tail of the sample distribution. These findings suggest two important pieces of information. The first is that, no matter whether

the firm has a high or low marketization degree, the economic policy uncertainty can have a positive effect on internal control. The second important piece of information is that the influence upon internal control is higher for firms in regions with a lower market development. These findings, estimated from Equation (2), support Hypothesis 2a. They show that the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the external system environment, the marketization degree. Firms are more motivated to improve internal control in the face of an uncertain external environment in regions with weak investor protection and poor anti-risk capacity.

Table 3. External system environment: marketization degree.

Dependent Variable		IC	
EPU_1	8.268 ***		
	(19.87)		
EPU_2		8.355 ***	
		(20.25)	
EPU_3			6.272 ***
			(18.52)
MKT	1.879 ***	1.887 ***	1.619 ***
	(17.10)	(16.81)	(15.66)
EPU_1×MKT	−0.757 ***		
	(−14.22)		
EPU_2×MKT		−0.748 ***	
		(−14.08)	
EPU_3×MKT			−0.557 ***
			(−12.67)
Size	3.342 ***	3.329 ***	3.350 ***
	(31.92)	(31.82)	(31.96)
Lage	0.362 ***	0.355 ***	0.386 ***
	(2.77)	(2.73)	(2.95)
Big4	0.193	0.212	0.180
	(0.35)	(0.39)	(0.33)
Roe	1.332 ***	1.384 ***	1.313 ***
	(2.63)	(2.74)	(2.59)
Bsegment	−0.282 ***	−0.278 ***	−0.290 ***
	(−6.65)	(−6.56)	(−6.82)
Export	0.432	0.438 *	0.428
	(1.63)	(1.66)	(1.62)
MA	−0.213	−0.214	−0.215
	(−1.48)	(−1.49)	(−1.49)
RSTR	0.262 *	0.252 *	0.294 **
	(1.82)	(1.75)	(2.03)
Growth	−0.984 ***	−0.976 ***	−1.022 ***
	(−9.09)	(−9.03)	(−9.45)
BSIZE	0.203 ***	0.201 ***	0.205 ***
	(5.48)	(5.43)	(5.53)
Ind	0.040 ***	0.039 ***	0.040 ***
	(3.62)	(3.56)	(3.62)
Lev	−8.087 ***	−8.037 ***	−8.124 ***
	(−15.60)	(−15.52)	(−15.65)
_cons	−47.993 ***	−48.133 ***	−45.652 ***
	(−20.76)	(−20.81)	(−19.81)
Industry	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.306	0.308	0.303
F	137.649	144.021	134.778

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

Internal system environment: nature of property rights. The second part of Hypothesis 2b, which predicts the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the internal system environment, the nature of property rights. Compared to non-state-owned firms, the influence of economic policy uncertainty upon internal control is higher for state-owned firms. We estimate Equation (3) and report the empirical results in Table 4. The coefficients of EPU_1, EPU_2, and EPU_3 is 1.772, 1.989, and 1.599, respectively. They are all significantly positive because the T-values are 16.63, 18.41, and 17.36, respectively, all of which are significant at the 1% level in each tail of the sample distribution. The coefficients of EPU_1×SOE, EPU_2×SOE, and EPU_3×SOE are 2.452, 2.399, and 1.661, respectively. They are all significantly positive because the T-values are 14.76, 14.40, and 11.82, respectively, all of which are significant at the 1% level in each tail of the sample distribution. These findings suggest two important pieces of information. The first is that, no matter whether the firm is state-owned or private, the economic policy uncertainty can have a positive effect on internal control. The second important piece of information is that the influence of economic policy uncertainty upon internal control is higher for state-owned firms. These findings, estimated from Equation (3), support Hypothesis 2b. They show that the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the internal system environment, the nature of property rights. These results support the theory that state-owned firms are more dependent on government policy, suggesting that state-owned firms are more sensitive to economic policy uncertainty.

Table 4. Internal system environment: nature of property rights.

Dependent Variable	IC		
EPU_1	1.772 ***		
	(16.63)		
EPU_2		1.989 ***	
		(18.41)	
EPU_3			1.599 ***
			(17.36)
SOE	−4.027 ***	−4.018 ***	−2.970 ***
	(−11.51)	(−11.24)	(−8.89)
EPU_1×SOE	2.452 ***		
	(14.76)		
EPU_2×SOE		2.399 ***	
		(14.40)	
EPU_3×SOE			1.661 ***
			(11.82)
Size	3.501 ***	3.482 ***	3.510 ***
	(33.68)	(33.51)	(33.70)
Lage	0.333 **	0.320 **	0.356 ***
	(2.46)	(2.37)	(2.64)
Big4	0.530	0.547	0.517
	(0.95)	(0.98)	(0.92)
Roe	1.411 ***	1.465 ***	1.395 ***
	(2.76)	(2.87)	(2.72)
Bsegment	−0.329 ***	−0.324 ***	−0.334 ***
	(−7.67)	(−7.56)	(−7.77)
Export	0.755 ***	0.758 ***	0.756 ***
	(2.90)	(2.91)	(2.90)
MA	−0.172	−0.171	−0.180
	(−1.19)	(−1.19)	(−1.24)
RSTR	0.375 ***	0.363 **	0.404 ***
	(2.58)	(2.50)	(2.77)
Growth	−1.017 ***	−1.007 ***	−1.060 ***
	(−9.24)	(−9.16)	(−9.61)

Table 4. *Cont.*

Dependent Variable	IC		
BSIZE	0.213 ***	0.210 ***	0.216 ***
	(5.74)	(5.67)	(5.80)
Ind	0.043 ***	0.042 ***	0.043 ***
	(3.81)	(3.75)	(3.78)
Lev	−8.911 ***	−8.845 ***	−8.926 ***
	(−17.46)	(−17.34)	(−17.46)
_cons	−36.761 ***	−36.735 ***	−36.822 ***
	(−15.93)	(−15.95)	(−15.93)
Industry	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.294	0.296	0.290
F	144.475	151.857	138.989

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

Other information channels: analyst following. The last part is Hypothesis 2c, which predicts that the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the other information channel, the analyst following. The influence of economic policy uncertainty upon internal control is more prominent for firms with fewer following analysts. We estimate Equation (4) and report the empirical results in Table 5. Where there is a difference in analyst following, the coefficients of EPU_1, EPU_2, and EPU_3 are 3.375, 3.632, and 2.769, respectively. These are all significantly positive because the T-values are 28.93, 31.06, and 28.18, respectively, all of which are significant at the 1% level in each tail of the sample distribution. The coefficients of EPU_1×AF, EPU_2×AF, and EPU_3×AF are −0.062, −0.069, and −0.048, respectively. These are all significantly negative because the T-values are −14.22, −14.08, and −12.67, respectively, all of which are significant at the 1% level in each tail of the sample distribution. These findings suggest two important pieces of information. The first is that, no matter how many analysts follow the firm, the economic policy uncertainty can have a positive effect on internal control. The second important piece of information is that the influence of economic policy uncertainty upon internal control is more prominent for the firms with fewer following analysts. These findings, estimated from Equation (4), support Hypothesis 2c. They show that the association between economic policy uncertainty and the foundation of firm sustainability, internal control, is moderated by the other information channel, the analyst following. This demonstrates that, when the firms are followed by a larger number of analysts, the environment enables information users to get more information sources, so that firms do not tend to enhance the internal control.

In summary, the regression results in Tables 3–5 indicate that, when there are relatively high demands for risk prevention and high-quality information, which damage firms' sustainability, the improvement of internal control is more significant. That is to say, the influence of economic policy uncertainty on internal control is moderated by the marketization degree, the nature of property rights, and the analyst following.

Table 5. Other information channels: analyst following.

Dependent Variable	IC		
EPU_1	3.375 ***		
	(28.93)		
EPU_2		3.632 ***	
		(31.06)	
EPU_3			2.769 ***
			(28.18)

Table 5. *Cont.*

Dependent Variable	IC		
AF	0.179 ***	0.192 ***	0.162 ***
	(9.21)	(9.74)	(8.98)
EPU_1×AF	−0.062 ***		
	(−7.00)		
EPU_2×AF		−0.069 ***	
		(−7.61)	
EPU_3×AF			−0.048 ***
			(−6.26)
Size	3.207 ***	3.185 ***	3.205 ***
	(29.56)	(29.38)	(29.49)
Lage	0.493 ***	0.489 ***	0.514 ***
	(3.70)	(3.67)	(3.85)
Big4	0.314	0.330	0.302
	(0.56)	(0.59)	(0.54)
Roe	0.640	0.687	0.612
	(1.26)	(1.35)	(1.20)
Bsegment	−0.315 ***	−0.308 ***	−0.320 ***
	(−7.39)	(−7.25)	(−7.51)
Export	0.798 ***	0.801 ***	0.801 ***
	(3.08)	(3.10)	(3.09)
MA	−0.212	−0.215	−0.215
	(−1.47)	(−1.49)	(−1.48)
RSTR	0.472 ***	0.456 ***	0.502 ***
	(3.24)	(3.13)	(3.44)
Growth	−1.013 ***	−1.003 ***	−1.049 ***
	(−9.30)	(−9.23)	(−9.63)
BSIZE	0.216 ***	0.213 ***	0.216 ***
	(5.86)	(5.78)	(5.87)
Ind	0.046 ***	0.045 ***	0.045 ***
	(4.06)	(3.97)	(4.01)
Lev	−8.585 ***	−8.503 ***	−8.603 ***
	(−17.00)	(−16.86)	(−17.02)
_cons	−34.396 ***	−34.462 ***	−33.656 ***
	(−14.66)	(−14.72)	(−14.34)
Industry	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.294	0.297	0.292
F	136.143	143.945	133.800

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

5.3. Further Tests

The results in Table 2 indicate that economic policy uncertainty and the overall quality of internal control are significantly positively correlated. In this section, we further discuss the major regression results in Table 2. We examine the association between economic policy uncertainty and internal control auditing fees (IC_fees). Our data on internal control auditing fees are hand-collected. Public listed firms' annual reports are available to download on the Shanghai and Shenzhen stock exchange websites, and we were able to hand-collect internal control auditing fees from these annual reports. Since internal control auditing fees are reported voluntarily, our sample size for analyzing internal control auditing fees was smaller than that for analyzing internal control. In this part, we collected 11,706 firm-year observations from 2007 to 2015.

We used model (1) to test the relationships between economic policy uncertainty and internal control auditing fees, and the results are listed in Table 6. It can be seen that the coefficients of EPU_1, EPU_2, and EPU_3 are all significantly negative at the 1% level, indicating that economic policy

uncertainty and internal control auditing fees are significantly negatively correlated whether the BBD index arithmetic average, standard deviation weight, or simple weight is adopted. This means that high economic policy uncertainty lowers firm internal control auditing fees. Research has already demonstrated that internal control and internal control auditing fees are negatively correlated [74–77]. These studies make clear that higher company internal control leads to better reliability of auditing evidence, lower auditing costs and risk, as well as lower internal control auditing fees. The regression results in Table 6 further reveal that economic policy uncertainty and internal control auditing fees are significantly negatively correlated, and, to a degree, indirectly demonstrate that the theoretical expectation of improving the internal control to cope with economic policy uncertainty and firms' sustainability is reasonable.

Table 6. Economic policy uncertainty and internal control auditing fees.

Dependent Variable	IC_fees		
EPU_1	−2.158 ***		
	(−4.89)		
EPU_2		−2.275 ***	
		(−4.88)	
EPU_3			−1.813 ***
			(−4.82)
Size	12.150 ***	12.163 ***	12.146 ***
	(8.95)	(8.95)	(8.95)
Lage	−5.818 ***	−5.800 ***	−5.832 ***
	(−2.82)	(−2.81)	(−2.82)
Big4	61.074 ***	61.067 ***	61.082 ***
	(6.01)	(6.01)	(6.01)
Roe	1.612	1.581	1.619
	(0.70)	(0.69)	(0.70)
Bsegement	0.201	0.198	0.203
	(0.61)	(0.60)	(0.62)
Export	1.935	1.933	1.936
	(0.45)	(0.45)	(0.45)
MA	−1.242	−1.245	−1.236
	(−0.85)	(−0.85)	(−0.85)
RSTR	3.407 **	3.415 **	3.385 **
	(2.32)	(2.32)	(2.30)
Growth	−1.089	−1.096	−1.062
	(−1.49)	(−1.50)	(−1.46)
BSIZE	0.405	0.408	0.404
	(1.15)	(1.16)	(1.15)
Ind	−1.127 ***	−1.127 ***	−1.127 ***
	(−2.78)	(−2.78)	(−2.78)
Lev	15.400 ***	15.363 ***	15.410 ***
	(3.31)	(3.30)	(3.31)
_cons	−186.782 ***	−186.832 ***	−187.069 ***
	(−8.41)	(−8.41)	(−8.42)
Industry	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	11706	11706	11706
Adjusted R^2	0.306	0.306	0.306
F	7.708	7.714	7.715

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

5.4. Robustness Checks

Although EPU is an exogenous variable, we also conduct the following robustness checks to make the research conclusions more robust:

First of all, although we managed to control the variables that might influence internal control through referring to the existing literature, the regressions in our paper may not include all potential factors that influence internal control. To eliminate the influence of potential emitted variables, we used the Hausman test to check the relationships between economic policy uncertainty and internal control. After making the judgment that it was better to adopt a fixed effects model rather than a random effects model, the former was adopted for re-regression of Table 2. We predict that the coefficients we test should be significantly positive.

Table 7 reports the relationship between economic policy uncertainty and internal control. It shows that, when controlling for firm-level fixed effects, the coefficients of EPU_1, EPU_2, and EPU_3 are 1.933, 2.096, and 1.614, respectively. The T-values are 26.05, 27.33 and 24.51, significantly positively at the 1% Level. After eliminating the possible intervention of endogeneity, the major conclusions of our paper still stand.

Table 7. Firm fixed effects: economic policy uncertainty and internal control.

Dependent Variable	IC		
EPU_1	1.993 ***		
	(26.05)		
EPU_2		2.096 ***	
		(27.33)	
EPU_3			1.614 ***
			(24.51)
Controls	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.311	0.312	0.308
F	276.441	286.217	280.039

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

Furthermore, we add time variable (Year) to our main test to eliminate the potential influence of time; Table 8 reports the results controlling time effect. It shows that the coefficients of EPU_1, EPU_2, and EPU_3 are 14.736, 13.736, and 13.747, respectively. All of the T-values are significantly positively at the 1% level. After eliminating the possible time effect, the major conclusions of our paper still stand.

Table 8. Control time effect: economic policy uncertainty and internal control.

Dependent Variable	IC		
EPU_1	14.736 ***		
	(54.84)		
EPU_2		13.736 ***	
		(54.84)	
EPU_3			13.747 ***
			(54.84)
Controls	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes
Observations	19,456	19,456	19,456
Adjusted R^2	0.420	0.420	0.420
F	230.582	230.582	230.582

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels of 10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th.

In order to make our moderation more convincing, we also re-regresses Hypothesis 2a–c using a grouping method to test the difference in the relationship between economic policy uncertainty and

internal control under different conditions. According to the median rank of marketization degree, we have grouped the marketization degree(G_MTK). G_MTK is 1 if the firm is located in the province where total score of the marketization process is in the top 16, and 0 otherwise. SOE is 1 if the firm is a state-owned firm, and 0 if the firm is private. Also, we have grouped the analyst following (G_AF). G_AF is 1 if the firm's number of analysts following is greater than the median of all firms' number of analysts following this fiscal year, and 0 otherwise. The results are shown in Table 9.

Table 9. Grouping method under different conditions.

Dependent Variable	IC					
	G_MTK = 1	G_MTK = 0	SOE = 1	SOE = 0	G_AF = 1	G_AF = 0
EPU_1	14.559 ***	15.746 ***	16.510 ***	13.524 ***	14.487 ***	15.780 ***
	(49.90)	(25.52)	(42.23)	(35.88)	(38.51)	(43.22)
_cons	−38.160 ***	−36.161 ***	−36.842 ***	−34.146 ***	−23.803 ***	−36.812 ***
	(−28.16)	(−13.18)	(−20.76)	(−19.79)	(−12.45)	(−20.99)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Cluster by firm	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16027	3429	8648	10808	9361	10095
Adjusted R^2	0.416	0.451	0.5061	0.3529	0.3999	0.4155
F	279.157	69.801	222.512	144.775	153.150	176.036

T-statistics are reported in parentheses. *, **, and *** indicate significance at two-tailed probability levels o10%, 5%, and 1%. Detailed variable definitions are reported in Appendix A. All continuous variables are winsorized at the 1st and 99th. The test results of EPU_2 and EPU_3 unreported are similar to those of EPU_1, and the results in our paper remain unchanged.

After the group regressions, we use the Suest method to test the difference between groups. For G_MTK, the Chi-square of the difference between groups (G_MTK = 1, G_MTK = 0) is 3.68, and the *P*-value is 0.055. It means that there is significant difference between the two groups (G_MTK = 1, G_MTK = 0). Meanwhile, the coefficient of EPU_1 in group G_MTK = 0 is larger than that in G_MTK = 1, suggesting a higher impact on internal control. For SOE, the Chi-square of the difference between groups (SOE = 1, SOE = 0) is 34.33, and the *P*-value is 0.000. This means that there is a significant difference between the two groups (SOE = 1, SOE = 0). Meanwhile, the coefficient of EPU_1 in group SOE = 1 is larger than that in SOE = 0, suggesting a higher impact on internal control. For G_AF, the Chi-square of the difference between groups (G_AF = 1, G_AF = 0) is 6.86, and the *P*-value is 0.009. This means that there is a significant difference between the two groups (G_AF = 1, G_AF = 0). Meanwhile, the coefficient of EPU_1 in group G_AF = 0 is larger than that in G_AF = 1, suggesting a higher impact on internal control. All the results suggest that our previous results of moderate regressions are robust.

Then, we group the BBD index according to the median and set dummy variable (DEPU). Meanwhile, weight was assigned to the BBD index according to quarter to set variable (SEPU) between continuous variable and dummy variable. Unreported regression results show that they are consistent with our main conclusions.

Finally, as for the dependent variable, internal control in this paper, we re-checked the internal control index after obtaining its natural logarithm. Unreported regression results showed that they are consistent with our main findings.

6. Conclusions

Sustainability is a perpetual topic. First of all, sustainability requires us to consider both the needs of current development and the needs of future development; we cannot pursue temporary development and interests at the expense of the interests of the next generation. Furthermore, sustainability means maintaining development trends even when facing unpredictable environmental shocks. Because the sustainability concept is quite wide, the research on sustainability is diverse and challenging, but mainly includes sustainable urban and rural development [78], sustainable use of the

environment and resources [79], energy sustainability, the economy [80], business and management aspects of sustainability [81], etc. This study is included in a branch of research that considers business and management aspects of sustainability, focusing on firms' sustainability.

Because sustainable development requires the economy to transform from high-speed to high-quality growth, we explore how firms seek sustainable development in a turbulent external environment by conducting the first study analyzing the association between economic policy uncertainty and internal control. We provide evidence that internal control is enhanced as firms seek to handle uncertainty and develop sustainably. Specifically, when economic policy uncertainty is higher, firms will improve internal control. Especially for those firms in the provinces with a low marketization degree, state-owned ones, and ones with a smaller number of analysts following, the effect is even greater. A more obvious promotion effect of uncertainty upon internal control on those firms mentioned above indicates that they are more sensitive to economic policy uncertainty and have more difficulty developing sustainability. Furthermore, we conducted an analysis of side demonstration, finding out that economic policy uncertainty lowers internal control auditing fees, demonstrating the association between uncertainty and internal control from the side. Collectively, these findings enrich the studies of economic policy uncertainty and internal control, giving empirical evidence for linking macro uncertainty factors and the micro foundation of sustainable development for firms.

Different from existing studies that care more about the outcomes of corporate sustainable development, such as profit and sales income [28,82], this study focuses on the micro-foundation of firms' sustainable development, i.e., internal control. We believe that internal control is the micro-foundation of corporate sustainable development, so we directly test the relationship between economic policy uncertainty and internal control, and explore whether enterprise managers will perceive economic policy uncertainties when constructing internal control and how to deal with the risks brought about by such uncertainties. There are two reasons to support us. First, based on the important internal control framework, the COSO framework recommended by the SEC, the four main objectives of internal control are: (1) effectiveness and efficiency of operations, (2) reliability of financial reporting, (3) compliance with applicable laws and regulations, and (4) safeguarding of assets provide guarantees. We have a view to improving efficiency, reducing risk, helping ensure the credibility of financial statements, complying with laws and regulations, and protecting asset safety. The COSO framework believes that an internal control system consists of five elements: controlled environment, risk assessment, internal control activities, information and communication, and supervision, which run all through enterprise management and business activities. At the same time, an overwhelming number of existing studies show that good internal control is closely related to corporate sustainable development, such as improving corporate investment efficiency [39], reducing the likelihood of bankruptcy and financial distress [83], and lowering the risk of stock price collapse [16,84,85]. No matter the objectives, elements, or existing experience, they all indicate that internal control can effectively improve the sustainable development of enterprises, serving as the micro-institutional foundation for corporate sustainable development.

Moreover, our research results show that, when economic policy uncertainty is higher, enterprises will improve the quality of internal control; it is further found that the internal control audit fees of enterprises will be reduced. As mentioned previously, different from previous studies that focus more on the influence of economic policy uncertainty on financial decisions such as investment and financing, we have studied the micro-institutional foundation of enterprises for sustainable development, i.e., internal control, which is a more fundamental issue, exploring the influence of economic policy uncertainty on the micro-institutional foundation of corporate sustainable development. Furthermore, our research has successfully captured how, when constructing and investing in internal control, managers can truly perceive external economic uncertainties and make corresponding responses, so as to effectively protect against the risks brought about by the uncertainties and ensure the sustainable development of enterprises. That economic policy uncertainty reduces internal control audit fees also proves that enterprises have indeed improved the efficiency of resource allocation,

backing up the relationship between economic policy uncertainty and internal control. The existing literature mainly discusses the influence of internal factors on internal control from the perspective of corporate traits or governance, with few considering the influence of external factors on internal control.

By drawing on the external variable of economic policy uncertainty, this paper studies the influence of external environmental uncertainty on the internal control, thus expanding the macroscopic view of internal control research. Therefore, this paper examines a more fundamental question: whether economic policy uncertainty will affect the system construction of corporate sustainable development, i.e., internal control; in other words, will a company seek institutional dividends by raising internal controls when external uncertainty increases? This paper also further advances the research on external environment and corporate sustainable development, and provides more complete evidence for the study of economic policy uncertainty and corporate sustainable development.

The current study has several important implications. First of all, the influence of economic policy uncertainty upon firms comes from implicit economic policy guidance and intensity, so policymakers can ease the pressure upon information demand by raising the information disclosure level and improving information consistency and comparability before and after the introduction of economic policies; they should also ensure that introduced policies are put into practice, so as to decrease possible losses that might be incurred by firms. Moreover, given that internal control serves as a means for firms to enhance their own ability to cope with risk, for the purpose of sustainability, policymakers need to emphasize the design and arrangement of an internal control system, elements and execution procedures, and ensure effective implementation of risk management and control procedures. There are several limitations to this work: first of all, because the Chinese economic policy uncertainty index is based on article indexes in the English version of the *South China Morning Post*, there may be a certain contextual discrepancy between it and the Chinese version. The development of emerging industries and firms has brought about new opportunities and challenges for sustainability. Future research may center on the sustainability of emerging firms, such as entrepreneurial firms.

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Appendix A

Type	Abbreviation	Measurements
Dependent Variable	IC	"Internal Control Index for Chinese Listed Companies" constructed by Chen et al. [14]
Independent Variable	EPU_1	The method adopted by Baker et al. [13] for building an index from the *South China Morning Post* is as follows: first, select articles about China and uncertainty in the newspaper, i.e., news reports containing "China, Chinese," "economy, economic,," and "uncertain, uncertainty." Then, search for policy-related articles in China EU, i.e., "policy OR spending OR budget OR political OR "interest rates" OR reform" AND "government OR Beijing OR authorities" AND "tax OR regulation OR regulatory OR "central bank" OR "People's Bank of China" OR PBOC OR deficit OR WTO." At the end, the number of the articles about policy uncertainty of the month is divided by the total number of articles, with 100 as the average benchmark for standardization processing. The method of calculating economic policy uncertainty is EPU_1=Σ monthly uncertainty index (BBD index)/12; considering the regression coefficient, EPU_1/100 is carried out.
	EPU_2	The average of 12-month BBD index standard deviation weight divided by 100, in which monthly weight demands calculation of standard deviation every month to be arranged in order from small to large (1–12).
	EPU_3	The weighted average of 12-month BBD index divided by 100, in which the weight for 1–12 months is, respectively, 1–12.

Type	Abbreviation	Measurements
Moderating variable	MKT	Total score in marketization process in the province or region where the firm is located.
	SOE	Nature of property right, an indicator variable that takes a value of 1 if a firm is state-owned for fiscal year, and 0 otherwise.
	AF	Analyst following, the number of analysts following a firm.
Control Variable	Size	Firm size, which equals the natural logarithm of a firm's total assets.
	Roe	Return on equity, the ratio of net income to common stockholders' equity.
	Growth	Sales growth, the ratio of operating income to the lagged operating income minus one.
	Export	Foreign sales, an indicator variable that takes a value of 1 if a firm has foreign sales for the fiscal year, and 0 otherwise.
	Big4	Auditor firm, an indicator variable that takes a value of 1 if a firm's auditor is a Big 4 audit firm for the fiscal year, and 0 otherwise.
	Bsegment	Business segments, the natural logarithm of a firm's business segments for the fiscal year.
	MA	Mergers and acquisitions, an indicator variable that takes a value of a if a firm is involved in mergers and acquisitions for the fiscal year, and 0 otherwise.
	RSTR	Restructuring, an indicator variable that takes a value of a if a firm is involved in restructuring for the fiscal year, and 0 otherwise.
	Lage	Firm age, natural logarithm of total number of years after getting listed at the end of accounting year plus 1.
	BSIZE	Size of board, number of directors serving on the board.
	Ind	Board independence, which equals the ratio of the number of independent directors to the total number of directors on board, multiplied by 100.
	Lev	Financial leverage, which equals the ratio of total liabilities to total assets.

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