

## Article

# Product Market Competition, Corporate Investment, and Firm Value: Scrutinizing the Role of Economic Policy Uncertainty

Oluwaseyi Ebenezer Olalere \*  and Janine Mukuddem-Petersen

Graduate School of Business, University of Cape Town, Cape Town 8002, South Africa;  
janine.mukuddem-petersen@gsb.uct.ac.za

\* Correspondence: oluwaseyi.olalere@uct.ac.za

**Abstract:** This study examines the effects of product market competition on corporate investment and firm value and the moderating role of economic policy uncertainty on this relationship. The firm-level data of 1971 listed corporate firms for BRIC (Brazil, Russia, India, China) countries during 2009–2020 were used, totaling 23,652 observations. Using the GMM estimates, our results depict that product market competition significantly influences corporate investment and firm value in BRIC countries. The result also reveals that economic policy uncertainty plays a significant role in the impact of product market competition on corporate investment and firm value at Brazilian, Russian, Indian, and Chinese firms. The study's findings contribute to the body of knowledge by providing new evidence on the relationship between PMC, corporate investment, and firm value. These findings are vital for policymakers and regulatory bodies to focus on economic uncertainty in a competitive environment without jeopardizing investment returns in emerging markets.

**Keywords:** corporate investment; product market competition; economic policy uncertainty; firm value

**JEL Classification:** C33; D21; G20; G30



**Citation:** Olalere, Oluwaseyi Ebenezer, and Janine Mukuddem-Petersen. 2023. Product Market Competition, Corporate Investment, and Firm Value: Scrutinizing the Role of Economic Policy Uncertainty. *Economies* 11: 167. <https://doi.org/10.3390/economies11060167>

Academic Editor: Ștefan Cristian Gherghina

Received: 21 April 2023

Revised: 1 June 2023

Accepted: 9 June 2023

Published: 14 June 2023



**Copyright:** © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

## 1. Introduction

The past two decades have brought about rapid globalization of both product and financial markets, generating a series of innovation-driven economic development policies that promote market integration and encourage intense competition for significant economic recovery. Theoretical studies argue that globalization increases competition in the product market, which influences corporate investment decisions. Six reasons are specified in the literature through which globalization of economic activities can increase competition (Mello and Wang 2012; Frésard and Valta 2016): first, increase in the flow of trade and foreign direct investment; second, reduction in barriers; third, rapid information diffusion; fourth, greater transfers in technology and processes; fifth, cross-border labor migration; sixth, geographical convergence of prices (Mello and Wang 2012; Frésard and Valta 2016). The combination of these factors has resulted in increased competition among firms in domestic markets, and these competitive pressures not only influence corporate investment decisions but also affect the cash flow stability of firms. As a result, many critical questions remain unanswered, such as “Does product market competition (PMC) impact corporate investment and firm value?” and “What is the moderating role of economic policy uncertainty (EPU) on the relationship?” Thus, this research addresses these fundamental questions.

Classical economic theory argues that competition in the product market is an essential driver of economic efficiency and, thus, has profound implications for corporate investments and firm value. According to Schumpeter's (1912) creative destruction theory, firms in highly competitive markets are more likely to invest in innovative activities and earn additional profits from their innovations. This predicts that corporate managers are under

enormous pressure to optimize profits by increasing efficiency to remain competitive in the product market (Giroud and Mueller 2011; Li et al. 2020). Proponents of the industrial organization view assert that competition is determined by the industry dynamics, such as the extent to which a firm controls market share, i.e., industry concentration. Abdoh and Varela (2017) suggest that competition bolsters valuable investments when a firm is not financially constrained and reduces investments when they are financially constrained. Studies also revealed that economic policy uncertainty reduces corporate investments and, thus, firm growth (Wang et al. 2014). Similarly, Ahsan et al. (2021) believe that uncertainty may also influence a firm's operating environment, reducing future investment opportunities and firm growth due to new and changing economic policies.

Uncertainty is triggered by economic shocks, which can decrease long-term investment and output for businesses due to rising expected costs. More importantly, corporate investment is usually costly and irreversible. Changes in policy impact how businesses operate and, consequently, how they make investments. Aside from political factors, policy uncertainty is typically linked to unforeseen economic events that influence firms' expected return to discount their future cash flows. Pastor and Veronesi (2012) argue that EPU raises operating costs, lowers investment, and causes economic contraction. Ongoing policy reform may increase uncertainty, delay investments, and possibly influences the firm's response to competition in product markets. Consequently, Akdoğan and MacKay (2008) document that firms operating in a highly competitive market invest more rapidly than those in monopolistic industries. An alternative argument posited that competition raises uncertainty's negative effects on investments due to the risk of operating in competitive marketplaces.

In addition to theoretical justification and empirical evidence, we consider that BRICs' global investment climate is relatively mature to form a more particular and comprehensive hypothesis. The BRICs countries are dynamic to the world economy with rapid economic growth, as evidenced by the average GDP growth of 25% nominal and USD 16.039 trillion. Over the years, these countries have contributed to the global economy's growth and development. Currently, the stakes are higher than ever before because emerging economies have become central to the global economy. Unlike the findings in existing research, this study has significant theoretical and empirical implications. First, there is a lack of empirical evidence focusing on emerging economies, such as the BRIC (Brazil, Russia, India, and China) countries. Second, there is a dearth of research on the role of EPU on PMC, corporate investment, and firm value in the empirical literature. To our knowledge, the findings of this study from the emerging market's perspective are new.

Several studies have argued that various policy uncertainties have a major impact on corporate behavior (Khan et al. 2019; Wang et al. 2017; Chen et al. 2017) and that firms in emerging economies face various types of uncertainties that have a major influence on corporations. Our study assumes that these uncertainties (particularly policy-related ones) are more likely to significantly affect the relationship between product market competition, corporate investment, and firm value of firms across BRIC countries. The contribution of this study is crucial for analytical and apparent reasons. Since these countries have distinct characteristics, such as policies toward economic openness, regulatory frameworks, and competitive environments, they are classified as one of the most sophisticated emerging economies regarding potential investment destinations (Fedderke et al. 2017). Hence, our study offers a robust and informative analysis of each country. Third, we apply a GMM model estimation to understand the dynamic role of economic policy uncertainty on PMC, corporate investment, and firm value nexus. The study focuses on listed corporate firms in BRIC countries using sample data from 2009–2020.

Overall, this study empirically contributes to the literature in multiple ways. Firstly, the findings of this study revealed that product market competition significantly influences corporate investment and firm value of firms. Secondly, the results also show that the interactive term PMC\*EPU significantly impacts corporate investment and firm value. These findings have important implications for emerging economies. Finally, we utilize an

alternative measure of competition using the Herfindahl–Hirschman index (HHI) method to provide a concentration effect on corporate investment and firm value. The remaining sections of this study are summarized as follows. Section 2 reviews the literature. Section 3 discusses the data and empirical methods. Section 4 presents our findings and discussions. Section 5 concludes the study.

## 2. Literature Review

The theoretical literature on the link between competition, corporate investment, and firm value remains ambiguous and relatively new, particularly in emerging economies. There are still conflicting arguments on the relationship, and exploring the role of EPU on the nexus is novel. A study documented that increased product market competition reduces not only market power and expected profit but also increases the risk to a firm's future cashflows (Frésard and Valta 2016). Theoretical arguments also reveal that a high PMC increases the risk of business failure perceived by investors and market participants. A seminal study on product market competition confirmed its effect on investments and economic productivity (Stigler 1958). Similarly, studies have shown that competition in the product market has a significant effect on investment (Jiang et al. 2015; Abdoh and Varela 2017), asset pricing (Bustamante and Donangelo 2017), and corporate cash holdings (Alimov 2014).

Empirical evidence suggests that firms' investment and financing decisions are linked to the competitive structure of the product market and the strategic interactions among market participants. Irvine and Pontiff (2009) state that the idiosyncratic volatility of stock returns and operating cash flows have significantly increased in recent decades. They ascribe the changes to intense competition. However, others argued that firms in highly concentrated markets have reduced idiosyncratic volatility compared to those that operate in competitive markets. Stoughton et al. (2017) argue that increased competition results in sub-optimal investment among firms. This suggests that PMC is also likely to reduce predicted profits, adversely influence firm efficiency, and increase the likelihood of failure (Lemma et al. 2018; Babar and Habib 2021). The study by Laksmana and Yang (2015) reveals that competition encourages corporate firms to invest in risky investments but also restrains management's use of free cash flow. The study reinforces that competition encourages efficient managerial behaviour because shareholders may compare managers' performance to the performance of other firms.

Jiang et al. (2015) found a positive relationship between PMC and corporate investment in Chinese manufacturing firms. The study reports that leading industries invest more, and such positive relationships are linked to environments characterized by rapid and predictable growth. According to the findings of Akdoğu and MacKay (2008), competition encourages firms to accelerate investment activities. This is because the value of postponing investment diminishes when investment opportunities are uncertain. The study by Abdoh and Varela (2018) demonstrates that competition enhances cash-flow investments; however, this is only true for firms that are not financially constrained. The findings suggest that competition reduces managerial slack and induces corporate executives to invest in value-added activities. In addition, Sabherwal and Thai (2019) explore the relationship between competition and cash holdings by employing a Tobit regression over the period of 1999–2015. The result demonstrates that increased (decreased) competition across countries correlates with increased (decreased) cash holdings. This relationship, however, deteriorates when firms face higher financial constraints.

Lyandres and Palazzo (2016) found an inverse relationship between a firm's cash holding and their competitors. The study argued that as a firm accumulates more cash, the possibility that a firm will invest more in innovation increases as well, reducing competitors' future earnings and the marginal advantage of cash holdings. This view was supported in the study by Aghion et al. (2005), confirming that competition tends to increase the innovative activities of top firms while decreasing the propensity for small firms to innovate. Likewise, Minniti (2010) explains that competition forces firms to invest more in

developing new products to replace outdated items. Furthermore, while theories may have suggested that competition improves efficiency and discourages managerial slack, stakeholders generally oppose competition due to its adverse impacts on firm earnings. [Ryu \(2019\)](#) investigated the impact of PMC on stock returns of firms in Korea. The result reveals that higher competition in the product market negatively affects stock returns.

Economic theory postulates that competition in product markets enforces discipline on risk-averse and effort-averse managers. It asserts that an increase in market competition has two opposite effects on managerial incentives. When competition increases, the likelihood of failure and performance-related job loss increases too ([Sheikh 2018](#)). On the other hand, increased competition lowers profits, and the value of any cost reduction benefits of higher effort. Hence, the overall effect may be ambiguous. Competition plays a vital role in a well-organized market. It helps lower prices, fosters innovation activity, results in less moral hazard, and provides good product quality to market participants. However, on the one hand, intense competition generates more consumer choices, so firms overuse resources to retain them. On the other hand, fierce competition induces firms to postpone investment, losing profitable opportunities.

Theoretical and empirical studies have affirmed the existence of a relationship between PMC, corporate investment, and firm value. However, there is conflicting evidence regarding the relationship between PMC, business investment, and firm value. [Stoughton et al. \(2017\)](#) contend that a high degree of PMC leads to ineffective investments. The study explains that a firm's information environment plays a crucial role in its investment decisions. Opposing arguments, however, suggest that PMC improves investment and expected profit when firms operate in an environment with high, predictable growth ([Jiang et al. 2015](#)). These conflicting views allow the study to address the inconsistencies in existing studies. Therefore, the study postulates that PMC significantly influences corporate investment and firm value.

**H<sub>1</sub>.** *PMC significantly influences corporate investment.*

**H<sub>2</sub>.** *PMC significantly influences firm value.*

The theoretical study asserts that under the condition of EPU, firms cannot accurately predict whether existing policies will change, or the timing, direction, and extent of future changes in a fierce market competition. Some studies argued that policy uncertainty shocks can cause problems by reducing capital resources, raising financial capital costs, and lowering firm performance and value ([Ma and Hao 2022](#)). Market expectations for firm value and profitability are lowered as a result of economic policy uncertainty, which also lowers corporate investments and real asset returns. Classical real options theory suggests that an increase in EPU will increase an investment project's "wait" value, which will also be influenced by the behavior of its competitors. Economic policy uncertainty increases competition in the market, reduces the value of "waiting" and severely erodes the value of projects, and, thus, encourages firms to invest in innovation earlier. Hence, we can argue that economic policy uncertainty intensifies the degree of competition in the product market.

The predictions of prior studies on the impact of economic policy uncertainty (EPU) on investment and performance are ambiguous and relatively diverse. For example, [He and Niu \(2018\)](#) provide evidence that the valuation of banks is negatively affected by the EPU. Similarly, [Chen et al. \(2019\)](#) found that corporate enterprises reduce short-term and long-term investment during severe policy uncertainty. [Olalere and Mukuddem-Petersen \(2022\)](#) present a different argument on how EPU influences firm value in emerging markets. Their findings posit that EPU affects firm value regardless of this diversity in the business environment and economic conditions. The study further argued that a fragile institutional environment could be attributed to the decline in firm value during higher EPU, meaning that consistent regulatory policy is critically crucial under economic reform. In other words, higher uncertainty adversely influences a firm's operating environment due to a volatile

policy environment. Hence, this study hypothesizes that EPU significantly moderates the nexus between PMC, corporate investment, and firm value.

**H<sub>3</sub>.** *EPU significantly moderates the nexus between PMC and corporate investment.*

**H<sub>4</sub>.** *EPU significantly moderates the nexus between PMC and firm value.*

### 3. Sample and Methodology

#### 3.1. Data and Variable Measurements

The study aims to explore the role of EPU on PMC, corporate investments, and firm value nexus of firms. The study uses sample data for the period (2009 to 2020) from 1971 listed corporate firms. The firm-level data in BRIC (Brazil, Russia, India, China) countries were extracted from the Eikon database. However, we did not consider South Africa due to the unavailability of complete data for the construction of variables on EPU. Essentially, we did not consider firms with missing variable data. The sample selection criteria include (1) a non-financial institution, (2) complete financial statements from 2009 to 2020, and (3) the firm's financial statements containing the necessary information to construct the research variables from 2009 to 2020 (see Table 1). Hence, we exclude financial institutions, such as conventional banks, insurance companies, and real estate, and only firms with complete and sufficient data were selected during the sample period. In this study, 23,652 firm-year observations are used for statistical testing after applying the sample selection criteria.

**Table 1.** The structure of panel data.

Country	Number of Firms Population	Excluded from Population	Full Sample	Number of Observations
Brazil	382	275	107	1284
Russia	614	504	110	1320
India	4313	3595	718	8616
China	4359	3323	1036	12,432
Total	9668	7697	1971	23,652
Sectors	Brazil	Russia	India	China
Industrials	30	40	315	403
Equipment and services	17	13	35	51
Consumer cyclicals	15	10	107	128
Consumer non-cyclicals	12	9	69	44
Materials	10	13	93	110
Energy	3	11	18	21
Utilities	15	9	41	82
Healthcare	3	2	23	94
Information technology	2	3	17	103
<b>Total sample size</b>	<b>107</b>	<b>110</b>	<b>718</b>	<b>1036</b>

Source: authors' computation.

The Lerner index is used to measure product market competition because it provides a systematic review of market power, as illustrated in Equation (1). The Lerner index identified the degree of monopoly with the difference between the firm's price and its marginal cost at the profit-maximizing rate of output (Elzinga and Mills 2011; Spierdijk and Zaouras 2017). Hence, a bigger difference between P and MC meant greater monopoly power. It is a more direct measure of PMC because it focuses on the pricing power apparent in the difference between price and marginal cost, thereby capturing the ability of firms to set prices above their marginal cost of production (Pontuch 2011; Elzinga and Mills 2011). It is directly linked with the long-run equilibrium conditions in a competitive market where

price equals marginal cost. It takes the value of 0 in the case of perfect competition and 1 under absolute monopoly. Equation (1) is as follows:

$$Lerner_{it} = \frac{Price_{it} - MC_{it}}{Price_{it}} \tag{1}$$

In the case of corporate firms, we defined the Lerner index as the firm’s operating profit margin (sales revenue minus costs divided by sales revenue) (Pontuch 2011), where COGS is the cost of goods sold and SGA is selling, general, and administrative expenses (Datta et al. 2013). Hence, Equation (1) can be rewritten as follows:

$$Lerner_{it} = Sales\ revenue_{it} - (COGS_{it} - SGA_{it}) / Sales\ revenue_{it} \tag{2}$$

Corporate investment is measured as capital investment scaled by total assets in the previous year. The enterprise value scaled by earnings before interest, tax, depreciation, and amortization (EBITDA) is used to measure the firm value (Bhullar and Bhatnagar 2013). The EPU index by Baker et al. (2016) was extracted from the source and converted into yearly frequency by taking twelve-month averages. We use GDP growth to capture the stability and instability of economic activity, and the consumer price index (CPI) is used to capture the inflation rate (Alouane et al. 2022). Asset tangibility (TAN) is measured as net property, plant, and equipment divided by total assets. The firm size is measured by the natural logarithm of total assets, while the quality of management is estimated using the return on assets (ROA) (Ahsan et al. 2021; Kim et al. 2021). The total debt scaled by total assets is used to measure leverage, and the operating expenses ratio measures corporate efficiency. The firm’s cash holding is measured by cash and short-term investments scaled by total assets (Yung and Nguyen 2020). Hence, Figure 1 illustrates the theoretical framework to show the variables in the study.

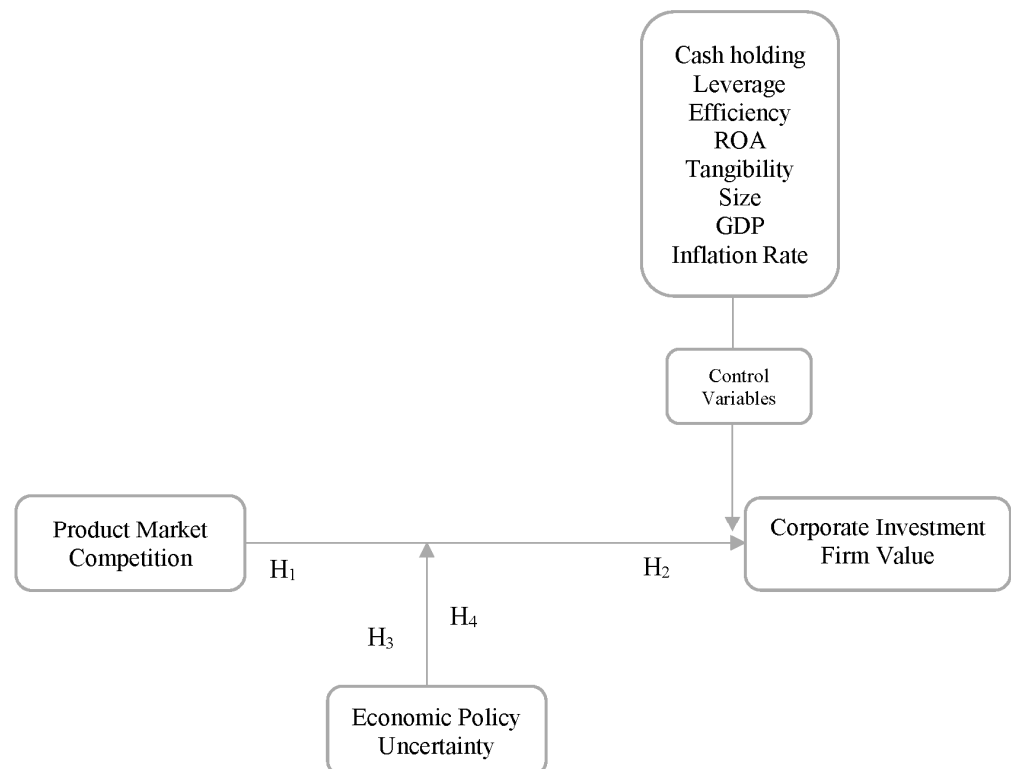


Figure 1. Theoretical model.

### 3.2. Model Specification and Econometric Method

This study intends to examine the moderating effect of EPU on PMC, corporate investment, and firm value nexus. Furthermore, the test is conducted to determine the impact of PMC on corporate investment, and firm value, and to analyze the effect of joint interaction between EPU and PMC on corporate investment and firm value. To achieve these objectives, this study estimates the following dynamic regression model:

$$CI_{it} = \alpha_0 + \delta CI_{it-1} + \beta_1 PMC_{it} + \beta_2 CH_{it} + \beta_3 LEV_{it} + \beta_4 EFF_{it} + \beta_5 ROA_{it} + \beta_6 TAN_{it} + \beta_7 SIZE_{it} + \beta_8 INFL_{it} + \beta_9 GDP_{it} + \varepsilon_{it} \quad (3)$$

$$FV_{it} = \alpha_0 + \delta FV_{it-1} + \beta_1 PMC_{it} + \beta_2 CH_{it} + \beta_3 LEV_{it} + \beta_4 EFF_{it} + \beta_5 ROA_{it} + \beta_6 TAN_{it} + \beta_7 SIZE_{it} + \beta_8 INFL_{it} + \beta_9 GDP_{it} + \varepsilon_{it} \quad (4)$$

$$CI_{it} = \alpha_0 + \delta CI_{it-1} + \beta_1 PMC_{it} + \beta_2 CH_{it} + \beta_3 LEV_{it} + \beta_4 EFF_{it} + \beta_5 ROA_{it} + \beta_6 TAN_{it} + \beta_7 SIZE_{it} + \beta_8 INFL_{it} + \beta_9 GDP_{it} + \beta_{10} EPU_{it} + \beta_{11} PMC * EPU_{it} + \varepsilon_{it} \quad (5)$$

$$FV_{it} = \alpha_0 + \delta FV_{it-1} + \beta_1 PMC_{it} + \beta_2 CH_{it} + \beta_3 LEV_{it} + \beta_4 EFF_{it} + \beta_5 ROA_{it} + \beta_6 TAN_{it} + \beta_7 SIZE_{it} + \beta_8 INFL_{it} + \beta_9 GDP_{it} + \beta_{10} EPU_{it} + \beta_{11} PMC * EPU_{it} + \varepsilon_{it} \quad (6)$$

The two-step system GMM model was used in this study. Some key factors influence our decision to use the GMM estimator. First, GMM addresses the potential endogeneity problem and the unobserved specific effects by using the lag of specific variables in the model. In idiosyncratic disturbances, individual-specific patterns of heteroscedasticity and serial correlation may be present. Second, it provides reliable and efficient predictions and less bias for studies with limited time observations and a constant time-series process. The GMM is considered a perfect estimator if the panel dataset has a short time dimension (T) and a larger country dimension (N). Third, given the high probability of correlation with previous occurrences (especially at time  $t - 1$ ), the GMM has an autoregressive dynamic that must be considered.

In the GMM model, the Sargan and Hansen J test of over-identifying restrictions is used to test the instruments' validity. The result validates that the models are well-specified (Roodman 2009; Kripfganz 2020). The Arellano–Bond test (AR2) confirms the absence of higher-order serial correlation in the model. According to Roodman (2009), the study can conclude that the GMM is an appropriate model because it allows for the generation of robust estimators with fewer assumptions.

## 4. Results and Discussion

### 4.1. Descriptive Statistics

Table 2 shows the descriptive statistics for each variable. The product market competition (PMC) has a mean value of  $-2.9\%$  with a  $24\%$  standard deviation. The corporate investment is estimated at  $0.36\%$  on average, with a  $1.8\%$  standard deviation. The firm value has a mean value of  $19\%$ , while economic policy uncertainty grew at an average value of  $7.6\%$  during the study period. The mean value for firm cash-holding is  $0.24\%$  during the study period. The leverage has a minimum and maximum value of  $-23.81\%$  and  $83\%$ , with an average value of  $6.3\%$ , whereas the average efficiency ratio is  $0.81\%$ . The mean return on asset ratio is  $0.11\%$ , while the size has a mean value of USD 22.5. The asset tangibility has a mean value of  $1.09\%$ . The inflation rate has a mean value of  $4.5\%$ . The average GDP growth rate in the BRIC countries is  $0.6\%$  for the study period.

Table 2. Summary of descriptive statistics.

Var	Aggregate Data		Brazil		Russia		India		China	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
PMC	−2.956	24.418	−0.3729	3.7135	0.4120	13.863	−15.682	286.602	−41.179	19.598
CI	0.3655	1.8608	0.0495	0.0444	0.0567	0.1382	1.1638	7.9707	0.0526	0.0528
FV	19.892	29.937	10.987	20.4185	12.879	59.007	13.515	17.859	46.907	358.024
EPU	7.6175	0.7095	7.6361	0.3948	7.7106	0.4211	7.0637	0.3456	7.9894	0.6987
CH	0.2488	0.2053	0.1223	0.1261	0.0987	0.1544	0.3621	0.2300	0.1992	0.1549
LEV	6.303	1.8128	0.4085	0.1764	7.3169	119.69	0.4947	0.2172	0.5514	0.2195
EFF	0.8134	5.7556	0.5824	0.5109	1.1049	1.2009	0.9978	0.7605	0.6785	7.8986
ROA	0.1154	0.6271	0.0950	0.0628	3.0730	36.370	0.1087	00.0860	0.0758	0.5398
TAN	1.0921	10.1484	0.3363	0.1660	3.3388	11.1344	0.2673	0.1993	0.2157	0.1593
SIZE	22.573	1.7029	22.4740	1.5682	22.5024	1.9684	22.858	1.9196	22.393	1.4861
INFL	4.5148	3.2709	5.5270	1.8706	6.9649	3.5184	7.1859	2.9900	2.2989	1.3733
GDP	0.6009	0.3739	0.0808	0.3192	0.0707	0.3387	0.5610	0.4253	0.7386	0.2003

Notes: PMC = product market competition; CI = corporate investment; FV = firm value; EPU = economic policy uncertainty; CH = cash-holding; LEV = leverage; EFF = efficiency ratio; ROA = return on assets; SIZE = firm size; GDP = gross domestic product growth; TAN = tangibility; INFL = inflation rate.

#### 4.2. Estimation of Results

The dynamic test results for the entire sample of firms in the BRICs countries are presented in Table 3. This study explores the direct influence of PMC on corporate investment (CI) and firm value (FV). We utilized the GMM estimator as a regression instrument. The J-statistic test results show that all models do not reject the null hypothesis, indicating that over-identifying restrictions are valid and model specifications are accurate (Arellano and Bond 1991). Furthermore, testing the AR(2) second-order serial correlation reveals that the  $\rho$ -value is insignificant at 0.05, implying that all models are free of serial autocorrelation issues. In addition, all lag(−1) variables demonstrate significance at the 1% level, attesting to the dynamic characteristics of the model specification. Finally, the selection of dynamic model specifications has been validated. The results can, therefore, be further interpreted.

Table 3 presents the impact of PMC on corporate investment (Model 1). The Model 1 test results indicate that the coefficient of PMC (0.0377) positively and significantly affects corporate investment at a 5% level. The result shows that increased PMC tends to increase the corporate investment of firms. The results support the viewpoints of Jiang et al. (2015) who found a negative relation. They argued that competition drives managers to invest more in capital expenditure, R&D, and riskier investments to survive in the long run. The result also supports the argument that competition restricts managers from making bad investments by limiting the overinvestment of free cash flows. According to Abdoh and Varela (2018), competition bolsters significant investment when firms are financially buoyant. They argued that the level of investment is driven by a firm's financial growth and value. Hence, the results of this test confirm and support the theoretical and empirical argument that an increase in PMC also increases corporate investment.

The test results in Model 2 show that PMC positively and significantly affects firm value at a 1% level. This implies that a rise in PMC improves firm value. This finding aligns with research conducted by Gu (2016) who found a positive relation. The study claims that firms that operate in competitive markets earn higher returns but are only common among R&D-intensive firms. The study further argued that firms in a competitive market are more likely to engage in innovative activities and are, therefore, more likely to earn higher future stock returns. Firms in a competitive marketplace are more inclined to take risks and innovate, which should lead to higher stock returns in the long run. Thus, based on the test results obtained in models 1 and 2, this study concludes that the influence of PMC on corporate investment and firm value in BRIC countries occurs due to the highly competitive markets and investment flows.

Models 3 and 4 show that the interactive term PMC\*EPU negatively and significantly affects corporate investment and firm value. This shows that the interaction between PMC



and EPU reduces corporate investment and firm value. In other words, higher levels of EPU in a competitive market will repress corporate investment and firm value. Under perfect competition, however, some studies argued that greater uncertainty would enhance the expected profit margin of capital and hence increase investment (Wang et al. 2014).

**Table 3.** Result of firm value Sys-GMM model.

Variables	CI Model 1	FV Model 2	CI Model 3	FV Model 4
L.CI <sub>it-1</sub>	0.4841 *** (27.19)		0.4902 *** (27.51)	
L.FV <sub>it-1</sub>		0.3981 *** (26.00)		0.4104 *** (26.35)
PMC	0.0377 ** (1.98)	0.0398 *** (3.18)	0.0758 ** (1.99)	−0.0971 *** (−3.84)
CH	−0.1634 ** (−2.43)	−0.1303 ** (−3.45)	−0.6482 ** (.2740)	−0.5721 *** (−3.74)
LEV	−0.0012 (−0.11)	−0.0108 *** (−3.37)	−0.0527 (−0.54)	−0.0180 (−0.40)
EFF	0.0964 *** (3.24)	−0.0587 *** (−4.49)	0.3920 *** (3.29)	−0.3099 *** (−5.83)
ROA	−0.0664 * (−1.78)	0.0143 (0.40)	−0.0845 (−1.24)	0.0656 (0.88)
TAN	0.0273 (0.60)	−0.0419 (−0.76)	−0.0014 (−0.15)	−0.0261 *** (−4.08)
SIZE	−3.7945 *** (−4.33)	−4.9016 *** (−9.85)	−0.4330 *** (−4.75)	−0.2407 *** (−5.38)
INFL	0.0354 *** (2.94)	−0.0309 *** (−7.84)	0.0346 *** (2.84)	−0.0456 *** (−6.11)
GDP	0.1615 *** (4.83)	−0.1995 *** (−7.95)	0.3519 *** (5.20)	−0.5327 *** (−10.85)
EPU			−0.0561 ** (−2.30)	−0.1723 *** (−12.57)
PMC*EPU			−0.0007 * (−1.86)	−0.0030 ** (−2.06)
_cons	10.389 *** (3.81)	17.236 *** (10.95)	6.2124 *** (3.31)	11.576 *** (11.85)
AR1	−2.656 (0.0079)	−1.2447 (0.0011)	−11.934 (0.0000)	−11.5 (0.0012)
AR2	−0.7281 (0.4665)	1.1355 (0.2562)	1.608 (0.1078)	2.184 (0.2891)
Hansen test	150.921 (0.1335)	449.393 (0.1205)	111.407 (0.3162)	434.222 (0.5351)
Country effect	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes
F test	1028.05 (0.0000)	1064.90 (0.0000)	1035.32 (0.0000)	1169.17 (0.0000)
No. of instruments	75	75	77	77
Observations	23,652	23,652	23,652	23,652

Note: \*\*\* significant at 1%, \*\* significant at 5%, and \* significant at 10%.

### 4.3. Estimation of Results by Country

#### 4.3.1. Product Market Competition, Corporate Investment, and Firm Value

In Table 4, PMC negatively and significantly impact corporate investment at Brazilian firms. This indicates that an increase in PMC decreases corporate investment, giving rise to recurrent volatility in investment. This finding signifies that with a 1% decrease in PMC, corporate investment increases by 15.2%. The results support the argument that increased competition motivates managers to defer investment in risky projects when firms are financially constrained. The results support the viewpoints of [Crepon et al. \(2006\)](#), [Jiang et al. \(2015\)](#), and [Abdoh and Varela \(2018\)](#), who found a negative relation. The result for Russian firms reveals that the coefficient of PMC ( $-0.0379$ ) negatively and significantly impacts corporate investment. This implies that intense PMC reduces the corporate investment of Russian firms. This result suggests that the corporate investment of firms will substantially decline if there is a steady increase in competition. The results support the viewpoints of [Jiang et al. \(2015\)](#), and [Abdoh and Varela \(2018\)](#) who found a negative relation.

Similarly, the results for the Indian firms reveal that the coefficient of PMC ( $-0.1584$ ) has a negative and significant influence on the corporate investment of firms. This suggests that a 1% decrease in PMC will increase corporate investment by 15.8%. The findings imply that an increase in PMC decreases corporate investment. [Valta \(2012\)](#) reveals that increased PMC raises financing costs, which may force managers to invest less than optimum to maintain an adequate level of internal funds. However, the findings for Chinese firms show that the coefficient of PMC ( $0.0254$ ) positively and significantly influences corporate investment. The results imply that a 1% rise in PMC will increase corporate investment by 2.5%, which suggests that an increase in PMC improves corporate investment. This finding aligns with research conducted by [Van Vo and Le \(2017\)](#), [Gu \(2016\)](#), and [Shin and Lee \(2022\)](#), who found a positive relation. The study claims that firms that operate in competitive markets earn higher returns, but only among R&D-intensive firms. The result also shows this association is more pronounced for firms with weak internal corporate governance mechanisms.

The empirical model in Table 4 indicates that the coefficient of PMC ( $0.0682$ ) positively and significantly impacts the firm value at a 1% level. This suggests that a 1% rise in PMC increases firm value by 6.82%. This shows that a rise in competition improves firm valuation. [Gu \(2016\)](#) reveals that firms that operate in highly competitive industries earn higher returns but are only common among R&D-intensive firms. The implication is that firms in highly competitive markets are more likely to engage in innovative activities and are, therefore, more likely to earn higher future stock returns. However, the result does not support the findings by [Moradi et al. \(2017\)](#), who find a negative relation between PMC and performance. The finding for Russian firms reveals that the coefficient of PMC ( $0.0169$ ) significantly and positively affects firm value at a 1% level. This suggests that a 1% rise in PMC increases firm value by 1.69%. The result implies that corporate firms in highly competitive markets are mostly R&D-intensive with the capacity to innovate, thereby creating stable cash flows, which increases firm value. The result is consistent with the arguments of [Gu \(2016\)](#), but contrary to the study by [Moradi et al. \(2017\)](#), who find a negative relation.

At Indian firms, the finding shows that the coefficient of PMC ( $0.0264$ ) significantly and positively influences firm value at a 1% level. The result means that a 1% rise in PMC increases firm value by around 2.6%. This suggests that an increase in PMC leads to an increase in firm value. Similarly, the result for Chinese firms shows a significant and negative effect coefficient of PMC ( $-0.0492$ ) on firm value at a 1% level. This implies that a 1% decrease in PMC leads to an increase in firm value by 4.9%. The findings imply that while predictable growth opportunities may motivate some firms to increase their investments in the face of intense competition, other firms may decline to invest even when growth opportunities offer potential profit.

Table 4. Result of corporate investment and FV.

Variables	Brazil		Russia		India		China	
	CI	FV	CI	FV	CI	FV	CI	FV
L.CI <sub>it-1</sub>	0.4050 *** (33.43)		0.1839 *** (16.19)		0.9705 *** (7.29)		0.4720 *** (22.89)	
L.FV <sub>it-1</sub>		0.2242 *** (21.67)		0.1991 *** (9.81)		0.5085 *** (25.50)		0.3631 *** (25.06)
PMC	-0.1526 *** (-4.88)	0.0682 *** (3.20)	-0.0379 ** (-2.04)	0.0169 *** (3.00)	-0.1584 *** (-7.23)	0.0264 *** (3.12)	0.0254 *** (3.58)	-0.0492 *** (-3.11)
CH	-1.142 *** (-8.88)	-0.0945 (-0.71)	1.1041 *** (13.56)	-0.1366 ** (-2.14)	3.2779 *** (30.70)	0.0382 *** (2.81)	-0.338 *** (-7.57)	-0.4807 *** (-4.33)
LEV	0.8927 *** (7.35)	0.6083 *** (4.29)	-0.0001 ** (-2.29)	-0.0003 *** (-15.23)	0.8466 *** (5.10)	-0.0735 (-1.03)	0.0731 (1.33)	-0.1377 (-1.02)
EFF	0.0954 (1.19)	0.1043 * (1.80)	-0.1371 *** (-5.10)	-0.0469 ** (-1.96)	0.2681 *** (7.57)	-0.0202 (-1.43)	0.0849 ** (2.09)	-0.2017 ** (-2.41)
ROA	1.3565 *** (4.67)	-0.9829 *** (-3.45)	0.0009 *** (3.66)	-0.0005 *** (-4.18)	-1.416 *** (-6.86)	-0.1862 ** (-1.99)	-0.1040 (-0.61)	-2.646 *** (-6.96)
TAN	0.1343 *** (3.20)	0.0559 *** (3.60)	0.2389 *** (2.75)	-0.0419 (-0.76)	-0.0033 *** (-4.20)	0.0088 *** (3.00)	0.0006 *** (0.15)	0.0289 ** (2.06)
SIZE	2.470 *** (3.23)	-1.555 *** (-2.99)	-2.175 ** (-2.55)	-0.0215 ** (-2.38)	-1.171 *** (-35.79)	0.1696 (0.46)	-0.0392 *** (-3.03)	-8.2641 *** (-16.49)
INFL	-0.0027 (-0.38)	-0.0372 *** (-8.99)	0.0088 * (1.82)	-0.0025 (-1.53)	0.1946 *** (35.80)	-0.0095 *** (-4.84)	0.0187 *** (5.65)	-0.0940 *** (-13.77)
GDP	0.1888 *** (4.75)	-0.1973 *** (-6.58)	0.6648 *** (8.05)	-0.0090 (-0.27)	-0.0285 * (-1.76)	-0.0424 *** (-3.47)	0.0585 ** (2.30)	-0.080 (-1.52)
_cons	-10.578 *** (-4.42)	6.816 *** (4.16)	3.5153 (1.30)	1.3191 *** (6.15)	23.1064 *** (30.70)	0.3503 (0.30)	0.2188 (0.69)	28.330 *** (17.55)
AR1	-3.5231 (0.0004)	-4.5898 (0.0000)	-3.808 (0.0001)	-4.0034 (0.0001)	-1.3786 (0.0168)	-9.4448 (0.0000)	-8.8391 (0.0020)	-11.5 (0.0012)
AR2	0.3733 (0.7089)	-1.035 (0.3007)	-0.3315 (0.7402)	-0.3175 (0.7508)	-1.1318 (0.2577)	-0.8942 (0.3712)	0.6136 (0.5395)	2.184 (0.2891)
Hansen test	67.89405 (0.3460)	71.49039 (0.2431)	78.4872 (0.1051)	64.513 (0.4585)	301.9115 (0.2245)	200.154 (0.3418)	84.000 (0.476)	359.699 (0.214)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F test	18,479.50 (0.0000)	2489.13 (0.0000)	509.20 (0.0000)	22,051.08 (0.0000)	551.07 (0.0000)	987.49 (0.0000)	825.42 (0.0000)	1583.30 (0.0000)
No. of instruments	76	76	76	76	76	76	76	76
Observations	1284	1284	1320	1320	8616	8616	12,432	12,432

Note: \*\*\* significant at 1%, \*\* significant at 5%, and \* significant at 10%.

#### 4.3.2. The Interactive Effect of EPU on PMC, Corporate Investment, and Firm Value Nexus

Table 4 reports the interactive effect of PMC\*EPU on corporate investment. The interaction between PMC and EPU significantly affects corporate investment. The findings for Brazilian firms reveal that the coefficient of the interactive term (PMC\*EPU) (-0.1698) significantly and positively affects corporate investment. The implication is that the higher the EPU, the more positive the effect of PMC on the corporate investment of firms. The findings support the argument that high levels of competition under EPU may trigger

growth opportunities for investment and encourage more risk-taking on the part of managers, which increases corporate profit. The EPU coefficient significantly and negatively influences corporate investment. However, other control variables are significant except for efficiency.

The result for Russian firms shows that the interactive term PMC\*EPU significantly and positively influences corporate investment. This indicates that the effect of PMC on firms' corporate investment increases when EPU rises. There is a negative relationship between the EPU coefficient and corporate investment, implying that an increase in the EPU coefficient is associated with a decrease in corporate investment.

The coefficient of interactive term PMC\*EPU (−0.0004) positively and significantly impacts corporate investment at Indian firms, suggesting that higher levels of EPU enhance the positive impact of PMC on corporate investment. The EPU has a positive and significant effect on corporate investment, implying that a rise in EPU improves corporate investment. Lastly, the interactive term PMC\*EPU negatively and significantly affects corporate investment at Chinese firms, which suggests that the higher the EPU, the more negative the effect of PMC on corporate investment. The findings support the argument that PMC, in the face of policy uncertainty, may trigger substantial financial costs, minimize investments, and raises economic instability.

At Brazilian firms, the interaction between PMC\*EPU significantly affects the firm value in Table 5. The coefficient of the interactive term PMC\*EPU (17.556) is negative and significant at the 1% level. This suggests that EPU increases the negative effect of PMC on firm value. The findings show that PMC has a more negative effect on firm value as EPU increases. This suggests that persistent EPU may influence the response of firms to competition in the product market and, thus, affect the value of a firm. At Russian firms, the interactive term PMC\*EPU has a negative and significant effect on firm value, suggesting that EPU increases the negative effect of PMC on firm value. The findings show that PMC has a more negative effect on company value as EPU increases. The interactive term PMC\*EPU positively and significantly influences firm value at Indian firms. This suggests that EPU influences the positive effect of PMC on firm value. The implication is that the negative effect of PMC on firm value increases as EPU rises. The coefficient of EPU has a significant and negative impact on firm value, indicating that higher levels of EPU are associated with lower valuations. Finally, at Chinese firms, the PMC\*EPU positively and significantly affects firm value, implying that EPU increases the positive impact of PMC on firm value. The positive impact of PMC on firm value increases as EPU rises. In addition, EPU negatively and significantly impacts firm value.

**Table 5.** Result of the interactive effect of the EPU Sys-GMM model.

Variables	Brazil		Russia		India		China	
	CI	FV	CI	FV	CI	FV	CI	FV
L.CI <sub>it-1</sub>	0.3952 *** (29.26)		0.1882 *** (17.98)		0.9759 *** (9.69)		0.4756 *** (22.42)	
L.FV <sub>it-1</sub>		0.2269 *** (23.93)		−0.0154 *** (−21.54)		0.4694 *** (22.03)		0.3623 *** (24.34)
PMC	−0.1698 *** (−4.53)	17.556 *** (2.99)	−0.0471 ** (−2.48)	1.1922 *** (9.58)	−0.0004 * (−1.83)	0.0263 (1.58)	0.0931 *** (4.44)	−0.0736 *** (−4.40)
CH	−1.2810 *** (−10.15)	−0.0213 (−0.17)	1.1604 *** (14.34)	−22.224 *** (−9.20)	0.4643 *** (4.34)	0.3568 *** (3.72)	−1.068 *** (−8.04)	−0.4323 *** (−3.96)
LEV	0.9142 *** (7.25)	0.6833 *** (4.56)	−0.0001 *** (−2.71)	−0.2420 *** (−4.43)	0.1026 (0.62)	−0.3728 *** (−2.66)	0.2763 * (1.72)	−0.1287 (−0.98)
EFF	0.1287 (1.58)	0.0636 (1.35)	−0.1388 *** (−5.45)	−5.2156 *** (−9.26)	0.7390 *** (4.09)	−0.0410 (−1.38)	0.2663 ** (2.38)	−0.2539 *** (−3.07)

Table 5. Cont.

Variables	Brazil		Russia		India		China	
	CI	FV	CI	FV	CI	FV	CI	FV
ROA	1.230 *** (4.27)	−0.8776 *** (−3.30)	0.0009 *** (3.67)	0.0079 (1.43)	−0.2556 (−1.48)	−0.4966 *** (−2.78)	−0.0377 * (−1.69)	−2.147 *** (−5.82)
TAN	0.0930 *** (2.65)	0.0497 *** (4.68)	0.2793 *** (3.77)	−2.4701 (−0.94)	0.0215 *** (4.68)	−0.0005 (−0.90)	0.0208 (1.13)	0.0573 *** (3.53)
SIZE	2.463 *** (3.27)	−0.7737 (−1.53)	−1.9307 ** (−2.26)	−19.512 *** (−10.21)	−0.4165 *** (−7.71)	−1.4429 * (−1.83)	−3.146 *** (−3.34)	−5.976 *** (−11.11)
INFL	−0.0041 (−0.57)	−0.0339 *** (−8.62)	−0.0089 (−1.38)	−0.0487 * (−1.88)	0.0624 *** (8.36)	−0.0117 *** (−2.83)	0.0556 *** (5.36)	−0.0739 *** (−10.56)
GDP	0.1307 *** (3.17)	−0.2328 *** (−5.73)	0.1048 (0.62)	4.9253 *** (7.82)	0.1612 *** (11.20)	−0.1605 *** (−5.87)	0.2179 *** (2.80)	−0.297 *** (−5.38)
EPU	−0.374 ** (−1.96)	2.226 *** (2.96)	−3.0385 *** (−4.44)	−15.960 *** (−5.23)	0.3305 *** (13.92)	−1.6267 *** (−6.97)	0.2658 (1.41)	−1.4023 *** (−10.57)
PMC*EPU	0.0023 ** (2.16)	−17.480 *** (−2.97)	0.00017 *** (3.79)	−0.1320 *** (−9.15)	0.00007 * (1.86)	0.0179 *** (3.71)	−0.0015 * (−1.87)	0.0051 *** (3.53)
_cons	−9.799 *** (−4.07)	22.813 *** (3.82)	9.1722 *** (3.01)	116.382 *** (14.43)	5.993 *** (11.15)	9.2051 *** (3.45)	7.1524 ** (2.50)	24.1607 ** (14.86)
AR1	−3.4659 (0.0005)	−4.5471 (0.0000)	−3.7861 (0.0002)	−2.6221 (0.0087)	−1.644 (0.0102)	−9.3072 (0.0000)	−8.8714 (0.0020)	−11.626 (0.0012)
AR2	0.3588 (0.7197)	−0.9350 (0.3497)	−0.3425 (0.7319)	−1.05 (0.2937)	−1.0565 (0.2907)	−0.9589 (0.3376)	0.6131 (0.5398)	1.689 (0.2912)
Hansen test	68.96937 (0.3131)	72.1426 (0.2267)	75.699 (0.1503)	96.18291 (0.5723)	338.349 (0.2385)	198.4637 (0.1372)	90.515 (0.1620)	349.423 (0.214)
Country effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
F test	19,430.87 (0.0000)	4221.58 (0.0000)	104.89 (0.0000)	164.08 (0.0000)	405.36 (0.0000)	1022.73 (0.0000)	825.20 (0.0000)	1655.56 (0.0000)
No. of instruments	78	78	78	78	78	78	76	76
Observations	1284	1284	1320	1320	8616	8616	12,432	12,432

Note: \*\*\* significant at 1%, \*\* significant at 5%, and \* significant at 10%.

## 5. Discussion of Findings

The coefficient of PMC is found to have a negative and significant impact on corporate investment. This means that a decline in PMC increases corporate investment. The results support the viewpoints of [Crepon et al. \(2006\)](#), [Jiang et al. \(2015\)](#), and [Abdoh and Varela \(2018\)](#), who found a negative relation. Some theoretical models rely on different assumptions. On the one hand, the real option theory assumes that a firm has a monopoly over an investment opportunity and that investment does not affect either product prices or market structure. On the other hand, the strategic growth option analyzes corporate investment under imperfect competition. Specifically, when the product markets are not monopolistic, other potential competitors can seize the growth opportunities. In such markets, firms usually recognize that early investment is associated with greater opportunities to expand in the future. Studies suggested that high levels of competition reduce revenue projections and raise cash flow risk for firms ([Irvine and Pontiff 2009](#); [Frésard and Valta 2016](#)). Some studies also claim that the level of financial constraint faced by a firm influences the link between PMC and investment. This further affirms that an environment characterized by unpredictable growth and instability drives an adverse link between PMC and investment.

Boubaker et al. (2018) argue that greater competition lowers profit margins, forcing managers to concentrate on short-term success and invest less in human capital. Other studies reveal that competition in the product market affects return volatility, increases the risk of a stock market collapse, reduces firms' profitability, and raises the relative risk of investment turnover.

The coefficient of PMC also has a positive and significant effect on corporate investment at Chinese firms. This implies that corporate investment increases with a rise in PMC. This finding aligns with research conducted by Van Vo and Le (2017), Gu (2016), and Shin and Lee (2022) who found a positive relationship. The study suggests that PMC helps firms innovate and gain a competitive edge by eliminating agency problems. Firms in the competitive market find it more difficult to survive. Thus, managers in competitive markets are more likely to put much more effort into enhancing a firm's sustainability, which leads to an increase in corporate investment activities. The study by Alimov (2014) demonstrates that a higher PMC enhances the value of cash holdings, and it is more familiar with companies who are in danger of losing investment projects to competitors. In addition, some studies argued that high level of competition encourages managers to invest more in capital expenditure and R&D and encourages management to undertake risky investments to survive in the long run. They also show that competition restricts managers from making bad investments by limiting the overinvestment of free cash flows.

Furthermore, the coefficient of PMC has a positive and significant effect on firm value. The results imply that firm value increases with a rise in PMC. The result does not support the findings by Moradi et al. (2017), who find a negative relation between PMC and performance. The supporting view reveals that higher competition reduces earnings volatility and raises profitability. This implies that intense competition improves the firm's asset quality and bolsters its profits in a competitive product market. Studies reveal that increased competition forces corporate firms to minimize costs, increase operating efficiency, and drive poorly run firms out of the market. This is similar to the findings at Russian firms. The implication is that firms that invest in R&D are often innovative and can compete in the product markets to generate additional economic value. The coefficient of PMC also has a negative and significant impact on firm value. The result supports the findings by Moradi et al. (2017), who find a negative relation between PMC and performance. The result implies that while predictable growth opportunities may motivate some firms to increase their investments in the face of intense competition, other firms may decline to invest even when growth opportunities offer potential profit.

Furthermore, the EPU significantly impacts the relationship between PMC, corporate investment, and firm value. The findings support the argument that high levels of competition under EPU may trigger growth opportunities for investment and encourage more risk-taking on the part of managers, which increases corporate profit. Proponents of real option theory argued that when there is a significant level of uncertainty, firms invest less in a fiercely competitive market. This is due to the fact that a rise in the level of uncertainty causes firms to place a larger value on the option of waiting rather than immediately undertaking investments that are irreversible and costly. In contrast, the theory of strategic growth option shows that under imperfect competition, uncertainty might encourage investment in a growth option. The reasoning behind this theory is that uncertainty can generate a growth option and delaying investments could leave the investment opportunity to other competitors, thus, increasing competitive advantage in the future. In short, high uncertainty discourages investment, while low uncertainty can increase the firms' motivation to invest in a competitive market.

#### *Robustness Check*

The study employs the Herfindahl–Hirschman index (HHI) an alternative measure of competition to determine the robustness of the empirical results. We measured HHI as the sum of the market square of an individual firm. The coefficient on PMC using the Herfindahl index shows a positive and significant effect on corporate investment, while it

shows a negative and significant impact on firm value. The interaction term (PMC\*EPU) negatively and significantly affects corporate investment. This suggests that an increase in EPU increases the negative effect of PMC on corporate investment. Furthermore, the coefficient of the interaction term (PMC\*EPU) positively and significantly affects firm value at the 1% level. The empirical results reinforce the robustness of our previous findings in Tables 3–5.

## 6. Conclusions

This study examines the effect of PMC on corporate investment and firm value, as well as the moderating role of EPU on the nexus. We use a panel of 1971 firms in the BRIC countries from 2009 to 2020, making up to 23,652 observations. The study uses the two-step system GMM model to provide correct and reliable estimations that address the model's endogeneity problem.

Our findings are diverse and contribute to the existing body of literature in several ways. First, we found that increased PMC adversely influences corporate investment at Brazilian, Russian, and Indian firms, while a positive relationship exists for Chinese firms. The findings suggest that while intense competition in the product market could bolster firms' investment capacity, higher competition could also adversely affect a firm's investment. In summary, competition yields a higher investment opportunity and enables corporate firms to become more financially secure. However, competition also prevents corporate managers from investing in risky investment projects, leading to a decline in return. The study also found that higher PMC leads to a decrease in the value of firms at Chinese firms, while an increase in PMC improves firm value at Brazilian, Russian, and Indian firms. Other control variables also have a significant impact on both corporate investment and firm value.

Second, the moderating role of EPU on the nexus between PMC, corporate investment, and firm value reveals different findings for each country. At Chinese firms, our study found robust evidence that economic policy uncertainty weakens "the effect of PMC on corporate investment of firms, increasing the likelihood of intense competition in the product market. Furthermore, the EPU increases the impact of product market competition on the firm value, suggesting that EPU magnifies the impact of PMC on firm value at Brazilian, Russian, and Indian corporate firms. In addition, this paper documents a significant phase in understanding how EPU moderates the nexus between PMC, corporate investment, and firm value. Policymakers must develop and implement strategies to minimize economic uncertainty because, when it rises, investors act quickly. While policy uncertainty is probably unavoidable, many policy changes would make it difficult for firms to comply with regulations, reducing market efficiency and value. The study offers implications on how changes in firms' competitive environments can influence both corporate investments and firm value. The robustness tests also corroborate our initial findings, signifying the relevance of the results to policymakers in emerging economies.

## 7. Managerial Applications

Frequent changes in policy conditions are associated with a cost. Managers need to be aware that the uncertainty of the external environment is not conducive to the stability and sustainable development of corporate firms. Therefore, firms should establish and improve the procedures for forecasting and identifying economic policy uncertainties and pay attention to the dynamic adjustment of competition in product markets. In such a competitive context, it is imperative for managers to understand that economic policy uncertainty poses challenges and implies opportunities for future increased returns. Thus, despite its adverse effects on firms' general and physical capital investments, rational and forward-looking firms can effectively shift and allocate resources to innovation projects to obtain more substantial long-term returns by increasing investments.

Our study provides critical and practical implications to corporate managers, investors, and policymakers in emerging economies. Corporate managers could consider economic

policy changes while making investment decisions that could affect the firm's worth. This is increasingly important because, during a period of uncertainty, PMC could serve as a corporate governance tool to monitor managerial decisions and facilitate the evaluation of corporate value in comparison to the competitors. Furthermore, to bolster investment in a high-potential market, policymakers must consolidate traditional industrial policies with competitive and innovative policies to improve market mechanisms and promote fair competition among firms. It is also imperative for investors to use the EPU index as a mechanism for improving investment strategies.

## 8. Limitations and Recommendations for Further Study

This study has some limitations, as with any other study. First, we only focus on a few selected countries, which are different from other regions across the world. Thus, generalizing the results of this study does not apply to other global economies. Second, due to the unavailability of data for some periods, we did not consider longer time series in the study. Alternatively, this study's limitations are helpful, provide the potential for future research, and may help understand the link between PMC, investment, and firm value. This study was conducted under normal economic conditions, which is the study's limitation. Further studies can examine how economic policy uncertainty influences the investment decisions of firms in comparison to developed and emerging economies. Future research can consider the impact of PMC on corporate investment during varying economic conditions (pre-financial crisis, normal economic conditions, and the COVID-19 pandemic period). Future studies can also consider other sophisticated econometric models that can explore the cause and effect of the relationship. Further studies can also consider an alternative measure, such as market capitalization or Tobin Q, to represent the firm value.

**Author Contributions:** Conceptualization, O.E.O.; Visualization, O.E.O. and J.M.-P.; investigation, O.E.O.; writing—original draft preparation, O.E.O. and J.M.-P.; writing—review and editing, O.E.O. and J.M.-P. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Informed Consent Statement:** Not applicable.

**Data Availability Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Abbreviations

PMC	Product market competition
CI	Corporate investment
FV	Firm value
EPU	Economic policy uncertainty
CH	Cash-holding
LEV	Leverage
EFF	Efficiency ratio
ROA	Return on assets
SIZE	Firm size
GDP	Gross domestic product growth
TAN	Tangibility
INFL	Inflation rate
(GMM)	Generalized method of moments
(HHI)	Herfindahl–Hirschman index
MC	Marginal cost
SGA	Selling, general, and administrative expenses



## References

- Abdoh, Hussein Ali Ahmad, and Oscar Varela. 2018. Product market competition, cash flow and corporate investments. *Managerial Finance* 44: 207–21. [CrossRef]
- Abdoh, Hussein, and Oscar Varela. 2017. Product market competition, idiosyncratic and systematic volatility. *Journal of Corporate Finance* 43: 500–13. [CrossRef]
- Aghion, Philippe, Nick Bloom, Richard Blundell, Rachel Griffith, and Peter Howitt. 2005. Competition and Innovation: An Inverted-U Relationship. *The Quarterly Journal of Economics* 120: 701–28. [CrossRef]
- Ahsan, Tanveer, Bakr Al-Gamrh, and Sultan Sikandar Mirza. 2021. Economic policy uncertainty and sustainable financial growth: Does business strategy matter? *Finance Research Letters* 46: 102381. [CrossRef]
- Akdoğan, Evrim, and Peter MacKay. 2008. Investment and Competition. *Journal of Financial and Quantitative Analysis* 43: 299–330. [CrossRef]
- Alimov, Azizjon. 2014. Product market competition and the value of corporate cash: Evidence from trade liberalization. *Journal of Corporate Finance* 25: 122–39. [CrossRef]
- Alouane, Nour, Ines Kahloul, and Jocelyn Grira. 2022. The Trilogy of Ownership, Income Diversification, and Performance Nexus: Empirical Evidence from Tunisian Banks. *Finance Research Letters* 45: 102180. [CrossRef]
- Arellano, Manuel, and Stephen Bond. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58: 277–97. [CrossRef]
- Babar, Md, and Ahsan Habib. 2021. Product market competition in accounting, finance, and corporate governance: A review of the literature. *International Review of Financial Analysis* 73: 101607. [CrossRef]
- Baker, Scott R., Nicholas Bloom, and Steven J. Davis. 2016. Measuring Economic Policy Uncertainty. *The Quarterly Journal of Economics* 131: 1593–636. [CrossRef]
- Bhullar, Pritpal Singh, and Dyal Bhatnagar. 2013. Theoretical framework EV vs. Stock price—A better measurement of firm value. *International Journal of Commerce, Business and Management* 2: 335–43.
- Boubaker, Sabri, Viet Anh Dang, and Syrine Sassi. 2018. Product Market Competition and Labor Investment Efficiency. Working Paper. Available online: <http://www.fmaconferences.org/Glasgow/Papers> (accessed on 23 March 2022).
- Bustamante, M. Cecilia, and Andres Donangelo. 2017. Product Market Competition and Industry Returns. *The Review of Financial Studies* 30: 4216–66. [CrossRef]
- Chen, Jian, Fuwei Jiang, and Guoshi Tong. 2017. Economic policy uncertainty in China and stock market expected returns. *Accounting & Finance* 57: 1265–86. [CrossRef]
- Chen, Liming, Ziqing Du, and Zhihao Hu. 2019. Impact of economic policy uncertainty on exchange rate volatility of China. *Finance Research Letters* 32: 101266. [CrossRef]
- Crepon, Bruno, Emmanuel Duguet, and Jacques Mairesse. 2006. Research, Innovation, and Productivity: An Econometric Analysis at the Firm Level. *Economics of Innovation and New Technology* 7: 115–58. [CrossRef]
- Datta, Sudip, Mai Iskandar-Datta, and Vivek Singh. 2013. Product market power, industry structure, and corporate earnings management. *Journal of Banking & Finance* 37: 3273–85. [CrossRef]
- Elzinga, Kenneth G., and David E. Mills. 2011. The Lerner Index of Monopoly Power: Origins and Uses. *The American Economic Review* 101: 558–64. [CrossRef]
- Fedderke, Johannes, Nonso Obikili, and Nicola Viegi. 2017. Markups and Concentration in South African Manufacturing Sectors: An Analysis with Administrative Data. *South African Journal of Economics* 86: 120–40. [CrossRef]
- Frésard, Laurent, and Philip Valta. 2016. How Does Corporate Investment Respond to Increased Entry Threat? *The Review of Corporate Finance Studies* 5: 1–35. [CrossRef]
- Giroud, Xavier, and Holger M. Mueller. 2011. Corporate Governance, Product Market Competition, and Equity Prices. *The Journal of Finance* 66: 563–600. [CrossRef]
- Gu, Lifeng. 2016. Product market competition, R&D investment, and stock returns. *Journal of Financial Economics* 119: 441–55. [CrossRef]
- He, Zelong, and Jijun Niu. 2018. The effect of economic policy uncertainty on bank valuations. *Applied Economics Letters* 25: 345–47. [CrossRef]
- Irvine, Paul J., and Jeffrey Pontiff. 2009. Idiosyncratic Return Volatility, Cash Flows, and Product Market Competition. *The Review of Financial Studies* 22: 1149–77. [CrossRef]
- Jiang, Fuxiu, Kenneth A. Kim, John R. Nofsinger, and Bing Zhu. 2015. Product market competition and corporate investment: Evidence from China. *Journal of Corporate Finance* 35: 196–210. [CrossRef]
- Khan, Muhammad Arif, Xuezhi Qin, and Khalil Jebran. 2019. Does uncertainty influence the leverage-investment association in Chinese firms? *Research in International Business and Finance* 50: 134–52. [CrossRef]
- Kim, JooMan, Insun Yang, Taeyong Yang, and Peter Koveos. 2021. The impact of R&D intensity, financial constraints, and dividend payout policy on firm value. *Finance Research Letters* 40: 101802. [CrossRef]
- Kripfganz, Sebastian. 2020. XTSEQREG: Stata Module to Perform Sequential Estimation of Linear Panel Data Models. Available online: <https://EconPapers.repec.org/RePEc:boc:bocode:s458355> (accessed on 9 April 2021).
- Laksmana, Indrarini, and Ya-Wen Yang. 2015. Product market competition and corporate investment decisions. *Review of Accounting and Finance* 14: 128–48. [CrossRef]

- Lemma, Tesfaye T., Minga Negash, Mthokozisi Mlilo, and Ayalew Lulseged. 2018. Institutional ownership, product market competition, and earnings management: Some evidence from international data. *Journal of Business Research* 90: 151–63. [\[CrossRef\]](#)
- Li, Scott, Qianqiu Liu, and James Refalo. 2020. Industry classification, product market competition, and firm characteristics. *Finance Research Letters* 36: 101319. [\[CrossRef\]](#)
- Lyandres, Evgeny, and Bernardino Palazzo. 2016. Cash Holdings, Competition, and Innovation. *Journal of Financial and Quantitative Analysis* 51: 1823–61. [\[CrossRef\]](#)
- Ma, Huanyu, and Dapeng Hao. 2022. Economic policy uncertainty, financial development, and financial constraints: Evidence from China. *International Review of Economics & Finance* 79: 368–86. [\[CrossRef\]](#)
- Mello, Antonio S., and Mengying Wang. 2012. Globalization, product market competition and corporate investment. Paper presented at the AFA 2013 San Diego Meetings, San Diego, CA, USA, January 4–6, pp. 1–65. [\[CrossRef\]](#)
- Minniti, Antonio. 2010. Product market competition, R&D composition and growth. *Economic Modelling* 27: 417–21. [\[CrossRef\]](#)
- Moradi, Mahdi, Mohammad Ali Bagherpour Velashani, and Mahdi Omidfar. 2017. Corporate governance, product market competition and firm performance: Evidence from Iran. *Humanomics* 33: 38–55. [\[CrossRef\]](#)
- Olalere, Oluwaseyi Ebenezer, and Janine Mukuddem-Petersen. 2022. Economic Policy Uncertainty and Firm Value: Is There a Link? A Panel Vector Autoregression Approach. *Asia-Pacific Social Science Review* 22: 106–20.
- Pastor, Lubos, and Pietro Veronesi. 2012. Uncertainty about Government Policy and Stock Prices. *The Journal of Finance* 67: 1219–64. [\[CrossRef\]](#)
- Pontuch, Peter. 2011. *Product Market Concentration, Financial Constraints, and Firms' Business Cycle Sensitivity* (No. urn: Hdl: 123456789/6271). Paris: Université Paris-Dauphine.
- Roodman, David. 2009. How to do Xtabond2: An Introduction to Difference and System GMM in Stata. *The Stata Journal: Promoting Communications on Statistics and Stata* 9: 86–136. [\[CrossRef\]](#)
- Ryu, Doowon. 2019. The US–Korea free trade agreement as a shock to product market competition: Evidence from the Korean stock market. *Finance Research Letters* 35: 101296. [\[CrossRef\]](#)
- Sabherwal, Sanjiv, and Trang Thai. 2019. Product Market Competition and Corporate Cash Holdings: A Cross-Country Evidence. Paper presented at the Paris December 2019 Finance Meeting EUROFIDAI-ESSEC, Paris, France, December 19, pp. 1–60. [\[CrossRef\]](#)
- Schumpeter, Joseph A. 1912. *The Theory of Economic Development*. Cambridge, MA: Harvard University Press.
- Sheikh, Shahbaz. 2018. Corporate social responsibility, product market competition, and firm value. *Journal of Economics and Business* 98: 40–55. [\[CrossRef\]](#)
- Shin, Ilhang, and Hansol Lee. 2022. Product market competition and a firm's R&D investment: New evidence from Korea. *Investment Management and Financial Innovations* 19: 287–99. [\[CrossRef\]](#)
- Spierdijk, Laura, and Michalis Zaouras. 2017. The Lerner index and revenue maximization. *Applied Economics Letters* 24: 1075–79. [\[CrossRef\]](#)
- Stigler, George J. 1958. The Economies of Scale. *The Journal of Law and Economics* 1: 54–71. [\[CrossRef\]](#)
- Stoughton, Neal M., Kit Pong Wong, and Long Yi. 2017. Investment Efficiency and Product Market Competition. *Journal of Financial and Quantitative Analysis* 52: 2611–42. [\[CrossRef\]](#)
- Valta, Philip. 2012. Competition and the cost of debt. *Journal of Financial Economics* 105: 661–82. [\[CrossRef\]](#)
- Van Vo, Lai, and Huong Thi Thu Le. 2017. Strategic growth option, uncertainty, and R&D investment. *International Review of Financial Analysis* 51: 16–24. [\[CrossRef\]](#)
- Wang, Yizhong, Carl R. Chen, and Ying Sophie Huang. 2014. Economic policy uncertainty and corporate investment: Evidence from China. *Pacific-Basin Finance Journal* 26: 227–43. [\[CrossRef\]](#)
- Wang, Yizhong, Yueling Wei, and Frank M. Song. 2017. Uncertainty and corporate R&D investment: Evidence from Chinese listed firms. *International Review of Economics & Finance* 47: 176–200. [\[CrossRef\]](#)
- Yung, Kenneth, and Trung Nguyen. 2020. Managerial ability, product market competition, and firm behavior. *International Review of Economics & Finance* 70: 102–16. [\[CrossRef\]](#)

**Disclaimer/Publisher's Note:** The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.