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Does Economic Policy Uncertainty Strengthen Peer Effects on Investments?

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ABSTRACT

The paper demonstrates that firms are more likely to follow their peers when they face economic policy uncertainty. Using a newly developed economic policy uncertainty index and the financial data from COMPUSTAT of US firms, I find evidence that economic policy uncertainty strengthens peer effects on investments. In this paper, I propose a reputation-based theory and information-based theory to support the findings. Peer effects are stronger for less successful firms and financial constrained firms during periods when economic policy uncertainty is notable. Accordingly, I use four standards (i.e. firm profitability, financially constrained status, growth rate and market to book ratio) to define followers and leaders. I document that follower firms respond to leader firms' investment changes, while leader firms do not respond to follower firms' investment changes. Finally, I show that the results are robust to alternative economic policy uncertainty measures (i.e. close presidential elections) and additional control variables (i.e. firm size and leverage).

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CHAPTER 1

INTRODUCTION

Typically, most research on corporate investments assumes that a firm's investment decisions are determined by its investment opportunities, capital structure, cash flow, and information environment. The role of peer firms' actions or characteristics on influencing corporate investment decisions is often ignored. However, there are recent studies providing evidences that corporate financial policies and investment decisions of a firm are positively correlated to industries (Bustamante and Fresard, 2017; Leary and Roberts, 2014). In other words, firms' financing and investment decisions respond to the actions and the characteristics of their peer. Graham et al. (2001) survey a significant number of CFOs and find that they adopt their peer firms' financing decisions as their own. Also, Lieberman (2006) shows that environmental uncertainty promotes imitation behavior between firms, where the mimicking behavior is tacit and complex. The goal of this paper is to empirically explore the effect of economic policy uncertainty on peer effects of firms' investment decisions.

The paper hypothesize that economic policy uncertainty strengthens peer effects based on two major theories, reputation-based theory and information-based theory. According to reputation-based theory, how the labor markets value the managers' management ability is critical for their career. Empirical evidences indicates that top managers' firings mainly relate to the firms' poor performance relative to the industries,

rather than the industry-wide failures (Scharfstein and Stein, 1990). Moreover, boards seldom blame the managers because of their unprofitable strategies or firms bad situations when other firms in the same industries employ the similar strategies or in the similar situations (Morck Randall, Shleifer Andrei, and Robert, 1989). To avoid negative reputation in the labor markets, they may not make investment decisions efficiently and rationally based on the information they possess. Rather, they ignore their private information and imitate their peers' investment decisions. When managers face economic policy uncertainty, it is difficult for them to predict future situation with great confidence. Therefore, a safer strategy for managers could simply mimic their peers' investment decisions, in case that the contrary decisions or behaviors may hurt their reputation in the managerial labor markets. Finally, it results in herding behavior.

According to the information-based theory, during the periods of economic policy uncertainty, most of the firms lack information to make rational and efficient investment decisions, and thus first movers are easily to be considered as possessing valuable or superior information. In another case, I suppose that first movers make decisions purely and rationally based on the information they have, and their actions reveal the information to the followers. After the revealed information accumulates to some extent, it could be rational for other firms to ignore their own information and mimic their peers' decisions. Even if firms can analyze the outcomes and make investment decisions based on their private information, it could be costly and time-consuming, but mimicking others is simple and costs less. Thus, it is not difficult to imagine why firms are more likely to follow their peers, especially when they face economic policy uncertainty.

A major hurdle of the study is how to appropriately measure economic policy uncertainty. Previous studies use proxies such as the dispersion in analysts' forecasts and volatility in stock returns to measure firm-level uncertainty. However, such measures fail to capture the overall level of economic policy uncertainty presented in the economy. To clear the hurdle, I adopt an index recently developed by Baker, Bloom and Davis (2016) (hereafter BBD). The BBD index is a weighted average of four components. The first component is constructed based on the count of newspaper articles in 10 leading U.S. newspapers including at least one of the key policy terms (i.e. white house, federal, congress, regulation and so on), at least one of the terms (i.e. economic and economy) and at least one of the terms (i.e. uncertainty and uncertain). This news-based component is most heavily weighted. The second component measures uncertainty about future changes of tax code. The third and the fourth component is based on the dispersion in economic forecasts on CPI and government spending (i.e. purchases by the federal, state or local government).

I collect firm-level data from COMPUSTAT North America. Using a sample of 505,720 observations and 17,416 unique firms between 1987 and 2016, I show that, peer effects are reinforced by economic policy uncertainty, implying that firms are more likely to imitate their peers' investment decisions when they face economic policy uncertainty and find it difficult to predict the future. Using level equation and differential equation, I find similar results that economic policy uncertainty strengthens peer effects. I also run regression using news and tax-related components of the BBD index. According to previous literature, among the four components regarding news, tax code, CPI and government spending, the news-related component provides major explanatory power of

the overall index (Gulen and Ion, 2016). Tax-related economic policy uncertainty is also important to predict firm investments. Empirical evidences show that firm investments respond to tax changes (Cummins, Hassett and Hubbard, 1996). Therefore, I focus on the news-related and tax-related components. I find that firms' peer effects are stronger when firms face news-related and tax-related economic policy uncertainty.

The paper answers the question, which firms mimic, by splitting the sample by market to book ratio, sales growth, earning growth and financial constrained status. To measure financial constraints, I follow Hadlock et al (2010) using the size-age index (SA index). The SA index is a combination of asset size and firm age and is calculated as (−0.737* Assets + 0.043*Assets2 − 0.040*Age), where Assets is the natural log of total book assets and Age is the number of years a firm first appears on COMPUSTAT. Specifically, a financially more constrained firm has a higher SA index. I calculate the average SA index for each firm over its time-series. I categorize firms with average SA indices falling in top (bottom) tertile in each industry as financially constrained (unconstrained) firms. I also split firms into high or low market to book ratio and earning (net income) growth using average market to book ratio and earning growth rate over its time-series and recognize firms falling in top (bottom) tertile in each industry as firms with high (low) market to book ratio and earning growth.

I sort firms within each industry-quarter into three groups based on their sales growth. High (low) sale growth firms fall into the top (bottom) third tertile of the distribution. Empirically, I find that less successful firms (i.e. financially constrained firms, firms with low market to book ratio, low earning growth and low sales growth) are more likely to imitate its peers' investment decisions when facing economic policy

uncertainty. The findings are consistent with the information-based theory that more successful firms are easily considered as possessing superior information. While their less successful counterparts, who lack such information, are inclined to stay conformity with the peers to take advantage of the information revealed by firms' behaviors.

To address the concern that the "peer effects" is a result that firms exhibit similar investment behavior when they face economic economic policy uncertainty, I use the sample of leaders and followers to analyze whether follower (leader) firms respond to investment changes of leader (follower) firms. I follow Leary and Roberts (2014) and categorize firms into two groups that we call leaders and followers. I define these two groups by sorting firms within each industry-quarter into four groups based on financially constrained status, earnings growth, sales growth and market to book ratio. Followers (leaders) are those firms in the bottom (top) thirds. The results show that follower firms do respond to leader firms' investment changes while leader firms do not respond to follower firms' investment changes. I do not find significant results for the group sorted by sales growth.

Next, I attempt to directly address the endogeneity concerns. My identification attempt relies on a plausibly exogenous variation generated by close presidential elections. Close presidential elections significantly increase economic policy uncertainty, as documented by previous literature (Julio and Yook, 2012). Elections isolate the impact of uncertainty related to national leadership from other confounding factors. Another advantage of using the data of close presidential elections is that it represents potential policy changes beyond economic policies. I apply the 2SLS regressions and use close presidential elections as an instrumental variable. The coefficients of the interaction terms

between economic policy uncertainty and peer firms average investment changes are positive and significant, which is consistent with the main findings that economic policy uncertainty strengthen peer effects. I also include another instrumental variable, political polarization in the House of Representatives. However, using the 2SLS regression method, I do not find significant results.

The findings continue to hold in a number of robustness checks. First, I use alternative measures of corporate investments (i.e. capital expenditure scaled by the total property, plant and equipment of the beginning periods and capital expenditure scaled by the total assets of the beginning periods). Using the general economic policy uncertainty index and the news- and tax- related components, the results remain similar with the main findings. Second, in order to mitigate concerns that omitted factors may explain corporate investment behaviors, I further include firm-level characteristics (i.e. firm size, measured by natural logarithm of total assets; firm book leverage, measured by book value of long-term and short-term debt divided by total assets). Again, the main results continue to hold.

The paper contributes to two strands of the literature. First, it extends research on the effects of economic policy uncertainty on firm level real investment decisions. Gulen and Ion (2016) document that economic policy uncertainty negatively affects corporate investments. Julio and Yook (2012) show that during election years, firms reduce capital expenditure by an average of 4.8% comparing with non-election years. Xu (2011) find that firms innovation are negatively related to economic policy uncertainty. Second, the paper contributes to the peer effects literature by adding evidences that economic policy uncertainty reinforces peer effects on firm investment decisions. Prior research study peer effects and herd behavior theoretically and empirically in corporate capital structure

(Leary and Roberts, 2014), risk management (Ahern et al., 2012; Bursztyn, Ederer, Ferman, and Yuchtman, 2014; Lahno, Serra-Garcia, Lahno, and Serra-Garcia, 2015), corporate governance (John and Kadyrzhanova, 2008), corporate social responsibilities (Cao, 2015) as well as financial policies (Bursztyn, Ederer, Ferman, and Yuchtman, 2014; Bustamante and Fresard, 2017; Chan, Chang, and Chen, 2013; Popadak, 2012). To the best of my knowledge, this paper is among the first studies to explore peer effects and economic policy uncertainty.

The rest of the paper proceeds as follows. Section 2 presents the motivation and hypotheses. Section 3 describes the data and sample. Section 4 reports the main regression results and subsample analyses. Section 5 presents robustness checks. Section 6 concludes.

CHAPTER 2

MOTIVATION AND HYPOTHESES

Peer effects have been studied, theoretically and empirically, across the fields of economics and finance over a long time: corporate capital structure (Leary and Roberts, 2014), risk management (Ahern et al., 2012; Bursztyn, Ederer, Ferman, and Yuchtman, 2014; Lahno, Serra-Garcia, Lahno, and Serra-Garcia, 2015), corporate governance (John and Kadyrzhanova, 2008), corporate social responsibilities (Cao, 2015) as well as financial policies (Bursztyn, Ederer, Ferman, and Yuchtman, 2014; Bustamante and Fresard, 2017; Chan, Chang, and Chen, 2013; Popadak, 2012).

Leary and Roberts (2014) point out that peer firms have significant influence on determining corporate capital structure and financial policies. Prior research also study the performance of peer firms influencing corporate investment decisions (Foucault and Fresard, 2014). According to Foucault and Fresard (2014), peer firms' valuation matters for firms' investment decisions because peer firms' valuation conveys important information to managers to evaluate their future growth opportunities. Pástor and Veronesi (2012) show that uncertainty makes the correlation of stock returns between firms increase, which also implies that firms' behaviors are conform during periods with high economic policy uncertainty. Arguably, imitation processes are most interesting in the time characterized by uncertainty or ambiguity. Facing uncertainty, managers find it difficult to predict outcomes and consequences of a certain behavior or decision. Along this way, uncertainty would promote imitating behaviors even if the consequence cannot

predict (Lieberman, 2006). As a result, I am motivated to study the mechanism of peer effects and imitation behaviors during economic policy uncertainty periods. There are two popular theories about imitation behaviors and peer effects, from the prospective of the reputation of the top managers and the information possessed by peers.

2.1 REPUTATION-BASED THEORY

Classical economic theory suggests that agents make investment decisions based on the available information they possess; decisions are made rationally and efficiently to reflect the agents expectations. However, in the real world, managers may not act rationally based on their own information and beliefs. In modern corporations, managers are routinely evaluated based on the performance. In many cases, the evaluation depends not only on the firms' absolute performance but also the performance relative to the peer firms. Scharfstein and Stein, (1990) suggests that managers may engage in herding behavior in investment decisions due to managerial reputation concerns.

Considering a case that a manager has a private signal indicating that a certain investment decision is wealth-maximizing for a firm. However, the manager also observes that managers from the peer firms take opposite action. Would the manager be brave enough to chanllenge the majority? Making decision based on his or her own private information may achieve a rare success. However, it is also possible that the decision ends up with a unusual failure. If it turns out that the manager is wrong, it would be a big fail. Professional managers concern about how others evaluate their ability in the managerial labor markets. When the evaluation of the firm's relative performance relates to the manager's job security. He or she is more likely to make a suboptimal decision and

simply follow others, regardless of his or her private signal. They mimic others' behavior because they are afraid of their contrary actions or decisions results in failure and damaging their reputation, especially during periods with high economic policy uncertainty.

When facing an unpredictable situation, managers are more likely to value their reputation in the labor markets. Although mimicking or herding behavior is not efficient from a rational investor's point of view, it is reasonable for a professional manager who cares about his or her own reputation in the labor markets. They would rather fail conventionally rather than succeed unconventionally (Scharfstein and Stein, 1990). Morck Randall, Shleifer Andrei, and Robert (1989) suggest that poor performance of a firm relative to its industry is a very important reason for a top manager's firing, rather industry-wide failure. They also suggest that it is difficult for boards to blame the managers for their bad strategies when other firms in the same industry also adopt the similar ones. Even though the managers are aware that mimicking others rather than acting based on their own signals is not the best decision for the whole corporation, he or she may still follow others, because managers may prefer the option of 'conventional success or failure' rather than 'unconventional success or failure'. Therefore, the managers might make a suboptimal but safe decision and mimic other firms regardless of his or her own private signal, when the evaluation of the managers' performance compared with the peer firms.

Thus, it is possible that managers ignore their own private information but mimic others' behaviors to avoid negative reputation by their disparate investment decisions. I expect that the incentive of imitation is stronger when they face economic policy

uncertainty. Actually, the investment decisions they imitate are not absolutely efficient, rational and profitable. However, since others can also make mistakes, an unprofitable investment decision that a manager follows is not too bad for his or her reputation – at least, the managers can share the blame (Bikhchandani and Sharma, 2000; Scharfstein and Stein, 1990).

Furthermore, when facing economic policy uncertainty, board members would lower their expectation on firm performance. They are probably less likely to blame their managers if other firms are in the similar situation. This benefits the managers and as a result, imitation occurs. In general, from the reputation prospective, managers have incentives to follow their peers' investment decisions. Moreover, economic policy uncertainty potentially increases the volatility of the returns of the investment, and the risk of failure of a project. Therefore, high economic policy uncertainty increases the managerial reputation concerns. In such circumstances, it is safe for managers to stay conform rather than make decisions isolated with their peers to avoid negative reputation.

2.2 INFORMATION-BASED THEORY

Firms may imitate when their peers are facing similar problems or in the similar situation and they believe the firms they follow possess superior information (Lieberman, 2006). Especially during the periods of economic policy uncertainty, firms lack information to predict future, and first movers are easily considered as having valuable information. In another case, I assume that first, each firm has their private information; secondly, the first movers in the markets purely make decisions based on their private

information and the actions or behaviors of the first movers reveal the information they have to rest of the markets.

On the one hand, while the revealed information accumulates to some extent, it could be rational and efficient for other firms to imitate their decisions and ignore the information they possess (Lieberman, 2006). According to the economic agents' herding model, herding behavior is a result of rational choice, when there are multiple decision makers who are making decisions in turns and the private signal each of them received is incomplete, regarding the true state of the world. The key point of the idea is that an agent who makes decision later can observe others' behavior. Although the agent cannot directly observe the private signal of others, she can still infer from the others' behavior. When the signal revealed by the behavior accumulates to a certain degree, the precision of information revealed by others is sufficiently high. The information the agent gets from observing others might possibly outweigh her own information. Therefore, regardless of her private signal, she can simply mimic others' behavior. (Bikhchandani, Hirshleifer, and Welch, 1998).

On the other hand, even if they rely on their private information, analyzing the outcomes is costly and time-consuming. They may finally imitate others' investment decisions. In either case, it may not be irrational or inefficient for the firms who observe the actions or decisions from their peer firms to imitate regardless of their own information (Bikhchandani, Hirshleifer, and Welch, 1998).

However, when the degree of precision of the private signal is high enough, it is unlikely that agents simply mimic others' behavior and ignore her private signal. The reason is that agents who act later need to wait and observe enough decisions made by

others in order to make the decision of ignoring her private information and mimicking. While, when economic policy uncertainty increases, the accuracy of the signals decrease generally. As a consequence, peer effects magnify.

Moreover, the successful firms in the industries are likely to be perceived as having superior information. For example, less successful firms may follow the successful rivals if they believe that their successful counterparts are better informed. In general, in the case of economic policy uncertainty, the imitation strategy is optimal for firms because it costs less to imitate others' investment decisions, but outcomes could be unexpectedly better than making decisions isolating from others.

Along this way, I would expect that firms have stronger incentives to imitate their peer firms' investment decisions during periods of economic policy uncertainty, when they believe that their peer firms have more valuable private information and make rational and efficient decisions. We would also expect that peer effects are stronger for follower firms.

Hypothesis 1: Peer effects are strengthened during the periods of economic policy uncertainty.

Hypothesis 2: Follower firms respond to leader firms' investment decision. However, leader firms do not respond to the follower firms.

CHAPTER 3

DATA AND MEASURES

3.1 ECONOMIC POLICY UNCERTAINTY

One of the challenges of the research is how to quantitatively measure economic policy uncertainty. Studies typically rely on ex-post firm-level outcomes (e.g. dispersion of analyst forecast or volatility of stock returns) to measure ex-ante economic uncertainty. Unfortunately, such measures cannot capture government economic policy uncertainty. Julio and Yook (2012) and Durnev (2010) use election data to measure economic policy uncertainty. While election data captures a portion of economic policy uncertainty during election years, it cannot capture the economic policy uncertainty in non-election years. In general, both methods are not good measures of economic uncertainty.

Therefore, in this paper, I employ another measure of economic policy uncertainty recently developed by Baker, Bloom, and Davis (2016), which captures government future economic policy uncertainty beyond the election data. The BBD index has been employed in several finance research works to study the effects of economic policy uncertainty on corporate financial and investment decisions (Bhattacharya, Hsu, Tian, and Xu, 2017; Gulen and Ion, 2016; Xu, 2011).

Baker et al. (2016) construct the US economic policy uncertainty index from four types of underlying components. The first component quantifies newspaper coverage of

policy related economic uncertainty. Baker et al. (2016) count articles that contain at least one of the terms of 'uncertainty' or 'uncertain', and at least one of the terms of 'economic' or 'economy', as well as at least one of the political terms, for example 'congress', 'deficit', 'Federal Reserve', 'legislation', 'regulation', or 'white house' and so on in 10 leading newspapers in the United States. They scale the raw counts by the total number of articles in the same newspaper for each month. Afterwards, they average across the ten newspapers and normalize the 10-paper counts to a mean of 100 since 1985. The second component captures future tax code changes. It is constructed as the total present dollar value of the tax provisions set to expire in the near future. The third component measures fiscal and monetary economic policy uncertainty by estimating the dispersion of forecast on future purchases by the federal, state or local government. The fourth component is degree of forecaster disagreement about CPI.

The BBD index is a weighted average of uncertainty related to tax, CPI, government spending as well as newspaper coverage frequency of discussing economic economic policy uncertainty. Gulen and Ion (2016) find that, among the four components of the BBD index, the news-based component has the major explanatory power of the overall economic policy uncertainty index. Cummins et al. (1996) use 14 OECD countries' data and find that tax changes also influence firm investment decisions in 12 out of 14 OECD countries, including the United States. Thus, I adopt the news-based and the tax-based components of EPU index to examine whether the main results continue to hold using these two alternative indices.

3.2 SAMPLE AND VARIABLES

The data for the empirical analyses comes from the quarterly COMPUSTAT North American files. I focus the analysis on a large sample of U.S. publicly listed firms. We restrict the sample to match the availability of the economic policy uncertainty index of Baker et al. (2016). The sample extends from 1987 Q1 to 2016 Q4. I require non-missing data on investment, sales growth, cash flow, Tobin's Q, book leverage and total assets. Also I exclude firms distributed to industries of utility, finance and industries that are considered as "almost nothing".

To accurately measure peer effects, I exclude firms within the industry-quarters with less than three observations. Finally, I have 17,416 unique firms. Table 3.1 summarizes statistics for the final sample consisting of 505,720 firm-quarter observations. To reduce the impact of extreme outliers, I Winsorize all financial variables at the 1% level on both sides of the sample distribution. In practice, I Winsorize the financial variables before calculating the peer firms average characteristics in order to mitigate the influence of the extreme observations.

I define peer effects based on three-digit SIC industry classification codes. Peer firms are firms in the same industry over the same quarter. The variables are grouped into two distinct categories, (i.e. firm-specific characteristics and peer firms averages). While the former includes variables constructed for firm *i*'s value in quarter t, the latter consists of variables constructed as the average of all firms' values within an industry-quarter combination excluding firm *i* itself.

Table 3.1. SUMMARY STATISTICS

Variable	Obs.	Mean	Std. Dev.	Min	Max
Firm-Specific Factors					
Investment	505,720	0.16	4.35	-20.16	13.96
Sales Growth	505,720	28.36%	112.79	-10000%	85167%
Tobin's Q	505,720	2.42	3.17	0.50	24.13
Cash Flow	505,720	-0.02	0.13	-0.87	0.15
Book Leverage	505,720	0.27	0.35	0.00	2.45
Size (natural logarithm of total assets)	505,720	4.91	2.39	-0.77	10.56
Peer Firm Averages					
Peer Firm Avg. Investment	505,720	0.17	2.31	-9.48	5.46
Peer Firm Avg. Sales Growth	505,720	2806%	27.60	-2205%	12241%
Peer Firm Avg. Tobin's Q	505,720	2.41	1.07	0.97	5.67
Peer Firm Avg. Cash Flow	505,720	-0.01	0.04	-0.13	0.05
Peer Firm Avg. Book Average	505,720	0.27	0.10	0.09	0.58
Peer Firm Avg. Size (natural logarithm of total assets)	505,720	4.91	1.17	2.76	8.28

Table 3.1. SUMMARY STATISTICS (CONTINUED)

Macro-level Factors					
EPU (logarithm of quarterly avg. US monthly BBD index)	505,720	4.62	0.27	4.15	5.20
Real GDP Growth	505,720	2.52	1.73	-3.46	5.27
Political Polarization	421,026	0.48	0.10	0.32	0.69

I define *Investment* as changes of capital expenditure scaled by total assets of the beginning period. *Cash Flow* is measured as income before extra ordinary items plus depreciation and amortization and deflated by lagged book value of total assets; Sales Growth, as the year-on-year growth in quarterly sales, is an additional control for investment opportunities; Tobin's Q, which also captures investment opportunities, is measured as market capitalization minus book value of equity and plus total assets and divided by book value of total assets. I construct quarterly EPU index by aggregating the monthly BBD index and taking natural logarithm of the 3-month averages of the BBD index. The EPU index ranges from 4.15 to 5.20, with a mean value of 4.62.

The investment ratio is 16% on average, while the peer firm average investment ratio is 17%. The average sales growth rate is 28.36%. The average Tobin's Q is 2.42, which ranges from 0.5 to 24.31. The mean value of book leverage is 0.27, with ranges from 0 to 2.45. The variable of size, which is defined as natural logarithm of total assets, has a mean value of 4.91. In average, I have 128.7 firms for each industry-quarter in the sample.

2.2 EMPIRICAL SPECIFICATION

The main model specification is based on Gulen and Ion,(2016) and Leary and Roberts (2014). Gulen and Ion (2016) model corporate investment as a function of the economic policy uncertainty index and other firm-level and country-level characteristics. Leary and Roberts (2014) model firm outcomes variables as a function of peer firms outcomes (excluding the firm itself), firm specific characteristics and peer firms' average characteristics. Since I am interested in how peer effects influence corporate investment during the periods of economic policy uncertainty, I include peer firms average investment, the one period lagged natural logarithm of the quarterly average EPU index, as well as the interaction term between peer firms average investment and the one period lagged quarterly EPU index.

Inspired by Leary and Roberts (2014), I use contemporaneous values of peer firms' average investment instead of one period lagged peer firms' average investment because it limits the amount of time for firms to respond to one another. The contemporaneous methods make it difficult to identify mimicking behavior among firms. As the EPU index is a time-varying country-level variable, I also include time fixed effects. I follow Gulen and Ion (2016) to control corporate investment opportunities over time by including *Sales Growth, Cash Flow, Tobin's Q, Real GDP Growth* and firm fixed effects. Next, I include peer firms averages (i.e. *Sales Growth, Cash Flow, Tobin's Q*), as in Leary and Roberts (2014), to control the influence of other peer firms financial characteristics on corporate investment. Finally, the main specifications are given by:

$$Investment_{i,j,t}$$

$$= \alpha + \beta_1 EPU_{t-1} + \beta_2 Investment_{-i,j,t} \times EPU_{t-1} + \beta_3 Investment_{-i,j,t}$$

$$+ \gamma \bar{X}_{-i,j,t-1} + \lambda X_{i,j,t-1} + \xi \mu_i$$

where the indices *i, j,* and *t* represent firm, industry, and year, respectively. The term $Investment_{-i,j,t}$ denote contemporaneous measures of peer firms' investments. The vectors $\bar{X}_{-i,j,t}$ and $X_{i,j,t}$ denote peer firms' averages and firms specific characteristics, respectively. The two vectors $\bar{X}_{-i,j,t-1}$ and $X_{i,j,t-1}$ include control variables known to correlate with investment decisions.

As specified in the last section, the variables correlated with investment decisions include *Cash Flow, Sales Growth,* and *Tobin's Q* (Gulen and Ion, 2016). In addition, in order to account for time-invariant firm heterogeneity, I include firm fixed effects (v_t). In the model, all standard errors are clustered at the firm level. The main hypothesis is that β_2, the coefficient of the interaction term between peer firms average investment and the one period lagged EPU index is positive. This implies that firms are more likely to mimic their peers when facing economic policy uncertainty.

CHAPTER 4

RESULTS

4.1 MAIN RESULTS

The level specifications use the levels for all of the variables on both the left- and right-hand sides of the equation. The first difference specifications use first differences for all of the variables on both the left- and right-hand sides of the equation. The only exception is the economic policy uncertainty index, which I use its levels across all specifications. In Specifications (1) – (3) of Table 4.1, I regress firm investments on peer firm average investment, one period lagged economic policy uncertainty and the interaction term of peer firm average investment and one period lagged economic policy uncertainty while controlling for firm-fixed effects. In Specification (1), I report the results of peer effects only on firm investment decision. As expected, the coefficient of peer firm average investment is positive and statistically significant. One unit change in peer firm average investment associates with 0.815 unit changes in firm investments. Thus, peer firms have notably impact on firms' investment decisions.

While Leary and Roberts (2014) document that peer firms play an important role in determining firm capital structure and financial policies, the preliminary findings are consistent with their findings. In Specification (2), I test the effects of economic policy uncertainty on firm investments. Consistent with Gulen and Ion (2016), the results show there are strong and negative relationship between economic policy uncertainty and firm

investments. One unit increases in economic policy uncertainty index is associated with 0.062 units reduction in firm investments.

The main question is whether peer effects would be strengthened when firms face economic policy uncertainty. Will the firms be more willing to follow others when they do not have clear idea about the future policy changes? I test this idea in Specification (3). The focus is the interaction term of peer firm average investment and the one period lagged EPU. I find that the coefficient of the interaction term is positive and significant at 5% level, implying that peer effects are reinforced when firm face economic policy uncertainty. The coefficient of peer firm average investment itself is positive and significant at 1% level. The coefficient of economic policy uncertainty is positive, however, it is not significant in this specification.

I run regression using first differences of the left- and right- hand variables but the level of economic policy uncertainty index. I focus on the interaction term of one period lagged economic policy uncertainty and peer firm average investment change. The coefficient of the interaction is positive and significant at 1% level, which is even more significant compared with the level specification. The coefficient of peer firm average investment change is positive and statistically significant at 5% level. The findings imply that firms are inclined to follow their peers when making investment decision and the peer effects are strengthened when they face economic policy uncertainty. The evidences are consistent with the findings of Lubo, Astor, and Veronesi (2012) that stock prices are closely related during government economic policy uncertainty periods, which also implies that firms tend to mimic their peers to make financial and investment decisions. Along this way, it is not surprised that their stock prices are highly correlated.

Table 4.1 MAIN REGRESSION RESULTS

	(1)	(2)	(3)	(4)
VARIABLES	*Investment*	*Investment*	*Investment*	*Δ Investment*
Peer Firm Avg. Investment	0.815***		0.476***	0.327**
	(43.68)		(3.27)	(2.03)
EPU (t-1)		-0.062***	0.404	-0.375
		(-4.12)	(1.20)	(-0.49)
*Peer Firm Avg. Investment * EPU (t-1)*			0.073**	0.109***
			(2.36)	(3.18)
Sale Growth (t-1)	0.000***	0.001***	0.000***	-0.001***
	(5.05)	(11.06)	(5.06)	(-6.87)
Tobin's Q (t-1)	0.087***	0.085***	0.087***	0.057***
	(26.44)	(26.36)	(26.45)	(6.40)
Cash Flow (t-1)	2.154***	1.109***	2.153***	2.761***
	(23.78)	(13.67)	(23.77)	(17.72)
Peer Firm Avg. Sale Growth (t-1)	0.000		0.000	0.001
	(1.17)		(1.21)	(1.19)
Peer Firm Avg. Tobin's Q (t-1)	-0.035***		-0.034***	-0.040
	(-3.99)		(-3.85)	(-1.50)

Table 4.1 MAIN REGRESSION RESULTS (CONTINUED)

Peer Firm Avg. Cash Flow (t-1)	0.020		0.006	1.181*
	(0.07)		(0.02)	(1.72)
Real GDP Growth (t-1)	0.233***	0.046***	0.150**	-0.029
	(2.78)	(19.87)	(2.52)	(-0.24)
Constant	-0.389**	1.643***	-2.104	1.730
	(-2.47)	(21.76)	(-1.33)	(0.49)
Obs.	462,327	462,327	462,327	430,003
Number of Firms	16,429	16,429	16,429	15,788
Adjusted R-squared	0.253	0.404	0.253	0.272
Firm fixed effects	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes

Statistical significant at the 5% and 1% levels is denoted by ** and ***, respectively.

4.2 COMPONENTS OF THE EPU INDEX ANALYSES

Baker, Bloom and Davis (2016) base on newspaper coverage frequency to develop the BBD index. Therefore, the news component is in principle designed to capture economy economic policy uncertainty. Gulen and Ion (2016) find that the news component provides majority of the explanatory power of overall BBD index. Among the four components, news, tax, CPI, federal, state and local, tax related economic policy uncertainty is also important to predict firm investment decisions. Cummins, Hassett and Hubbard (1996) document evidences that firm investment respond to tax change in 12 out of 14 OECD countries, including the United States. Therefore, I focus on these two

components of the BBD index, news related and tax related components, for the analyses in this section.

I firstly use levels for all variables on both left- and right-hand sides of the equation in Specification (1) and (2) of Table 4.2. In the first column, I report regression results using the news based EPU index as the explanatory variable while controlling for firm specific characteristics and peer firm averages. The coefficient of the interaction term of the one period lagged news based EPU index and peer firm average investment is positive and statistically significant at 1% level. The peer firm average investment also has a positive and statistically significant coefficient.

The results are consistent with the finding documented in the last section that peer effects are strengthened when firms face economic policy uncertainty. In Specification (2), I report regression results using tax-related economic policy uncertainty index as the explanatory variable instead of the general EPU index. The coefficient of one period lagged tax-related economic policy uncertainty index is negative and significant at 5% level, implying that tax-related economic policy uncertainty have negative influence on firm investment. The coefficient of peer firm average investment is positive and significant at 1% level, which means that peer firms investment is a strong explanatory variable for firm investment decisions.

I focus on the interaction term of one period lagged tax-related economic policy uncertainty index and peer firm average investment to verify whether peer effects will be reinforced when firm face tax-related economic policy uncertainty. I find the coefficient of the interaction term is positive and significant at 1% level.

Table 4.2 COMPUNENTS OF EPU INDEX ANALYSES

EPU Components	*News*	*Tax*	*News*	*Tax*
VARIABLES	*Investment*	*Investment*	*ΔInvestment*	*Δ Investment*
Peer Firm Avg. Investment	0.339***	0.590***	0.230*	0.594***
	(3.00)	(17.23)	(1.87)	(16.00)
EPU (t-1)	0.834	-0.195**	0.462	0.067
	(1.32)	(-2.08)	(0.56)	(0.78)
*Peer Firm Avg. Investment * EPU (t-1)*	0.102***	0.053***	0.129***	0.057***
	(4.25)	(7.75)	(4.96)	(7.76)
Sale Growth (t-1)	0.000***	0.000***	-0.001***	-0.001***
	(5.06)	(5.03)	(-6.90)	(-6.83)
Tobin's Q (t-1)	0.087***	0.088***	0.057***	0.057***
	(26.44)	(26.49)	(6.39)	(6.46)
Cash Flow (t-1)	2.151***	2.145***	2.757***	2.753***
	(23.75)	(23.68)	(17.69)	(17.64)
Peer Firm Avg. Sale Growth (t-1)	0.000	0.000	0.001	0.001
	(1.18)	(0.65)	(0.95)	(1.59)
Peer Firm Avg. Tobin's Q (t-1)	-0.034***	-0.030***	-0.043	-0.026

Table 4.2 COMPUNENTS OF EPU INDEX ANALYSES (CONTINUED)

	(-3.88)	(-3.43)	(-1.61)	(-0.97)
Peer Firm Avg. Cash Flow (t-1)	-0.032	-0.091	1.085	0.952
	(-0.11)	(-0.31)	(1.58)	(1.39)
Real GDP Growth (t-1)	0.434**	0.006	0.153	0.031
	(2.16)	(0.05)	(0.52)	(0.26)
Constant	-4.724	0.824	-2.272	-0.312
	(-1.41)	(1.45)	(-0.57)	(-0.82)
Obs.	462,327	462,327	430,003	430,003
Number of Firms	16,429	16,429	15,788	15,788
Adjusted R-squared	0.253	0.255	0.272	0.274
Firm fixed effects	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes

Thus, I conclude that firms respond positively to peer firm average investment when facing tax-related economic policy uncertainty. In Specification (3) and (4), I report regression results using first differences for all of the variables on both left- and right-hand of the equation except the indexes of news-related and tax-related economic policy uncertainty. The first difference regression results are very similar with the level regressions.

Using both the news-related and tax-related EPU index, I find that the coefficients of the interaction term of the one period lagged tax-related and news-based EPU index and peer firm average investment change are positive and significant at 1% level. Thus, the findings are also robust using the change of firms' investment as dependent variables. In general, I conclude that firms are more likely to follow their peers when making investment decision when they face economic policy uncertainty.

4.3 SUBSAMPLE ANALYSIS: WHICH FIRMS MIMIC?

Patel, Zeckhauser and Hendricks (1991) suggest that facing uncertainty, combined with natural inclination of individuals to free ride on others' information, may lead to herd behavior in making corporate financial policies and decisions. Cvii and Banerjee (1992) show that when people find that to obtain their own information is noisy, costly and time consuming, it is more likely for firms to rely on others' information when making their owns. As shown by Leary and Roberts (2014), smaller, less profitable firms with low earnings growth are more sensitive to financial decisions made by their more successful counterparts.

To examine heterogeneity in the coefficient on the interaction term of peer firms average investment and economic policy uncertainty, I split the sample according to market to book ratio, financial constrains, earnings growth and sales growth. I expect peer effects during economic policy uncertainty period would be stronger for financially constrained firms, whose financial policies and particularly, investment decisions are more sensitive to market conditions than those of financially unconstrained firms. Moreover, I would also expect that firms with low market to book ratio, low sale growth

and low earnings growth will be more likely to follow their more successful peers when facing economic policy uncertainty.

I measure financial constraints using the size-age index (the SA index), which is developed by Hadlock et al (2010). The SA index is a combination of asset size and firm age, which is calculated as (−0.737* Assets + 0.043*Assets2 − 0.040*Age), where Assets is the natural log of total book assets and Age is the number of years a firm first appears on COMPUSTAT. Specifically, financially more constrained firms have higher SA index. I calculate the average SA index for each firm over its time-series and classify firms as financially constrained or financially unconstrained. I categorize firms with average SA index falling in top (bottom) tertile in each industry as financially constrained (unconstrained).

Empirical evidence shows that firm size is related to a firm's productivity, survival and profitability. Moreover, large firms can finance from the internal resources, debt or equity issuance. However, small firms have limited internal resources and limited capability to issue debt or equity. Additionally, Audretsch and Elston (2002) point out that small and young firms are more likely to experience credit rationing. Potential lenders may lack information on managerial capabilities and investment opportunities of such small and young firms. The potential lenders are unlikely to be able to identify the risks of the firms. This kind of information asymmetry leads the potential lenders to increase the interest rates or limit the amount of money they are willing to lend at any particular interest rate.

I split firms according to average book to market ratio and earnings growth over its time-series and recognize firms falling in top (bottom) tertile in each industry as firms with high (low) market to book ratio and earnings growth. I sort firms within each industry-year into three groups based on their sales growth. High sales growth firms fall into the top third and low sales growth firms fall into the bottom third of the distribution. Specifically, I interact peer firm average investment and economic policy uncertainty index with indicator variables identifying the lower and upper thirds of each interaction variables' distribution. For binary variables, the interaction is directly with the binary variable. Moreover, to avoid redundancy, I focus on both investment and the changes of investment as the outcome variable of interest.

Table 4.3 presents the results. In the column (1) and (2), I report the results of subsample based on market to book ratio. I focus on the interaction term of peer firm average investment, economic policy uncertainty and binary indicator variable of firms recognized with low market to book ratio. The results show that using level and first difference models, the coefficients of the interaction terms are positive and statistically significant at 5% level, which means that peer effects during economic policy uncertainty periods are stronger for firms with low market to book ratio. As a result, less valued firms are more likely to follow their peer firms when facing economic economic policy uncertainty. Columns (3) and (4) show the results for the earnings growth subsample.

I find that firms with low earnings growth are more sensitive to their peers' investment decisions when facing economic policy uncertainty. The results of subsample based on sales growth are tested in Specification (5) and (6). In the model using levels of the variables, the loadings of corporate investment on the interaction term are

Table 4.3 SUBSAMPLE ANALYSES

	Market to Book Ratio		*Earnings Growth*		*Sales Growth*		*Financially Constrained*	
	Investment	*Δ Investment*	*Investment*	*Δ Investment*	*Investment*	*Δ Investment*	*Investment*	*Δ Investment*
*Peer firm avg. investment*EPU (t-1)*group indicator*	0.112**	0.122**	0.169***	0.172***	0.107***	0.082*	0.091	0.124
	(2.42)	(2.42)	(3.47)	(3.19)	(3.02)	(1.74)	(0.94)	(1.22)
Peer firm avg. characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Specific Factors	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Real GDP Growth	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	462,327	430,003	462,327	430,003	462,327	430,003	455,150	423,638
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

economically significant, at 1% level. While, for the first difference model, the coefficient of the interaction term of peer firm average investment and economic policy uncertainty with binary indicator variable is positive, however, not statistically significant. I do not find significant results for the subsample based on financial constraints.

4.4 ROBUSTNESS CHECKS

In the last section, I conclude that firms with low market to book ratio, low earnings growth and sales growth, are more likely to mimic their counterparts investment decisions when facing economic policy uncertainty. In this section, I perform robustness checks for the findings. I categorize firms falling in top (bottom) tertile regarding their market to book ratio, sales growth, earnings growth and SA index as leader (follower) firms. I then calculate the leader and follower firms average investment changes. I perform robustness checks by regressing leader firms' investment changes on the follower firms and also follower firm average investment changes on their leaders. I first focus on the follower firms' average investment changes interacting with the EPU index.

I present the regression results in panel A of Table 4.4. It shows that, except the subsample of sale growth, the coefficients of interaction terms of leader firms' investment changes and the EPU index are positive and statistically significant for the subsamples of financial constraints, earnings growth and market to book ratio. The results imply that follower firms do respond to their leaders investment decisions when they face economic policy uncertainty, which also indicate that peer effects are stronger for follower firms during the periods of economic policy uncertainty.

Table 4.4 LEADERS AND FOLLOWERS

	Change in Firm Investment			
	Sales Growth	*Financial Constraints*	*Earnings Growth*	*Market to Book*
Panel A: Do Follower Firms Respond to Leaders?				
*Leader Firms Avg. Investment Change*EPU (t-1)*	0.229*	0.324***	0.306***	0.219***
	(1.79)	(2.60)	(5.76)	(4.77)
Firm Specific Characteristics	Yes	Yes	Yes	Yes
Peer Firms Avg. Characteristics	Yes	Yes	Yes	Yes
Real GDP Growth	Yes	Yes	Yes	Yes
Obs.	207,913	30,477	121,553	119,087
Adjusted R-squared	0.245	0.135	0.215	0.201
Firm Fixed Effects	Yes	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes	Yes
Panel B: Do Leader Firms Respond to Followers?				
Follower Firms Avg. Investment Change EPU (t-1)*	0.057	0.059	0.062	0.054
	(0.83)	(0.89)	(1.13)	(0.92)
Firm Specific Characteristics	Yes	Yes	Yes	Yes
Peer Firms Avg. Characteristics	Yes	Yes	Yes	Yes

Table 4.4 LEADERS AND FOLLOWERS (CONTINUED)

Real GDP Growth	Yes	Yes	Yes	Yes
Obs.	111,533	28,527	116,185	113,123
Adjusted R-squared	0.226	0.412	0.207	0.204
Firm Fixed Effects	Yes	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes	Yes

CHAPTER 5

ROBUSTNESS

5.1 ALTERNATIVE POLICY UNCERTAINTY MEASURES

The strategy to alleviate the endogeneity problem is the instrumental variable approach. The election uncertainty reflects political uncertainty and potential changes in government leaderships or government policies (Julio and Yook, 2012). Election can isolate uncertainty related to government leadership from other factors. I follow Julio and Yook (2012) to choose close presidential elections as one of the plausible exogenous shock to government policies. There are two close presidential elections, the 2000 and 2004 presidential elections, during the sample period.

I run a baseline regression using the EPU index and replace it with the close election dummy, which equals one if there is a close presidential election in year t and zero otherwise. The regression results are reported in Table 5.1. The coefficients of the interaction term of the one period lagged EPU index and peer firms average investment (changes) are positive and economically significant at 5% level, which are consistent with the previous findings that peer effects are reinforced during high economic policy uncertainty periods. The results are robust to the instrumental variable.

I use the political polarization in the House of Representatives as an instrumental variable for economic economic policy uncertainty. Scott R. Baker, Nicholas Bloom and

Table 5.1 INSTRUMENTAL VARIABLE APPROACHES

	Investment	*Δ Investment*	*Investment*	*Δ Investment*
	Close Presidential Election		*Political Polarization*	
*Peer Firms Avg. Investment **				
Uncertainty (t-1)	0.516**	0.049**	0.001	0.010
	(2.25)	(2.08)	(0.03)	(0.41)
Firm Specific Characteristics	Yes	Yes	Yes	Yes
Peer Firms Avg. Characteristics	Yes	Yes	Yes	Yes
Obs.	462,327	430,003	381,396	351,914
Adjusted R-squared	0.245	0.269	0.228	0.244
Firm Fixed Effects	Yes	Yes	Yes	Yes
Quarter Dummies	Yes	Yes	Yes	Yes

Steven J. Davis (2014) point out that political polarization increase economic economic policy uncertainty in the United States. It is possible that when the political parties in the Congress are more polarized, the political parties find it more difficult to reach an agreement. Therefore, the political polarization is likely to satisfy the relevance criterion as an instrumental variable for economic policy uncertainty. However, it is not obvious that political polarization could influence corporate investments through a channel other than economic policy uncertainty; therefore, it satisfies the other aspect of exclusion

restriction as an instrumental variable.

I construct the measure of political polarization using the U.S. House roll-call vote data obtained from the Political Institutions and Public Choice House Roll-Call Database. I focus on bill and joint resolution, since those two types of legislations may affect laws or constitutions. I follow Xu (2011) to measure political polarization as an average disagreement on bills or joint resolutions in the House. Political polarization is defined as $\frac{1}{n}\sum_{n=1}^{N} 1 - |Y_{ea_{n,t}}\% - N_{ay_{n,t}}\%|$, where $Y_{ea_{n,t}}\%$ $\left(N_{ay_{n,t}}\%\right)$ is the percentage of Y_{ea} (N_{ay}) votes among all votes for bill n in year t. N is the total number of bills or joint resolution in year t. I focus on bills regarding economy, taxes, and budget, defense, foreign policies and energy and environment issues as well as appropriation bills. A higher value of the variable indicates a higher degree of polarization. I estimate the baseline models and use the measure of political polarization as the instrumental variable for economic policy uncertainty. The regression results are not economically significant. However, the sign of the coefficients of the interaction term of peer firms average investment and economic policy uncertainty in both level and first difference models remains positive.

5.2 ALTERNATIVE MEASURES OF INVESTMENT

Table 5.2 presents the regression results using alternative measures of corporate investments. Following Bustamante and Fresard (2017) and Leary and Roberts (2014), I define investment as capital expenditure scaled by total property, plant and equipment of the beginning periods. I also scale capital expenditure by total assets of the beginning

Table 5.2 ALTERNATIVE MEASURES OF INVESTMENT

VARIABLES	*General*	*News*	*Tax*	*General*	*News*	*Tax*
	Δ Investment CAPX/PPE(t-1))			*Δ Investment CAPX/Total Assets (t-1)*		
*Peer Firm Avg. Investment*EPU (t-1)*	0.080**	0.144***	0.019***	0.164***	0.178***	0.064***
	(2.48)	(5.46)	(3.14)	(4.92)	(6.81)	(9.23)
Firm Specific Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Peer Firm Avg. Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Real GDP Growth	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	426,701	426,701	426,701	430,003	430,003	430,003
No. of Firms	15,677	15,677	15,677	15,788	15,788	15,788
Adjusted R-squared	0.145	0.145	0.145	0.222	0.222	0.223
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes

periods as another measure of investment.

Afterwards, I run regression using the first difference model and test the effects of the general, the news-based and the tax-related EPU index and peer firm average investment on corporate investments. The results in Table 5.2 show that all the coefficients of the interaction terms between the EPU index and the peer firm average investment are positive and most of the coefficients are significant at 5% level, using the general, news-based as well as tax-related EPU index. Therefore, the results are robust to alternative measurements of investment as well as the other two components of the EPU index.

5.3 ADDITIONAL CONTROL VARIABLES

Another concern is the omitted firm-level characteristics that influence a firm's investment decisions. For example, Ahn, Denis and Denis (2006) document that firm leverage has negative impact on investment decisions within diversified firms. Specifically, the impact is greater for high Q than for low Q firms. Aivazian, Ge and Qiu (2003) find evidences that firm leverage has significant impact on investment decisions. Hadlock et al. (2010) argue that firm size is a particularly useful predictor for firms' financial constraint levels, which are accordingly related to firms' investment decisions.

In Table 5.3, I report the regression results after controlling firm leverage and size. I use natural logarithm of firm total assets to measure firm size and the ratio of firm total debt to total asset as a measure of firm's book leverage. The dependent variables are

Table 5.3 ADDITONAL CONTROLS

VARIABLES	*General Investment*	*News Investment*	*Taxes Investment*
Peer Firm Avg. Investment	0.475***	0.341***	0.588***
	(3.27)	(3.01)	(17.18)
EPU (t-1)	-0.511	-0.865	0.074
	(-1.49)	(-1.35)	(0.77)
*Peer Firm Avg. Investment * EPU (t-1)*	0.073**	0.101***	0.054***
	(2.36)	(4.23)	(7.79)
Sale Growth (t-1)	0.000***	0.000***	0.000***
	(5.18)	(5.17)	(5.16)
Tobin's Q (t-1)	0.084***	0.084***	0.084***
	(24.96)	(24.96)	(24.97)
Cash Flow (t-1)	2.075***	2.073***	2.069***
	(22.39)	(22.37)	(22.31)
Book Leverage (t-1)	-0.399***	-0.399***	-0.399***
	(-15.20)	(-15.19)	(-15.17)
Size (t-1)	-0.145***	-0.144***	-0.146***
	(-19.18)	(-19.16)	(-19.34)
Peer Firm Avg. Sale Growth (t-1)	0.000	0.000	0.000
	(1.61)	(1.57)	(1.10)

Table 5.3 ADDITONAL CONTROLS (CONTINUED)

Peer Firm Avg. Tobin's Q (t-1)	-0.042***	-0.042***	-0.040***
	(-4.72)	(-4.74)	(-4.44)
Peer Firm Avg. Cash Flow (t-1)	0.241	0.195	0.207
	(0.75)	(0.60)	(0.64)
Peer Firm Avg. Book Leverage (t-1)	0.134	0.129	0.153*
	(1.61)	(1.55)	(1.83)
Peer Firm Avg. Size (t-1)	-0.050***	-0.049***	-0.060***
	(-3.57)	(-3.50)	(-4.27)
Real GDP Growth (t-1)	-0.109*	-0.342*	0.023
	(-1.77)	(-1.65)	(0.20)
Constant	3.794**	5.952*	0.949*
	(2.33)	(1.73)	(1.67)
Obs.	462,327	462,327	462,327
Number of Firms	16,429	16,429	16,429
Adjusted R-squared	0.254	0.254	0.255
Firm fixed effects	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes

either firm investment. I run regression using general U.S. economic policy uncertainty and the two main components of the BBD index. The results demonstrate that the peer effects are strengthened during the periods of economic policy uncertainty, which are consistent with the previous regression results. In general, after controlling firm size and leverage, I continue to find statistically significant results, which conform to the main results. Thus, the regression results are not partially driven by the omitted variables.

CHAPTER 6

LIMITATIONS

The paper generally tests that peer effects are magnified by economic policy uncertainty. Based on reputation-based theory and information-based theory, the follower firms are likely to follow the leader firms, while the leader firms are less likely to follow the follower firms. In other words, leaders lead and followers follow. The empirical results support my hypotheses. However, there are still some limitations of the paper.

First, the definition of peer effects is roughly the firms in the same industry at the same time period excluding the firm itself. When calculating the peer firm characteristics, the effects of leaders firms are weakened by the follower firms. If there is a concrete measure of peer firms, then the general peer effects can be precisely approximated.

Second, I support my hypotheses by two theories, i.e. reputation-based theory and information-based theory. However, I do not find appropriate ways to test the two channels. For example, reputation-based mechanism suggested that higher economic policy uncertainty increases CEO career concerns. And it leads to stronger peer effects due to increased career concerns of managers. At the same time, it might be likely that higher economic policy uncertainty worsen agency conflicts between managers and shareholders. Agency conflicts can be resolved by good corporate governance, through either incentive plans (CEO compensation) or monitoring. However, this paper does not provide a channel through which the managerial career concern mechanism works.

Future studies can investigate the possible channel through which peer effects are magnified by economic policy uncertainty. As well as, future studies can also test the peer effects on the other aspects of firm behavior, e.g. cash holdings, stock splits, dividend payout policies and so on.

CHAPTER 7

CONCLUSION

The paper shows that firms do not make investment decisions in isolation, and firms' investment decisions actively respond to the investments of their peers, when facing economic economic policy uncertainty. In other words, peer firms' investments influence corporate investment decisions significantly during the periods of economic policy uncertainty. Indeed, peer firms' behaviors have robust and remarkable impact on corporate investments. Besides, I provide theoretical support (i.e. reputation based theory and information based theory) for the findings on peer effects, from the perspective of managers. Afterwards, I observe that the influence from the peers is stronger for relatively less successful firms (i.e. less valued firms, less profitable, financially constrained firms and firms with lower growth rates).

The results are robust to the additional tests. The empirical findings suggest that the impact of peer effects on corporate investments is significant during the periods of economic policy uncertainty. However, whether following closely to peers' investments leads to more efficient investment decisions and the efficient capital allocation in the economy still remains unclear. On the one hand, less successful firms have more incentives to imitate, especially when they face economic policy uncertainty, in order to maintain their industrial status. On the other hand, they may be lack of resources and proven incapable of imitating their successful and profitable peers. Moreover, imitating peers' investment decisions may result in reducing diversities and increasing systematic

risks. Therefore, I believe that the real consequence of peer effects is an interesting topic for the future research.

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