

# **The Effects of Uncertainty on European Mergers and Acquisitions**

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**A Study of the Relationship Between Firm Acquisitiveness and Uncertainty in Europe**

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# **The Effects of Uncertainty on European Mergers and Acquisitions: A Study of the Relationship Between Firm Acquisitiveness and Uncertainty in Europe**

## **Abstract:**

The purpose of this paper is to investigate the relationship between uncertainty and mergers and acquisitions (M&A) in Europe. We use price and company data for firms in the 10 largest economies in Europe for the period 1990-2018. Through our tests, we find that increased uncertainty has a negative effect on firm acquisitiveness. We also find that firms undertaking M&A transactions during periods of higher uncertainty spend a longer time completing the deals. We find no evidence that European firms use more stock as payment during periods of higher uncertainty, suggesting that there are other factors that are more important to firms when choosing the form of payment for M&A transactions.

## **Keywords:**

Mergers & Acquisitions, Uncertainty, Corporate Investments

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# 1. Introduction

## 1.1. Background

Mergers and Acquisitions (M&A), as a business strategy and form of corporate investment, has increased in importance significantly during the last decades. The sheer amount of capital allocated to M&A has grown from USD 435 billion in 1985, to averaging USD 3.4 trillion per year 2015-2020 (Institute of Mergers Acquisitions and Alliances (IMAA), u.d.). As a result of the magnitude of capital being allocated to M&A, it has become a strategic phenomenon necessary to understand for academics, politicians, and practitioners. The risk and complexity associated with successfully completing a merger or an acquisition makes it highly sensitive to both intrinsic and external factors. Furthermore, the irreversible nature and often large amount of capital needed for M&A investments, make those investments further sensitive to external uncertainty on a macro level, as shown by (Dixit & Pindyck, 1994).

Uncertainty for a decision maker is considered to be the situation in which the decision outcomes and their probabilities are unknown. During recent years, an increasing number of studies examining the dynamics of corporate investments and uncertainty, shows that uncertainty reduces the willingness to undertake corporate investments, e.g., (Gulen & Ion, 2016) and (Kim & Kung, 2016). (Nguyen & Phan, 2017) and (Bonaime, Gulen, & Ion, 2018) narrows the scope by looking solely on the effects of policy uncertainty on M&A in the United States and find that firm acquisitiveness is reduced during periods of higher uncertainty.

In our study, we follow (Nguyen & Phan, 2017) and expand the scope in two different ways. Firstly, by looking at uncertainty from a broader perspective using the newly developed World Uncertainty Index (WUI) created by (Ahir, Bloom, & Furceri, 2018), rather than only looking at policy uncertainty using the BBD index developed by (Baker, Bloom, & Davis, 2016). Secondly, by looking at a different geographic area, i.e., Europe rather than the United States<sup>1</sup>.

Since uncertainty is something that exists in the perception of humans rather than as a tangible object or number, measuring uncertainty has historically been a challenge for researchers. To deal with this issue, researchers often turn to proxies such as the Chicago Board Options Exchange (CBOE) Volatility Index (VIX), political elections, and the economic policy uncertainty index constructed by (Baker, Bloom, & Davis, 2016) (BBD index). These are, however, considered to have shortcomings as proxies for uncertainty. The VIX only captures effects of short-term concerns as it represents the

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<sup>1</sup> Specifically, we look at the 10 largest European economies excluding Russia and Turkey. These include Belgium, France, Germany, Italy, Netherlands, Poland, Spain, Sweden, Switzerland, and the UK.

market's expectations of volatility 30 days forward, uncertainty related to the outcome of political elections are short-term by nature, and the BBD index focuses only on measuring economic policy uncertainty. However, despite its limitations, policy uncertainty has increased in popularity in the recent literature. Policy uncertainty refers to the uncertainty related to the development of government policies regarding taxes, fiscal policies, and electoral outcomes which will influence political leadership. A high degree of policy uncertainty regarding matters such as future bailouts, government spending, and financial regulation complicates the process of strategic and investment planning for companies. However, it leaves out many factors with explanatory power for the economic outlook, e.g., uncertainty regarding, macro-economic outlooks, geopolitical tensions, and armed conflicts etc. We aim to broaden the field of studying uncertainty and M&A activity by using a newly created measurement for uncertainty, the World Uncertainty Index (WUI).

The WUI was launched in 2018, constructed to capture uncertainty on a more extensive scale compared to the BBD index. Rather than only looking at uncertainty regarding economic policies, the WUI also directly captures uncertainty related to major events such as economic crises, wars, and outbreaks of global pandemics. By text mining The Economist Intelligence Unit (EIU) reports, a single source is used for the 143 nations that it covers, which increases comparability and makes it ideal when studying data from different countries. The index is constructed by measuring the frequency of the word “uncertainty”, and its variants, normalised in relation to the total amount of words in each report. By doing this, the index captures uncertainty regarding both near- and long-term concerns. For further details on the World Uncertainty Index, we refer the reader to the WUI webpage. (Ahir, Bloom, & Furceri, World Uncertainty Index, u.d.)

We also extend on (Nguyen & Phan, 2017) by shifting focus from the United States and instead examine M&A data from Europe. Throughout the literature researching the dynamics of corporate investments under uncertainty, most studies look at data from the United States. The European and the U.S. economies differ in many ways regarding important economic aspects such as labour market dynamics, sector exposure and fiscal policies. For example, the United States' proposed COVID-19 stimulus package is roughly three times that of the stimulus packages suggested by the European Union (Reuter Staff, 2021). The U.S. labour market is two to three times more mobile than the labour market in Europe, according to the OECD (Causa & Pichelmann, 2020). The two economies also differ in their dependency towards specific sectors, e.g., travel and tourism represent 2.7% of U.S. GDP (World Bank, u.d.). The same figure for the European Union is 3.9% (10.3% when including sectors closely linked to travel and tourism) (Pernicle & Debyser, 2020). Factors like these and several more underscore the importance of conducting separate investigations, in order to ensure that market dynamics discovered for the U.S. market applies to the European market as well. The

fact that the European economy is one of the three biggest economies in the world provides further motivation for us to shift our focus to Europe.

## 1.2. Question

Our extension to Nguyen & Phan's study lies in substituting policy uncertainty as measured by the BBD index for overall uncertainty as measured by the WUI. We also expand the time period to 1990-2018 as well as shift focus from the U.S. market and instead examine the dynamics between uncertainty and M&A activity on the European market. Thus, the question our work seek to answer is:

*How is M&A activity in the sense of firm acquisitiveness in Europe's 10 biggest economies affected by uncertainty?*

Our research is highly relevant mainly due to two factors. Firstly, as an increasing amount of capital is being allocated to M&A, it plays a much bigger role as a form of corporate investment. Secondly, although uncertainty is a dynamic phenomenon, both policy uncertainty (as measured by the BBD index) and uncertainty (as measured by the WUI) are at record levels.<sup>2</sup> The combination of M&A's importance for corporations and the increased levels of uncertainty makes it crucial for policymakers, researchers, and practitioners to understand the relationship between M&A and uncertainty. This study and its findings will therefore contribute to fill in the gaps regarding the relationship between M&A activity and uncertainty in Europe.

## 1.3. Methodology

In this study, we focus on testing how firm acquisitiveness, time to completion, and payment considerations relate to uncertainty. Following (Nguyen & Phan, 2017), we also test if firms in industries with a greater exposure to government spending differ in their sensitivity to uncertainty compared to other industries. We investigate the relationship between uncertainty and acquisitiveness, as well as how uncertainty affects payment considerations by using a probit model. To examine how long time it takes to complete an M&A transaction, we use Ordinary Least Squares (OLS) regressions. To further validate our result, we test both with and without industry fixed effects and conduct a robustness check to test for endogeneity. We discuss our methodology in further detail in section 4.

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<sup>2</sup> This refers to an average for the last 3-year period.

## 1.4. Results and Interpretation

Our main empirical finding is that increased levels of uncertainty reduce firm acquisitiveness for European firms. This is in line with our predictions and the previous literature examining policy uncertainty and M&A activity on the U.S. market. However, we do not find the same negative relationship to hold for industries that are more dependent on government spending. We suggest this could be the result of governments increasing their spending as a response to events triggering uncertainty, thus generating positive effects for the industries exposed to government spending.

Furthermore, we find that firms undertaking M&A transactions during periods of higher uncertainty spend longer time completing the deals. This is consistent with the previous literature, suggesting that there exists a value in waiting for better information when undertaking irreversible investment projects.

We also investigate firms' payment considerations where we find no evidence that firms use more stock as payment during periods of higher uncertainty. This is not in line with the findings of (Nguyen & Phan, 2017), which suggests that there are other factors that are more important to European firms when choosing the form of payment for M&A transactions.

## 2. Related Literature & Relative Contribution

Our study mainly relates to two research areas: uncertainty and M&A dynamics. We contribute to the ongoing research in explaining the determinants of M&A activity by expanding the geographical scope and by using a new measurement of uncertainty.

M&A activity is a large, and thus important, part of corporate investments. Previous research has studied the dynamics of M&A activity through many different perspectives. Previous papers have established that different factors, such as bidder and target valuations, the business cycle, corporate liquidity, risk management etc., impact M&A activity. (Harford, 2005) finds that shocks relating to regulation, the economy and technology drive industry merger waves when there is sufficient overall capital liquidity. (Bhagwat, Dam, & Harford, 2016) show that increases in market-wide implied volatility, as proxied by the VIX, are linked to decreased M&A activity.

A distinction to make when looking at previous research that studies the connection between M&A activity and uncertainty is that of political versus policy uncertainty. While the former captures uncertainty related to specific political events, perhaps most importantly political elections, the latter is a broader concept that also captures other events tied to governmental policies. Research about political uncertainty and M&A activity has been conducted by (Cao, Li, & Liu, 2019) who use national elections to study the effects of cross-border acquisition. Another study by (Chen, Cihan, Jens, & Page, 2018) examine M&A activity around gubernatorial elections in the U.S. Recent research on the topic has utilised the BBD index (Bloom et al. 2016) to capture policy uncertainty rather than political uncertainty. Our paper is closest related to those of (Nguyen & Phan, 2017) and (Bonaime, Gulen, & Ion, 2018). Both papers use the aforementioned BBD index as a proxy for policy uncertainty.

(Bonaime, Gulen, & Ion, 2018) study the effect of policy uncertainty shocks on M&A activity at both the macroeconomic and firm level by using U.S. data between 1985 to 2014. The authors find that political and regulatory uncertainty is strongly negatively linked to M&A activity at both levels with the strongest effect being attributed to uncertainty relating to monetary and fiscal policies, government spending, regulation, and taxes. (Nguyen & Phan, 2017) examine the relationship between policy uncertainty and M&A activity by using U.S. data between 1987 and 2014. They find that policy uncertainty is negatively connected to firm acquisitiveness and that higher policy uncertainty increases the time it takes to complete a deal. Additionally, the authors conclude that policy uncertainty stimulates stock payment rather than cash payment and that bid premiums are lower in times of higher policy uncertainty. Nguyen & Phan also show that acquirers on average create larger shareholder value from acquisitions undertaken in periods of higher policy uncertainty.

We expand on the literature by looking at data outside the United States, specifically on the 10 largest economies in Europe. We also use an alternative index that uses a common source for creating country-specific indexes. This makes our tests less likely to have measurement errors that could otherwise stem from the use of different sources for the country-specific uncertainty indexes.



### 3. Empirical Background & Data Description

In this section we present the three main datasets that we use for our tests. Firstly, we obtain our M&A data consisting of completed M&A deals in our 10 selected European countries for the period 1990-2018. Secondly, we collect accounting and price data, which we use to construct our control variables. Thirdly, we compile quarterly data from the WUI as a proxy for uncertainty. Further details on all three datasets follow below.

#### 3.1. M&A Data

The M&A data sample in our study is collected from the Platinum Database of the Securities Data Company (SDC). The sample consists of all completed deals from 1990-2018 within our selected countries (Belgium, France, Germany, Italy, Netherlands, Poland, Spain, Sweden, Switzerland, and the United Kingdom) with a value exceeding USD 1 million. The deal values are gathered from the SDC database in nominal USD value at the time of the deal. We exclude deals where the ratio of the deal value is below 1% of the acquirer's market capitalisation at the time of the acquisition, deals in which the acquirer already held a majority share of the target, and deals where the acquirer owns less than 50% after the deal is completed. We also exclude deals made by firms from the Utility and Financial industries, i.e., firms with Standard Industry Classification (SIC) codes (4900-4999) and (6000-6999), respectively. The exemption of the Utility and Financial industries follows the previous literature and is due to those industries being highly regulated.

To construct the variables used for the tests in this study, we use SEDOL codes as common identifiers when merging the M&A data from SDC with accounting data from Compustat. SEDOL codes are assigned to companies by the London Stock Exchange on the request of market participants. Some companies in the SDC dataset do not have a SEDOL code and are thus excluded from our final sample. Although it is unfortunate that a better common identifier is not available for European firms, we believe this does not render our sample unrepresentative of the original dataset. Neither the distribution of deals per country nor the deal value per country is materially changed after excluding firms without SEDOL codes. Our final sample, as listed in Table 1 contains 2,083 M&A deals.

**Table 1**  
**Distribution of M&A Deals by Year and Country**

Table 1 reports the frequency of M&A deals by year and acquirer country for the sample period 1990-2018.

Years	Belgium	France	Germany	Italy	Netherlands	Poland	Spain	Sweden	Switzerland	UK	Total
1990	0	0	0	0	0	0	0	0	0	10	10
1991	0	5	6	0	0	0	0	0	1	18	30
1992	0	3	0	0	3	0	0	0	0	24	30
1993	0	3	3	2	1	0	0	1	3	49	62
1994	2	4	3	0	2	0	0	2	5	44	62
1995	0	5	4	0	3	0	0	1	2	55	70
1996	1	4	4	3	3	0	0	4	3	56	78
1997	0	12	5	2	5	0	2	6	1	31	64
1998	0	15	4	3	13	0	2	1	0	42	80
1999	0	17	9	2	12	0	4	2	10	58	114
2000	3	25	8	6	11	0	7	12	4	41	117
2001	2	17	3	0	3	0	1	5	6	22	59
2002	2	10	2	2	1	0	6	2	6	24	55
2003	1	10	6	5	1	0	2	6	5	41	77
2004	2	13	10	3	2	0	6	5	9	53	103
2005	1	19	7	11	5	3	7	15	7	49	124
2006	5	21	12	11	4	5	12	15	3	62	150
2007	2	19	12	6	9	1	7	4	6	63	129
2008	1	10	15	3	1	0	2	2	4	38	76
2009	1	12	8	8	2	2	3	8	9	37	90
2010	2	13	5	3	4	1	0	6	5	39	78
2011	2	8	5	5	3	3	2	6	4	36	74
2012	1	14	3	3	3	3	5	4	3	37	76
2013	2	7	1	0	2	0	1	2	2	14	31
2014	1	6	7	4	3	2	3	7	3	17	53
2015	3	7	0	4	1	3	1	5	4	15	43
2016	0	5	5	5	1	0	2	9	3	16	46
2017	3	12	2	3	3	1	4	5	4	15	52
2018	0	12	3	6	1	2	2	5	3	16	50
<b>Total</b>	<b>37</b>	<b>308</b>	<b>152</b>	<b>100</b>	<b>102</b>	<b>26</b>	<b>81</b>	<b>140</b>	<b>115</b>	<b>1,022</b>	<b>2,083</b>

M&A activity increased from 1990 to 2000 before dropping the years following the ‘dot-com’ crash and regaining strength 2004-2007. ‘The Great Recession’ caused another drop in M&A activity from which the number of transactions gradually declined throughout the remainder of the sample period. Most M&A deals in the sample were undertaken by UK firms (49.1%) followed by France (14.8%). The number of deals is not a function of GDP, as can be seen by looking at the German data. Germany is the largest economy in the sample, yet their transaction volumes are far below those of the United Kingdom and France. As can be seen in Table 2, most transactions have been made by firms in Business Services (16.3%), Chemical and Allied Products (9.1%), and Communications (6.0%).

**Table 2**  
**Distribution of M&A Deals by Industry**

Table 2 reports the frequency of M&A deals by industry for the sample period 1990-2018.

2-digit SIC Code	Description	Frequency	Percent
73	Business Services	339	16.3
28	Chemicals and Allied Products	190	9.1
48	Communications	126	6.0
20	Food and Kindred Products	107	5.1
36	Electronic & Other Electrical Equipment & Components	87	4.2
35	Industrial and Commercial Machinery and Computer Equipment	83	4.0
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	80	3.8
87	Engineering, Accounting, Research, and Management Services	75	3.6
37	Transportation Equipment	61	2.9
32	Stone, Clay, Glass, and Concrete Products	58	2.8
27	Printing, Publishing and Allied Industries	53	2.5
50	Wholesale Trade - Durable Goods	50	2.4
	Industries with < 2% representation in sample	774	37.2
<b>Total</b>		<b>2,083</b>	<b>100</b>

### 3.2. Accounting & Price Data for Control Variables

We collect our accounting and price data for the control variables from the Compustat Global database. We filter on those firms with SEDOL codes and with headquarters in our selected countries. We include historical data for both active and inactive firms to avoid a potential survivorship bias in our sample. We merge the accounting and price data with our M&A data by using SEDOL codes as common identifiers. The firms in our M&A dataset that do not have a match in the Compustat Global database are excluded from the study. We then use the firm-specific accounting data to construct our control variables. Extreme outliers in the merged sample that lack economic sense due to faulty data are excluded from the final sample.

Table 3 presents the variables used for testing the relationship between uncertainty and M&A activity, both for the full sample and for the M&A subsample separately. The full sample contains 69,871 firm-year observations. MARKET-TO-BOOK\_RATIO is constructed as the market value of equity plus the difference between the book value assets and equity, divided by the book value of assets. LAST\_12\_MONTH\_RETURNS is calculated as the buy-and-hold returns over a 12-month period. BOOK\_LEVERAGE is the ratio of debt at book value divided by total book value of assets. For a complete list of variables and definitions, we refer the reader to the appendix. The average WUI value of the full sample (0.204) is slightly higher than that of the M&A subsample (0.181). The means for the control variables are higher in the M&A subsample for SIZE, LAST\_12\_MONTH\_RETURNS, AVERAGE\_SALES\_GROWTH, and BOOK\_LEVERAGE.

**Table 3**  
**Descriptive Statistics**

Table 3 reports the summary statistics of the full sample and the M&A subsample

A. Full Sample

Variable	N	Mean	Q1	Median	Q3	Std. Dev
WUI	69,871	0.204	0.074	0.143	0.302	0.181
SIZE	69,871	5.244	3.729	5.103	6.671	2.255
MARKET-TO-BOOK_RATIO	69,871	1.958	0.979	1.252	1.770	18.864
LAST_12_MONTH_RETURNS	69,871	0.117	-0.2	0.0	0.3	0.717
AVERAGE_SALES_GROWTH	69,871	0.086	-0.034	0.056	0.166	0.315
BOOK_LEVERAGE	69,871	0.187	0.045	0.168	0.294	0.154
NON-CASH_WORKING_CAPITAL	69,871	0.050	-0.053	0.057	0.184	1.639

B. M&A Subsample

Variable	N	Mean	Q1	Median	Q3	Std. Dev
WUI	2,083	0.181	0.060	0.138	0.249	0.173
SIZE	2,083	7.077	5.225	7.014	8.922	2.405
MARKET-TO-BOOK_RATIO	2,083	1.784	1.154	1.441	1.893	1.430
LAST_12_MONTH_RETURNS	2,083	0.187	-0.1	1.0	0.4	0.575
AVERAGE_SALES_GROWTH	2,083	0.134	0.006	0.082	0.202	0.287
BOOK_LEVERAGE	2,083	0.204	0.101	0.190	0.296	0.136
NON-CASH_WORKING_CAPITAL	2,083	0.037	-0.063	0.029	0.124	0.159

### 3.3. The World Uncertainty Index as a Proxy for Uncertainty

Whereas (Nguyen & Phan, 2017) studies how M&A activity is connected to policy uncertainty using the BBD index, we aim to broaden the understanding of the relationship between M&A-activity and uncertainty by looking at uncertainty as measured by the WUI. We construct our WUI variable as the country-specific index value the quarter prior to an M&A announcement where applicable, otherwise it is measured at the last quarter of the year.

The WUI was launched in 2018 and is constructed to capture uncertainty on a more extensive scale compared to the BBD index. By using a single source for all 143 nations covered, the WUI also increases comparability. The WUI uses text mining of The Economist Intelligence Unit (EIU) country reports. The index is then created by counting the number of times the word ‘uncertainty’, or its variants, appears in The EIU country reports. The indexes are normalised by the total number of words in each report and rescaled by a factor of 1,000. A higher (lower) number corresponds to higher (lower) uncertainty. The design of the WUI makes it ideal for comparing the relationship between M&A activity and uncertainty for the European market. However, it might still not be a perfect measure of uncertainty but is rather a proxy.

The Economist, which produces The EIU reports, positions themselves as politically belonging to the “radical centre”, not identifying themselves with either the political right- or left-wing (The Economist, 2017). This is important, since a problem with private newspapers is that they often have a political agenda. This political bias

is mentioned as a potential error source for the BBD index, even if in the end the authors conclude that it does not have a significant effect on the index (Baker, Bloom, & Davis, 2016).

Figure 1  
**Uncertainty and M&A Data**

Figure 1 displays M&A deal volume in Graph A and aggregate M&A deal value in Graph B with the WUI index over the sample period 1990-2018.

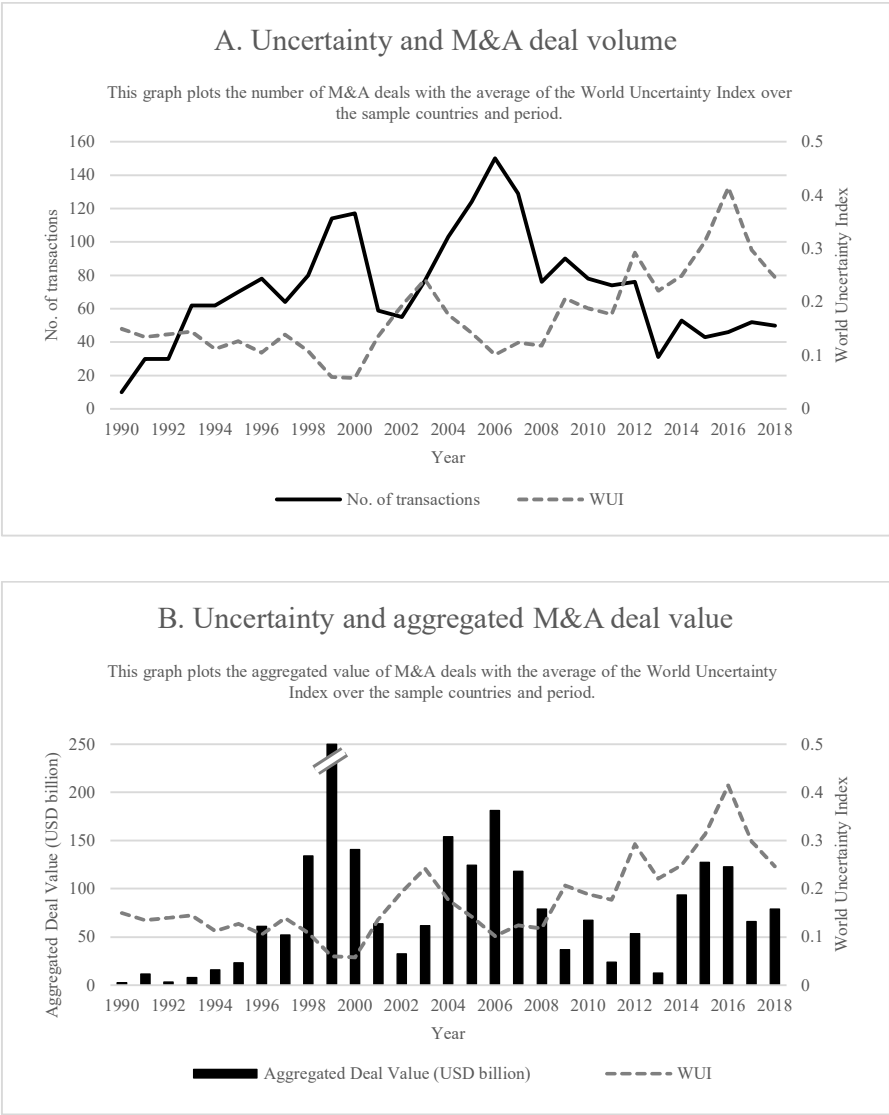


Figure 1 contains two graphs, Graph A. plots the WUI with number of M&A deals over the sample period and Graph B. plots the WUI with aggregated M&A deal value. The

figure indicates that both the number of M&A deals and the aggregated deal value spiked when uncertainty was low. However, looking at the patterns we see that the number of deals take on a negative trend as the WUI starts trending upwards. A similar pattern of decreasing deal value for increasing levels of uncertainty, is on the other hand not found to the same extent in graph B. 1999 was an extreme year in our sample where deal value reached USD 470 billion. The year was heavily impacted by Vodafone's acquisitions of AirTouch (deal value of USD 60 billion) and Mannesmann AG (deal value of USD 203 billion).

## 4. Empirical Analysis

In this section we present the methodology for our empirical analysis, our predictions, and the following results.

### 4.1. Firm acquisitiveness & uncertainty

(Gulen & Ion, 2016) show that there exists a negative relationship between firms' capital investments and uncertainty related to policy and regulatory outcomes, with a significantly stronger relationship when investments are irreversible. It has also been shown that a firm's cost of capital and default risk increases under elevated levels of policy uncertainty (Pástor & Veronesi, 2013), (Gilchrist, Sim, & Zakrajšek, 2014) and (Brogaard & Detzel, 2015). More recent works by (Nguyen & Phan, 2017) and (Bonaime, Gulen, & Ion, 2018) show that policy uncertainty has a negative effect on firm acquisitiveness.

We form our prediction based on the previous literature but note some differences in our study. (Nguyen & Phan, 2017) and (Bonaime, Gulen, & Ion, 2018) both perform their studies by applying the BBD index to the U.S market, whereas we apply the WUI to the European market. The European and the U.S. economies differ in many ways regarding important economic aspects such as labour market dynamics, sector exposure and fiscal policies. Despite these differences, the U.S. and the European markets are both highly sophisticated and dynamic ecosystems for businesses. We believe that the differences between the U.S. and European market will be outweighed by their similarities, leading to firms operating on the different markets responding similarly to uncertainty. Although we use the WUI instead of the BBD index, we also believe that firms' responses to these indexes will show similar patterns. Thus, we expect, even with our extensions in mind, that our findings will be similar to those of (Nguyen & Phan, 2017). Therefore, we predict a negative relationship between uncertainty and firm acquisitiveness in Europe.

When investigating the relationship between policy uncertainty and firm acquisitiveness we use the following probit model:

$$(1) M\&A\_DUMMY_{i,t} = \alpha + \beta \times WUI_{r,q-1} + \lambda \times C_{i,t-1} \\ + \gamma INDUSTRY\_FIXED\_EFFECTS + \varepsilon_{i,t}$$

where  $M\&A\_DUMMY$  is a dichotomous variable which equals 1 if firm  $i$  announces at least one acquisition in year  $t$ , and 0 otherwise.  $WUI$  is the uncertainty variable, measured as the value of the World Uncertainty Index the quarter prior to firm  $i$ 's M&A

announcement, in firm  $i$ 's country of incorporation  $r$ . We denominate our vector of control variables as  $C$ . Following the M&A literature, we control for firm characteristics that have explanatory power of firm acquisitiveness, including SIZE, MARKET-TO-BOOK\_RATIO, BOOK\_LEVERAGE, LAST\_12\_MONTH\_RETURNS, NONCASH\_WORKING\_CAPITAL, and AVERAGE\_SALES\_GROWTH. We calculate the variable AVERAGE\_SALES\_GROWTH as the three-year average growth rate, when not available we use the average two-year growth rate or the one-year growth rate. In contrast to (Nguyen & Phan, 2017), we do not include firm age, calculated as the number of years a firm appears in the Compustat database, as a control variable. This is due to insufficient data availability that might be derived from us using SEDOL codes, which are not automatically provided to firms. We include industry fixed effects in the regression to control for common industry factors that could affect acquisitiveness. In this, and the following regressions, we cluster standard errors by years since all firms within the same country are subject to the same amount of uncertainty at a given point in time. The definitions of the variables are provided in the Appendix.

The results of the M&A probit regression are presented in the first column in Table 4. The coefficient of WUI is negative (-0.310) with a statistical significance at the 1% level. This indicates that there exists a negative relationship between firm acquisitiveness and uncertainty. It could be that firm acquisitiveness and our uncertainty measure is jointly correlated with other, unobservable, and non-uncertainty-related factors such as investment opportunities. This leads to an endogeneity concern that could render our coefficient results inconsistent and biased. To address this issue, we rerun the probit model while controlling for macro-economic measures that we use as proxies for investment opportunities and the economic outlook, more specifically, we use GDP growth rates, yield spreads, a consumer confidence indicator, and country index returns. Our results persist while running this robustness test which suggests that our findings are robust to endogeneity correction. The results of the test can be found in the appendix, in Table 7.



**Table 4**  
**Uncertainty and Firm Acquisitiveness**

Table 4 reports the M&A probit results. The dependent variable, M&A\_DUMMY, assumes the value 1 if a company makes at least one acquisition any given year, and 0 otherwise. WUI is the index value the quarter prior to a company's M&A announcement. Other variables are defined in the appendix. Industries dependent on government spending include defense, health services, engineering & management services, and heavy construction. Significance levels for the Z-statistics are given by \*p<0.1, \*\*p<0.05, \*\*\*p<0.01, are based on heteroscedasticity-robust standard errors clustered by years and are reported within parentheses.

Variable	Dependent variable: M&A_Dummy		
	(1)	Industries Dependent on Government Spending (2)	Remaining Industries (3)
WUI	-0.310*** (0.065)	-0.049 (0.215)	-0.297*** (0.068)
SIZE	0.185*** (0.006)	0.103*** (0.020)	0.172*** (0.005)
MARKET-TO-BOOK_RATIO	-0.000*** (0.000)	-0.005 (0.014)	-0.000** (0.000)
LAST_12_MONTH_RETURNS	0.061*** (0.010)	0.020 (0.047)	0.063*** (0.010)
3_YEAR_AVERAGE_SALES_GROWTH	0.303*** (0.033)	0.321** (0.132)	0.320*** (0.032)
BOOK_LEVERAGE	-0.422*** (0.070)	-0.803*** (0.274)	-0.350*** (0.068)
NON-CASH_WORKING_CAPITAL	-0.008*** (0.001)	-0.106 (0.189)	-0.008*** (0.002)
Intercept		-2.302*** (0.142)	-2.841*** (0.037)
Industry fixed effects	Yes	No	No
Observations	69,717	3,752	66,119
Pseudo-R <sup>2</sup>	0.094	0.033	0.085

#### 4.1.1. Firms with exposure to government spending

The WUI spikes concurrently with extreme events in the developed world e.g., the 9/11 attacks, the Global financial crisis of 2008, U.S.-China tensions, Brexit, the COVID-19 pandemic etc. Events such as these, which has consequences on the global economy, are often met with responses from policymakers, which can trigger shifts in government spending. Thus, the increased uncertainty could coincide with increased government spending which benefit firms in industries that are more exposed to government expenditure. On the other hand, as shown in the previous literature focused on U.S. data, it could also be that these industries are more affected by uncertainty related to changes in government policies. This makes it interesting to test if the negative effect of uncertainty on firm acquisitiveness is more or less pronounced for firms in industries that are more dependent on government spending. According to (Baker, Bloom, & Davis, 2016), defense, health services, engineering & management (E&M) services, and heavy construction are especially responsive to uncertainty relating to government spending and regulatory policies. To test if these industries are more or less affected by

uncertainty, we rerun the M&A probit model separately for the aforementioned subgroups.

The results from our test show that there do not exist a significant relationship between firm acquisitiveness and uncertainty for the industry-specific subgroup. This result differs from that of (Nguyen & Phan, 2017) who find that the negative relationship between policy uncertainty and firm acquisitiveness is larger for industries that tend to be more dependent on government spending. A possible explanation for our deviating results, as mentioned above, could be that firms within health services, the defense sector, (E&M), and heavy construction in Europe might see an upswing from increased government spending in times of elevated uncertainty.

#### 4.2. Time to completion

The irreversibility of M&A deals, as well as the resources needed, make the required time to completion an interesting aspect to examine. (Dixit & Pindyck, 1994) argues that there exists an option value of waiting for better information before undertaking irreversible investment projects. Similarly, (Bernanke, 1983) finds that agents face a trade-off between collecting extra returns from early commitment and receiving the benefits from more information derived from waiting. Given the previous literature and our findings that firms are indeed sensitive to uncertainty, we predict that the time it takes to complete an M&A deal is prolonged during periods of higher uncertainty. Following (Nguyen & Phan, 2017), we investigate the time it takes to complete M&A deals by running the following ordinary least squares (OLS) model:

$$(2) TIME\_TO\_COMPLETION_{i,j} = \alpha + \beta \times WUI_{r,q-1} + \lambda \times C_{i,t-1} + \gamma INDUSTRY\_FIXED\_EFFECTS + \varepsilon_{i,t}$$

We construct TIME\_TO\_COMPLETION as the natural logarithm of 1 plus the number of years it takes for firm  $i$  to complete deal  $j$ . The time it takes to complete a deal is measured as the time in years from deal announcement to deal completion. We use a vector of control variables,  $C$ , which includes SIZE, MARKET-TO-BOOK\_RATIO, BOOK\_LEVERAGE, LAST\_12\_MONTH\_STOCK\_RETURNS, AVERAGE\_SALES\_GROWTH, NONCASH\_WORKING\_CAPITAL, STOCK\_DUMMY, CASH\_DUMMY, DIVERSIFYING\_DUMMY, PUBLIC\_TARGET\_DUMMY, and CHALLENGE\_DUMMY. Our sample only consists of completed deals, and some deals are excluded from this test as they have missing data regarding their date of completion and/or the control variables. In Table 5 we present our results which show that the WUI coefficient is positive and statistically significant at the 10% level, when controlling for industry fixed effects, and statistically

significant at the 5% level when not controlling for industry fixed effects. These results indicate that acquirers use more time to complete M&A deals during times of elevated uncertainty. However, we note that there could be other explanatory factors that are omitted from the model, e.g., deal complexity, which has been shown by (Luypaert & De Maeseneire, 2015) to increase the time it takes to complete an M&A deal.

**Table 5**  
**Uncertainty and Time to Completion**

Table 5 reports the OLS regression results for the time it takes to complete an M&A deal. The dependent variable, TIME\_TO\_COMPLETION, is the natural logarithm of 1 plus the number of years it takes to complete an M&A deal, measured as the time from announcement to completion. WUI is the index value the quarter prior to a company's M&A announcement. Other variables are defined in the appendix. Significance levels for the t-statistics are given by \*p<0.1, \*\*p<0.05, \*\*\*p<0.01, are based on heteroscedasticity-robust standard errors clustered by years and are reported within parentheses.

Variable	Dependent variable: TIME_TO_COMPLETION	
	(1)	(2)
WUI	0.216* (0.112)	0.245** (0.109)
SIZE	0.019 (0.011)	0.017* (0.009)
MARKET-TO-BOOK_RATIO	-0.013* (0.007)	-0.014* (0.007)
LAST_12_MONTH_RETURNS	0.039 (0.028)	-0.028 (0.027)
3_YEAR_AVERAGE_SALES_GROWTH	-0.066* (0.064)	-0.062 (0.060)
BOOK_LEVERAGE	0.130 (0.159)	0.208 (0.149)
NON-CASH_WORKING_CAPITAL	0.122 (0.132)	0.207** (0.105)
STOCK_DUMMY	0.120** (0.049)	0.134*** (0.047)
CASH_DUMMY	0.017 (0.036)	0.032 (0.036)
DIVERSIFYING_DUMMY	-0.079** (0.036)	-0.077** (0.035)
PUBLIC_TARGET_DUMMY	0.159*** (0.042)	0.155*** (0.038)
CHALLENGE_DUMMY	-0.176* (0.102)	-0.170** (0.114)
Intercept		0.030 (0.069)
Industry fixed effects	Yes	No
Observations	1,173	1,173
R <sup>2</sup>	0.095	0.055

### 4.3. Payment considerations

Uncertainty can increase the volatility of cash flows and therefore lead to an increased default risk. This could in turn lead to a higher cost of financing and make it harder for firms to obtain external funding when undertaking M&A investments. Furthermore, increased uncertainty could motivate firms to keep more cash on hand as a safety measure. These arguments suggest that during periods of higher uncertainty, firms could be less prone to trade cash, which are considered to be safe assets, in exchange for hard assets, which are considered to be riskier. We therefore expect firms to use more stock as payment during periods of higher uncertainty. We test this by using the following probit model:

$$(3) \text{STOCK\_DUMMY}_{i,t} = \alpha + \beta \times \text{WUI}_{r,q-1} + \lambda \times C_{i,t-1} + \\ \gamma \text{INDUSTRY\_FIXED\_EFFECTS} + \varepsilon_{i,t}$$

STOCK\_DUMMY is a dichotomous variable that assumes the value 1 if deal  $j$  made by firm  $i$  is fully paid in stock (defined as >99%), and 0 otherwise.  $C$  is a vector of control variables. See Table 6 for full list of variables and the appendix for definitions.

The result from the regression is reported in Table 6, where the coefficient for the WUI variable is positive but not significant. Contrary to (Nguyen & Phan, 2017), we do thus not find evidence that acquirers to a larger extent use stock as payment in periods of higher uncertainty. Our result would imply that firms' payment decisions are not determined by uncertainty. An explanation for our finding could be that other factors are more important for firms when considering the form of payment. (Faccio & Masulis, 2005) find in their study of European M&A that bidders prefer cash as payment for transactions when the voting control of their dominant shareholders is threatened. They also suggest that bidders choose stock financing to a larger extent when their financial conditions weaken. The authors conclude that the two aforementioned factors have stronger effects on payment consideration in Europe compared to the findings of (Martin, 1996) in the United States. This suggests that our findings could differ from those of (Nguyen & Phan, 2017) due to inherent differences between the United States and Europe.

**Table 6**  
**Uncertainty and Payment Consideration**

Table 6 reports the probit regression results for payment consideration. The dependent variable, STOCK\_DUMMY, is a dummy variable assuming the value 1 if an M&A transaction has been paid fully in stock (defined as >99%), and 0 otherwise. WUI is the index value the quarter prior to a firm's M&A announcement. Other variables are defined in the appendix. Significance levels for the Z-statistics are given by \*p<0.1, \*\*p<0.05, \*\*\*p<0.01, are based on heteroscedasticity-robust standard errors clustered by years and are reported within parentheses.

Variable	Dependent variable: STOCK_DUMMY	
	(1)	(2)
WUI	0.180 (0.239)	0.125 (0.224)
SIZE	-0.204*** (0.023)	-0.178*** (0.021)
MARKET-TO-BOOK_RATIO	-0.011 (0.028)	-0.003 (0.026)
LAST_12_MONTH_RETURNS	-0.037 (0.077)	-0.052 (0.075)
3_YEAR_AVERAGE_SALES_GROWTH	0.046 (0.134)	0.051 (0.133)
BOOK_LEVERAGE	0.786** (0.334)	0.646** (0.303)
NON-CASH_WORKING_CAPITAL	-0.325 (0.294)	-0.407* (0.233)
DIVERSIFYING_DUMMY	-0.170* (0.087)	-0.119 (0.078)
PUBLIC_TARGET_DUMMY	0.893*** (0.119)	0.842*** (0.106)
CHALLENGE_DUMMY	-0.971*** (0.303)	-0.921*** (0.281)
Intercept		-0.389*** (0.146)
Industry fixed effects	Yes	No
Observations	1,568	1,657
Pseudo-R <sup>2</sup>	0.133	0.098

## 5. Discussion & Wider Implications

In this section we highlight some of the most important insights from our report. We also briefly discuss ways in which our report can be used as a foundation for further research. One of the most important results from this report is that uncertainty, as measured by the WUI, has a real negative effect on European firms' decision to engage in M&A. Another important insight is that increased uncertainty prolongs the time European firms spend to complete an M&A transaction. These insights contribute to filling the gap in the literature examining the relationship between uncertainty and M&A activity in Europe. This can be valuable for both the academic community in conducting future research and decision makers navigating elevated levels of uncertainty.

While having based our choice of methodology on the previous literature, there is room to reflect, be self-critical and suggest possible improvements to our applied methods. Comparing our data sources with other available sources, we see a discrepancy in the number of deals where our data sample is smaller. Collecting a larger data sample while remaining stringent in the data handling, would be more time consuming but could provide further robustness to our findings. A more comprehensive dataset could also have enabled us to include more control variables with explanatory power. In our data, we also exclude non-completed deals, by instead including them we could have expanded our analysis by, e.g., examining whether deals are cancelled more often in times of elevated levels of uncertainty. We also acknowledge that when choosing what to test for, expanding the scope of tests could have enabled us to gain insights about more aspects of the M&A dynamics.

Uncertainty across the world has, as mentioned in previous sections, reached record levels during recent years. Firms' behaviour relative to uncertainty could adapt as a response to the changing environment, making firms more comfortable with uncertainty. The possibility of changing M&A dynamics might make it interesting for future researchers to examine whether our results will persist over time.

## 6. Conclusions

Uncertainty is an important aspect that firms face when deciding whether to undertake large investments such as mergers and acquisitions. This study examines the relationship between uncertainty, as measured by the World Uncertainty Index, and M&A activity in Europe. We find statistically significant evidence supporting our prediction that increased uncertainty has a negative effect on firm acquisitiveness. However, we do not find this negative relationship to hold for industries that are more dependent on government spending. We also find that firms undertaking M&A transactions during periods of higher uncertainty spend a longer time completing the deals. Regarding payment consideration, we find no evidence that European firms use more stock as payment during periods of higher uncertainty, suggesting that there are other factors that are more important to firms when choosing the form of payment for M&A transactions.

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## Appendix. Variable Definitions

**AVERAGE\_SALES\_GROWTH:** *The three-year average growth rate. When not available the average two-year growth rate or the one-year growth rate is used.*

**BOOK\_LEVERAGE:** *The ratio of the book value of short-term and long-term debt to the book value of assets.*

**CASH\_DUMMY:** *A variable that equals 1 if an M&A deal is financed with >99% cash, and 0 otherwise.*

**CHALLENGE\_DUMMY:** *A variable that equals 1 if an acquirer's offer is challenged by a competing offer, and 0 otherwise.*

**CONSUMER\_CONFIDENCE\_INDICATOR:** *Consumer Opinion Composite Confidence OECD Indicator for the Euro Area.*

**DIVERSIFYING\_DUMMY:** *A variable that equals 1 if the acquirer and target do not belong to the same 2-digit SIC code, and 0 otherwise.*

**GDP\_GROWTH:** *One-year GDP growth for a company's country of incorporation.*

**LAST\_12\_MONTH\_INDEX\_RETURNS:** *The 12-month MSCI country index return for all countries except for Poland where the Warsaw W.I.G Index was used.*

**LAST\_12\_MONTH\_RETURNS:** *The buy-and-hold 12-month stock return.*

**M&A\_DUMMY:** *A variable that equals 1 if a firm makes an M&A announcement in a given year, and 0 otherwise.*

**MARKET-TO-BOOK\_RATIO:** *The ratio of the market value of assets to the book value of assets. The market value of assets is calculated as the market value of equity plus the difference between the book value assets and equity.*

**NONCASH\_WORKING\_CAPITAL:** *The ratio of working capital minus cash to the book value of assets.*

**PUBLIC\_TARGET\_DUMMY:** *A variable that equals 1 if the target is publicly listed, and 0 otherwise.*

**SIZE:** *The natural logarithm of the book value of assets.*

**STOCK\_DUMMY:** *A variable that equals 1 if an M&A deal is financed with >99% stock, and 0 otherwise.*

**WUI:** *The quarterly value of the World Uncertainty Index for a company's country of incorporation.*

*YIELD\_SPREAD: Measured as the difference between long-term interest rates and short-term interest rates. Long-term interest rates are measured for government bonds maturing in ten years. The rates are generally averages of daily rates. The interest rates are implied by the prices at which the government bonds are traded on financial markets. The bonds' capital repayment is guaranteed by governments. Short-term interest rates are the rates at which short-term government paper is issued or traded in the market or the rates short-term borrowings are effected between financial institutions or the rate. The rates are generally averages of daily rates. Short-term interest rates are based on three-month money market rates where available.*

## Appendix. Supplementary tables

**Table 7**  
**Uncertainty and Firm Acquisitiveness with Macro-Economic Control Variables**

Table 7 reports the M&A probit regression results while controlling for macro-economic variables. The dependent variable, M&A\_DUMMY, assumes the value 1 if a company makes at least one acquisition any given year, and 0 otherwise. WUI is the index value the quarter prior to a company's M&A announcement. Other variables are defined in the appendix. Significance levels for the Z-statistics are given by \*p<0.1, \*\*p<0.05, \*\*\*p<0.01, are based on heteroscedasticity-robust standard errors clustered by years and are reported within parentheses.

Variable	Dependent variable: M&A_DUMMY	
	(1)	(2)
WUI	-0.294*** (0.067)	-0.265*** (0.067)
SIZE	0.186*** (0.006)	0.169*** (0.005)
MARKET-TO-BOOK_RATIO	-0.000** (0.000)	-0.000** (0.000)
LAST_12_MONTH_RETURNS	0.063*** (0.011)	0.062*** (0.010)
3_YEAR_AVERAGE_SALES_GROWTH	0.284*** (0.034)	0.303*** (0.032)
BOOK_LEVERAGE	-0.415*** (0.071)	-0.383*** (0.066)
NON-CASH_WORKING_CAPITAL	-0.008*** (0.001)	-0.008*** (0.002)
GDP_GROWTH	0.207 (0.455)	0.062 (0.448)
LAST_12_MONTH_INDEX_RETURNS	0.351*** (0.053)	0.323*** (0.051)
YIELD_SPREAD	-0.040*** (0.009)	-0.042*** (0.009)
CONSUMER_CONFIDENCE_INDEX	0.013* (0.007)	0.012* (0.007)
Intercept		-3.962*** (0.656)
Industry fixed effects	Yes	No
Observations	69,700	69,854
Pseudo-R <sup>2</sup>	0.098	0.085