The Impact of Brexit on Cross-border M&A Transactions

An analysis of deal activity, acquisition premiums, and announcement effects in the UK

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Master Thesis Financial Economics

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Date final version: 05-09-2023

Abstract

This thesis analyzes the impact of Brexit on cross-border mergers and acquisitions (M&A) in the United Kingdom (UK), with a particular emphasis on deal activity, acquisition premiums, and announcement effects. The sample is comprised of 15,852 M&A transactions announced between the 1st of January 2013 and the 1st of January 2023, which are categorized according to three distinct phases of Brexit: the Pre- and Post-Referendum period and the Post-Effective date period. The results support the risk-averse nature of investors reflected in the consolidation of UK acquirers in the European Union (EU) after the Referendum, illustrated through a significant increase in cross-border deal activity. Contrarily, UK targets seem to be temporarily targeted less in cross-border deals following the Referendum. These findings on deal activity seem to diminish after the Effective date of Brexit, providing implications for market stabilization. Following the Referendum, announcements effects of UK acquirers, measured through the cumulative abnormal returns, have been positively affected, showing signs of positive initial market reactions regarding the diversification of assets of UK parties. Acquisitions of UK targets seem to, at least significantly visible in the short-term, negatively affect the announcement effects of EU acquirers following the Referendum. A change in pricing dynamics in M&A is exhibited through the analysis of acquisition premiums, explained by the application of the home bias theory in M&A and the influence of economic policy uncertainty. It is found that UK acquirers pay significantly lower premiums for EU targets following Brexit. A discount is temporarily exhibited after the Referendum on UK targets, illustrated by reduced acquisition premiums. Yet the departure from the EU has caused UK targets to receive higher premiums observed in the long term. The study provides valuable insights into the stability and ongoing effects of Brexit on M&A activity and contributes to former literature by the incorporation of the distinct Brexit periods, application of classical financial theories, and the concept of economic policy uncertainty. The paper hereby aims to provide a more comprehensive understanding of the influence of Brexit on M&A transactions and provide relevant implications for researchers, M&A managers, and remaining stakeholders.

Keywords: Mergers and Acquisitions, Brexit, Acquisition Premiums, Announcement Effects, Deal Activity, Cross-Border Transactions, Risk-Aversity, Home Bias, Economic Policy Uncertainty

Table of Contents

1. Introduction

The European Union (**EU**) consisting of 27 members anno 2023, serves as the world's largest economically and politically integrated union. As studies pointed out, the EU positively affects economic growth and foreign direct investment (**FDI**) inflows between EU countries as well as from outer EU parties (Bevan & Estrin, 2004). A decision to leave this union would result in great political and economic uncertainties resulting in increased transaction costs, more complex trade barriers, and changes to regulatory and legal frameworks. Evidently, the decision of the United Kingdom (**UK**) to leave the EU after the Brexit referendum in June of 2016 has had significant consequences and resulted in a period of turmoil. This is illustrated by the depreciation in the value of the Sterling, changes in former trade agreements, and policy uncertainties resulting in economic consequences quantified in consumption-equivalent welfare losses of around 0.4-1.2% per household (Steinberg, 2019). Considering an interplay between uncertainties and financial markets, the economic consequences are expected to be evident in corporate activities and investment behaviors. One of these activities greatly influenced by economic conditions and market volatility is mergers & acquisitions (**M&A**).

M&A has become an integrated part of the economic landscape ever since the first wave of transactions occurred in the late nineteenth century. Through M&A, companies aim to enhance shareholder value by exploiting different types of synergies through for example gaining market share, achieving economies of scale, or other operational efficiencies (CFI, 2020). The popularity of M&A activities resulted in a record number of transactions in 2021, which highlights the persistent relevance of the economic impact and paths the way for further research in explaining M&A characteristics (PWC, 2023). M&A activity and success is determined by a multitude of uncertainties and overall market volatility. This can be primarily attributed to an interplay between the valuations and perception of the overall economic outlook reflected in the M&A market. Previous research has evaluated determinants of the M&A market, often focusing on key factors that influence the overall deal activity, transaction volumes, premiums paid, and long- or short-term performance of the deals. By analyzing the determinants, research attempts to gain insights into the underlying factors that drive M&A.

The UK has traditionally been a major player in the global M&A landscape, attributed to a favorable regulatory and legal framework as well as a strong presence of financial institutions. Therefore, the uncertainty arising from geopolitical situations such as an event as Brexit is prone to have influenced transactions in the UK and should be researched to evaluate the influence of geopolitical events on the M&A market. Over the years, the effects following from Brexit have become increasingly evident. As a result, financial markets, where London functions as an important center, have experienced adjustments and shifts, leading to relocation to other cities such as Paris. The relocations followed from the need to continue servicing European clients considering the changing regulatory landscape due to

Brexit. Accordingly, these effects resulted in a movement of over 7,000 jobs, already underlining the substantial impact of Brexit on the broader economy, specifically within the financial sector (White, 2023).

M&A transactions have different dimensions as they occur between or within countries, classified as cross-border and domestic respectively. Considering Brexit has particularly influenced the dynamics between the UK and EU, it can provide valuable insights into the ramifications on the M&A market by studying cross-border transactions involving the expected 28 directly affected parties. The abnormalities triggered by Brexit are therefore researched to determine whether positive or detrimental effects amid the event have caused transactions involving UK parties to experience side effects under different states of uncertainty. This study will quantifiably analyze the impact on the UK M&A market through M&A determinants; deal activity, acquisition premiums, and the announcement effects, to answer the following research question: *What is the impact of Brexit on deal activity, acquisition premiums, and announcement effects in cross-border mergers and acquisitions (M&A) transactions involving the UK?*

By analyzing cross-border deal activity, the overall frequencies of M&A transactions since Brexit will provide a general understanding of the response of the market. Using theories such as the Modern portfolio theory and aspect of the risk-averse nature of investors, it is hypothesized that UK investors will diversify risk through a reallocation of assets (Markowitz, 1952). Additionally, the high level of economic policy uncertainty[1] (**EPU**) following Brexit causes reasons to believe FDI inflows reduced into the country enduring high EPU (Paudyal et al., 2021). Furthermore, by examining acquisition premiums, or the amount paid in addition to the target's market value, a deeper understanding will be reached of Brexit its influence on pricing in transactions. In light of the associated Brexit uncertainties, the phenomenon of home bias is one way this paper hypothesizes on a significant effect in the height of acquisition premiums. Lastly, a common short-term performance measure in M&A is the announcement effects experienced around transactions. These effects, measured through the cumulative abnormal returns of the acquirer, give implications for the market's reaction and whether they perceive the transactions as value-enhancing or diminishing.

The paper uses a sample between the 1st of January 2013 and the 1st of January 2023 that includes M&A transactions involving solely EU and UK parties. The sample is timestamped according to the Pre-Referendum, Post-Referendum and Post-Effective period to analyze the effects separately and between periods, considering changes in states of uncertainties and possible effects of market stabilization. The

[1] Economic policy uncertainty can be defined as the level of economic risk resulting from a lack of clarity about the future course of a government's formed economic policies (An et al., 2022).

study provides several interesting insights, as the results show after the Referendum cross-border deal activity involving UK acquirers significantly increased since Brexit, but decreased for UK targets, in line with a risk-averse attitude of investors and pro-active consolidation of the UK's position in the EU. These effects diminish over time, implying abnormal cross-border deal activity stabilizes over the course of the Post-Effective period. Additionally, UK acquirers seem to pay significantly lower acquisition premiums since the Referendum, persistent still after the Effective Brexit date. EU acquirers, on the other hand, pay significantly higher premiums after the Effective Brexit date, but do experience a temporary discount on UK targets following the Referendum (Kakkad, 2022). The announcement effects show fewer substantial effects after the Effective date but do exhibit the risk-averse nature of investors in the immediate aftermath of the Referendum. This is reflected through an increase in abnormal returns after the Referendum in transactions involving UK acquirers. Opposite to UK acquirers and in line with risk-adversity, EU acquirers seem to experience more negative effects when acquiring UK targets in this period, characterized by the influence of high economic policy uncertainty. Finally, in line with Thaler (1978), the application of the winner's curse theory in M&A is highlighted through the negative (positive) effect of the number of bidders on abnormal returns (premiums).

This paper adds relevance to the literature in several ways. The recent nature of the Effective date of Brexit in January 2020 adds a new dimension to previous research, which only incorporates the Referendum date as an arbitrary timestamp. This is, thus far, the first paper examining the three distinct periods, considering the period before- and after the Referendum and after the Effective date separately. Hereby, the analysis explores transactions in a more advanced post-Brexit environment. The differentiation between these three periods will therefore provide insights on whether stability is reached over time or if the changes brought about by Brexit are continuing to shape the M&A activity well into 2022. Further, the results contribute to the contradicting research on M&A determinants and shed light on the consequences of geopolitical events as Brexit, resulting in relevant practical implications for stakeholders in M&A transactions experiencing conditions of uncertainties.

The rest of this paper is organized as follows. The second section provides the theoretical background on the event of Brexit, determinants of M&A transactions, and previous literature discussing the UK M&A market in general and since Brexit. Hypotheses are developed based on these insights and the gaps in former research. In Section 3, the relevant variables are determined to construct formulas that are tested to formulate an answer to the hypotheses. The results of the analyses are discussed in Section 4, followed by several robustness checks using instrumental variable- and sensitivity analyses in Section 5. Section 6 discusses both the results and compares them with previous research as well as the limitations and implications of the research. Finally, the paper is concluded in Section 7.

2. Theoretical Background and Hypotheses Development

This section will discuss Brexit and former literature evaluating overall drivers and factors influencing deal terms and -activity in cross-border transactions, and the M&A market in the UK. Following the extensive literature review, hypotheses are derived from rational expectations while incorporating relevant financial studies and behavioral theories.

2.1 Brexit and economic consequences

In the following section, the implications of Brexit and resulting economic consequences that emerged from the associated uncertainties are elaborated upon.

2.1.1 Brexit event study

On the 23rd of June in 2016 a referendum was organized in the UK determining whether the country should remain a member state of the EU. The change in the attitude of the British people towards EU membership can be attributed to a diverse range of factors, such as the difficult economic recovery following the recession in 2008, policy-related issues surrounding immigration, and overall public sentiments as Euroscepticism, all contributing to a seemingly overall disappointment in the EU membership of the UK. The Brexit Referendum resulted in the majority of UK citizens voting in favor of departure from the EU, marking the beginning of a transitioning period that lasted until the 31st of January 2020, the date the UK officially left the EU, also referred to as the Effective date of Brexit (Government of the Netherlands, n.d). Subsequently, the UK's decision to leave the single European market and adjoined customs union created the need for renewed regulations surrounding the wide body of policies and agreements in place as an EU member.

The impactful decision was characterized by a period of great political, regulatory, and more specifically economic policy uncertainty (EPU). Since the EU was and is the UK's largest trading partner, the EU-UK Trade and cooperation agreement (TCA) was established in December 2020, which economic nature is expected to have had the most implications for cross-border M&A transactions (House of Commons Library, 2022). The new agreement established new economic and social partnerships enabling a new form of economic integration between the UK and EU member states. The formation of the agreement has tried to limit the economic and political disruptions in the absence of such an agreement (European Commission, 2021). Yet, the TCA did impose new trade barriers and implications for cross-border exchanges that were not in place Pre-Brexit.

Ever since the referendum in 2016, the UK has experienced significant economic effects. As of June 2022, investments in the UK were still 11% lower, the trade of goods was 7% lower, and the overall UK GDP decreased by 5.5% compared to Pre-Brexit levels (Springford, 2022). Additionally, the

Sterling has suffered greatly from Brexit, and continues to face challenges, having suffered its worst month since the referendum in August of 2022 (Smith, 2022). These long-lasting effects imply relevance to examine both the periods before the Referendum, during the Transitioning period, and after the Effective date. It thus will be researched whether initial market reactions do eventually stabilize over these periods or whether these have had a lasting effect quantifiably reflected in the UK M&A market. For instance, bilateral trade, trade between two countries, has been proven to be positively correlated with cross-border M&A, meaning the creation of new trade agreements is expected to aid mitigating the costs and ease of doing business across borders and encourage transactions, despite no longer being an EU-member state (Rossi and Volpin, 2004).

Since financial markets reflect the sentiment of investors and their outlook of the future, reactions to an event leading to considerable political and economic uncertainties as Brexit can be quantifiably analyzed through the exploration of aspects as the reaction of the native currency, bilateral trade, FDI and stock market returns. These factors are expected to have resulted in, at least, temporary spill-over effects in M&A transactions during the distinct phases. Specifically, the short-term wealth effects can be readily measured by assessing abnormal returns and paid acquisition premiums. These are expected to be particularly evident when involving a cross-border transaction involving a UK or EU party, due to newly imposed regulatory complexity and experienced uncertainties surrounding Brexit.

2.1.2 Economic policy uncertainty

The declined economic performance of the UK following Brexit and adjacent financial markets can be explained by the influence of a concept referred to as economic policy uncertainty (**EPU**). EPU is defined as the level of economic risk resulting from a lack of clarity about the future course of a government's formed economic policies (An et al., 2022). Research has shown that EPU has large implications for macroeconomic factors such as trade, FDI, and currency movements (An et al., 2022). Adhering to Brakman et al. (2008), it is established that FDI is largely made up of cross-border M&A transactions, meaning a change in FDI has substantial implications for cross-border transactions. Additionally, according to the research on decreased FDI inflows in India by Sinha & Gosh (2021), it is suggested FDI inflows in countries experiencing EPU seem to diminish, as investors are less prone to invest because of decreased confidence in a country experiencing EPU. Canh et al. (2020), also affirm this research as they conclude that domestic EPU adversely affects FDI inflows into the host country. Considering the uncertainty surrounding Brexit, it can thus be reasoned that FDI inflows and acquisition of UK targets will be adversely impacted. It is expected these changes will be especially evident in the short-term, during the transitioning period, while new economic orders and agreements must stabilize. This is confirmed by the Economic Policy Uncertainty database[2], resulting in the highest EPU index

[2] *Economic Policy Uncertainty index* - https://www.policyuncertainty.com/

values during the transitioning period, underlining the aftermath of Brexit on risk perception during an active and uncertain period of policy formation.

EPU and overall investor sentiment surrounding Brexit is similarly reflected in the significant depreciation of the value of the Sterling after the initial vote in 2016, which experienced the largest drop in over 30 years within a single day after the referendum (Allen et al., 2016). This reaction reflects the negative outlook from investors on the UK's departure from the EU, as a significant depreciation in currency value indicates investors assumed that pound-dominated assets would perform worse (Coyle, 2021). Hence investors are less willing to hold investments in these assets, leading to additional questions related to the overall reallocation of pound-dominated assets in the market.

2.1.3 Reallocation of assets

The reaction of the market reflected in decreased investor confidence and subsequent drop in the value of the Sterling is in line with the neoclassical Modern portfolio theory (**MPT**), which assumes investors are risk-averse and rational and thus have a preference to hold less risky assets (Markowitz, 1952). Adding to this decreased willingness of holding investments that are pound-dominated, the need subsequently arose for companies in the UK and neighboring EU countries to reevaluate their position in the market. Consequently, EU companies faced the decision of relocating their operations out of the UK or whether consolidate their position in the UK market through cross-border M&A transactions. Conversely, from the perspective of a company domiciled in the UK, relocation to EU countries to remain connected to the market required careful consideration. According to Gao et al. (2020), the Referendum indeed supported the MPT and led investors to diversify leading to a reallocation of their assets. This resulted in investors holding relatively fewer portfolio shares in the riskier and more uncertain UK market compared to the European market after the Referendum in 2016, an effect which the researchers determined to be caused by uncertainties as EPU instead of the expected diminished market correlation. Amid this research, the EPU following an event as Brexit can contribute to investors taking a hedging position in a country that is not experiencing EPU, leading to an increase in cross-border transactions and the aforementioned reallocation of assets in the investor's portfolio (Paudyal et al., 2021). These effects indicate only a fraction of the researched spill-over effects of Brexit, and therefore provide reasons to expect implications for M&A transactions. First, to provide a more general understanding of M&A transactions, relevant drivers and factors influencing deal terms are discussed.

2.2 M&A acquisition premiums & announcement effects

The complex transactions describing the process where one company acquirers or mergers with another company is referred to as M&A. Understanding the drivers and success determinants of the deals is crucial for investors and researchers to understand both the potential impact on short-term shareholder value as well as the overall goal of long-term value creation following the transaction (CFI Team, 2020). M&A transactions can either be domestic, meaning the parties operate in the same economy, or cross-border, which entails any asset transaction between two firms belonging to distinct economies (Chen & Findlay, 2003). Cross-border transactions add an extra layer of complexity due to the differences in economies, legal and regulatory frameworks, and culture (Erel et al., 2012). There has been extensive research conducted surrounding different aspects of M&A transactions, explained through neoclassical as well as behavioral theories. To quantify the short-term effect of M&A transactions, literature often refers to methods analyzing the acquisition premiums paid for a target and the cumulative abnormal returns surrounding the announcement of the transaction in question.

2.2.1 Drivers of acquisition premiums

A key driver in the determination of the purchase price in a transaction is the acquisition premium that is paid by the acquirer, determined by the difference between the purchase price and the current (market) value of the target company (CFI, 2023). The height of this premium can differ depending on the drivers surrounding the transactions. Commonly mentioned drivers of paid premiums are the expected synergies, overall strategic fit, company-specific factors, bargaining power of the acquirer or target, competition among bidders, managerial drivers, and overall market conditions (Hayes and Kindness, 2020).

Companies are expected to be rationally and strategically motivated to undertake M&A for synergy purposes, which means they anticipate that the transaction will lead to benefits such as cost savings, improved competitive position, a larger market share, or other strategic value. This leads to companies willing to pay a higher price for a company than the current (market) value of the target as they can exploit opportunities from the transaction and establish the increased value of the merged firm over the combined value of the same separated firms (CFI, 2022). Company-specific factors such as financial health and overall growth prospects are also factors influencing the height of premium paid (Morris et al., 2019). In line with the MPT, financially healthy companies are seen as more favorable targets as they are considered less risky, improving their valuation and subsequent bargaining position, resulting in an increased willingness to pay a higher premium (Markowitz, 1952).

The number of bidders can also influence the height of the transaction premium, which has been extensively researched leading to the application of the winner's curse theory in M&A transactions,

where the winning party ends up overpaying for the target company (Varaiya & Ferris, 1987). Liu et al. (2021), have researched the phenomenon in takeovers and found that the phenomenon indeed applies to the field of M&A. Amid this research, a multitude of bidders results in a higher premium being paid which in the long run causes acquirers to experience lower announcements effects in terms of abnormal returns, while exploiting fewer merger synergies eventually (Liu et al., 2021). Numerous studies have also explored additional behavioral factors that impact the premiums paid in M&A transactions, with a particular focus on behavioral managerial drivers. As such, the managerial hubris hypothesis developed by Roll (1986), describes the behavior where a manager is overconfident in his/her ability to successfully achieve synergies resulting in negative announcement effects and often paying an overly high price for the target, coming from a state of irrational decision making.

Lastly, acquisition premiums can be greatly affected by market drivers, referring to the overall conditions in the market such as trends in the industries, investor sentiment, or overall economic outlook. As such Mateev (2018), emphasizes the influence of important developments in the stock market, governance systems and policies on the premiums paid in cross-border European transactions. Adding to this, literature has shown that when the conditions in the market are favorable, acquirers are more willing to pay a higher premium to realize growth opportunities and secure strategic assets compared to when these are unfavorable (Aktas et al., 2018). Weitzel et al. (2014), confirm this, as their findings suggest that targets in countries undergoing a crisis are generally paid lower premiums and this effect is amplified when experiencing a state of severe EPU (Nhuyen & Phan, 2017). Yet, the topic remains debated in the academic fields as contradicting research established that during economic downturns as the great recession, shareholders require significant premiums, leading to an increase in the average premium being paid (BCG, 2020).

2.2.2 Influence of announcement effects on abnormal returns

When M&A transactions are undertaken, the target and acquirer are expected to experience effects from the announcement of the transaction, which tends to result in abnormal or deviating returns around the announcement date. Drivers of these abnormal returns following M&A announcements depend on different factors which can be of endogenous or exogenous nature. Following an event as Brexit it is expected that the abnormal returns following an M&A announcement are influenced by the sentiment following the departure of the UK from the EU, the height of the paid premium, and macroeconomic factors resulting from the uncertainties (Rhodes-Kropf et al., 2005).

To explain the drivers of abnormal returns, previous literature often refers to the Efficient market hypothesis (EMH) established by Fama, which states that markets are efficient and capable of fully incorporating all available information (Fama, 1970). The short-term wealth effects following merger announcements, measured through abnormal returns, challenge this hypothesis. Amid the research by

Rhodes-Kropf et al., (2005), it is suggested that around announcements the market does reassess the worth of the companies involved in the transaction causing returns to deviate from the expected returns. The Efficient market theory is therefore challenged by these abnormal returns around merger announcements. This would imply that the market is not fully efficient, and implies investors are able to exploit from the uncertainties resulting from asymmetrical information around M&A to achieve and benefit from abnormal returns (Rhodes-Kropf et al., 2005). Adding to the research of Rhodes-Kropf et al. (2005), Von Gersdorff (2009) finds evidence where the persistence of abnormal returns is in line with the semi-strong EMH, where the market incorporates all publicly available information, experienced shortly after M&A transactions are made public.

Following the widely used technique in research, analyzing abnormal returns best reflects the short-term performance of M&A transactions as opposed to wanting to measure the long-term effects of the transaction (Rehm & West, 2016). This announcement effect on the stock prices, experienced by both the acquirer and target, can be positive or negative and is considered a good reflection of the market sentiment circulating the transaction (Rehm & West, 2018). The experienced change in returns depend on several factors and reveals information about the perceived overall deal sentiment through expected synergies, the paid premium, and stand-alone values of the bidder(s). However, isolating the effects of the individual variables is considered impossible according to previous literature and is therefore determined to be out of the scope of this research (Hietala, Kaplan and Robinson, 2001).

The topic of abnormal returns for acquirers has been a subject of debate in the financial field despite the extensive body of literature, illustrated by contradicting results. As such according to Malatesta (1983), it is established that acquirers generally tend to experience negative significant abnormal returns immediately after M&A announcements. However, Betton et al. (2008), contradict their research as they conclude positive announcement effects for acquirers. For targets, extensive research has provided more consistent results where abnormal returns tend to be generally positive and leastwise value-creating around the announcement of the mergers (Betton et al., 2008). Looking specifically at cross-border transactions Malatesta (1983) establishes that announcement effects in acquisitions that are cross-border yield higher acquirer abnormal returns when undertaken in developed markets, hence less risky markets, adding to the general understanding of the dynamics influencing abnormal returns.

2.3 Brexit and M&A transactions

This section specifically evaluates the interplay between UK M&A and the topics of announcement effects, premiums, and deal activity. First, literature on overall UK M&A trends is discussed followed by the thus far research into the specific consequences of Brexit on the UK M&A market to date. Finally, the evaluated literature and theories from the preceding sections are combined to derive the relevant hypotheses that will be subjected to testing.

2.3.1 Overall trends in UK M&A

The UK has historically been a major player in the field of M&A. Despite Brexit uncertainty and factors such as the recovery from the financial crisis, the UK M&A market has experienced significant growth during the last decade, resulting in a volume increase from GBP 252 billion in 2010 to GBP 457 billion in 2022 (IMAA Institute, n.d.). The success of the UK market can among others be attributed to its unique and strategic position between the EU and the US, sophisticated legal framework, and the regulatory environment favorable for M&A. Specifically concerning an EU context, the UK's use of the Sterling has enabled the country to historically set its macroeconomic policies and interest rates while being an EU-member state (Uddin & Boateng, 2011). Notwithstanding departure of the EU, the country experienced a record of deal activity in 2021 and thus far managed to sustain its position as a top player behind the US and China with London functioning as one of the world's biggest financial centers (PWC, 2023). Additionally, the UK remained well engaged in cross-border deals. As of the 2021 recorded deal activity, more than half the volume was accounted for by cross-border deals (Maftah, 2022).

Pre-Brexit, Mateev (2017) highlighted that the short-term wealth announcement effects between Continental Europe and the UK were not significantly different based on research conducted on a large Pre-Referendum sample between 2002-2010. However, when UK firms acquired a continental European counterparty, UK firms did experience higher abnormal returns (Mateev, 2017). In addition, Mateev (2018) concluded that in intra-European transactions, UK targets received higher acquisition bid premiums than EU counterparties (Mateev, 2018). This research therefore establishes groundwork that there were already differences in market reactions to transactions involving a UK party, while still being an EU member. In line with the former literature, the effect will be mainly analyzed from a cross-border perspective since Brexit is best treated as an exogenous shock to the market affecting international transactions. Transactions involving UK and EU parties are thus considered the focal transactions of interest, as the departure from the EU directly impacts the trade and economic relationships between these parties.

2.3.2 Previous literature on Brexit and M&A transactions

Previous literature has examined the potential and thus far effects Brexit has had on cross-border M&A activity in the UK and consecutive short-term wealth effects measured through acquisition premiums and abnormal returns. As established, cross-border transactions have different drivers and motivations than domestic transactions (Chen & Finaly, 2003). According to research by Erel et al. (2012), movements in the home currency, stock market valuations, geographical location and macroeconomic factors influence the likelihood of cross-border M&A transactions. They find that firms from weaker-performing economies are more likely to be targeted, while acquirers are more likely to come from currencies and stock markets that have recently appreciated (Erel et al., 2012). The home currency movements of the UK through the significant drop in the value of the Sterling around the Brexit Referendum, and still ongoing challenges in its recovery, is therefore a way to hypothesize on the influence on the deal activity. According to Kakkad (2022), this depreciation of the home currency has resulted in a so-called discount on UK targets. Next to currency movements, the discount can be conjunctly attributed to the UK's stock market returns falling behind international peers since the Referendum (Kakkad, 2022). Additionally, extensive research surrounding the influence of previously discussed EPU, shows EPU diminishes FDI inflows to a target domicile and thus negatively influences the likelihood of the overall occurrence of M&A. This gives reason to expect that overall cross-border deal activity, in terms of numbers, will have declined since the referendum (Nguyen and Phan, 2017).

However, this conclusion on cross-border deal activity is challenged by multiple theories. Froot and Stein (1991), argue that the real depreciation of a currency will enhance the international M&A for the country experiencing the depreciation. This theory is in line with observed market evidence involving UK target illustrated by the actual number of deals completed and overall deal volume of UK takeovers (PWC, 2023). When examining the perspective involving a UK acquirer in a cross-border transaction it has been discussed that reallocation of assets to EU-member states can enhance stability for the position of a UK-domiciled company. This is in line with the previously discussed MPT and the subsequent advantage of the diversification of assets while reducing the riskiness of the company's EU status. Paudyal et al. (2021), provide further evidence for this increased activity by suggesting that countries facing periods of high EPU, such as UK domiciled parties during Brexit, seek to hedge and protect their investments. Therefore, UK acquirers are expected to be more inclined to undertake cross-border M&A involving countries experiencing lower levels of EPU amid Brexit. In addition, this view is sustained by Lin et al. (2020), who establish that after the Brexit referendum, deals have a higher likelihood to be undertaken and completed, specifically involving a UK acquirer and EU target. Finally, the following hypothesis on overall deal activity is derived supporting the rationale of Froot and Stein (1991), Lin et al. (2020), and market evidence from PWC (2023).

H1; Cross-border deal activity involving a UK and EU party has increased since Brexit.

Next, it has been established that during uncertain conditions or periods of economic downturn investors are less willing to take risks and are more cautious with their investments, emphasizing the importance of investor sentiment in financial markets (Qi et al., 2021). In the case of Brexit, the EPU following the political and economic situation would therefore give reason to place the UK targets in an unfavorable and more financially unstable situation compared to EU markets. This leads to a potential declined willingness to pay equivalent acquisition premiums for UK target companies by a non-UK acquirer. Additionally, Brexit did not only lead to increased trade barriers and information asymmetry but also potentially contributed to an increased cultural distance by undermining the trust of EU-domiciled companies. This gives reason to believe the height of premiums could be affected by the behavioral theory of home bias. As researched by Sun et al. (2021), the home bias theory was supported as companies were found to pay higher premiums when a target is located in the acquirer's home country. The theory can be attributed to familiarity with the economic environment, cultural identity, and an advantage to the accessibility of information, especially relevant when referring to M&A transactions (Sun et al., 2021). Therefore, it can be reasoned that since Brexit, UK targets require are less accept equivalent premiums influenced by the theories of home bias and EPU. This is also in line with the research of Mateev (2018), who found that Pre-Brexit, UK targets received higher premiums in intra-European deals, when still part of the EU.

When taking the standpoint of UK acquirer into consideration, it can be reasoned that these entities are willing to pay higher premiums to complete deals where they acquire EU targets. Again, in line with the reasoning that the reallocation of assets to EU member states can enhance stability for their EU position. Additionally, the above reasoning has been previously established in research analyzing the Chinese M&A market. Urbsiêne et al. (2015), found that the average Chinese acquirers, where China is considered, a country facing high EPU, paid on average double the premium for EU target companies than similar EU counterparties did. On the contrary, the home bias theory can also be reasoned from the perspective of the UK acquirer, meaning they are now willing to pay lower premiums for EU targets as these transactions are likely to experience increased agency costs and regulatory complications not experienced if the transactions involve two UK parties. These conflicting views in combination with the above-mentioned target perspective on the height of the premium paid in M&A transactions gives reason to suspect Brexit has influenced the height of premiums and leads to the following hypothesis.

H2; Brexit has significantly influenced the height of acquisition premiums in cross-border M&A transactions involving UK and EU parties.

As for the announcement effects, previous evidence has suggested that the abnormal returns of cross-border deals remain unchanged after Brexit (Lin et al., 2020). Yet, considering that the availability of information and the number of transactions has increased since 2020, in combination with evidence from the several discussed studies surrounding EPU, it is rationalized that the announcement effects can be affected by the departure of the UK from the EU. Announcement effects mostly reflect short-term wealth effects and market sentiment, where it has been established that the market revises the expected gains of the transactions to consider the uncertainties arising from economic policy considerations. This would give reason to suspect a different reaction on cross-border UK M&A deals at least visible in the short term. As such Paudyal et al. (2021), imply that abnormal returns for the acquirer are negatively associated with the EPU of the target's home country. In addition, higher EPU in an acquirer's domicile is positively associated with abnormal returns around the announcement when the target domicile experiences less EPU (Paudyal et al., 2021). This research applies to the case of Brexit and the acquiring party in cross-border transactions. On the other hand, the MPT could also have implications, as risk-aversity could lead to reduced investor confidence resulting in a negative effect on returns EU acquirers in cross-border transactions and investors taking hedging positions (Markowitz, 1952 & Gao et al., 2020). Besides, it should be noted that other factors like the height of the premium paid by the acquirer can influence the market sentiment and in turn the abnormal returns. Meaning that if a premium is viewed as excessive to firm value, it can result in negative announcement effects surrounding the transaction, in line with the application of the winner's curse theory in M&A (Thaler, 1978). Considering the fact Brexit caused a substantial presence of EPU and the application of the MPT and winner's curse theory, UK and EU acquirers are thus expected to have experienced significant effects on their returns since Brexit. Thus, the following hypothesis is constructed to analyze the effect on announcement effects.

H3; Announcement effects experienced by acquirers around cross-border M&A transactions have been significantly influenced by Brexit for transactions involving UK and EU parties.

The vast amount of literature discussed in these sections has led to the development of the above hypotheses. Theories such as the MPT, home bias and the winner's curse are considered when explaining the effects observed in M&A transactions since Brexit. This paper thus adds to the body of research by incorporating relevant theories and results of previous studies, while accounting for the different phases of Brexit, to evaluate the distinct effects on the UK M&A market. Consequently, the following section will elaborate upon the measurement of the variables and methods used to answer the hypotheses.

3. Data and Methodology

This section will elaborate on the sample selection, choice of variables and related methodology. After which the descriptive statistics are presented of the variables included in the empirical analysis.

3.1 Sample composition and deal characteristics

The large sample used in this research is constructed out of a total of 15,852 M&A transactions between the 1st of January 2013 and 1st of January 2023, retrieved from the Eikon/Refinitiv database. The sample includes M&A transactions from 28 countries, that involve either a UK or EU domiciled party. In addition, the minimum deal size is EUR 1 MLN. It is decided that the acquirer has bought more than 10% of the target's shares, as the acquirer then qualifies as a principal shareholder in the company, able to exert relevance (Smith, 2021). Lastly, all deals included in the sample have been completed and have a known deal value. When analyzing the overall deal activity in the number of transactions per country during the sample period, several preliminary observations can be made. The UK's position as a major player in the M&A market is recognized in the dataset. This results in the UK being the largest player represented in the sample, where transactions involving either a UK acquirer or target make up 1/3 of total number of transactions **(Table A1**). The UK's position is followed by other big players. Italy and France are present in 25% of the remaining activity where Sweden, Spain, and Germany follow respectively. The yearly activity per country is visualized in the **Table 1**. Not only does the UK witness the most transactions overall, per year their presence is also the highest in terms of activity.

Table 1
Full Sample Yearly Deal Activity– Part 1

Country	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Austria	25	19	17	15	16	24	18	16	20	13	183
Belgium	40	36	47	46	46	37	32	29	48	34	395
Bulgaria	4	9	4	10	6	10	6	3	6	5	63
Croatia	1	1	1	2	0	0	0	0	4	0	9
Cyprus	10	14	10	19	16	19	14	18	12	7	139
Czech Republic	15	12	16	19	18	17	20	13	15	11	156
Denmark	46	36	42	54	49	39	37	41	48	31	423
Estonia	3	15	6	14	11	9	5	6	10	11	90
Finland	47	42	37	40	46	43	51	48	55	44	453
France	161	205	261	230	250	189	182	149	162	153	1942
Germany	127	163	168	172	159	167	182	129	153	105	1525
Greece	13	18	5	16	32	31	25	16	24	15	195
Hungary	9	5	7	7	19	7	14	7	8	9	92
Ireland	31	45	57	37	53	49	69	37	61	41	480
Italy	105	128	177	245	231	234	263	222	206	179	1990

Table 1
Full Sample Yearly Deal Activity– Part 2

Country	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total
Latvia	0	3	0	7	6	3	9	10	6	5	49
Lithuania	7	17	7	6	13	7	5	7	8	11	88
Luxembourg	36	39	31	43	50	54	52	39	53	25	422
Malta	2	5	8	8	6	8	2	7	7	8	61
Netherlands	59	94	102	128	116	92	102	71	102	71	937
Poland	81	93	127	100	103	115	101	83	73	45	921
Portugal	12	14	26	19	35	30	34	32	29	24	255
Romania	11	11	8	14	32	14	14	10	22	16	152
Slovakia	4	6	6	2	1	9	4	2	4	5	43
Slovenia	6	5	4	9	3	11	6	4	7	2	57
Spain	101	159	156	167	189	162	176	124	147	185	1566
Sweden	109	84	110	154	136	190	177	193	263	160	1576
United Kingdom	515	625	613	549	638	650	562	442	612	513	5719

Note: Table 1 shows the total amount of deals per country (EU and UK) for each year in the sample timeframe, transactions are counted when a country acted as either acquiring party or was a target.

Next, a division in the sample is made, where cross-border deals are examined, later split amongst different variables to highlight the specific effect of leaving the EU based solely on transactions including UK parties, in line with the research of Lin et al. (2020). The inclusion of the full sample in combination with cross-border specific variables will allow for a more in-depth analysis while measuring not only UK cross-border transactions but also incorporating EU-EU transactions during the sample period. When looking at the difference between domestic and cross-border deals several first observations can be made. Of all the transactions in the sample between 2013-2023 around 26% consists of cross-border deals, meaning the remaining 74% were domestic deals. Of all the cross-border deals, the UK had the highest representation, having played a role in almost 35% of all cross-border M&A transactions (**Table A1**). After making the first observations, the sample shows that the UK acted as an acquirer in 983 cross-border deals and was targeted in 469 deals. This signifies that in the sample, the UK is a preferred acquirer over target in EU cross-border transactions. Further considering a UK acquirer, most transactions targeted companies domiciled in France, Germany, Italy, Spain, and the Netherlands. Transactions in which the UK has been targeted have seen the highest representation from acquirers domiciled in France, Germany, Netherlands, Sweden, and Ireland respectively (**Table A2).**

3.2 Independent variables

3.2.1 The event of Brexit

To answer the hypotheses constructed in the literature review section of this paper, the event of Brexit is used as an independent variable in the research, as it is examined how the different phases of the event have influenced the UK M&A market. Every hypothesis will be answered by comparing the different periods accordingly. Therefore, the *Brexit* variable is a categorical variable coded according

to three timestamps, where three dummy variables are created based on the three different periods. The first period entails the *Pre-Referendum period (PRE-REF)*, including the transactions before the Referendum on the 23rd of June 2016. Second, the period is analyzed between the Referendum and the Effective date of Brexit, being 31st of January 2020, this term will be referred to as the *Post-Referendum period (POST-REF)*. Lastly, the period following the Effective date until the 1st of January 2023 is analyzed, hereafter the *Post-Effective period (POST-EFF)*. These periods are examined differently to see how the initial market reaction may stabilize over time, and whether the observed effects are substantially different during the different phases of Brexit, summarized in **Table A3**.

3.2.2 Target and acquirer status

It is hypothesized that Brexit influenced cross-border transactions involving a UK party through factors such as increased regulatory hurdles and related uncertainty. When analyzing the effects of Brexit on acquisition premiums, abnormal returns, and deal activity, it is therefore, crucial to consider both the target nation status and acquirer nation status as independent variables to identify patterns and significant differences based on the specific parties present in the transactions. The independent variables signifying target nation and acquirer nation status are therefore created by introducing two dummy variables, *UK Target* and *UK Acquirer,* assigned a 1 when based in the UK and 0 otherwise. In addition, a cross-border deal variable *(CBDEAL)* is created to identify all deals where the acquirer nation does not equal the target nation. The three variables are later used in the creation of interaction terms resulting in variables including only the transactions that are cross-border and include a UK party, resulting in CBDEAL*UK Acquirer *(CBUKA)* or CBDEAL*UK Target *(CBUKT)*.

3.3 Dependent variables

In this section the dependent variables used to evaluate the hypotheses are discussed, followed by an explanation of the relevant methodology used to measure the variables of cross-border deal activity, acquisition premiums, and the cumulative abnormal returns, summarized in **Table A3.**

3.3.1 Measuring cross-border deal activity

The deal activity in terms of the number of cross-border deals is used as the dependent variable in the first hypothesis in the research. Under deal activity, we look at the number of cross-border transactions, announced during the three different periods. As it is hypothesized cross-border deal activity has increased since Brexit from both the perspective of a UK party acquiring EU parties, as well as an EU acquirer and a UK target. To conclude, to answer the first hypothesis, the dependent variable is a variable consisting of all cross-border deals (*CBDEAL)*, assigned a 1 when the transaction is classified as cross-border, implying the target nation does not equal the acquirer nation and a 0 if the transaction is domestic.

3.3.2 Measuring acquisition premiums

The dependent variables used to analyze the second hypothesis are the acquisition premiums that have been paid by the acquirer for the target their shares in the transaction. Considering information leakage around transactions is common in the M&A market, the premiums are analyzed by looking at the *Premium 4-weeks prior to announcement (PREMIUM 4-WEEKS).* This to mitigate the effect of potential takeover rumors reaching the market several days or weeks before the announcement and thereby smooth out the short-term fluctuation that might occur in a shorter time frame (Gomes & Marsat, 2018). The research methodology is in line with research on the EPU influence on premiums, as suggested by Nguyen and Phan (2017). The available premiums are derived as percentages from the Eikon/Refinitiv database where the provided value is composed of the price paid by the acquirer for the target's share (offer price) minus target's stock price prior to announcement which is then again divided by the pre-announcement target stock price. This means that this subsample will only include publicly listed targets as the relevant stock prices have been retrieved to compile the variables.

$$Acquisition\ premium\ in\ \%\ (X)\ =\ \frac{Offer\ price - Target\ stock\ price\ (t)}{Target\ stock\ price\ (t)}\ \text{x}\ 100\%$$

Where, $t = 4$*-weeks prior to announcement date of transaction.*

3.3.3 Measuring cumulative abnormal returns

The short-term effect of the announcement effects of M&A transactions will be quantified by using the cumulative abnormal return (**CAR**) as a dependent variable that are experienced by the acquirer around the transaction announcement. CARs are calculated by basing them around a specific event, which in this case refers to announcement of the M&A transaction and the subsequent effect on the stock returns of the acquirer, in line with the event study methodology suggested by Brown and Warner (1985) and Fama (1970). These returns experienced around the announcement are referred to as abnormal, considering that in the absence of this event, the returns would not have been realized. There are several steps to be followed to correctly determine the CAR. The first step is defining the event and estimation window. In this research the event window requires determination of the number of days before and after the M&A announcement, to analyze the reaction of the market to the transaction on the actual realized returns. Since this research specifically focuses on the short-term announcement effects experienced by the acquirer, a five-day event window is defined as measuring returns two days prior and after the announcement of the transaction, referred to as to as *CAR [-2, +2].* Considering the broad time span of the sample, diversification of industries, differences between countries and focus on market reactions following Brexit, it has been decided to make use of the Market Adjusted Model (MAM) to calculate the abnormal returns for company *j* on day *t* (Brown & Warner, 1980). This model does not require an additional estimation period, instead it considers the actual market return during the event window as ex-ante expected returns ($R_{m,t}$), expected to be a good proxy for the expected returns on

that day. The expected return model following the market is a variation on the original Market Model which calculates expected returns based on firm-specific constants, where the expected firm returns use an OLS beta to be a linear function of the market return (Dyckman et al., 1984). By changing certain assumptions of the Market Model, the expected returns ($R_{m,t}$) for the acquirers can be calculated when wanting to use the MAM. Next, in the MAM it is assumed that for the expected return $R_{m,t}$, the stock price of the acquirer, has been indexed against a country-specific benchmark to account for the expectations in the market on day *t* (Brown & Warner, 1980). This country benchmark is based on data extracted from the WRDS institute and its access to daily world indices (WRDS, 2023). When transforming this model to the MAM, several additional assumptions are made. It is presumed that the expected returns are constant throughout different securities, yet differ across time and country, therefore α_i for firm-specific risk is set to 0 and β_i ,which equals the risk of the market, is set equal to one (Dyckman et al., 1984, Brown & Warner, 1980). This model is therefore also coherent with the Asset Pricing model, supposing that the securities consist of systematic risk of unity, resulting in a beta coefficient of 1 (Brown & Warner, 1980). These assumptions result in the following equations.

Market model (MM) calculation of expected returns for firm *j* and time *t*

$$E(R_{j,t}) = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

Where in the Market Adjusted Model (MAM), $\alpha_i = 0 \; and \; \beta_i = 1$ for firm *j* and time *t* resulting in,

$$E(R_{j,t}) = R_{m,t}$$

The actual realized returns or post-ante returns of the acquirers over the event window ($RR_{j,t}$) are calculated by the extraction of the relevant daily stock prices for acquiring firm *j* during the event window from the Compustat Global database. The next step is calculating the daily abnormal returns ($AR_{j,t}$) of the acquirer's stock, which is calculated by subtracting the expected returns, ($R_{m,t}$) from the actual realized return ($RR_{j,t}$) for firm *j* on *t* day relative to the event window resulting in the following equation for the daily abnormal returns (Brown & Warner, 1980). This results in the following.

Market adjusted model (MAM) for daily abnormal returns

$$AR_{j,t} = RR_{j,t} - R_{m,t}$$

Finally, to capture the announcement effect of the transaction, the cumulative abnormal return (CAR_j) of the specific firm *j* is calculated through the summation of the daily abnormal returns ($AR_{j,t}$) over the event window.

$$CAR[-2, +2] = CAR_j = \sum_{t-2}^{t+2} AR_{j,t},$$

When analyzing the five-day event window.

3.4 Control variables

Based on previous literature, several control variables will be included in the research to account for the possible effects these variables impose on the dependent variables in the analysis. All the data necessary for the measurement of the variables is retrieved from the Eikon/Refinitiv database or the World Bank Database. The denotation and description of the variables are displayed in **Table A3**.

3.4.1 Domestic UK deals

One of the control variables that will be used in this research is a dummy variable that includes all the domestic UK transactions (*DOMUK*), if assigned a 0 it classifies as an intra-EU transaction consisting of two EU parties. An extra variable for intra-EU transactions is omitted to address possible multicollinearity issues arising from the interplay between the variables. However, the *DOMUK* variable is included for a more thorough analysis of, and comparison to, activity between domestic UK transactions and cross-border transactions considering a large part of the UK-involved transactions classifies as domestic.

3.4.2 Industry type

The industry type of the target and acquirer is also considered as a control variable. Since the market is likely to respond less extremely when the target and acquirer operate within the same industry, due to a better understanding of the target company's value by the acquirer and perceived smoother integration of the companies (Lin et al., 2020). This may diminish negative announcement effects and increase the height of the premium as synergies can be achieved more easily. Therefore, a dummy variable called *INDUSTRY* is created that will equal 1 if the target and acquirer have an identical macro industry, categorized in thirteen industries in the Eikon/Refinitiv database.

3.4.3 Payment type

Previous literature has repeatedly shown that the payment type in M&A transactions has influenced the height of the premium being paid and the returns experienced around the announcement. For instance, a study by Wansley et al., (1983) found that cash-financed acquisitions result in higher acquisition premiums than stock-financed deals, this as cash-financed deals result in tax benefits and fewer regulatory requirements enhancing efficiency. Therefore, including payment type as a control variable can help to address the underlying drivers of changes in acquisition premiums and returns. Additionally, by including payment type as a control variable, we can identify potential differences in the impact of Brexit on cash- and stock-financed deals. For example, a study by Gao and Kling (2008) found that uncertainty, as created by Brexit, may lead to a shift towards cash-financed deals due to increased regulations. Not only premiums, but returns are also positively influenced by the payment type, as cash financed deals seem to earn higher abnormal returns (Wansley et al., 1983). Hence, controlling for

payment type allows us to identify the potential differential effects of Brexit on M&A transactions and provides more nuance for understanding the potential Brexit effects. The variable will be defined as a dummy variable referred to as *PAYMENT*, where acquisitions paid for fully with cash are assigned a 1, and when another type of payment is used the variable is a assigned a 0.

3.4.4 Deal size

Research shows that the relative deal size of the transactions has been influenced by Brexit, as deal size declined if the transaction was announced after the Referendum (Nguyen, 2019). Therefore, there are reasons to include the deal size as a control variable in the research. This variable is primarily based on the value extracted from the Eikon/Refinitiv database, where the value is referred to as the Rank value including the debt of the target (Eikon/Refinitiv, n.d.). Based on previous literature as Paudyal et al. (2021), the deal size variable (*DEAL SIZE)* is ultimately constructed by taking the natural logarithm of the monetary value of the transaction to account for the large differences in deal value.

3.4.5 Percentage of acquired stock

The percentage of stock acquired (*STOCK ACQ%)* is another crucial control variable when analyzing transactions as it provides insight into the level of ownership the acquiring firm holds in the target company after deal completion. Considering there can be significant differences between majority and minority deals, both included in the sample where a minimum of 10% is assumed. It also impacts the competition among potential acquirers, as a larger stock acquisition tends to mitigate the number of bidders, and the level of information asymmetry between the acquiring firm and the market.

3.4.6 Number of bidders

The number of bidders is another relevant variable as it has shown to significantly influence the height of the premium being paid and the announcement effects of transactions. Here, the winner's curse becomes especially relevant, as an increase in the number of bidders tends to heighten the acquisition bid resulting in the acquirer possibly overpaying for the target, which in turn negatively influences announcement effects (Thaler, 1987). Therefore, a variable is included that signifies how many bidders were present during the transaction process. This variable is denoted as *BIDDERS* ranging in the sample from 1 to 4.

3.4.7 Firm- and country specific variables

Several firm- and country specific variables are also included in the analysis related to both the target and acquirer, in line with previous research regarding M&A transactions as suggested by Lin et al., (2020). First, the variable *ACQUIRER EXPERIENCE is* created, which indicates whether the acquirer is a serial acquirer, implying a multitude of transactions in the sample period, found a strong determinant

of variations in M&A determinants (Hitt et al., 2012). As for the target specific variables, a dummy variable is added for the status of the target, in line with research of (Lin et al (2020) and Nguyen & Phan (2017)) referred to as *TARGET DUMMY,* awarded a 1 if the target is public. Lastly, the sample will control for two country specific characteristics the *GDP PER CAPITA* of the target nation and GDP annual growth percentage of the target nation (*GDP GROWTH)*, retrieved from the World Bank database, this to account for any large economic differences within countries. This also in line with the research of Lin et al. (2020), where for *GDP PER CAPITA* the natural logarithm is employed to account for large differences in economies and address the possible skewness of variable.

3.5 Year and industry fixed effects

The analysis will lastly include yearly fixed effects to discard the influence of exogenous events outside of Brexit, such as large macroeconomic events such as COVID or the War in Ukraine. The inclusion of year fixed effects mitigates the influence of year-related events that are experienced in the entire market. Since the sample consists of ten years, the research will include nine yearly dummy variables ($Year\_dummy(i)$) that will be assigned a 1 or 0 dependent on the specific year the transaction was announced in. The analysis will refer to these variables as *YEAR FIXED EFFECTS*. Additionally, the industry fixed effects will be controlled for referred to as *INDUSTRY FIXED EFFECTS*, this to control for the notion that premiums tend to differ across time and industries (Madura et al., 2012). The macro industries are defined by Refinitiv/Eikon upon which twelve industry dummies are constructed.

3.6 Model specifications

To empirically test the different hypotheses, several types of regressions will be used. A binary logistic regression will be constructed for the first hypothesis (*H1*) considering the dependent variable *CBDEAL* is a binary variable either assigned a value of 0 or 1. This model is employed considering a logistic regression discards the limitations of multicollinearity and heteroscedasticity of a linear probability model when dealing with a binary dependent variable (Penman, 2022). The specifications of the model used to analyze the cross-border deal activity in *H1* are presented in a simplified form in equation (1) & (2). In each regression two of the three independent Brexit phase variables are included; in which case the omitted Brexit phase variable serves as the Reference group. Additionally, control variables, a constant for the yearly- and industry fixed effects, and an error term added. The following formula is derived (Penman, 2022).

If *Pre-Referendum period* is considered the reference group,

$$(1)\ \log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 POST\text{-}REF + \beta_2 POST - EFF + \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5(POST - REF * UK\ TARGET) + \beta_6(POST - EFF * UK\ TARGET) + \beta_7(POST - REF * UK\ ACQUIRER) + \beta_8(POST - EFF * UK\ ACQUIRER) + \sum_k \beta_k\ Control\ variables + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) + \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j) + \varepsilon$$

If *Post-Referendum period* is considered the reference group,

$$(2)\ \log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 PRE - REF + \beta_2 POST - EFF + \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5(PRE - REF * UK\ TARGET) + \beta_6(POST - EFF * UK\ TARGET) + \beta_7(PRE - REF * UK\ ACQUIRER) + \beta_8(POST - EFF * UK\ ACQUIRER) + \sum_k \beta_k\ Control\ variables + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) + \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j) + \varepsilon$$

Where in equation (1) and (2) p illustrates the probability (log-odds) that *CBDEAL* equals 1 dependent on the values of the variables on the right-hand side.

Hypothesis 2 (*H2*) will be tested using an Ordinary Least Squares (OLS) regression model. This hypothesis revolves around whether there is a difference in premiums being paid by or for UK parties during the different Brexit phases. Hence, the different Brexit variables are incorporated once again as independent variables in the regression model, where the omitted variable is the reference group. To carefully evaluate the statement, the formula includes several additional interaction variables based on triple interaction terms between classifying as a cross-border deal and involving UK target (*CBUKT)* or acquirer (*CBUKA),* and the related Brexit phase. The simplified formulas of the baseline models are depicted below including the variables which are defined in **Table A3.**

If *Pre-Referendum period* is considered the reference group,

$$
\begin{aligned}
(3)\ PREMIUM\ 4-WEEKS \\
&= \beta_0 + \beta_1 POST-REF + \beta_2 POST-EFF \\
&+ \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5 CBDEAL \\
&+ \beta_6 (POST-REF * CBUKT) + \beta_7 (POST-EFF * CBUKT) \\
&+ \beta_8 (POST-REF * CBUKA) + \beta_9 (POST-EFF * CBUKA) \\
&+ \sum\nolimits_k \beta_k\ Control\ variables\ + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) \\
&+ \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j)\ +\ \varepsilon
\end{aligned}
$$

If *Post-Referendum period* is considered the reference group,

$$
\begin{aligned}
(4)\ PREMIUM\ 4-WEEKS \\
&= \beta_0 + \beta_1 PRE-REF + \beta_2 POST-EFF \\
&+ \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5 CBDEAL \\
&+ \beta_6 (PRE-REF * CBUKT) + \beta_7 (POST-EFF * CBUKT) \\
&+ \beta_8 (PRE-REF * CBUKA) + \beta_9 (POST-EFF * CBUKA) \\
&+ \sum\nolimits_k \beta_k\ Control\ variables\ + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) \\
&+ \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j)\ +\ \varepsilon
\end{aligned}
$$

Where, in equation (3) and (4) *CBUKA* and *CBUKT* refer to the interaction variables of *UK Acquirer/Target,* and *CBDEAL* and the dependent variable is tested based upon the premium measure defined in **section 3.3.2**.

Lastly, to evaluate the third hypothesis (*H3)* regarding the announcement effects experienced by acquirers around M&A transactions, another set of multiple linear regression (OLS) models will be employed. This statement will be evaluated by analyzing the results derived from the following multilinear equations (5) and (6). The regression analysis will be conducted over the five-day event window to measure the cumulative abnormal returns. The simplified formulas of the baseline models are shown below and similarly to equations (3) and (4) the different reference groups referring to the Brexit variable, interaction variables and control variables are included.

When *Pre-Referendum period* is the reference group,

$$
\begin{aligned}
(5)\ CAR[-2,+2] &= \beta_0 + \beta_1 POST - REF + \beta_2 POST - EFF \\
&+ \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5 CBDEAL \\
&+ \beta_6 (POST - REF * CBUKT) + \beta_7 (POST - EFF * CBUKT) \\
&+ \beta_8 (POST - REF * CBUKA) + \beta_9 (POST - EFF * CBUKA) \\
&+ \sum\nolimits_k \beta_k\ Control\ variables\ + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) \\
&+ \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j)\ +\ \varepsilon
\end{aligned}
$$

If *Post-Referendum period* is considered the reference group,

$$
\begin{aligned}
(6)\ CAR[-2,+2] &= \beta_0 + \beta_1 PRE - REF + \beta_2 POST - EFF \\
&+ \beta_3 UK\ TARGET + \beta_4 UK\ ACQUIRER + \beta_5 CBDEAL \\
&+ \beta_6 (PRE - REF * CBUKT) + \beta_7 (POST - EFF * CBUKT) \\
&+ \beta_8 (PRE - REF * CBUKA) + \beta_9 (POST - EFF * CBUKA) \\
&+ \sum\nolimits_k \beta_k\ Control\ variables\ + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) \\
&+ \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j)\ + \varepsilon
\end{aligned}
$$

Where in equation (5) and (6), *CBUKA* and *CBUKT* are the interaction variables of *UK Acquirer and Target*, and *CBDEAL*.

3.7 Descriptive statistics

In **Table 2**, the descriptive statistics of the variables are shown that are used in the regression, which are used for initial observations of the sample. The statistics are presented according to the distinct periods of Brexit as well as for the whole period. Additionally, the sample is divided according to the three different hypotheses. As expected, when wanting to inspect the CAR and premium-related variables, the number of observations becomes substantially smaller, which therefore creates the need to separately inspect the descriptive statistics for a more thorough analysis.

Regarding the acquisition premiums, the reduction in sample size (*N = 1522*) can be attributed to the general absence of deal-specific disclosed information and a lack of the public status of targets, which is reflected in the value of the control variable *TARGET DUMMY,* changing from 0.12 in the full sample to a mean 0.99 in the premium sub-sample. Further, the variable *PREMIUM 4-WEEKS* exhibits large standard deviations, which gives reason to suspect the presence of substantial outliers in the sample and creates the need for further exploration of the distribution of these variables before conducting further statistical analyses. Additionally, it seems the average percentage of stock acquired is considerably smaller in the sub-sample of premiums compared to the other samples. Considering the *CAR [-2,+2]*, the sub-sample does not initially indicate significant mean differences between the periods, which makes the creation of interaction variables relevant to more carefully assess possible differences. Lastly, it is observed from the CAR sub-sample that only 8% includes public targets, implying that public acquirers in this sub-sample prefer non-listed target companies in acquisitions and have the largest presence of serial acquirers compared to the other samples illustrated through *ACQUIRER EXPERIENCE*.

Next, t-tests are conducted on the mean difference between each variable to account for the variations between Brexit phases. As for deal activity, the UK's presence in the sample remains substantial throughout the different periods of Brexit and through the different sub-samples, implying a broad range of transactions consistently involving UK parties in the sub-samples. The full sample shows that through the different phases, the UK acted as an acquirer in approximately 32-35% of transactions and was targeted on an average of approximately 28-32%. Another interesting observation are the strong negative coefficients in columns (**10-4**) and (**10-7**) for *GDP PER CAPITA* and *GDP GROWTH* comparing the Post-Effective period to the Pre- and Post-Referendum phase. These values could possibly be explained by the influence of large macroeconomic events in the Post-Effective period such as COVID and the war in Ukraine. However, as already discussed these effects will be controlled for in the analyses through fixed effects per year. In conclusion, these remarks highlight the significance of carefully analyzing the sample characteristics and help rationalize the assumptions and choice of variables before performing the specified regressions, which results are discussed in the next section.

Table 2
Descriptive Statistics

		Full Sample			PRE-REF				POST-REF				POST-EFF				Mean difference		
Variables	***N***	**Mean (1)**	**Median (2)**	**Std (3)**	***N***	**Mean (4)**	**Median (5)**	**Std (6)**	***N***	**Mean (7)**	**Median (8)**	**Std (9)**	***N***	**Mean (10)**	**Median (11)**	**Std (12)**	**(7)-(4)**	**(10-4)**	**(10-7)**
Full sample	15852				5274				6228				4350						
UK ACQUIRER		0.33	0	0.47		0.35	0	0.48		0.32	0	0.47		0.32	0	0.47	-0.03***	-0.03***	0.02
UK TARGET		0.30	0	0.46		0.32	0	0.47		0.28	0	0.45		0.30	0	0.46	-0.04***	-0.03***	0.00
CBDEAL		0.26	0	0.44		0.24	0	0.43		0.27	0	0.45		0.27	0	0.44	0.04***	0.03***	-0.01
PAYMENT		0.81	1	0		0.83	1	0.38		0.83	1	0.38		0.78	1	0.42	0.00	-0.05***	-0.05***
INDUSTRY		0.50	0	0.5		0.51	1	0.50		0.49	0	0.50		0.49	0	0.50	-0.02	-0.02***	-0.01
DEAL SIZE		3.31	3.15	2		3.31	3.16	1.87		3.28	3.11	1.88		3.37	3.18	1.96	-0.03	0.05	0.08**
STOCK ACQ%		85.43	100.00	26.80		84.30	100.00	27.71		85.43	100.00	26.76		86.79	100.00	25.66	1.13**	2.49***	1.36***
BIDDERS		1.01	1	0.09		1.01	1	0.09		1.00	1	0.08		1.01	1	0.11	0.00	0.00	0.00***
ACQUIRER EXPERIENCE		0.55	1	0.50		0.55	1	0.50		0.56	1	0.5		0.55	1	0.5	0.01	0.00	-0.01
TARGET DUMMY		0.12	10.62	0.32		0.13	0	0.34		0.11	0	0.32		0.11	0	0.32	-0.02***	-0.02***	0.00
GDP PER CAPITA		9.50	5.79	3.10		10.35	10.64	1.16		10.41	10.67	1.10		7.16	10.36	4.92	0.05**	-3.19***	-3.24***
GDP GROWTH		1.27	1.39	3.69		1.55	1.39	2.42		1.74	1.50	1.89		0.25	0	6.00	0.18***	-1.30***	-1.48***
PREMIUM 4-WEEKS	1522	40.61	20.48	251.37	503	48.50	17.70	339.66	606	37.55	17.84	244.04	413	35.50	27.45	71.62	-10.96	-13.00	-2.05
UK ACQUIRER		0.19	0	0.40		0.18	0	0.39		0.20	0	0.40		0.20	0	0.40	0.02	0.02	0.00
UK TARGET		0.20	0	0.40		0.20	0	0.40		0.20	0	0.40		0.19	0	0.39	0.00	-0.01	-0.01
CBDEAL		0.25	0	0.43		0.25	0	0.43		0.28	0	0.45		0.20	0	0.40	0.02	-0.05*	-0.07***
DOMUK		0.17	0	0.37		0.16	0	0.37		0.16	0	0.37		0.18	0	0.38	0.00	0.02	0.01
PAYMENT		0.80	1	0.40		0.78	1	0.41		0.78	1	0.41		0.84	1	0.37	0.00	0.06**	0.06**
INDUSTRY		0.40	0	0.49		0.46	0	0.50		0.36	0	0.48		0.39	0	0.49	-0.10***	-0.07**	0.03
DEAL SIZE		4.49	4.36	2.28		4.16	4.06	2.25		4.55	4.37	2.22		4.79	4.86	2.35	0.39***	0.63***	0.23
STOCK ACQ%		57.08	52.83	33.66		55.45	51.19	33.57		56.59	52.02	33.67		59.76	58.70	33.69	1.14	4.31	3.17
BIDDERS		1.06	1	0.28		1.05	1	0.26		1.05	1	0.25		1.08	1	0.33	0.00	0.03	0.03*
ACQUIRER EXPERIENCE		0.45	0	0.50		0.43	0	0.50		0.46	0	0.50		0.44	0	0.50	0.02	0.00	0.00
TARGET DUMMY		0.99	1	0.08		1	1	0.04		0.99	1	0.10		0.99	1	0.10	-0.01*	-0.01	0.00
GDP PER CAPITA		9.70	10.55	2.70		10.37	10.60	0.81		10.42	10.57	0.75		7.82	10.36	4.53	0.05	-2.55***	-2.60***
GDP GROWTH		1.24	1.29	3.59		1.36	1.14	2.04		1.95	1.50	1.75		0.05	0	5.98	0.59***	-1.31***	-1.90***
CAR[-2.+2]	4864	0.01	0.01	0.05	1611	0.01	0.01	0.05	1811	0.01	0.01	0.05	1431	0.01	0.01	0.05	0.00	0.00	0.00
UK ACQUIRER		0.40	0	0.49		0.45	0	0.50		0.40	0	0.49		0.35	0	0.48	-0.06***	-0.10***	-0.05***
UK TARGET		0.38	0	0.48		0.42	0	0.49		0.37	0	0.48		0.34	0	0.47	-0.05***	-0.08***	-0.03*
CBDEAL		0.25	0	0.43		0.23	0	0.42		0.25	0	0.44		0.26	0	0.44	0.02	0.03**	0.01
DOMUK		0.35	0	0.48		0.40	0	0.49		0.34	0	0.47		0.31	0	0.46	-0.06***	-0.08***	-0.03
PAYMENT		0.68	1	0.47		0.69	1	0.46		0.70	1	0.46		0.64	1	0.48	0.01	-0.05***	-0.06***
INDUSTRY		0.62	1	0.48		0.66	1	0.47		0.63	1	0.48		0.58	1	0.49	-0.03	-0.07***	-0.04**
DEAL SIZE		3.13	2.90	1.85		3.23	3.07	1.86		3.06	2.79	1.86		3.09	2.89	1.84	-0.17***	-0.14**	0.03
STOCK ACQ%		88.29	100	24.62		87.27	100	25.47		88.83	100	24.06		88.77	100	24.33	1.56*	1.50*	-0.06
BIDDERS		1.00	1	0.06		1.00	1	0.07		1.00	1.00	0.02		1.00	1	0.07	0.00**	0.00	0.00**
ACQUIRER EXPERIENCE		0.80	1	0.40		0.78	1	0.41		0.82	1	0.39		0.77	1	0.42	0.03**	-0.01	-0.04**
TARGET DUMMY		0.08	0	0.27		0.10	0	0.30		0.07	0	0.26		0.07	0	0.26	-0.03***	-0.03***	0.00
GDP PER CAPITA		9.48	10.67	3.20		10.45	10.68	0.91		10.51	10.73	0.83		7.07	10.36	4.99	0.06**	-3.38***	-3.44***
GDP GROWTH		1.25	1.39	3.60		1.57	1.45	2.10		1.67	1.39	1.58		0.35	0	5.89	0.10	-1.22***	-1.32***

This table displays the descriptive statistics for a sample of 15,852 M&A transactions announced between January1, 2013 and January 1, 2023. The sample is divided further based on phases of Brexit, specified in PRE-REF, POST-REF and POST-EFF columns. Further elaboration on variable denotation can be found in Table A3. The Mean, Median and Standard deviation for each variable is reported. Using a t-test the mean difference between columns 4, 7,10 and are calculated, where *, ** and *** denote the statistical significance at a 10%, 5% and 1% level respectively.

4. Results

In this section, the empirical results of the regression analyses are presented and discussed to be able to appropriately reject or accept the hypotheses.

4.1 Cross-border deal activity

4.1.1 Correlation

First, a correlation matrix is formed (**Table A4**) to ensure there are no multicollinearity issues when including the relevant variables solving equations **(1)** and **(2)**. These issues can occur when specific variables used in the regression are highly correlated and therefore should be carefully evaluated before executing the regression models to present reliable results. The Pearson correlation coefficient (ρ) is considered highly correlated if $\rho > 0.7$ or $\rho < -0.7$ (Calkins, 2005). If this is the case and the corresponding p-value is statistically significant, the variance inflation factor (VIF) is calculated, where if VIF > 10, further action needs to be taken (Ferre, 2009). In the sample used for the analysis of cross-border deal activity, the variables *UK Target* and *UK Acquirer* have a significant positive correlation ($\rho = 0.7830, p=0.0000$). After calculating the VIF, the values are smaller than 10, indicating no initial significant issues regarding multicollinearity.

4.1.2 Empirical analysis of cross-border deal activity

Following the formulas specified in **Section 3.4**, logistic regressions based on equations (1) and (2) are performed to examine H1 presented in **Table 3.** The models include the dependent variable (*CBDEAL)*, independent variables, control variables, and industry- and year fixed effects, regressed on the two reference periods presented in columns **(1)** and **(2).** The two reference periods require separate regressions to not only compare the Post-Effective and Post-Referendum period to the Pre-Referendum period, but also the Post-Effective and Pre-Referendum period to the Post-Referendum period. In this way, an additional time frame is isolated only incorporating the period between the Post-Referendum and Post-Effective period to analyze these effects. The key variables of interest are the interaction terms between the Brexit periods and the UK Target and UK Acquirer variables, which assess the probability of a cross-border deal involving a UK party during different phases.

The results of the baseline models presented in **Table 3** present statistically significant results for all the key variables of interest. First, it is observed that the interaction variable concerning a UK target had a significant negative coefficient ($\beta = -0.4245, p < 0.05$) when comparing the Post-Referendum period to the Pre-Referendum period, indicating a decrease in the likelihood of being a cross-border UK target in this phase. Interestingly, the likelihood increased again over the course of Brexit, best reflected in the coefficient representing comparing the Post-Effective period to the Post-Referendum period ($\beta = 0.8075, p < 0.01$).

Table 3
Logistic Regression Results on Cross-Border Deal Activity

Dependent variable: CBDEAL		
	PRE-REF	POST-REF
	(1)	**(2)**
Independent variables		
PRE-REF		-0.1658
		(0.121)
POST-REF	0.1658	
	(0.121)	
POST-EFF	0.3089	0.1431
	(0.279)	(0.252)
UK TARGET	-2.0505***	-2.4750***
	(0.132)	(0.127)
UK ACQUIRER	0.8051***	1.1192***
	(0.115)	(0.105)
*PRE-REF*UK Target*		0.4255**
		(0.182)
*PRE-REF*UK Acquirer*		-0.3142**
		(0.155)
*POST-REF*UK Target*	-0.4245**	
	(0.182)	
*POST-REF*UK Acquirer*	0.3142**	
	(0.155)	
*POST-EFF*UK Target*	0.3830*	0.8075***
	(0.368)	(0.214)
*POST-EFF*UK Acquirer*	-0.3543*.	-0.6685***
	(0.192)	(0.187)
Deal characteristics		
PAYMENT	0.2465***	0.2465***
	(0.057)	(0.057)
INDUSTRY	0.0904**	0.0904**
	(0.043)	(0.043)
DEAL SIZE	0.2247***	0.2247***
	(0.012)	(0.012)
STOCK ACQ%	0.0017**	0.0017**
	(0.001)	(0.001)
BIDDERS	-0.0676	-0.0676
	(0.223)	(0.223)
Firm- and Country characteristics		
ACQUIRER EXPERIENCE	0.2202***	0.2202***
	(0.042)	(0.042)
TARGET DUMMY	-0.3633***	-0.3633***
	(0.071)	(0.071)
GDP PER CAPITA	-0.0328	-0.0328
	(0.051)	(0.051)
GDP GROWTH	0.0278***	0.0278***
	(0.009)	(0.009)
CONSTANT	-1.6829***	-1.5171**
	(0.588)	(0.600)
YEARLY FIXED EFFECTS	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes
N	14309	14309
Pseudo R-Squared	0.1009	0.1009

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for each variable in the logistic regression model. Column (1) & (2) differ depending on Brexit Reference period. The models include different specifications and control variables, where in this table the dependent variable is a dummy variable representing the presence of cross-border deals (*CBDEAL)*. The models incorporate fixed effects for yearly and industry variations in each model. The number of observations and Pseudo R-squared are also provided for each model. The models are statistically significant at the 1% level.

Considering this a logistic regression, the economic significance can be assessed by interpreting the odds ratio associated with the coefficients, resulting in e^(*0.8075) = 2.2428*. This means that in the Post-Effective period compared to the Post-Referendum there is approximately a 124.28% increase in the likelihood of the UK being targeted, and likewise a 34.47%[3] reduction in odds of being a UK target in a cross-border transaction when analyzing the difference between the Post-Referendum to Pre-Referendum period.

From a UK acquirer perspective, the interaction term showed statistically significant coefficients at a 5% level and a positive value (*β = 0.3142*) when comparing the Post-Referendum to the Pre-Referendum period, indicating the likelihood of a cross-border deal increased when the acquirer was from the UK. However, the likelihood diminished again when comparing the period after the Effective date to the Post-Referendum period (β = *-0.6685)* significant at the 1% level. Implicating the likelihood of the UK acting as an acquirer diminished again with approximately 48.67%[4]. These results provide evidence for a pattern in UK acquirers' behavior and exhibiting a more proactive approach in the initial period following the Referendum. This can potentially be driven by the increase in EPU following Brexit and changing market dynamics leading to diversification within investors' portfolio. Further, the control variables add relevance by exhibiting high statistically significant and consistent results across the models, indicating the Reference periods do not directly influence the characteristics underlying cross-border transactions.

In conclusion, the statistically significant coefficients for UK targets indicate a decline in cross-border activity involving UK targets immediately after the Referendum, followed by an increase after the Effective date. This implies that following the Referendum, EU counterparties were initially less willing to acquire UK targets but gradually regained their interest. This result adheres to the risk-averse nature of investors and EPU leading to a decline in willingness to invest in more risky assets during uncertain times (Markowitz, 1952 & Paudyal et al. 2020). Considering a UK acquirer, the results support an increase in cross-border deal activity in the period following the Referendum, supporting the literature on the reallocation of assets or rationale of consolidation of the UK's position in the EU (Paudyal et al., 2021 & Gao et al., 2020). However, the effect is attenuated after analyzing the period after the Effective date, suggesting possible market stabilization following the Effective date. Therefore, the null hypothesis expecting a decrease in cross-border deal activity since Brexit is partially rejected. Brexit has also caused for a temporary decline the cross-border deal activity including UK targets in the transitioning period, again diminishing over time, thus providing partial support for the null hypothesis. Hence, *H1* is partially accepted after analysis of the models.

[3] Odds ratio = $e^{\beta} = e^{-0.4245} = 0.6553$ and (1-0.6553) *100% = 34.47%
[4] Odds ratio = $e^{\beta} = e^{-0.6685} = 0.5133$ and (1-0.5133) *100% = 48.67%

4.2 Height of acquisition premium analysis

4.2.1 Correlation

The combination of the removal of outliers due to large standard deviations and the overall limited availability of acquisition premium data led to a significant reduction in the sample size (*N=1156)*. The scarcity of data can be attributed to the decreased availability of information and limited public status of targets, resulting in a smaller pool for analysis. To account for this reduction and possible implications for the interpretation of *H2*, a new correlation matrix is constructed to address possible multicollinearity issues. The matrix indicated a high correlation among the same variables of *PRE-REF, POST-REF, UK Target* and *UK Acquirer* as in the initial sample, with the addition of the *DOMUK* variable having a large correlation with *UK Target* and *UK Acquirer* (**Table A5**). This can be logically reasoned, considering many transactions in the sample are classified as domestic UK. After conducting VIF analysis again on the independent variables, the calculated VIFs do not exceed 10, hereby discarding the rise of serious multicollinearity issues. The control DOMUK variable does provide a VIF of 12.7138, which gives reason to drop the variable from the regressions to avoid multicollinearity complications.

4.2.2 Empirical analysis

The second hypothesis analyses the potential impact of Brexit on the height of acquisition premiums. Two OLS regression models are executed to assess the influence of the independent variables on the dependent variable *PREMIUM 4-WEEKS*. The results of the multiple models are presented in **Table 4**, where the columns **(1)** and **(2)** differ based on the Reference period, where both models include the variables representing the deal characteristics and the firm- and country-characteristics. The models also control for industry- and year fixed effects. The key variables of interest in these models are the triple interaction variables between a cross-border UK target or acquirer and the relevant phase of Brexit.

Based on the baseline regression results in **Table 4**, the most notable findings are deducted from comparison of the Post-Effective period to the Pre-Referendum and Post-Referendum period. The first evidence is found when considering the interaction term between a UK acquirer in a cross-border transactions and presence in the Post-Effective period (*POST-EFF*CBUKA*). In column (1), this variable demonstrates statistically significant negative effects at a 5% level, with a coefficient of β = *-17.3695* when compared to the Pre-Referendum period and β = *-14.7195* when compared to the Post-Referendum period. Since the premiums are measured as percentages, these results signify that when a UK party acts as an acquirer in the Post-Effective period, hence all dummy variables in the interaction term are equivalent to 1, the premium payment is lower by approximately 17.37% or 14.72% compared to the two other periods.

Table 4
OLS Regression Results on the Height of Acquisition Premiums

Dependent Variable: PREMIUM 4-WEEKS		
	PRE-REF	POST-REF
	(1)	**(2)**
Independent variables		
PRE-REF		-7.5223*
		(4.068)
POST-REF	7.5223*	
	(4.068)	
POST-EFF	21.0653***	13.5429**
	(6.782)	(5.499)
UK TARGET	-1.0675	1.3606
	(5.079)	(4.515)
UK ACQUIRER	2.6333	-0.0168
	(5.298)	(4.483)
CBDEAL	0.8420	0.8420
	(1.524)	(1.524)
*PRE-REF*CBUKT*		-2.4281
		(6.686)
*PRE-REF*CBUKA*		2.6501
		(6.904)
*POST-REF*CBUKT*	2.4281	
	(6.686)	
*POST-REF*CBUKA*	-2.6501	
	(6.904)	
*POST-EFF*CBUKT*	21.0531**	18.6250**
	(8.715)	(8.482)
*POST-EFF*CBUKA*	-17.3695**	-14.7195**
	(8.083)	(7.450)
Deal characteristics		
PAYMENT	1.8080	1.8080
	(1.821)	(1.821)
INDUSTRY	2.1415	2.1415
	(1.527)	(1.527)
DEAL SIZE	1.4844***	1.4844***
	(0.385)	(0.385)
STOCK ACQ%	0.1510***	0.1510***
	(0.026)	(0.026)
BIDDERS	11.4134***	11.4134***
	(2.518)	(2.518)
Firm- and Country characteristics		
ACQUIRER EXPERIENCE	-0.0060	-0.0060
	(1.382)	(1.382)
TARGET DUMMY	8.2922*	8.2922*
	(4.243)	(4.243)
GDP PER CAPITA	5.6093***	5.6093***
	(1.910)	(1.910)
GDP GROWTH	1.2386**	1.2386**
	(0.563)	(0.563)
CONSTANT	-73.1791***	-65.6568***
	(20.078)	(20.675)
YEARLY FIXED EFFECTS	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes
N	1156	1156
Adjusted R-Squared	0.170	0.170

Note: The table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for each variable in the OLS regression model. Column (1) & (2) differ depending on Brexit Reference period. The models include all control variables. The dependent variable is the 4-Weeks Premium Paid (*PREMIUM 4-WEEKS*) in percentages (e.g. 10.2 = 10.2%). The models incorporate fixed effects for yearly and industry variations in each model. The number of observations and adjusted R-squared are also provided for each model. The model as a whole is statistically significant at the 1% level.

The evidence thus shows that UK acquirers pay lower premiums in the Post-Effective period in cross-border transactions compared to Pre- and Post-Referendum levels. The coefficient is less negative in the Post-Referendum compared to the Pre-Referendum period ($\beta = -0.1472 > \beta = -0.1737$). The results thus align with the finding that acquirers experiencing higher EPU, as in the Post-Referendum period, pay relatively higher premiums (Urbsiêne et al., 2015). The findings likewise provide support for the rationale of the home bias theory. Since the UK is willing to pay lower premiums following the event of Brexit, possibly due to persistent increased information asymmetry and regulatory complexities due to the departure of the UK from the EU (Sun et al., 2021). It should be noted that the statistically positive significant value of *POST-EFF* could have an influence on the overall level of premiums paid in this period across transactions, and inferences should therefore be made with caution.

In terms of UK target firms in cross-border transactions, the interaction variables from the Post-Effective period (*POST-EFF*CBUKT*) consistently exhibit positive statistically significant coefficients ($p < 0.05$). These values indicate a general increase in premium payments for transactions involving UK targets after the Post-Effective date compared to the Pre-Referendum ($\beta = 21.0531$) and Post-Referendum ($\beta = 18.6250$) periods, increasing by 21.05% and 18.63% respectively. More interestingly, the coefficients show that premiums paid for UK targets in the Pre-Referendum period were relatively higher compared to the Post-Referendum period. This finding aligns with the reasoning of Kakkad (2022) and supports the rationale of a temporary discount of UK firms for EU counterparties after Brexit, as the premium height decreased when comparing the coefficients. However, these conclusions should be taken with caution considering the reduced sample size and other underlying factors resulting in a general premium increase. Lastly, the coefficients of the control variables provide significant consistent evidence that larger deal sizes, a higher percentage of stock acquired, and the number of bidders increases the height of the premium payments. This significant positive relationship between the number of bidders and the height of the premium provides initial support for the winner's curse application in M&A in line with the research of Liu et al. (2021).

In conclusion, the evidence provided by the regression results supports the rejection of the null hypothesis that Brexit has not influenced the height of acquisition premiums. The findings demonstrate that acquisition premiums have been affected throughout the different phases of Brexit, illustrated through a significant general reduction in premiums paid by UK acquirers in the Post-Effective period but a temporal increase after the Referendum. Contrarily, a temporary discount for UK target firms was exhibited in the aftermath of Brexit, but general increase in the height of the premium paid for UK targets. Both results align with the home bias theory and increase in information asymmetry due to departure from the EU. However, it is important to note that further academic reasoning and analysis would be valuable to validate these temporal conclusions, considering the remaining key interaction variables provided insignificant results and the sample size has been compromised.

4.3 The effect of Brexit on announcement effects

4.3.1 Correlation matrix

Since the number of observations (*N = 4054*) also decreases when analyzing the effect on announcements effects in transactions, an additional correlation matrix is constructed (**Table A6**). The reduced sample size is ascribed to a lack of public acquirers and consequently, information about their stock prices. The matrix again demonstrates a high and significant correlation coefficient in the *POST-EFF, POST-REF, UK Target, UK Acquirer*, and *DOMUK* variables. The VIF values are calculated for the highly correlated variables in this sample to dispose of possible multicollinearity issues. The VIF coefficients result again in non-concerning values for the independent variables (VIF < 10). The *DOMUK* control variable does display a concerning value (VIF = 20.2880) leading to the decision to again omit the variable from the regressions used to answer *H3* regarding announcement effects.

4.3.2 Empirical analysis

Finally, to formulate an answer to the question of whether announcement effects have been significantly influenced by Brexit, the cumulative abnormal returns over a five-day event window are used as the dependent variable in the baseline OLS regression models based on equations **(5)** & **(6)**. The sample used in the following regressions is a subset of the large sample, resulting in the sample consisting of 4,054 transactions. Likewise, to the other analyses, the models in columns **(1)** & **(2)** include the dependent and independent variables, and the deal- and firm-specific control variables, regressed on the distinct Reference periods. All models include the *YEARLY FIXED EFFECTS* and *INDUSTRY FIXED EFFECTS*. The results are presented in **Table 5.**

There are several significant coefficients following the analysis of the OLS regression models. First, in the baseline models the results are statistically significant when taking the perspective of a UK acquirer in the Post-Referendum period compared to the Pre-Referendum period. The findings suggest that UK acquirers experience more positive returns in the Post-Referendum period than in the Pre-Referendum period significant at 5% ($\beta = 0.1271$), or a significant increase in cumulative abnormal returns of 12.71% with a one unit change in the *POST-REF*CBUKA* variable. This finding is in line with the rational expectation following the research of Paudyal et al. (2021), who suggest that acquirers experiencing high EPU acquiring targets in countries with less EPU would yield higher abnormal returns. While not statically significant, the results exhibit negative announcement effects for UK acquirers in cross-border transactions in the Post-Effective period compared to the other time frames, possibly attributable to a changed EU market situation and decrease in EPU over time, mediating the increase in abnormal returns in the aftermath of Brexit.

Table 5
OLS Regression Results of Announcement Effects Analysis

Dependent Variable: CAR [-2, +2]		
	PRE-REF	POST-REF
	(1)	**(2)**
Independent variables		
PRE-REF		0.0072 (0.005)
POST-REF	-0.0075 (0.005)	
POST-EFF	-0.0060 (0.014)	0.0007 (0.013)
UK TARGET	-0.0017 (0.003)	-0.0019 (0.003)
UK ACQUIRER	-0.0004 (0.003)	-0.0003 (0.003)
CBDEAL	0.0007 (0.003)	0.0039 (0.003)
*PRE-REF*CBUKT*		-0.0952 (0.084)
*PRE-REF*CBUKA*		0.0803 (0.080)
*POST-REF*CBUKT*	-0.1331** (0.065)	
*POST-REF*CBUKA*	0.1271** (0.061)	
*POST-EFF*CBUKT*	0.0413 (0.116)	0.0670 (0.115)
*POST-EFF*CBUKA*	-0.0465 (0.112)	-0.0776 (0.111)
Deal characteristics		
PAYMENT	-0.0036* (0.002)	-0.0036* (0.002)
INDUSTRY	0.0040** (0.002)	0.0040** (0.002)
DEAL SIZE	0.0006 (0.001)	0.0006 (0.001)
STOCK ACQ%	0.0000** (0.000)	0.0000** (0.000)
BIDDERS	-0.0516** (0.022)	-0.0529** (0.021)
Firm- and Country characteristics		
ACQUIRER EXPERIENCE	-0.0016 (0.002)	-0.0014 (0.002)
TARGET DUMMY	-0.0086** (0.003)	-0.0087** (0.003)
GDP PER CAPITA	0.0053* (0.003)	0.0053* (0.003)
GDP GROWTH	-0.0003 (0.001)	-0.0003 (0.001)
CONSTANT	0.0119 (0.038)	0.0056 (0.038)
YEARLY FIXED EFFECTS	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes
N	4054	4054
Adjusted R-Squared	0.016	0.016

Note: The table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for each variable in the OLS regression model. Column (1) & (2) differ depending on Brexit Reference period. The models include all control variables. The dependent variable are the cumulative abnormal returns over a 5-day event window CAR [-2, +2], where 0.01=1%. The models incorporate fixed effects for yearly and industry variations in each model. The number of observations and adjusted R-squared are also provided for each model. The models as a whole are statistically significant at the 1% level.

Further, the regressions reveal effects that are relevant to analyze from the perspective of a UK target. The models provide statistically significant evidence that EU acquirers experience more negative announcement effects when acquiring UK targets in the Post-Referendum period compared to the Pre-Referendum period (β=-0.1331, $p < 0.05$). Again, these results are in line with the study of Paudyal et al. (2021) and the influence of EPU on abnormal returns. Further, although not statistically significant positive coefficients are found in the Post-Effective period, opposing the Post-Referendum period, giving indications for market stabilization around the sentiment of UK-related acquisitions by EU acquirers. Additionally, the significant coefficients following both perspectives of UK involvement, confirm the risk-adversity of investors, and how diversification of assets to less risky perceived assets is perceived by the market, adhering to the MPT (Markowitz, 1952).

Considering the adjusted R-squared of the models returns low values, it gives reason to believe other variables are relevant in explaining the variation among variables. Regarding the relevant control variables, the significant coefficients in the models show that cash-financed transactions, transactions including public targets and a multitude of bidders tend to negatively affect the acquirer's returns. This negative effect following an increase in the number of bidders again supports the rationale of the winner's curse (Tahler, 1978) and how the market reacts when perceiving an acquirer has overpaid for a target. Further, the significant coefficients following the *INDUSTRY* variable align with the research of Lin et al. (2021), suggesting the market responds more positively if both parties operate within the same industry, due to a perceived smoother integration and better sense of valuation. The findings thus underline the importance of the inclusion of the control variables and a better understanding of the dynamics behind M&A transactions.

Overall, the analysis of the five-day cumulative abnormal returns provides sufficient statistical evidence to reject the null hypothesis stating that announcement effects experience no significant effects in light of Brexit, and thus *H3* is supported. The evidence is most profound in the case of the Post-Referendum era when taking the perspective of the UK acquirer and target in comparison to the Pre-Referendum period. Based on the results, the positive announcement effects for UK acquirers in cross-border transactions indicate the market sentiment around the reallocation of assets during these periods following the uncertainty surrounding Brexit. Likewise, EU acquirers appear to have been affected negatively by purchasing, more uncertain, UK targets in the Post-Referendum period. The effects can be rationalized through the dynamics behind abnormal returns, as they best reflect short-term market reactions and thus its effect would be expected most profound in the immediate aftermath of Brexit. Yet, more research could improve statistical significance for the Post-Effective coefficients concerning UK targets and acquirers, as opportunities may have presented themselves in the new post-Brexit scenario and a reduction in EPU could have created a different outlook on the acquisitions involving UK and EU parties.

5. Robustness Tests

After conducting the variety of analysis, it is noteworthy to analyze whether the results remain robust when changing aspect of the research design. To enhance the validity and credibility of the research, several additional analyses will thus be conducted. In the previous section multicollinearity concerns have already been discarded through the correlation matrixes while possible heteroscedasticity issues have been addressed by the incorporation of the robust standard errors in the analyses. An Instrumental variable analysis is deployed to address the presence of endogeneity, possibly present when using an OLS regressions, used to test the second and third hypothesis (Abdallah et al., 2015). Further in the section, the robustness checks will try to enhance the reliability of the results through sensitivity analyses, where either new input parameters for the dependent variables are used, or adjustments are made to the original assumptions of the sample.

5.1 Instrumental variable analysis

An Instrumental variable (**IV**) analysis is used to address endogeneity concerns in OLS models. In an OLS regression model, the estimated beta coefficients of variables can be biased due to several factors such as the omission of variables, reverse causality, or an error in the measurement of the variables, which ultimately make causality difficult to establish and hereby violates the basic exogeneity assumption of OLS regressions (Frost, 2022). These biased variables are then considered to be endogenous. Considering the method of empirical research for *H2* and *H3*, the presence of endogeneity should therefore be corrected, facilitated by the introduction of an IV analysis. When introducing instrumental variables, it is important that the variables hold the exogeneity and relevance condition (Chen & Pearl, 2015). The relevance assumption refers to the condition that the introduced variable has a correlation with the expected endogenous variable (Chen & Pearl, 2015). The exogeneity condition demands the instrumental variable to have no correlation with the error term in the model, implying that the IV only influences the dependent variable indirectly, meaning through its influence on the independent variable (Date, n.d.). The analysis typically makes use of a Two-Stage Least-Squares regression model (2SLS), which tries to correct the part of the suspected independent variables that are considered endogenous, thus correlated with the error term in the model (Date, n.d.). Regrettably, this analysis cannot be readily employed for logistic regression models (*H1*), explaining the choice for only incorporating an IV analysis for *H2* and *H3* (Foster, 1997). The first stage of the 2SLS model corrects the presumed endogenous variables, by regressing the instrumental variables and relevant control variables on the presumed problematic variable, resulting in a set of new fitted values for the endogenous variable in question. In the second stage, these new fitted values for the endogenous variables are used as the input parameters in the original or baseline OLS models to provide more accurate estimations of the regression coefficients (IBM, 2021).

5.1.1 Two-Stage Least-Squares model specifications

In this research, the variables that are presumed to be endogenous are the independent variables of *UK Target* and *UK Acquirer.* This is plausible as the set of assumptions, overall method of sample selection, and underlying factors driving M&A could have missed unobserved factors that influence the presence and probability of UK parties in a transaction. Three instrumental variables are therefore introduced, starting with a variable representing the exchange rate of the Sterling (index = 2010), retrieved from the World Bank Database, referred to as *Exchange Rate*. Considering the turbulent years experienced by the Sterling as described by Coyle (2021), this variable could have a direct influence on the presence of a UK party in cross-border transactions. Next, the instrumental variable representing the yearly percentage change in the consumer price index in the UK (*Inflation*) is introduced, also retrieved from the World Bank Database. This can be reasoned as inflation can influence the likelihood of UK parties acting as an acquirer or target in transactions reasoned through the MPT of Markowitz (1952) and risk-adversity coming with turbulent market situations. Lastly, a variable is introduced that represents the level of EPU in the UK (*EPU)* based on an index constructed from newspaper articles involving policy uncertainty in the UK (index = 2011), retrieved from the Economic Policy Uncertainty Database. Considering EPU has been a common research topic in cross-border M&A as researched by Paudyal et al. (2021), it is believed the variable might have explanatory meaning unobserved in the original models. Before employing the 2SLS regressions, the variables need to satisfy the two conditions. First, the variables satisfy the relevance condition (1) as a non-zero correlation with the variables *UK Target* and *Acquirer* is confirmed through the calculation of the respective covariances, resulting in all non-zero values, which can be summarized as denoted below.

$$(1)\ COV\left(IV_i, X_j\right) \neq 0$$

Where, IV_i represent the instrumental variables; *Exchange Rate, Inflation* and *EPU* and X_j the independent variables *UK Target* and *UK Acquirer*.

Second, the IV should not influence the dependent variables *PREMIUM 4-WEEKS or CAR [-2, +2]* directly, yet only through its influence on *UK Target and UK Acquirer,* satisfying the exogeneity condition. Since this condition is not formally testable, it should be theoretically reasoned (Chen et al., 2015). With regards to the instrumental variables, it can be reasoned that the exchange rate of the Sterling, EPU and Inflation in the UK only influences the analyzed M&A premiums through their effect on increasing the likelihood of the presence of a UK acquirer or target. This since the focus of these instrumental variables is exclusively on the UK and does not consider inflation, exchange rates or EPU in other EU countries. Therefore, in case of exclusion of UK parties in the transaction, the nature and specification of the macroeconomic IVs give reason to believe to not directly influence the height of the premiums paid in M&A transactions. Contrarily to proven prominent deal-specific drivers of premiums such as perceived synergies, bargaining power, and the multitude of bidders (Varaiya &

Ferris, 1987). The same reasoning can be used for the announcement effects experienced around M&A transactions. The volatility of the British currency, inflation, and EPU in the UK is only relevant in the cases where a UK acquirer of Target is involved, which in turn might therefore influence the abnormal returns around the announcement. These rationales are justified by the research of Erel et al. (2012), who argue firms are more likely to be targeted in weaker-performing economies, hence a direct influence on deal presence, but indirect when considering the abnormal returns experienced. Contrarily, the economic performance of the home country of the acquirer has a positive relationship with the likelihood of acting as an acquirer (Erel at al., 2012). Thus, the EPU, exchange rate and inflation of the UK is not expected to directly influence the announcement effects experienced around M&A transactions in this sample but do directly affect the likelihood of UK participation in cross-border transactions. Therefore, the second assumption of exogeneity is satisfied and simplified accordingly below, where the IVs only influence the dependent variables through their influence on the independent variables (Chen et al., 2015).

$$(2)\ Y_k \perp IV_i | X_j$$

Where, IV_i represents the instrumental variables *Exchange Rate, Inflation* and *EPU*, X_j the independent variables *UK Target* and *UK Acquirer,* and Y_k the dependent variables *PREMIUM 4-WEEKS* and *CAR [-2, +2]*.

5.1.2 Results of 2SLS model for acquisition Premiums

After establishing that the variables meet the criteria of IV analysis, the first stage of the 2SLS model is performed. This first stage is performed twice, for UK Target and UK Acquirer respectively. The first stage models include the IVs and relevant variables specified in equations **(7)** and **(8)** (**Appendix**) and regressed on the *PREMIUM 4-WEEKS* variable and thus reduced sample. Next, the second stage of the 2SLS model is performed by including the new fitted values for *UK Target* and *UK Acquirer* and relevant interaction variables, in the original OLS equations used to test the *H2.* The simplified results of the second stage of the models are depicted in columns **(3)** and **(4)** of **Table 6**[5]. The results of the baseline OLS models regarding acquisition premiums in **Table 4** are presented in columns **(1)** and **(2)** for clarifying purposes.

When comparing the IV analysis with the original analysis, the variables of interest in the original models, *POST-EFF*CBUKA* and *POST-EFF*CBUK*T, again provide statistically significant results. The new values reinforce the conclusion that Brexit has led to a slight temporary discount on UK targets in the Post-Referendum period and a general increase in the height of the premium paid in Post-Effective period. This is illustrated through the decrease in the coefficient when comparing the Post-Effective period and Pre-Referendum period (β = 19.1034) to the Post-Effective period and Post-

[5] The extended results and values of the 2SLS for the Acquisition Premiums are found in **Table A7.**

Referendum (β =19.0454) period, significant at the 1% level. The coefficients for the UK Acquirer in the Post-Effective period again remain statistically negative, indicating a general decrease in the height of the premium paid compared to both time frames. However, the coefficients do not exhibit the same pattern as the original models, hence contradicting the conclusion that a relatively higher premium was paid in the transitioning period, during the highest periods of EPU.

Table 6
Summary of Results of OLS and 2SLS Regressions of Acquisition Premiums

Dependent Variable: PREMIUM 4-WEEKS				
	PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**
Independent variables				
*PRE-REF*CBUKT*			-2.4281 (6.686)	-1.7356 (5.050)
*PRE-REF*CBUKA*			2.6501 (6.904)	2.5500 (5.257)
*POST-REF*CBUKT*	2.4281 (6.686)	1.3942 (4.515)		
*POST-REF*CBUKA*	-2.6501 (6.904)	-0.1263 (4.488)		
*POST-EFF*CBUKT*	21.0531** (8.715)	19.1034*** (7.269)	18.6250** (8.482)	19.0454*** (7.322)
*POST-EFF*CBUKA*	-17.3695** (8.083)	-14.6652** (5.973)	-14.7195** (7.450)	-14.6846** (6.013)
Deal characteristics	Yes	Yes	Yes	Yes
Firm- and Country characteristics	Yes	Yes	Yes	Yes
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes
N	1156	1156	1156	1156
Adjusted R-Squared	0.170	0.172	0.170	0.172

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for the interaction variables in the OLS regression models. Column (1) & (3) are the baseline OLS models, followed by the models employing a 2SLS regression analysis (2) & (4). The dependent variable is the *PREMIUM 4-WEEKS*. The models incorporate fixed effects and control variables for yearly and industry variations in each model. The number of observations and adjusted R-squared are provided for each model. The models are statistically significant at the 1% level.

5.1.3 Results of 2SLS model for announcement effects

Similarly, to the previous section above, the 2SLS is employed to address the endogeneity concerns in the analysis for the announcement effects. The specifications of the regressions used for the first stage models, now using the *CAR [-2, +2]* sample, are listed under equation **(7)** and **(8)** (**Appendix**). In the second stage, the fitted values forthcoming from the first stages for *UK Target* and *UK Acquirer* and in turn, relevant interaction variables are likewise used as the new input parameters in the original OLS equations used to test the *H3*.

The results of the second stages of the models are depicted in columns **(3)** and **(4)** of **Table 7**[6]. The results of the baseline OLS models regarding the announcement effects around the transactions of **Table 5** are depicted in columns **(1)** and **(3)** for comparison**.**

When analyzing the results following the IV analysis to inspect the influence on the announcement effect examined in the hypothesis, the results remain robust. As in the original analysis depicted, the variables of interest *POST-REF*CBUKT* and *POST-REF*CBUKA* remain statistically significant and consistent across the IV analysis, depicted in columns **(2)** and **(4).** A UK Target in the Post-Referendum period compared to the Pre-Referendum period (β=-0.1281, $p < 0.05$) experiences more negative abnormal returns, in line with the conclusions related to high EPU and adjacent market sentiment. Additionally, UK acquirers experience more positive returns (β=0.1235, $p < 0.05$) engaging in cross-border transactions during this period, supporting the rationale of the MPT and how diversification of assets to less risky EU countries is perceived positively in the market (Markowitz, 1952). It is plausible that the slight decrease in the magnitude of the coefficients can be attributed to the influence of the IVs and new fitted values. All considered, the IV analysis provides additional statistical support for the acceptance of *H3*.

Table 7
Summary of Results of OLS and 2SLS Regressions of Announcement Effects

Dependent Variable: CAR [-2, +2]				
	PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**
Independent variables				
*PRE-REF*CBUKT*			-0.0952	-0.0906
			(0.084)	(0.083)
*PRE-REF*CBUKA*			0.0803	0.0770
			(0.080)	(0.079)
*POST-REF*CBUKT*	-0.1331**	-0.1281**		
	(0.065)	(0.065)		
*POST-REF*CBUKA*	0.1271**	0.1235**		
	(0.061)	(0.062)		
*POST-EFF*CBUKT*	0.0413	-0.0528	0.0670	0.0754
	(0.116)	(0.113)	(0.115)	(0.115)
*POST-EFF*CBUKA*	-0.0465	0.0489	-0.0776	-0.0846
	(0.112)	(0.117)	(0.111)	(0.111)
Deal characteristics	Yes	Yes	Yes	Yes
Firm- and Country characteristics	Yes	Yes	Yes	Yes
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes
N	4054	4054	4054	4054
Adjusted R-Squared	0.016	0.016	0.016	0.016

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$) for the interaction variables in the OLS regression models. Column (1) & (3) are the baseline OLS models, followed by the models employing a 2SLS regression analysis (2) & (4). The dependent variable is the *CAR [-2,+2]*. The models incorporate fixed effects and control variables for yearly and industry variations in each model. The number of observations and adjusted R-squared are provided for each model. The models are statistically significant at the 1% level.

[6] The extended results of the 2SLS analysis are found in **Table A8.**

5.2 Sensitivity analyses

Finally, sensitivity analyses are performed to enhance the generalizability, validity, and reliability of the research. The sensitivity analyses addressing *H2* and *H3* will extend the baseline OLS regressions by employing 2SLS models. These 2SLS regression models will incorporate the fitted values based on the new input parameters to provide supplementary insights.

5.2.1 Majority acquisitions

One of the assumptions of the sample is a minimum percentage of acquired shares of 10%. However, considering the variable of *STOCK ACQ %* is significant across when testing *H1*, the percentage of shares acquired seems to have a relevant influence on cross-border deal activity. After conducting the regression analysis involving deal activity, additional tests are therefore conducted to see if the results remain robust when only including transactions where more than 50% of the shares are acquired, meaning the investor obtains a controlling interest in the company. When only including deals where a controlling interest is acquired, the sample reduces to 12,205. After conducting the robustness tests, the results in **Table A9** show additional and even increased support for *H1*. Additionally, the adjusted R-squared of the model increases and the results increase in significance and magnitude. This justifies the belief that majority deals have been more heavily influenced by Brexit. UK acquirers still exhibited a tendency to increase their cross-border deal activity following the Referendum, followed by a subsequent decline after the Effective date. As found in the full sample, UK parties are also targeted less immediately after the Referendum, followed by an incline after the Effective date. The fact Brexit seems to have had a more significant influence on majority deals can be attributed to the nature of a majority investments. Since majority deals often consist of more substantial investments and control, they are more susceptible to the regulatory changes and uncertainties that arose from Brexit, even more heightened in a cross-border transactions. The new complexities in the trade agreements, regulatory framework, and transactions costs seem to have influenced acquirers and targets to alter the decisions about their deals more strongly than in minority deals. This can be logically deduced as minority deals involve smaller ownership stakes, making them less concerned with regulatory hurdles and longer transaction times.

5.2.2 Additional measures of premiums

Considering information reaches financial markets before the announcement of M&A transactions, a 4-week premium represents a common measure to mitigate the potential effects of insider trading by incorporating an extensive time frame. However, to test the robustness of the acquisition premium hypothesis, two other measures of the premiums are examined to see whether the results remain consistent over these different time periods, presented in **Table A10**. Specifically, the variables *PREMIUM 1-WEEK* and *PREMIUM 1-DAY* are included as the dependent variables in the baseline

OLS regression models as well as in the 2SLS regression models following the IV analysis. When examining the *PREMIUM 1-DAY* analysis, the results for the UK Target in Post-Effective period remain positive and statistically significant yet fail to exhibit the temporary discount shown in the original OLS analysis. The same holds true when using the *PREMIUM 1-WEEK* as the new input parameter as the dependent variable in the original analysis. Yet, the variable does exhibit evidence supporting the temporary discount in columns (6) and (8) when employing the 2SLS analysis. From the perspective of the UK acquirer, the sensitivity analyses do not provide robust results in terms of statistical significance in the baseline models or 2SLS models when considering the 1-day premiums. When using the 1-week premium as the dependent variable, only the 2SLS analysis provides limited support in terms of statistical power and coefficient magnitudes for the negative trend experienced by the UK acquirer.
These supplementary analyses underline the possible limitations in terms of the validity and generalizability of the results of the premium hypothesis and therefore should be taken into consideration when interpreting the baseline results.

5.2.3 Support window for cumulative abnormal returns

Lastly, a new measure is introduced to help ensure the validity of the third hypothesis inspecting the announcement effects. In the initial analysis, a five-day event window is used, in the robustness checks an additional window for support is introduced that uses a three-day event window to analyze the cumulative abnormal returns, *CAR [-1, +1].* This three-day event window is in line with the research on EPU and its effect on abnormal returns in M&A by Nguyen and Phan (2017). Additionally, according to the research methodology of Golubov et al. (2012), it is recommended to use an additional window for support in the research of abnormal returns. The results of the baseline models and 2SLS models using the *CAR [-1,+1]* as the dependent variable are presented in **Table A11**. The results reinforce and strengthen the statistical positive coefficients related to the UK acquirer in the Post-Referendum period (*POST-REF*CBUKA)* compared to the Pre-Referendum period sustaining the conclusions from initial analysis provided in **Table 5**. In addition, the statistical negative coefficient for the UK target (*POST-REF*CBUKT*) in this period remains robust and increases in magnitude. Yet, for the 2SLS regression models in columns **(2)** and **(4)** the results diminish in terms of statistical significance but remain consistently negative for the UK target and positive for the UK acquirer in the Post-Referendum period. Thus, the sensitivity analysis provides additional support for *H3,* and the conclusions based on the results of the baseline model related to the announcement effects around M&A transactions.

6. Discussion

6.1 Summary of findings

In this section the findings of previous literature and conclusions from the empirical analyses, summarized in **Table 8** are discussed, to answer the research question: *What is the impact of Brexit on deal activity, acquisition premiums, and announcement effects in cross-border mergers and acquisitions (M&A) transactions involving the UK?*

The first hypothesis (*H1)* expected that Brexit would lead to an increase in cross-border deal activity, both from the perspective of the UK acquirer and target. The logistic regression models employed pointed out several interesting conclusions. Following the Referendum, the results indicate a significant increase in the likelihood of UK acquirers in cross-border transactions, reflected through a proactive reallocation of their assets to less risky EU member states, hereby hedging their investments in line with Gao et al. (2020). Additionally, the finding supports the research of Paudyal et al. (2021), who suggest an increase in EPU leads to acquirers seeking to reallocate to countries experiencing a less severe state of EPU. The findings are contradictory to the stance of Erel et al. (2020) and that the depreciation of the Sterling should decrease international M&A, yet in line with the findings on exchange volatility and cross-border M&A of Froot and Stein (1991). Furthermore, the findings shed light on investors risk-adversity, as predicted by the MPT developed by Markowitz (1952). Interestingly, after the Effective date the coefficient becomes significantly negative, indicating a decrease in the likelihood of UK parties acquiring EU parties, giving implications for market stabilization in terms of deal activity. The risk-averse nature of investors and the influence of EPU is also exemplified by the significant negative interaction terms that show EU acquirers are less likely to target UK parties, experiencing more EPU, in cross-border transactions in the period immediately following to the Referendum. An effect which also appears to attenuate after the Effective date indicating stabilization of the initial market reactions and a regained interest in UK targets. Finally, the robustness checks provide additional statistical support for the findings and offer additional insights, showing that majority deals have been more strongly affected by Brexit. This can be attributed due to the nature of majority deals, where increased regulatory challenges and complexities associated with acquiring a controlling interest are more strongly influenced by EPU and thus the turmoil surrounding Brexit. Overall, the evidence thus **partially supports** the first hypothesis as the results exhibit a significant temporary increase (decrease) in cross-border deal activity for the UK acquirer (target) during the transitioning period, yet the effect diminishes over time.

Next, a series of OLS regressions are used to answer the second hypothesis (*H2)*, stating that cross-border acquisitions have been significantly influenced by the UK's departure from the EU based on analyses of the acquisition premium paid 4-weeks prior to announcement. The results illustrate that

after the Effective date, UK acquirers pay significantly lower premiums compared to both Pre- and Post-Referendum periods. Interestingly, the departure of the UK from the EU thus supports the application of the home bias theory in M&A where a perceived increase in (cultural) distance leads to a decrease in willingness for the height of the premium due to among others, a lasting increase in information asymmetry and resulting transaction costs (Sun et al., 2021). Further, the observed temporary relative increase in the premium paid by acquirers during the transitioning period supports the research suggesting a positive relationship between EPU in an acquirer's domicile and the height of the paid premium (Urbsiêne et al., 2015). More, the analysis exhibits a significant general increase in the premium paid for UK targets after the Effective date, also ascribed to the implications of the home bias theory from a UK target perspective, demanding higher premiums due to the increased barriers. Additionally, the coefficients support the temporary discount for UK targets following Brexit cohering to the rationale presented by Kakkad (2022) attributed to a depreciation of the Sterling and initial market reactions. The temporary observation concerning EU acquirers also supports the research of Weitzel et al. (2014), suggesting targets in a state of crisis are paid lower premiums. The findings from the UK target perspective are supported through the introduction of IVs, yet the remainder of the results are not consistently statistically robust. In conclusion, Brexit seems to have had a significant and lasting influence on the height of acquisition premiums paid in cross-border transactions, **supporting** the second hypothesis. However, more research is needed to attain additional robustness of the results. The effects of Brexit are reasoned through persistently increased information asymmetry leading to higher transaction costs and the application of the home bias theory in M&A, and temporary effects leading to a discount (premium increase) for UK targets (acquirers) in the aftermath of Brexit influenced by the depreciation of the Sterling and state of EPU.

Finally, the third hypothesis (*H3)* predicts a significant influence of Brexit on the announcement effects experienced in international M&A. The hypothesis is supported by the results of the OLS regressions, where the five-day cumulative abnormal returns served as the dependent variable. The results indicate a significant positive effect experienced by UK acquirers on returns following M&A announcements in the Post-Referendum period compared to the Pre-Referendum period. This is in line with the notion that acquisitions in countries experiencing less EPU are positively associated with acquirers domiciled in countries facing higher EPU (Paudyal et al., 2021). Additionally, the significant negative effect on the abnormal returns for EU acquirers engaging in cross-border transactions with UK targets following Brexit contradicts the findings indicating no effect on abnormal returns, suggested by Lin et al., (2020). These significant negative effects on the announcement effects for the EU acquirers and conversely positive effects for UK acquirers provide additional insights into how market dynamics immediately triggered after Brexit influence investors sentiment and confirms the risk-aversity of investors, as described by Markowitz (1952) and Gao et al., (2020). Finally, the sensitivity analysis using an event window of three-days and IV analysis show consistent robust results reinforcing the relevant

conclusions made after analyzing the influence of Brexit on announcement effects. The third hypothesis is thus **supported** by multiple statistical analyses and is in line with former literature on the influence of EPU and Brexit on announcement effects as well as the application of the classical financial MPT. Finally, the relevance of the included control variables underlying M&A transactions is confirmed through most evidently, implications for the winner's curse theory, illustrated through an increase in the premium paid with a multitude of bidders, and a negative effect on CARs following an increase in bidders (Thaler, 1978).

Table 8
Summary of Results

Hypothesis	Dependent variable	Independent variable	Post-Ref to Pre-Ref	Post-Eff to Pre-Ref	Post-Eff to Post-Ref	Robust
H1	Cross-border deal activity	UK Acquirer	**Significant positive effect**	**Significant negative effect**	**Significant negative effect**	Yes
H1	Cross-border deal activity	UK Target	**Significant negative effect**	**Significant Positive effect**	**Significant positive effect**	Yes
H2	Acquisition premiums	UK Acquirer in cross-border deal	Negative effect	**Significant negative effect**	**Significant negative effect**	No
H2	Acquisition premiums	UK Target in cross-border deal	Positive effect	**Significant positive effect**	**Significant positive effect**	No
H3	Announcement effects for acquirer	UK Acquirer in cross-border deal	**Significant positive effect**	Negative effect	Negative effect	Yes
H3	Announcement effects for acquirer	UK Target in cross-border deal	**Significant negative effect**	Significant positive effect	Positive effect	Yes

Note: Table 8 summarizes the results of all relevant analyses used to answer the hypotheses.

6.2 Limitations

When interpreting these findings, several limitations should be taken into consideration following the research design and sample selection. First, there is a significant reduction in sample size when analyzing the premium and CAR-related samples due to the lack of public status of the targets and acquirers respectively. This reduced sample size might therefore limit the generalizability of the results. The second is a limitation related to the restricted focus on including only cross-border transactions involving EU and UK parties. Even if this allows for a targeted analysis of the specific impact of Brexit on the most directly influenced parties, the exclusion of other countries might limit the applicability of the finding to other relevant countries omitted in the research. Additionally, the sample selection requiring a minimum of 10% of shares acquired in the transaction could also have an impact on the generalizability of the study, considering the evidence found on majority deals.

As for the regression models, the relatively low adjusted R-squared values indicate that the variation in the dependent variables can be explained by variables not included in the models and implies the presence of other relevant factors. The Instrumental variable analysis has tried to address these endogeneity concerns related to the omitted variable bias in the OLS regressions. Yet, the selection of appropriate instrumental variables remains complicated and subjective, which might have attributed to the lack of robustness of results regarding the premiums and overall applicability of the findings of the

IV analysis. Since an analysis for empirically addressing endogeneity concerns for the logistic regression models was out of the scope of this paper, further research could be beneficial to increase validity regarding the deal-activity results. The conclusions should therefore be taken with caution and investigated in further research through the exploration of additional variables or analyses.

Lastly, even though the analysis of the three distinct Brexit periods provides several interesting insights, the relatively short time-periods, especially the Post-Effective period, might not fully capture the stabilization of the market and implications of the recently imposed agreements, and thus the long-term effects following Brexit. Concluding that acknowledging the limitations of the study is important in the interpretation of the findings. The reduction in sample sizes, the focus on solely UK and EU transactions, acquired share percentage, adjusted R-squared values, lack of certain robustness of the results, selection of instrumental variables, and a relatively short time after the Effective period, thus all add to the applicability and scope of the findings.

6.3 Theoretical and practical implications

The study aims to add to the existing literature on cross-border M&A transactions influenced by Brexit. First, the new temporal approach offers valuable insights by analyzing the three phases of Brexit separately, between and within periods. This allows for a more comprehensive understanding of market dynamics changing over time and stabilization of factors related to the deal activity, premiums paid, and announcement effects. Additionally, the up-to-date sample better reflects the real-time effects, hereby enhancing the validity and relevance of the findings adding to the research of Lin et al. (2020), and the Pre-Brexit study of Mateev (2018). Next, the analysis of deal characteristics as premiums and announcement effects contribute to conflicting existing literature on abnormal returns and provide an overall more holistic understanding of events such as Brexit its impact on cross-border M&A and specifically the application and influence of the MPT (Markowitz, 1952), home bias theory in M&A (Sun et al., 2021) and EPU (Paudyal et al., 2021). From a practical standpoint, the study provides implications for M&A managers and corresponding parties. As such, the trend of the reallocation of assets of UK acquirers following Brexit can be considered in the process of possible target identification and formulation of M&A strategies. Additionally, the decrease in premiums paid by UK acquirers Post-Brexit could impact the pricing strategies in cross-border transactions. Therefore, M&A managers can take the findings into consideration in the valuation of targets and negotiations of deal terms. Finally, UK acquirers experiencing more positive announcement effects and EU acquirers vice versa following the Referendum, emphasizes risk-aversity and the implications of EPU following an event as Brexit. All in all, the effects exhibited in cross-border M&A transactions after the occurrence of great geopolitical events, characterized by newly imposed uncertainties, can be of use for more rational decision-making and overall strategy formulation in a turbulent M&A environment.

6.4 Direction for further research

The study and limitations provide several dimensions for further research. As discussed in the limitations, the variation in dependent variables is not fully explained by the selected variables. The inclusion of different instrumental variables and additional control variables related to M&A transactions could therefore be considered in further research, to help address and inspect additional underlying mechanisms. Considering the recurring proven influence of the MPT in this research, the inclusion of risk-related proxies could be similarly valuable. For example, on a micro-economic level, more firm-specific variables related to acquirer or target financial health, or on a macro-economic level, the inclusion of variables representing market volatility and uncertainty, could be of significance. Unfortunately, these variables were out of scope in this research due to a lack of data availability. As for the implications of the announcement effects, this study analyses the short-term announcement effects through cumulative abnormal returns. Since the transactions that transpired after the Post-Effective period have not provided significant results concerning the CARs, the analysis of the long-term announcement effects, through the measurement of the Buy-and-Hold returns, could serve as an interesting addition to assess the actual long-term performance of the transactions. Regarding the assumptions of the sample, the expansion of the scope of transactions through the inclusion of more countries could help improve concerns regarding the sample size and provide insights on the global repercussions of Brexit. Lastly, it would be interesting for further research to analyze the effects of Brexit on domestic UK transactions. The inclusion of these transactions caused multicollinearity issues and thus were discarded in this research yet could offer new perspectives into the influence of Brexit and the intra-country consequences.

7. Conclusion

The uncertainties and regulatory changes that originated from the Brexit Referendum on the 23rd of June 2016 led to numerous economic consequences still present in today's economy. Considering the lasting impact of the geopolitical event and resulting implications for financial markets, this study aimed to analyze the influence on a micro-economic level within the M&A landscape during a ten-year period. A broad sample of 15,852 transactions is used to investigate Brexit and its influence on cross-border transactions, specifically concerning the impact on overall deal activity, acquisition premiums and announcement effects. The findings on cross-border deal activity show intriguing patterns highlighted by the influence of economic policy uncertainty, the Modern portfolio theory, and the home bias theory. EU acquirers were less likely to target UK parties following the Referendum, while UK acquirers increased their presence in cross-border deal activity during this period, both rationalized by the reallocation of assets and underlying diversification strategies to reduce investor risk. This was followed by an attenuating effect after the Effective date, illustrating a stabilization of the market in terms of the observed abnormal deal activity. Also highlighted in the analysis is the notion that majority deals have been more strongly affected by the UK's departure from the EU, likely due to the increased regulatory challenges that come with acquiring a controlling interest. The analysis concerning acquisition premiums provides support for the application of the home bias theory in cross-border M&A, as the increase in information asymmetry following Brexit has had a substantial impact resulting in a general decrease (increase) in premiums being paid by UK (EU) acquirers. Further, a temporary discount effect was exhibited during the transitioning period indicating UK targets were being acquired at relatively lower premiums. UK acquirers paid a slightly higher premium during this period attributed to the influence of high EPU. The risk-averse nature of investors is again highlighted through the trend of significant positive effects on returns for UK acquirers, and negative effects for EU acquirers in cross-border deals, following announcements of transactions shortly after Brexit. Finally, the premium and announcement effect hypothesis exhibit support for the application for the winner's curse application in M&A. The interpretation of the findings does come with limitations and further research would benefit extensive comprehension of the results. Theoretical contributions are made in terms of temporal relevance and a new measurement of the Brexit variable, hereby adding new insights into various aspects of cross-border M&A transactions that transpired during the different Brexit phases. Finally, the findings also provide practical contributions for M&A managers and other stakeholders in cross-border transactions, through the implications for decision-making and strategies when facing political and economic uncertainties in a changing M&A landscape.

Appendix

Table A1
Cross-Border& Domestic Deals Overview Full Sample

Country	Domestic deal	Domestic deals EU-EU	Cross-border deals	Cross-border deals UK	UK Target in CB deal	UK Acquirer in CB Deal
United Kingdom	4267	0	1452	1452	469	983
France	1123	1769	820	174	66	108
Luxembourg	25	371	397	51	38	13
Germany	653	1311	872	214	70	144
Italy	1480	1857	511	134	32	102
Poland	619	880	302	41	4	37
Netherlands	260	738	677	199	56	143
Sweden	935	1464	641	112	63	49
Spain	947	1398	619	168	18	150
Belgium	131	347	264	48	14	34
Finland	226	429	227	24	10	14
Denmark	191	381	232	42	13	29
Austria	43	173	140	10	2	8
Cyprus	35	125	104	14	4	10
Ireland	191	329	289	151	71	80
Portugal	108	231	147	24	3	21
Romania	77	143	75	9	0	9
Hungary	65	93	30	2	0	2
Czech Republic	66	146	90	10	0	10
Lithuania	48	88	40	0	0	0
Greece	99	189	96	6	0	6
Croatia	0	9	9	0	0	0
Estonia	46	88	44	2	0	2
Slovenia	21	54	36	3	0	3
Bulgaria	31	63	32	0	0	0
Malta	16	49	45	12	5	7
Slovakia	4	28	26	2	0	2
Latvia	23	52	29	0	0	0
Total # transactions	11730	12805	4123	1452	469	983

Note: Table A1 shows the full sample of transactions divided per country and divided based on domestic, domestic EU-EU (intra-EU), cross-border, cross-border deals only if UK is on one side of transactions, and UK target/acquirer in cross-border deal.

Table A2
Cross-Table of All Transactions

Acquirer Nation	Target Nation																									
	AU	BE	BL	CY	CR	DEN	EST	FI	FR	GB	GR	HU	IR	IT	LAT	LIT	LUX	MA	NL	PL	PO	RO	SK	SL	SP	SW	UK
Austria (AU)	43	3	2	0	0	0	0	1	2	20	0	2	0	4	1	0	0	1	2	11	0	6	0	7	3	2	2
Belgium (BE)	1	131	3	0	1	1	0	1	22	17	0	1	5	3	0	0	3	0	36	3	1	0	0	2	15	0	14
Bulgaria (BL)	0	0	31	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
Croatia (CRO)	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	0	0
Cyprus (CY)	1	0	1	35	4	0	1	0	0	0	24	0	3	0	1	2	1	0	2	24	0	7	0	0	3	1	4
Czech (CR) Republic	3	0	0	1	66	1	0	0	1	1	0	1	1	3	0	0	0	0	1	10	0	2	9	2	3	0	0
Denmark (DEN)	1	1	0	0	1	191	1	6	6	16	1	0	4	5	0	2	2	0	3	7	0	1	0	0	3	19	13
Estonia (EST)	0	0	0	0	0	1	46	2	0	1	0	0	0	0	8	10	0	0	1	1	0	0	0	0	0	0	0
Finland (FI)	0	0	0	0	1	8	2	226	3	8	0	0	2	2	1	2	0	0	7	3	0	0	0	0	1	36	10
France (FR)	8	36	3	1	1	4	1	8	1123	50	3	1	14	61	0	1	10	0	39	6	17	5	0	1	91	10	66
Germany (GB)	28	6	0	0	8	11	1	9	52	653	5	3	13	23	2	1	9	0	39	24	7	5	1	2	45	28	70
Greece (GR)	0	0	1	2	0	0	0	0	0	0	99	0	0	1	0	0	0	0	0	1	1	3	1	0	1	0	0
Hungary (HU)	1	0	0	0	0	0	0	0	0	0	0	65	0	1	0	0	0	0	0	3	0	1	0	1	0	1	0
Ireland (IR)	1	4	0	1	0	1	0	2	8	13	2	0	191	10	0	0	0	0	7	2	2	4	0	0	7	2	71
Italy (IT)	2	2	0	0	4	5	1	0	37	25	9	0	2	1480	0	0	4	0	6	7	3	3	0	3	25	2	32
Latvia (LAT)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	1	0	0	0	0
Lithuania (LIT)	0	0	0	0	0	2	0	1	0	0	0	0	0	0	5	48	0	0	0	1	0	1	1	0	2	1	0
Luxembourg (LUX)	3	5	2	2	3	1	1	8	49	52	13	2	9	52	2	1	25	0	12	29	15	2	1	2	36	3	38
Malta (MA)	0	4	0	1	0	1	0	1	1	1	1	0	0	2	1	0	0	16	1	2	0	1	0	0	3	4	5
Netherlands (NL)	5	18	9	5	6	6	0	7	34	49	7	2	8	15	1	1	5	0	260	36	5	8	3	3	21	12	56
Poland (PL)	1	1	4	1	4	1	0	0	5	13	0	5	1	4	1	2	3	1	5	619	3	5	2	1	2	2	4
Portugal (PO)	0	1	0	0	1	0	0	0	5	1	0	0	0	4	0	0	0	0	0	2	108	0	0	0	8	3	3
Romania (RO)	0	0	2	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	77	0	0	0	0	0
Slovakia (SK)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	4	0	2	0	0
Slovenia (SL)	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	21	0	0	0
Spain (SP)	1	7	0	1	0	1	0	0	22	17	3	0	2	29	1	0	2	0	10	9	41	2	1	0	947	6	18
Sweden (SW)	6	13	2	0	5	67	10	81	28	50	11	1	8	17	4	4	2	7	41	8	3	4	0	0	25	935	63
United Kingdom (UK)	8	34	0	10	10	29	2	14	108	144	6	2	80	102	0	0	13	7	143	37	21	9	2	3	150	49	4267

Note: Table A2 shows the a cross-table of all the 15,852 transactions as either acquirer or target during the 1st of January 2013 and 1st of January 2023.

Table A3
Summarizing Table of Variables

Variables	Denotation	Type	Condition	Value
Brexit, where		Categorical variable	Three levels	
Pre-Referendum period	*PRE-REF*	Dummy Variable	01/01/2013 < X* <= 23/06/2016	[0,1]
Post-Referendum period	*POST-REF*	Dummy Variable	23/06/2016 < X <= 31/12/2020	[0,1]
Post-Effective period	*POST-EFF*	Dummy Variable	31/01/2020 < X <= 31/12/2022	[0,1]
UK Acquirer	*UK ACQUIRER*	Dummy variable	UK Acquirer (1), EU Target (0)	[0,1]
UK Target	*UK TARGET*	Dummy variable	UK Target (1), EU Target (0)	[0,1]
Cross-border deal	*CBDEAL*	Dummy variable	Acquirer nation does not equal Target Nation	[0,1]
Premium 4 weeks prior to announcement	*PREMIUM 4-WEEKS*	Numerical variable	Premium expressed in percentages, 4 weeks prior to announcement	%
Cumulative abnormal returns, five-day event window	*CAR [-2,+2]*	Numerical variable	Five-day event window used for the cumulative abnormal returns	%
Domestic UK transaction	*DOMUK*	Dummy variable	UK Acquirer * UK Target	[0,1]
Payment type	*PAYMENT*	Dummy variable	Cash payments (1) other type of payments (0)	[0,1]
Industry type	*INDUSTRY*	Dummy variable	Industry equals one if Acquirer and Target Macro Industry are identical	[0,1]
Deal size	*DEAL SIZE*	Numerical variable	Natural logarithm of Rank value including net debt of Target	LN
Percentage of Acquired stock	*STOCK ACQ %*	Numerical variable	The disclosed percentage of shares acquired disclosed	%
Number of bidders	*BIDDERS*	Numerical variable	The number of bidders in the transactions	[1-4]
Experience of the Acquirer	*ACQUIRER EXPERIENCE*	Dummy Variable	Experience equals one if acquirer is a serial acquirer	[0,1]
Public status of Target	*TARGET DUMMY*	Dummy variable	The status of the Target, where public (1) and other (0)	[0,1]
GDP per capita (USD$)	*GDP PER CAPITA*	Numerical variable	Natural logarithm of the GDP per capita of Target nation in year of transaction	LN
GDP Growth (annual percentage)	*GDP GROWTH*	Numerical variable	Annual percentage growth of the GDP of the Target nation in year of transaction	%
Year Fixed effects	*YEAR FIXED EFFECTS*	Dummy variable	Account for yearly fixed effects through yearly dummy variables – *Year_dummy (i)*	[0,1]
Industry Fixed Effects	*INDUSTRY FIXED EFFECTS*	Dummy variable	Account for industry fixed effects through macro industries– *Industry_dummy (j)*	[0,1]

Note: Table A3 summarizes the denotation, conditions and values of the variables used in the empirical analysis.
*X refers to M&A transaction announcement date

Table A4
Correlation Matrix for Cross-border Deal Activity

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
PRE-REF	(1)	1													
POST-EFF	(2)	-0.4342***	1												
POST-REF	(3)	-0.5681***	-0.4947***	1											
UK TARGET	(4)	0.0367***	-0.0023	-0.0333**	1										
UK ACQUIRER	(5)	0.0313***	-0.0113	-0.0199**	0.7901***	1									
PAYMENT	(6)	0.0247***	-0.0600***	0.0309***	-0.1135***	-0.0991***	1								
INDUSTRY	(7)	0.0170**	-0.0126	-0.0049	-0.0103	-0.0220**	-0.0706	1							
DEAL SIZE	(8)	-0.0012	0.0165**	-0.0139*	-0.0648***	-0.0505***	-0.0116	-0.0097	1						
STOCK ACQ%	(9)	-0.0297***	0.0312***	0.0002	0.2088***	0.2154***	-0.1016***	0.0831***	0.0203**	1					
BIDDERS	(10)	-0.0004	0.0144*	-0.0128	0.0255***	0.0115	-0.0247***	-0.0139*	0.1041***	0.0072	1				
TARGET DUMMY	(11)	0.0240***	-0.0078	-0.0160**	-0.0908***	-0.1131***	-0.0319***	-0.0610***	0.2008***	-0.3929	0.1582***	1			
EXPERIENCE	(12)	-0.0060	-0.0058	0.0111	0.0874***	0.1183***	-0.0560***	-0.0014	0.0577**	0.0061	-0.0328***	-0.0685***	1		
GDP PER CAPITA	(13)	0.1944***	-0.4629***	0.2354***	0.0517***	0.0428***	-0.0115	0.0035	0.0165**	0.0020	0.0065	0.0152*	0.0352***	1	
GDP GROWTH	(14)	0.0547***	-0.1692***	0.1018***	-0.0511***	-0.0251***	0.0334***	0.0011	-0.0248***	-0.0037	-0.0079	-0.0058	-0.0060	0.1038***	1

Note: Table A4 presents the correlation matrix for the variables used in the cross-border deal activity hypothesis. The Pearson correlation coefficients and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) are presented.

Table A5
Correlation Matrix for Acquisition Premiums

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
PREMIUM 4-WEEKS	(1)	1																
PRE-REF	(2)	-0.0231	1															
POST-EFF	(3)	0.0408	-0.3524***	1														
POST-REF	(4)	-0.0086	-0.7027***	-0.4183***	1													
UK Target	(5)	0.1949***	0.0339	-0.0741**	0.0235	1												
UK Acquirer	(6)	0.1576***	-0.0175	-0.0378	0.0457	0.7946***	1											
CBEAL	(7)	-0.0176	-0.0125	-0.0214	0.0284	-0.1055***	-0.0902***	1										
PAYMENT	(8)	-0.0854***	-0.0103	0.0554*	-0.0321	-0.1243***	-0.0873***	0.0378	1									
INDUSTRY	(9)	0.0221	0.1004***	-0.0151	-0.0860***	0.0348	-0.0119	-0.0083	-0.1851***	1								
DEAL SIZE	(10)	0.2426***	-0.0820***	0.0350	0.0530*	0.1692***	0.1373***	0.0556*	-0.3172***	0.1146***	1							
STOCK ACQ%	(11)	0.3287***	-0.0132	-0.0047	0.0164	0.4407***	0.4023***	-0.0613**	-0.3275***	0.0368	0.4122***	1						
BIDDERS	(12)	0.1904***	-0.0066	0.0261	-0.0134	0.1305***	0.0890***	-0.0135	-0.0454	-0.0227	0.1409***	0.1621***	1					
DOMUK	(13)	0.1850***	0.0124	-0.0545**	0.0294	0.9006***	0.8906***	-0.2511***	-0.1121***	0.0133	0.1447***	0.4242***	0.1131***	1				
TARGET DUMMY	(14)	0.0223	0.0470	-0.0112	-0.0371	-0.0588**	-0.0328	0.0070	0.0268	0.0511*	0.0050	-0.0168	0.0164	-0.0433	1			
EXPERIENCE	(15)	-0.0856***	-0.0198	-0.0004	0.0196	-0.2066***	-0.1870***	0.0922***	-0.0332	0.1182***	0.0312	-0.2336***	-0.0665**	-0.2040***	0.0009	1		
GDP PER CAPITA	(16)	0.1912***	-0.0404	-0.0138	0.0497*	0.2966***	0.2657***	-0.0731**	-0.1817***	0.0389	0.3355***	0.2864***	0.0749**	0.2680***	0.0271	-0.1173***	1	
GDP GROWTH	(17)	0.0040	-0.2136***	0.2688***	0.0030	0.0414	0.0229	-0.0116	0.1189***	-0.0627**	-0.0617**	-0.0259	0.0400	0.0495*	-0.0427	0.0079	-0.3209***	1

Note: Table A5 presents the correlation matrix for the variables used in the acquisition premium analysis. The Pearson correlation coefficients and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) are presented.

Table A6
Correlation Matrix for Announcement Effects

Variables		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
CAR[−2,+2]	(1)	1																
PRE-REF	(2)	-0.0157	1															
POST-EFF	(3)	0.0356	-0.3545***	1														
POST-REF	(4)	-0.0114**	-0.7101***	-0.4066***	1													
UK Target	(5)	0.0109	0.0838***	-0.0817***	-0.0204	1												
UK Acquirer	(6)	0.0095	0.0834***	-0.0848***	-0.0176	0.8317***	1											
CBEAL	(7)	0.0358**	-0.0275	0.0206	0.0113	-0.3099***	-0.2233***	1										
PAYMENT	(8)	-0.0541***	-0.0022	-0.0484***	0.0386**	-0.1168***	-0.1109***	0.0604***	1									
INDUSTRY	(9)	-0.0008	0.0380**	-0.0365**	-0.0096	-0.0423**	-0.0464***	0.0244	0.0060	1								
DEAL SIZE	(10)	0.0076	0.0407**	0.0193	-0.0543***	-0.1690***	-0.1796***	0.1897***	0.0640***	0.1187***	1							
STOCK ACQ%	(11)	0.0851***	-0.0256	-0.0051	0.0289*	0.2073***	0.2273***	0.0093	-0.1431***	0.0306*	-0.0163	1						
BIDDERS	(12)	-0.0498***	0.0367**	-0.0057	-0.0316*	0.0005	-0.0018	-0.0142	-0.0709***	0.0244	0.0995***	-0.0033	1					
DOMUK	(13)	0.0068	0.0850***	-0.0713***	-0.0294*	0.9403***	0.8946***	-0.4180***	-0.1104***	-0.0447***	-0.1899***	0.2040***	0.0034	1				
TARGET DUMMY	(14)	-0.0462***	0.0625***	-0.0045	-0.0576***	-0.1205***	-0.1420***	-0.0102	-0.1063***	0.0522***	0.2760***	-0.2887***	0.1466***	-0.1267***	1			
EXPERIENCE	(15)	-0.0221	-0.0264	-0.0271	0.0462**	0.1369***	0.1343***	-0.0608***	0.0617***	0.0309*	0.0114	0.0320*	0.0095	0.1370***	-0.0506***	1		
GDP PER CAPITA	(16)	0.0335*	-0.0766****	0.0762***	0.0174	0.3484***	0.3070***	-0.0676***	-0.1475***	0.0094	0.0101	0.1889***	0.0078	0.3271***	-0.0736***	0.0851***	1	
GDP GROWTH	(17)	0.0073	-0.2110***	0.4297***	-0.1174***	0.0801***	0.0789***	-0.0430**	0.0397**	-0.0513***	-0.0222	-0.0088	0.0062	0.0808***	-0.0299*	-0.0021	-0.1932***	1

Note: Table A6 presents the correlation matrix for the variables used in the announcement effect analysis. The Pearson correlation coefficients and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) are presented.

Equation (7)

First-Stage IV Analysis UK Target

$$(7)\ UK\ Target = \beta_0 + \beta_1 EPU + \beta_2 INFLATION + \beta_3 EXCHANGE\ RATE + \sum_k \beta_k\ Control\ variables + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) + \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j) + \varepsilon$$

Equation (8)

First-Stage IV Analysis UK Acquirer

$$(8)\ UK\ Acquirer = \beta_0 + \beta_1 EPU + \beta_2 INFLATION + \beta_3 EXCHANGE\ RATE + \sum_k \beta_k\ Control\ variables + \sum_{i=1}^{9} \gamma_i\ Year\_dummy(i) + \sum_{j=1}^{12} \delta_j\ Industry\_dummy(j) + \varepsilon$$

Table A7
Extended Results of OLS and 2SLS Regressions of Acquisition Premiums

Dependent Variable: PREMIUM 4-WEEKS				
	PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**
Independent variables				
PRE-REF			-7.5223*	-7.6862*
			(4.068)	(4.020)
POST-REF	7.5223*	7.3215*		
	(4.068)	(4.017)		
POST-EFF	21.0653***	21.0185***	13.5429**	13.6447**
	(6.782)	(6.869)	(5.499)	(5.645)
UK TARGET	-1.0675	-35.6605	1.3606	-34.4041
	(5.079)	(23.988)	(4.515)	(24.425)
UK ACQUIRER	2.6333	-16.4246	-0.0168	-16.7587
	(5.298)	(16.826)	(4.483)	(17.025)
CBDEAL	0.8420	0.8729	0.8420	0.9120
	(1.524)	(1.511)	(1.524)	(1.525)
*PRE-REF*CBUKT*			-2.4281	-1.7356
			(6.686)	(5.050)
*PRE-REF*CBUKA*			2.6501	2.5500
			(6.904)	(5.257)
*POST-REF*CBUKT*	2.4281	1.3942		
	(6.686)	(4.515)		
*POST-REF*CBUKA*	-2.6501	-0.1263		
	(6.904)	(4.488)		
*POST-EFF*CBUKT*	21.0531**	19.1034***	18.6250**	19.0454***
	(8.715)	(7.269)	(8.482)	(7.322)
*POST-EFF*CBUKA*	-17.3695**	-14.6652**	-14.7195**	-14.6846**
	(8.083)	(5.973)	(7.450)	(6.013)
Deal characteristics				
PAYMENT	1.8080	3.4552	1.8080	3.4732
	(1.821)	(2.213)	(1.821)	(2.214)
INDUSTRY	2.1415	1.8458	2.1415	1.8979
	(1.527)	(1.556)	(1.527)	(1.555)
DEAL SIZE	1.4844***	1.2867***	1.4844***	1.2962***
	(0.385)	(0.413)	(0.385)	(0.417)
STOCK ACQ%	0.1510***	0.3767**	0.1510***	0.3746
	(0.026)	(0.177)	(0.026)	(0.180)
BIDDERS	11.4134***	-3.1631***	11.4134***	16.9789***
	(2.518)	(2.835)	(2.518)	(4.896)
Firm- and Country characteristics				
ACQUIRER EXPERIENCE	-0.0060	-3.1631	-0.0060	-3.1876
	(1.382)	(2.835)	(1.382)	(2.866)
TARGET DUMMY	8.2922*	-5.7232**	8.2922*	-5.6651
	(4.243)	(10.901)	(4.243)	(11.029)
GDP PER CAPITA	5.6093***	12.3564**	5.6093***	12.2167**
	(1.910)	(5.287)	(1.910)	(5.440)
GDP GROWTH	1.2386**	0.6891	1.2386**	0.6583
	(0.563)	(0.728)	(0.563)	(0.728)
CONSTANT	-73.1791***	-133.6988***	-73.1791***	-124.7546**
	(20.078)	(48.549)	(20.078)	(50.324)
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes
N	1156	1156	1156	1156
Adjusted R-Squared	0.170	0.172	0.170	0.172

Note: This table includes the extended coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for the variables in the OLS regression models. Column (1) & (3) are the baseline models, followed by the models employing a 2SLS regression analysis (2) & (4). The models include different specifications, where in this table the dependent variable is the *PREMIUM 4-WEEKS*. The models incorporate fixed effects for yearly and industry variations in each model. The number of observations and Pseudo R-squared are also provided for each model. All models are significant at the 1% level.

Table A8
Extended Results of OLS and 2SLS Regressions of Announcement Effects

Dependent Variable: CAR [-2,+2]

	PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**
Independent variables				
PRE-REF			0.0072	0.0071
			(0.005)	(0.005)
POST-REF	-0.0075	-0.0076		
	(0.005)	(0.005)		
POST-EFF	-0.0060	-0.0059	0.0007	0.0008
	(0.014)	(0.014)	(0.013)	(0.013)
UK TARGET	-0.0017	-0.0033	-0.0019	-0.0045
	(0.003)	(0.014)	(0.003)	(0.013)
UK ACQUIRER	-0.0004	-0.0034	-0.0003	-0.0045
	(0.003)	(0.014)	(0.003)	(0.014)
CBDEAL	0.0007	0.0011	0.0039	0.0044*
	(0.003)	(0.003)	(0.003)	(0.003)
*PRE-REF*CBUKT*			-0.0952	-0.0906
			(0.084)	(0.083)
*PRE-REF*CBUKA*			0.0803	0.0770
			(0.080)	(0.079)
*POST-REF*CBUKT*	-0.1331**	-0.1281**		
	(0.065)	(0.065)		
*POST-REF*CBUKA*	0.1271**	0.1235**		
	(0.061)	(0.062)		
*POST-EFF*CBUKT*	0.0413	-0.0528	0.0670	0.0754
	(0.116)	(0.113)	(0.115)	(0.115)
*POST-EFF*CBUKA*	-0.0465	0.0489	-0.0776	-0.0846
	(0.112)	(0.117)	(0.111)	(0.111)
Deal characteristics				
PAYMENT	-0.0036*	-0.0040	-0.0036*	-0.0041
	(0.002)	(0.003)	(0.002)	(0.003)
INDUSTRY	0.0040**	0.0038*	0.0040**	0.0037*
	(0.002)	(0.002)	(0.002)	(0.002)
DEAL SIZE	0.0006	0.0006	0.0006	0.0005
	(0.001)	(0.001)	(0.001)	(0.001)
STOCK ACQ%	0.0000**	0.0000	0.0000**	0.0000
	(0.000)	(0.000)	(0.000)	(0.000)
BIDDERS	-0.0516**	-0.0508**	-0.0529**	-0.0517**
	(0.022)	(0.022)	(0.021)	(0.021)
Firm- and Country characteristics				
ACQUIRER EXPERIENCE	-0.0016	-0.0014	-0.0014	-0.0010
	(0.002)	(0.003)	(0.002)	(0.003)
TARGET DUMMY	-0.0086**	-0.0086**	-0.0087**	-0.0086**
	(0.003)	(0.003)	(0.003)	(0.003)
GDP PER CAPITA	0.0053*	0.0061	0.0053*	0.0067
	(0.003)	(0.009)	(0.003)	(0.008)
GDP GROWTH	-0.0003	-0.0005	-0.0003	-0.0004
	(0.001)	(0.001)	(0.001)	(0.001)
CONSTANT	0.0119	0.0039	0.0056	-0.0087
	(0.038)	(0.088)	(0.038)	(0.086)
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes
N	4054	4054	4054	4054
Adjusted R-Squared	0.016	0.016	0.016	0.016

Note: This table includes the extended coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for interaction variables in the OLS regression models. Column (1) & (3) are the baseline models, followed by 2SLS regression models following IV analysis in column (2) & (4). The models include different specifications and control variables, the dependent variable is the three-day cumulative abnormal return, CAR [-2,+2]. Each model incorporates yearly and industry fixed effects. The number of observations and adjusted R-squared are also provided for each model. All models are significant at the 1% level.

TABLE A9
Sensitivity Analysis for Cross-border Deal Activity

Dependent Variable: CBDEAL		
	PRE-REF	POST-REF
	(1)	**(2)**
*PRE-REF**		0.5352***
UK TARGET		(0.247)
*PRE-REF**		-0.4015**
UK ACQUIRER		(0.165)
*POST-REF**	-0.5352***	
UK TARGET	(0.191)	
*POST-REF**	0.4015**	
UK ACQUIRER	(0.165)	
*POST-EFF**	0.4102*	0.9454***
UK TARGET	(0.226)	(0.223)
*POST-EFF**	-0.4211**	-0.8227***
UK ACQUIRER	(0.203)	(0.196)
Deal characteristics	Yes	Yes
Firm- and country characteristics	Yes	Yes
YEARLY FIXED EFFECTS	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes
N	12205	12205
Pseudo R-Squared	0.1174	0.1174

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for the interactions variables in the logistic regression models. Column (1) and (2) represent the difference reference periods. The models include different specifications, where in this table the dependent variable is a dummy variable representing the presence of cross-border deals (*CBDEAL)*. The models incorporate fixed effects for yearly and industry variations in each model. The number of observations and Pseudo R-squared are also provided for each model. The sensitivity analysis only includes majority (>50%) deals. All models are significant at the 1% level.

Table A10
Sensitivity Analysis for Acquisition Premiums

Dependent Variable:	**PREMIUM 1-DAY**				**PREMIUM 1-WEEK**			
	PRE-REF		POST-REF		PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
*PRE-REF**			5.5173	4.6583			2.3247	1.1438
UK TARGET			(5.554)	(3.627)			(6.478)	(4.655)
*PRE-REF**			-2.8229	-0.5205			-2.4223	0.1116
UK ACQUIRER			(5.584)	(3.816)			(6.557)	(4.843)
*POST-REF**	-5.5173	-0.7039			-2.3247	-0.3214		
UK TARGET	(5.554)	(4.279)			(6.478)	(4.525)		
*POST-REF**	2.8229	2.1703			2.4223	-2.4828		
UK ACQUIRER	(5.584)	(4.103)			(6.557)	(4.416)		
*POST-EFF**	15.9740*	20.1204**	21.4913**	20.4115***	15.6215*	16.3144**	17.9462**	16.2836**
UK TARGET	(8.423)	(7.841)	(8.758)	(7.822)	(8.378)	(7.136)	8.331	(7.172)
*POST-EFF**	-10.2242	-10.8649	-13.0471	-10.6495	-11.7099	-11.3453*	-14.1322*	-11.3433*
UK ACQUIRER	(8.149)	(7.273)	(8.263)	(7.249)	(8.246)	(6.636)	(7.882)	(6.674)
Deal characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm- and country characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1217	1217	1217	1217	1167	1167	1167	1167
Adjusted R-Squared	0.149	0.148	0.149	0.148	0.166	0.168	0.166	0.168

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for the interaction variables in the OLS regression models. Column (1), (3), (5) & (7) are the baseline OLS regression models. Column (2), (4), (6) & (8) represent the 2SLS regression models following IV analysis. The models include different specifications and control variables, the dependent variables are the 1-Day and 1-Week acquisition premium paid in %. Each model incorporates yearly and industry fixed effects. The number of observations and adjusted R-squared are also provided for each model. All models are significant at the 1% level.

Table A11
Sensitivity Analysis for Announcement Effects

Dependent Variable: CAR [-1, +1]				
	PRE-REF		POST-REF	
	(1)	**(2)**	**(3)**	**(4)**
*PRE-REF**			-0.0272	-0.0163
CBUKT			(0.084)	(0.083)
*PRE-REF**			0.0184	0.0102
CBUKA			(0.079)	(0.078)
*POST-REF**	-0.1489**	-0.1401		
CBUKT	(0.060)	(0.060)		
*POST-REF**	0.1388**	0.1327		
CBUKA	(0.056)	(0.057)		
*POST-EFF**	-0.0320	-0.0173	0.0003	0.0164
CBUKT	(0.105)	(0.105)	(0.104)	(0.104)
*POST-EFF**	0.0226	0.0101	-0.0133	-0.0271
CBUKA	(0.102)	(0.102)	(0.101)	(0.102)
Deal characteristics	Yes	Yes	Yes	Yes
Firm- and country characteristics	Yes	Yes	Yes	Yes
YEARLY FIXED EFFECTS	Yes	Yes	Yes	Yes
INDUSTRY FIXED EFFECTS	Yes	Yes	Yes	Yes
N	4054	4054	4054	4054
Adjusted R-Squared	0.021	0.018	0.021	0.018

Note: This table includes the coefficients, (Robust standard errors), and statistical significance levels (* p < 0.1, ** p < 0.05, *** p < 0.01) for interaction variables in the OLS regression models. Column (1) & (3) are the baseline models, followed by 2SLS regression models following IV analysis in column (2) & (4). The models include different specifications and control variables, the dependent variable is the three-day cumulative abnormal return, CAR [-1,+1]. Each model incorporates yearly and industry fixed effects. The number of observations and adjusted R-squared are also provided for each model. All models are significant at the 1% level.

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