

INTERNATIONAL BOND MARKETS, RISK PREMIUMS AND BREXIT: THEORY AND EMPIRICAL FINDINGS

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To
my wife Gülcan,
and my sons Kenan and Deniz.

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1. Introduction

1.1 Basic Perspectives and Motivation

On June 23rd, 2016, the United Kingdom (UK) voted in a referendum to leave the European Union (EU) – an event that is now widely referred to as “Brexit”. For the vast majority of observers, this decision in favour of leave came, to a large extent, rather unexpectedly. Brexit represents a unique shock as, for the first time ever, a member state of the EU is in fact going to leave. Hence, the range of historical experience with similar events is quite limited. This restricts the extent to which previous analyses can be used in order to understand the effects of Brexit. Nevertheless, understanding its effects – and the Brexit process (the UK officially left the EU on January 31, 2020) – on individual firms, economic sectors and the economy in general is of a great importance for corporate managers, economists and policy makers. To some extent, Brexit stands for uncertainty, namely in the very early stages, but as alternative scenarios become clearer and companies, including banks in the UK and Eurozone (and economic agents in countries outside of the EU), start to adjust, various risk aspects appear on the radar of decision-makers. The picture emerging in financial markets in the UK and the Eurozone countries reveals important information. Taking financial market adjustment dynamics and the new spreads in corporate and government bond markets into account could allow firms, investors and policy makers to prepare for and mitigate the impact of Brexit, to manage the exposure of individual firms, particular sectors and the economy as a whole in a transitory environment of higher economic and political risk and to find the best possible policy mix in order to moderate its aftermath. Against this background, the present study – with the subsequent three articles – analyses the effects of the Brexit vote on risk conditions in international bond markets, with the principle aim of extending existing knowledge and the literature by introducing new aspects and data as well as discussing the results; new empirical findings should help to better understand European and global financial market dynamics.

The UK became a member of the European Communities (EC) 1973 and was strongly involved in the launch of the Single Market in 1993. Being a member of the EU had a considerable influence on the UK’s economic development. While the UK’s Gross Domestic Product (GDP) per capita relative to the that of the EU founding members

declined steadily from 1945 to 1972, it was relatively stable between 1973 and 2010 (Campos and Coricelli (2015) and Campos et al. (2019)). Since becoming a member of the EU in 1973, GDP per capita in the UK has doubled, increasing more than in other non-EU English speaking countries over the same period, including the United States (OECD (2016), p.8). Having access to the European Single Market – created in 1993 – with its free movement of goods, services, capital and people is important not only for free trade in goods and services (including financial services) but also for foreign direct investment (FDI) and immigration. Moreover, the EU has trade agreements with more than 60 other countries and prospective agreements under negotiation with a further 67 economies. During its 47 years of membership, a set of complex relationships between the UK and the economies of other EU member states developed. In particular, the UK developed its traditionally strong banking sector – broadly speaking, the financial sector – since the 1980s: at first through financial market liberalization under the governments of Prime Minister Margaret Thatcher, later followed by impulses from the EU Single Market, notably high levels of intra-EU capital mobility coupled with the principle of the single passport for banks (a bank active in one EU member country can offer services throughout the whole EU). Thus, the departure of the UK from the EU would cause a significant loss for both sides.

When considering how the outcome of the Brexit referendum may affect risk conditions in the financial markets, at least two aspects should be reflected upon. Firstly, the indirect effects through the future expected impact on the real economy, and secondly, the direct effects through an increase in economic policy uncertainty – possibly associated with a new fiscal and monetary policy mix where the Bank of England is largely politically independent. According to the dividend discount model of Gordon and Shapiro (1956), expectations about future effects on the real economy caused by the Brexit vote will immediately affect financial assets. The effects of Brexit on the economies of the UK and other EU member states were debated intensively in the community of economic experts, banks, industrial and financial lobby groups as well as governments – prior to the vote in June 2016; and the relevant effects are still being debated. However, it is hard to forecast the magnitude of those effects, since those would largely depend on the outcome of the negotiations about the future relationship between the EU and the UK – due to the economic shock due to the coronavirus pandemic in 2020, a postponement of the effective leave date from the EU

Single Market, envisaged by the Johnson government to be at the end of 2020, is still a possibility (the papers in this study do not cover any coronavirus shock perspectives). Nevertheless, many economists – one may say a clear majority – agreed that the short-, medium- and long-term net economic effects of leaving the EU were likely to be negative and substantial (Welfens (2017) and IMF (2016a, 2016b))¹. A recent study by the Bank of England (2018) indicates that in no-deal no-transition scenario, the medium-term real income loss could be between 7.75% and 10.5% over five years.

According to the IMF (2016b, p.9) the potential economic impacts of the Brexit vote on the British and remaining EU economies can be expected through the following channels: trade in goods and services, investment, productivity, immigration and fiscal costs. Regarding the trade channel, the most important aspect is that the UK would probably lose its access to the European Single Market and preferential access to other non-EU markets. Trade between the UK and the EU would become more costly and trade agreements with non-EU countries might be less advantageous and take a long time to conclude. Nearly half of UK goods and services exports go to the EU (about 63% are linked to EU membership) and accounted for about 13% of UK GDP in 2014 (IMF (2016b), p.11). Brexit is likely to increase barriers to trade and financial flows (via higher tariffs, stricter border controls and rules of origin checks, increased cross-country regulation differences and non-tariff measures) leading to higher trading costs and thus welfare losses.

Moreover, the European Single Market assures the principle of mutual recognition and the so-called single passport. UK financial firms may lose their passport to provide financial services to the Single Market. The financial sector in the UK appears to have taken outstanding advantages of the passport, since it has grown considerably in recent decades becoming a key component of the British economy². Financial services are of particular importance to the UK economy accounting for about 7% of output and 4% of employment in 2015 (OECD (2016), p.14). London, and the wider UK, is the leading global international financial and related professional service centre with a trade surplus in financial services of £63bn in 2015 (ca. 3.3 percent of UK's GDP), which was more than the combined surpluses of the next three leading countries,

¹ For further details on studies and their projections, please see Appendix 3 in IMF (2016b).

² The UK trade in financial services as a percentage of GDP has risen much faster than the EU and the OECD averages, see Bank of England (2015).

namely the United States, Switzerland and Luxemburg (House of Commons (2018), p.4). About a third of the UK's financial services exports are to the EU. Thus, the Brexit vote would have immense implications for the financial service sector, an economic sector which is critical to the UK economy. Several studies point out that financial sectors in both in the UK and the EU would be most affected by Brexit (see Schiereck et al. (2016), Ramiah et al. (2017) and Hill et al. (2019)). Though the UK would be most affected by an exit, the EU27 would similarly experience negative effects from reduced trade in financial services³. Any effects on UK financial sector and markets will also have outward spillovers to other EU economies⁴. Some of the key financial sector activities which serve EU27 clients are provided out of London, for example, derivatives clearing and investment banking activities are reliant on the UK to a significant extent (ECB (2020)). A disruption of these interdependences between the EU27 and the UK generated by Brexit would entail additional costs for both.

Furthermore, the European Single Market is very important for the UK's attractiveness with regard to foreign direct investment (FDI) of both EU as well as non-EU investors. Almost half of the FDI received by the UK comes from the EU. Brexit would likely bring higher barriers to the UK's inward FDI blocking foreign capital and innovation that would require costly domestic investment and cause welfare losses (Dhingra et al. (2016) and McGrattan and Waddle (2020)). In addition, the UK would lose its benefit, from the perspective of non-EU multinationals, as an attractive point-of-access to the Single Market that it has previously enjoyed as an EU member country. If access to the Single Market would be lost, lower FDI inflows seem unavoidable. In the case of a hard Brexit, the UK would receive almost half of their FDI inflows from other European countries, which could otherwise be expected, in the long run (Welfens and Baier (2018)). In their subsequent study, Baier and Welfens (2019) confirm the expected FDI pattern showing that in the wake of the Brexit referendum, FDI inflows to the UK banking sector have declined. Since trade and investment are important

³ In August 2016, the UK accounts for 78% of foreign exchange turnover, 74% of OTC interest rate derivatives and 85% of hedge fund assets, 49% of private equity funds raised, 30% of equity market capitalisation and 26% of bank lending in the EU, see DGIP (2017, p.9).

⁴ Financial links show that Luxembourg, the Netherlands, Cyprus, Malts and Ireland are most exposed, see Appendix 4 in IMF (2016b).

drivers of long-term GDP growth, Brexit would cause lower levels of openness and innovation, weakening technical progress and productivity in the UK.

Additionally, EU membership allows the free movement of natural persons. Out of around 2.5 million jobs that were added in the UK in 2005-2015, 2.2 million were filled by immigrants, with nearly 60% originating from the EU, contributing on average 0.7 percentage points to GDP per year since 2005 (OECD (2016), p.26). Restriction on immigration would reduce labour force growth (or could even bring about a long run decline of the UK labour force if there is considerable outward re-migration of EU immigrants), reduce productivity overall and therefore potential GDP growth and fiscal revenues (IMF (2016b)). Using a Computable General Equilibrium model with an integrated Melitz (2003) framework, Jafari and Britz (2020) find that about two-thirds of the Brexit impacts are due to the consequences of a reduced labour force - suggesting that labour force development will be a key issue in determining impacts post-Brexit.

The UK was a net contributor to the EU budget at a cost of around 0.3% of GDP per year – an amount that could be saved when the UK leaves the EU (IMF (2016a)). However, the negative Brexit shock which causes losses in terms of GDP would imply lower economic activity and thus generate reduced tax revenues that would most likely offset these post-Brexit expenditure savings on the part of the British government. According to Emmerson et al. (2016), even a relatively small reduction in national income of only 0.6 percent would outweigh the saving of the EU budget contribution and raise the UK budget deficit substantially. There is some potential for further deregulation in the UK upon leaving the EU that might partially outweigh losses from reduced access to the Single Market. However, the range seems quite limited, since the UK already ranks amongst the most liberalized markets in the world (see IMF (2016b), p.21).

In addition to all of the above, an increase in economic policy uncertainty induced by the UK's decision to leave the EU can itself affect financial markets directly. In the theoretical finance literature, Pastor and Veronesi (2012) identify two types of uncertainty related to future government policy. First, so-called political uncertainty - defined as uncertainty about whether the prevailing government policy will change. Second, so-called impact uncertainty, which refers to uncertainty about the impact that a new government policy will have on the profitability of the private sector. Hence,

there is uncertainty about future government action, as well as uncertainty about the economic effects of those actions. They find that stock prices fall at the announcement of a policy change and that these reactions are weak if the change is widely anticipated, but they can be strong if the markets are caught by surprise (e.g., in the case of Brexit). The Brexit vote led to substantial disruption in the political scene, resulting resignations at the highest levels, first of then Prime Minister David Cameron followed by that of his successor in office, Prime Minister Theresa May. From a macroeconomic perspective, the UK's decision to leave the EU is strongly associated with a rise in economic, political, and institutional uncertainty, which is projected to have negative macroeconomic consequences, especially in the UK and advanced EU economies (IMF, 2016c). Firms have to make important economic choices based on the expected future economic policy decisions of their government. UK firms and the British economy face higher economic policy uncertainty, for example concerning the UK's future legal and regulatory framework, international trading agreements and immigration policy (Hill et al. (2019)).

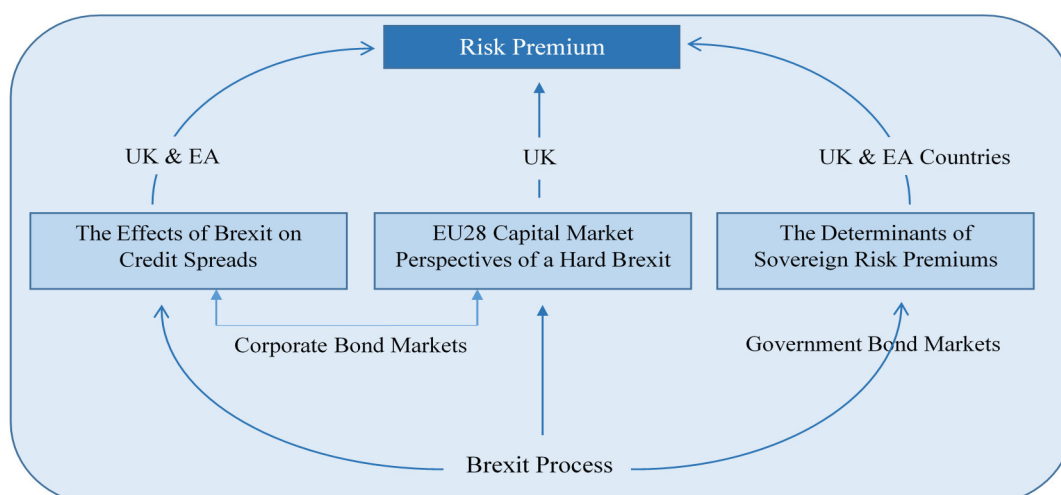
Several studies have already developed and used different indicators in order to measure the uncertainty triggered by Brexit. Baker et al. (2016) developed a new index of economic policy uncertainty (EPU) based on media reports. The EPU index for the UK rose to extraordinary levels following the referendum, far exceeding the levels reached during the 2007/08 Global Financial Crisis and the subsequent European sovereign debt crisis. Using the EPU for the UK, Belke et al. (2018) find that policy uncertainty after the 23rd June 2016 induced huge spillovers to financial markets, which exceeded all previous historical maxima. Bloom et al. (2018) use a newly created firm-level survey, the Decision Maker Panel (DMP), launched in August 2016 by the Bank of England, Stanford University and the University of Nottingham. They find that Brexit provided a major and persistent uncertainty shock particularly in industries that are more dependent on trade with the EU and on EU migrant labour. In a subsequent study, Bloom et al. (2019) confirm these results concluding that the UK's decision to leave the EU has generated a large, broad and long-lasting increase in uncertainty.

Using a general equilibrium model of government policy choice, Pastor and Veronesi (2013) find that political uncertainty increases the equity risk premium. Greater uncertainty leads to an increase of the risk associated with any investment, since the

pay-off of the investment is less certain. Investors would typically seek compensation for bearing the higher risk and would therefore demand a higher risk premium (see Christiano et al. (2014), Gilchrist et al. (2014) and Arellano et al. (2019)). Consequentially, in the immediate aftermath of the Brexit referendum result announcement, financial markets may anticipate significant negative economic effects from the exit vote. Risk premiums would be likely to go up leading to a marked deterioration in financial conditions and subsequently to higher funding costs. The resulting uncertainty could lead to more difficult financial conditions in other European economies as well. Another risk could even be that the UK's exit from the EU causes a repricing of risk more generally, for the UK as well as for remaining EU member states.

The present thesis analyses the effects of Brexit on risk premiums in the corporate and sovereign bond markets in the UK and the EU, respectively; including time-varying aspects. Each chapter is an autonomous study. While Chapters 2 and 3 are co-authored papers, Chapter 4 is based on a single-authored paper. The following Figure 1.1 illustrates how all papers are connected with each other. A key aspect in Chapter 2 is to determine and quantify the impact of Brexit-related events on risk condition in the UK and the Euro Area (EA) corporate bond markets over different maturities and economic sectors. The subsequent study in Chapter 3 is based on this approach and extends it by additionally analysing Brexit effects on different rating categories in the UK's corporate bond market. In contrast, the analysis in Chapter 4 focuses on Brexit vote effects on sovereign risk premiums in the UK and the European government bond markets and potential changes in the investors risk assessment.

Figure 1.1: Framework of the thesis



1.2 Overview

In the following subchapter, a brief summary of the studies which comprise the present dissertation is presented.

Chapter 2: The effects of Brexit on credit spreads: Evidence from UK and Eurozone corporate bond markets

This chapter presents the paper “The effects of Brexit on credit spreads: Evidence from UK and Eurozone corporate bond markets” which was co-authored with Arthur Korus. The paper was published by Springer in the journal *International Economics and Economic Policy* (January 2019, Vol. 16, Issue 1).

A key aspect is to determine and quantify the impact of Brexit-related events, including the result of the Brexit referendum itself, on the risk premiums in the UK and EA corporate bond markets, respectively. Estimation results indicate that only the actual announcement of the UK referendum result had an effect on credit spreads in the UK and EA. In order to investigate more specific sector-related effects of the referendum result, differentiated analysis for the financial and non-financial sector is conducted. Empirical findings show that the impact of the Brexit vote on risk premiums is higher for financials than for non-financials, especially in the EA corporate bond market where credit spreads in the non-financial sector were hardly or not at all affected by the referendum result. Finally, in order to consider the potential changing evaluation of the determinants of corporate bond spreads due to altering risk pricing triggered by the Brexit referendum result, the sample is split in to the period before and the period after the referendum. Our findings indicate that the relevance of determining variables changes over time and that particularly the effects of credit default risk is far stronger and plays a significant role in the post-referendum period in both the UK and the EA.

This paper provides several contributions to the existing literature on the determinants of corporate bond yield spreads. To the best of our knowledge, it is the first to analyse the impact of Brexit on the risk premium in the UK and the EA corporate bond markets. It also extends the existing literature on corporate yield spreads in the UK and EA, which to date is rather scarce. It analyses the UK and EA corporate bond markets simultaneously allowing for a direct comparison of the two markets and is the first to make use of the forward swap market as an explanatory variable for credit spreads.

Chapter 3: EU28 Capital Market Perspectives of a Hard BREXIT: Theory, Empirical Findings and Policy Options

This chapter is based on the paper “EU28 Capital Market Perspectives of a Hard BREXIT: Theory, Empirical Findings and Policy Options” which was co-authored with Paul Welfens (first author), Fabian Baier, Arthur Korus and Tian Xiong, and is a De Gruyter publication in the journal *The Economists’ Voice* (September 2019, Vol. 16, Issue 1).

The likelihood of a no-deal Brexit has strongly increased after the current Prime Minister Boris Johnson replaced Theresa May in July 2019. A “quasi no-deal Brexit” – the Johnson government’s UK-EU deal of late 2019 plus no adequate post-Brexit EU-UK trade and cooperation treaty – would bring a strong long run welfare loss for the UK and also a recession. Key aspects covered refer to the cost of leaving the EU without a deal and in particular the implications for corporate bond risk premiums in the UK. The empirical analysis is mainly based on the approach discussed in Chapter 2. Additionally, two rating categories are incorporated in the analysis; AA rated bonds as being representative of a very good credit quality and BBB rated bonds as representative of a lower credit quality, since this is the lowest investment grade category. Estimation results suggest that in the case of the Brexit referendum, market participants did not make a distinction between AA and BBB rated bonds, i.e., corporate bond spreads were affected by the announcement of the referendum result irrespective of the respective rating category.

Chapter 4: The Determinants of Sovereign Risk Premiums in the UK and the European Government Bond Market: The Impact of Brexit

This chapter presents the paper “The Determinants of Sovereign Risk Premiums in the UK and the European Government Bond Market: The Impact of Brexit” where the author of the present dissertation holds single authorship. The paper was published by the European Institute for International Economic Relations (EIIW/University of Wuppertal) as Discussion Paper No. 271 (March 2020).

Focusing on risk premiums, a key aspect of this study is to analyse recent developments in the British and European government bond markets with reference to the United Kingdom’s decision to leave the European Union. The risk premium is expected to express the risk conditions exposure of the UK and selected EA countries.

Several findings are of a particular interest. The empirical results show that the announcement of the Brexit referendum result led to an immediate increase of the risk premium in the UK and some other selected European government bond markets. Furthermore, the results suggest that there is a considerable change in risk pricing after the announcement of the referendum result. Credit default risk and the risk aversion play a much more important role in the post-referendum period than they did prior to the vote, particularly in the United Kingdom. Finally, estimation results also indicate that using a regional rather than an international measure of risk aversion might be more appropriate in order to capture investors' risk assessment, especially when analysing Euro Area countries.

This paper differs from the existing literature in that, to the best of my knowledge, it is the first study that focuses on the potential effects of the Brexit referendum result on risk premiums in the UK and European government bond markets. Furthermore, it extends the existing literature on the effects of Brexit on financial markets. It analyses risk premiums in the UK and the EA government bond markets simultaneously which allows for direct comparison of Brexit effects in both of those markets. Moreover, estimating the period before and the period after the announcement of the Brexit referendum result enables an analysis of potential changes in investors' risk assessment. Finally, this study is the first to use a newly developed regional risk aversion variable in order to capture the willingness of investors to bear county-specific risks.

At the bottom line, the chapters in the present study contribute to the field of both theoretical and empirical analysis in the Brexit debate and shed new light both on corporate bonds risk premiums in the UK and the Eurozone as well as on government bonds yields in the context of the Brexit process. The papers have been presented at numerous international conferences and at EIIW workshops and the author is grateful for the opportunity to have presented part of the papers in a Bundesbank-sponsored project of the EIIW. Chapter 5 presents selected policy conclusions and points out key aspects of potential future research.

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5. Concluding Remarks

In this chapter, several policy implications, limitations and future research recommendations which can be derived from the papers presented in the underlying dissertation will be explicated. A thorough understanding of the effects of the UK's decision to leave the EU is an important issue for academics, financial economists and policymakers alike. Over the last four years, several issues related to the Brexit process and its effects have been analysed. This thesis focuses on the impact of Brexit on risk premiums in corporate and government bond markets in the UK and the EU, respectively. Although corporate bond markets are less liquid than equity or foreign exchange markets, they still play a very important role for capital raising from the perspective of companies and are a reliable indicator for risk conditions in the market. Moreover, since sovereign bond markets are generally used as a benchmark for asset pricing and asset allocation purposes, they play a crucial role in modern financial markets. Hence, the potential effects of determining variables on risk premiums in corporate as well as in government bond markets are issues of great importance.

5.1 Policy Implications

The empirical results presented in chapter 2 and chapter 3 show that the very announcement of the result of the Brexit referendum had an impact on risk conditions leading to higher risk premiums in the UK corporate bond market. Additionally, a further analysis of more sector-related and rating-specific effects find that both financial and non-financial sectors were affected by Brexit and that market participants made little distinction between very good and lower credit quality. Hence, the empirical findings suggest that the referendum result had a wide and deep impact on financial conditions affecting yield spreads in corporate markets irrespective of the economic sector or rating category. Persistent upside pressure on risk premiums could, in fact, have a major impact on many companies' marginal funding costs reducing their profitability and thus willingness to invest.

The UK government may raise the issue of reducing the statutory corporate tax rate in order to counteract the negative effects of increasing risk premiums on firms' profitability and investment and in the end on dampening output growth. A reduction of corporate tax could generate strong effects on FDI inflows, particularly greenfield

FDI, which would be important for capital accumulation and productivity growth. However, this option is highly disputable since the statutory corporate tax rate in the UK has already reached a very low level, competing with other OECD tax haven countries (Welfens and Baier (2018)). At the same time, lower tax revenue growth would have considerable effects on the fiscal outlook in the UK implying a higher credit default risk and an additional upward pressure on UK government bonds.

One of the major challenges for the UK in order to moderate the effects of Brexit and its aftermath could be an increase of the risk premium for corporate bonds in the banking sector in particular. A higher risk premium may imply an upward shift of the supply curve in the loan market leading to lower credit growth, thus having negative effects on output growth (Bernanke and Blinder (1988)). In order to countervail these negative effects, the British government could undertake financial deregulation. A deregulation of the financial sector could attract higher capital inflows into the banking sector and stimulate the financial services sector as a strategic growth pillar of the UK economy. However, financial deregulation would imply lower prospects for the UK's banks to retain broad regulatory equivalence from the EU. Additionally, such a policy decision may push other financial centres (e.g., New York) to pursue more deregulation putting increasing pressure on the EU to also deregulate and in the end causing a regulatory "race to the bottom" that would be harmful to the stability of the global financial system (Baier and Welfens (2019)).

Estimation results of the analysis presented in chapter 2 indicate that risk premiums in the EA non-financial sector were hardly or not at all affected by the Brexit vote. However, to conclude that the UK's exit would have no effects on risk premiums in the non-financial sector in the EA corporate bond market would be misleading. Due to spillover effects and a strong cross-sector interdependence between the financial and non-financial sectors it is plausible to assume that Brexit would have both medium- and long-term effects on the non-financial sector in the EA too. In addition, many global investment banks which currently serve the EA market from London support EA non-financial corporations to access the global financial market. In order to address these concerns, the EU should foster the integration of EU capital markets. The capital market union (CMU) would support investment and private risk sharing and thus meet challenges related to market fragmentation and the potential reduction in market depth and efficiency resulting from Brexit (ECB (2020)). Moreover, the CMU would further

increase the relevance and prominence of the European capital market on the global stage.

A key aspect of the study presented in chapter 4 is the analysis of risk premiums in the UK and European government bond markets with reference to the UK's decision to leave the EU. Empirical results show that the announcement of the Brexit referendum result led to an immediate increase of the risk premiums in the UK and some other selected European government bond markets. Additionally, there is a considerable change in the importance of the determinants of sovereign bond spreads due to the change in the risk pricing triggered by the Brexit referendum result, particularly in the UK. In the period after the referendum, the credit default risk and risk aversion play much more important roles than they did prior to the vote. The strong importance of credit risk indicates that the Brexit decision had an effect on the creditworthiness of the UK. Hence, a more aggressive fiscal approach, in order to milden the aftermath of Brexit, would have further positive effects on credit risk leading again to higher risk premiums. Therefore, any policy easing decision considered by British government should be temporary and fixed within a credible medium-term fiscal consolidation plan (IMF (2018)).

Furthermore, the positive effect of risk aversion shows that the UK's safe haven status is weakening. Most importantly, a loss of market confidence is deemed to lead to an increase in long-term real interest rates and debt service costs, partly offsetting the stimulus effects of measures taken to deal with the Brexit process and further adding to financing pressures. From this perspective, it is all the more important that the British government would be able to adopt a consistent macroeconomic policy that would help to restore broad confidence on the part of international investors in the UK - particularly in the case of a hard Brexit, where a new downgrade of UK government bonds due to a negative rating outlook by leading rating agencies (such as S&P and Fitch) seems possible. An increase of the risk premium in the sovereign bond market would have additional negative effects on the real economy (Gadatsch (2015)). In order to combat these negative effects, the Bank of England could try to reduce the bank rate and further increase liquidity by implementing conventional and unconventional monetary policy measures alike. However, those measures are only worth considering as long as they would not endanger the Bank's mandate to hit the inflation target.

5.2 Limitations and Future Research

In order to approximate the corporate credit default risk in the analysis presented in chapters 2 and 3, the corresponding CDS premium on government bonds is used due to limited access to corporate CDS data. This step implies that only the indirect impact of default risk - as a consequence of the risk transfer channel from sovereign to corporate - is measured. Recent research in this field has presented strong theoretical and empirical evidence for risk transfer from sovereign to corporate (see, e.g., Gomez-Puig et al. (2019), Augustin et al. (2018) and Bedendo and Colla (2015)). Nonetheless, using sovereign CDS as a proxy for corporate default risk might be misleading and not perfectly sufficient in order to capture the full variation in the corporate CDS markets. Moreover, Breckenfelder and Schwaab (2018) argue that such effects tend to be rather time-, country- and sector-specific, being stronger when a country faces a sharp increase in its expected default risk. In summary, including corporate rather than sovereign CDS would enrich the empirical model and add additional quality to the analysis.

Furthermore, in chapter 2 the impact of the Brexit vote on seven different business sectors, of which three are financial and four are non-financial business sectors, is analysed. Unfortunately, the model provided unstable results; as for analysing business sectors, more specific data at a microeconomic level are required. Nevertheless, it would be of particular interest to understand Brexit-related effects on sectoral risk premiums since changes in relative sectoral financing costs would contribute to shifts in medium-term and long run structural changes. In fact, due to diverse risk conditions in each business sector, and given that different business sectors are influenced by macroeconomic instabilities in different ways, it may be assumed that risk premium response differs across sectors.

Hence, an interesting question would be to what extent business sectors in the UK and the EA corporate bond market are facing higher risk premiums triggered by the Brexit process. In some sectors, there could be a homogenous risk premium development, while other sectors experience a different, more varied, development path. This would depend especially on the analytical results and changing risk perception of international investors. Naturally, country-specific aspects would also play a role due to a different trade intensity between the UK and respective EU member states. It is to be expected that sectors in the UK, which are relatively strongly dependent on trade

intensity between the UK and the EU, will face higher risk premiums than sectors that are less linked with the European single market (Davies and Studnicka (2018)). However, companies in the non-tradeable sectors could also be affected since Brexit is expected to have a rather significant negative effect in the UK and a modestly negative effect in the EU. Estimating the determinants of corporate bond yield spreads in times of market turmoil is of particular interest for companies and investors to illuminate the conditions under which the refinancing of debt is particularly costly and to generate information, if possible, about the variables which should be monitored in future with the intention of possibly reducing refinancing costs. Hence, an advanced detailed analysis of specific business sectors, for example banking, financial services, automobile, ICT etc., would generate further information of particular interest for corresponding companies in the relevant sectors.

The analysis in chapter 4 elaborates on the impact of the Brexit referendum result on risk premiums in the UK and selected EA countries. While nine of the largest EA economies are included in the sample, subsequent research in this field might consider extending the sample of countries in order to meet concerns regarding high heterogeneity of the euro area. The study presented herein focuses on the effects of Brexit in the long-term, namely 10-year government bond markets. Although yields on 10-year sovereign bonds play a key role in the monetary policy transmission process and are generally used as a benchmark for asset pricing purposes, one might consider incorporating additional maturities in the research, for example 2-year and 5-year maturities. This extension could help to better understand the dispersal of Brexit effects over time.

Finally, since an unexpected event (i.e., shock) can have different effects on global and regional financial markets, a newly developed regional risk aversion variable is used in chapter 4 in order to account for investor sentiment. The new variable is calculated as a pure corporate yield spread and has several advantages. The empirical results indicate that using regional rather than international risk aversion might be more appropriate in order to capture investors' risk assessment. Hence, an interesting avenue for further research would be to extend and apply this approach to other countries or currency areas, for example Switzerland or even the United States or China.

The effective implementation of Brexit – read the end of the United Kingdom’s single market membership – in 2020 (or if postponed in 2021) could also be a new focus for future research. Even beyond this historical date, there will be decisions to be reached about the future EU-UK trade relationship and the results of these negotiations could also be analysed with respect to the impact on sectoral risk premiums. One will have to observe how the EU27 countries react in the medium term with respect to the Brexit challenge; small EU countries may possibly decide to increasingly cooperate in order to secure more political weight within the EU. Finally, the role of UK banking FDI in the Eurozone will be interesting to observe.

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