University of Wuppertal
Bergische Universität Wuppertal

Europäische Wirtschaft und Internationale Makroökonomik

Paul J.J. Welfens/Fabian Baier/
Samir Kadiric/Arthur Korus/Tian Xiong

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

Read our papers for more high-quality, independent economic analysis

Presented at a workshop of the Centre for European Policy Studies (CEPS) Brussels (November 5, 2018) **Hard Brexit: Should We Care? -** Economist's Voice Event on Brexit Discussion Paper

Europäische Wirtschaft und Internationale Wirtschaftsbeziehungen
European Economy and International Economic Relations

Paul J.J. Welfens/Fabian Baier/
Samir Kadiric/Arthur Korus/Tian Xiong

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

March 2019

Summary:

Key aspects covered refer to the cost of leaving the EU and in particular the implications for corporate bond risk premiums in the UK and the Eurozone: The gap between the interest rates of corporate bonds and government bonds could increase in the UK and Eurozone, respectively, as a result of BREXIT where the 2016 BREXIT referendum itself is considered to be a first BREXIT event (see the empirical findings), followed by the main BREXIT event, namely the day of officially leaving the EU - possibly as a No-deal BREXIT. It is as yet not clear what type of BREXIT will be implemented – hard versus soft – and it is also unclear what type of free trade agreement the EU and the UK could accomplish post-BREXIT. However, it is obviously necessary to carefully consider the background of the BREXIT dynamics and to then refer to various versions of BREXIT if one is to understand the inherent politico-economic dynamics of BREXIT – with a No-deal case representing an analytical benchmark which most politicians in the British Parliament obviously would want to avoid; a simple way to indeed avoid this case, with obvious high costs for the British economy, is not easy to discern as the UK's political system is fractured. If the safe-haven status of the UK should be impaired by BREXIT, the rise of government bond interest rates by 0.3% would stand for the same burden as the net UK contribution to the EU.

Corresponding Author: Prof. Dr. Paul J.J. Welfens, Jean Monnet Professor for European Economic Integration; Chair for Macroeconomics; President of the European Institute for International Economic Relations at the University of Wuppertal, (Rainer-Gruenter-Str. 21, D-42119 Wuppertal; +49 202 4391371), Alfred Grosser Professorship 2007/08, Sciences Po, Paris; Research Fellow, IZA, Bonn; Non-Resident Senior Fellow at AICGS/Johns Hopkins University, Washington DC

Prof. Welfens has testified before the US Senate, the German Parliament, the EP, the ECB, the IMF, the UN.

welfens@eiiw.uni-wuppertal.de, www.eiiw.eu

Co-Author: Fabian J. Baier M.Sc., Research Assistant at European Institute for International Economic Relations (EIIW) and at Schumpeter School of Business and Economics at the University of Wuppertal, Rainer-Gruenter-Str. 21, 42119 Wuppertal, Germany, baier@eiiw.uni-wuppertal.de

Co-Author : Samir Kadiric, M.B.A., Research Assistant at European Institute for International Economic Relations (EIIW) and at Schumpeter School of Business and Economics at the University of Wuppertal, Rainer-Gruenter-Str. 21, 42119 Wuppertal, Germany, kadiric@eiiw.uni-wuppertal.de

Co-Author : Arthur Korus, Dipl.Ök., Research Assistant at European Institute for International Economic Relations (EIIW) and at Schumpeter School of Business and Economics at the University of Wuppertal, Rainer-Gruenter-Str. 21, 42119 Wuppertal, Germany, korus@eiiw.uni-wuppertal.de

Co-Author : Tian Xiong, M.Sc., Research Assistant at European Institute for International Economic Relations (EIIW) and at Schumpeter School of Business and Economics at the University of Wuppertal, Rainer-Gruenter-Str. 21, 42119 Wuppertal, Germany, xiong@eiiw.uni-wuppertal.de

EIIW 2015 = 20 years of award-winning research

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

EIIW Diskussionsbeitrag 256
EIIW Discussion Paper 256

Presented at the Centre for European Policy Studies
Hard Brexit: Should We Care?
Economist's Voice Event on Brexit
CEPS, Brussels, *5 November 2018*

Table of Contents

List of Figures

List of Tables

1. Introduction

As regards the EU-UK negotiated BREXIT Withdrawal Agreement, Prime Minister May has not obtained a majority in the British Parliament on 15 January 2019 – despite the public support of the British Confederation of Industry and the Bank of England whose analysis has shown that every type of BREXIT means considerable economic losses for the UK (BANK OF ENGLAND, 2018). The Treasury study of 2016 (HM GOVT, 2016) had already suggested that the long run economic loss of a "hard BREXIT" would be around 7% of GDP.

The proposed EU-UK deal envisages a temporary customs union between the EU and the UK; particularly relevant for Northern Ireland and the EU, including such a union as backstop if no technical solution can be found quickly for differentiating between UK imports from non-EU countries and EU countries where the latter would have a free trade area for goods post-BREXIT. Moreover, the UK would pay about £39 billion GBP as an 'exit bill' and give assurances to the three million citizens living in the UK – and the EU would give similar assurances to the one million UK citizens living in the EU so as to reduce the uncertainty of the status of the respective groups.

The likelihood of a No-deal BREXIT entering into force on March 29, 2019, has strongly increased after May lost a vote on approving the Withdrawal Agreement in the Parliament in January by an historic 432 votes to 202. A new Bank of England study of late 2018 has indicated that a hard No-deal BREXIT would bring a medium term real income loss of 10.5% over five years, a peak of unemployment at 7.5% and a peak in the inflation rate of 6.5% which, of course, would mainly reflect the strong depreciation of the British Pound in the context of BREXIT implementation. All this has created heightened uncertainty in the UK that to some extent has been compounded by international impulses:

- The ongoing US-China trade conflict – with President Trump sending contradictory twitter news regarding a potential truce in the Sino-US conflict – generates new uncertainty in world markets and additional volatility in global financial markets.

- It is noteworthy that even in China surveys find that market participants are worried over the BREXIT process (BCC, 2018).

- As regards financial market dynamics, a particular interest concerns the issue of potential rising corporate bond risk premiums; as well as international shifts of cumulated inward portfolio investment inflows owned by foreigners who are likely to relocate about 12% of the stock post-BREXIT (EICHENGREEN, 2019); an enhanced Branson model can explain these portfolio adjustment dynamics (WELFENS, 2019a).

- It is of particular interest to understand the BREXIT-related effects on sectoral risk premiums (non-financials versus industrial sectors and other services sectors) since changes in relative sectoral financing cost will contribute to shifts in medium term and long run structural changes. One may expect that the year of the actual BREXIT implementation will witness similar financial market dynamics as those observed – albeit possibly in a milder form – in the months following the referendum in June 2016.

- For the EU there could also be a considerable cost of BREXIT which to some extent can be explained through the EU27-UK trade links, however, there are additional links that have not been studied extensively, e.g. foreign direct investment effects and associated economic policy impulses. WELFENS/BAIER (2018) have studied the FDI dynamics of BREXIT which raise the issue of a potential downward corporate tax rate spiral in the UK and Western Europe post-BREXIT, respectively.

- There also are legal risks: The European Parliament has commissioned a report on the legal perspectives of a No-deal BREXIT, including the Irish border issue (Appendix 1).

- A major challenge for the UK will be rising risk premiums for corporate bonds, particularly for financials; a BREXIT-related rise of the risk premium for corporate bonds in the banking sector in particular could become a major problem for the UK since this implies an upward shift of the supply curve in the loan market; recalling the insights from the BERNANKE/BLINDER (1988) approach with its useful distinction between the government bond interest rate and the loan interest rate (and the finding that credit growth and output growth are strongly correlated in certain episodes) one would naturally focus on that particular risk premium which might have a macro impact on the economy.

The Treasury study's result for the case of a negotiated UK-EU trade agreement was a long run output loss of 6%; there is an additional 4% loss in the form of not realizing the results of the Cameron government's negotiations with the European Commission in early 2016. 10% income loss from BREXIT should have been mentioned in Cameron's info brochure sent to all households, but it was not (WELFENS, 2017). From this perspective, the 2016 BREXIT referendum in the United Kingdom cannot be deemed as "normal":

- With a 'normal' information policy from the Cameron government in spring 2016 – following the information standards established in the 2014 Scottish independence referendum prior to which the Cameron government informed voters about £1,400 per capita income loss which a vote for independence would entail – the result of an orderly EU referendum would have been 52% for Remain – a result one can calculate using UK popularity functions and the impact of economic growth on the popularity of government, respectively.

- It is also noteworthy that there was a considerable contradiction between the Cameron governments' standard view that EU immigration had been a burden – a claim repeated by the May government in the White Paper of 2017 (HM GOVT, 2017) - while the OECD (2013) has shown that immigration in the UK in fact stood for a positive net revenue effect (see also KIERZENKOWSKI ET AL., 2016); that EU immigration, equivalent to 0.2%-0.3% of population growth per year, could become an important point in the EU referendum was strange and seems to have represented a policy approach that made immigrants into a scapegoat for sharp UK budget cuts after the banking crisis that to a large extent represented national expenditure cuts in the form of massive reductions of transfers to local communities (who was to blame for the underprovision of local services? Many voters who did not understand the fiscal maneuver obviously thought that EU immigrants were the cause, an assumption that successive governments have done little to correct, rather it has been encouraged).

In late 2016, the new May government quickly made it clear that it wanted to proceed with BREXIT but it took until summer 2018 for the government to declare in the so-called Chequers declaration that the UK wants to remain in the customs union for goods with the EU. Without majority support in the British Parliament a No-deal could become reality in 2019.

A No-deal BREXIT is also often dubbed the 'WTO scenario' as the UK would face a post-BREXIT trade regime that would be governed by the UK's membership of the World Trade Organization. Many economic studies on BREXIT have considered several varieties of BREXIT – from soft BREXIT, assuming for example the case of the UK obtaining a far-ranging free trade agreement, to a medium BREXIT setting with the UK remaining linked to the EU through its membership of the European Economic Area (like Norway) to the more extreme case of a hard BREXIT: This extreme case of a WTO BREXIT indeed may be considered to be useful benchmark as is shown in the subsequent Table 1. There is a considerable variation in the estimates.

Table 1:   Selected Estimates of Economic Loss for the UK in the Case of Hard BREXIT (Difference in GDP (in %) from baseline scenario by 2030)

Study	WTO Scenario
Minford et al.	+4
PwC	-3.5
HM Government	-7.5 (-5.4 to -9.5)
NIESR	-3.2 (-2.7 to -3.7)
IMF	-4.5
CPB	-4.1 (-2.7 to -8.7)
Rabobank	-18 to -18.5
Rand	-4.9
E3ME	-3
Bank of England (2018 study*)	-7.5% to -10.5%
EIIW	-15.8

Source: summary from WELFENS/HANRAHAN (2018), p. 7; and BANK OF ENGLAND, 2018 – the time horizon in that study is five years post-BREXIT.

The following analysis looks into forecast revisions of the Office for Budget Responsibility in the UK – looking at figures published prior to the referendum and more recent forecasts – and then we also present new regression results plus policy implications in the context of BREXIT, including a No-deal BREXIT. Postponing the BREXIT day beyond a few months after March 29, 2019, is not assumed here since the European elections in May 2019 would not easily allow an extension beyond late July when the newly elected members of the European Parliament would meet for the first time. There would be legal problems if the UK, still being a member country on March 29, would not have elected MEPs for the UK and yet would be still a member country in August. From this perspective, it seems that a second referendum is also quite an unlikely option to have any realistic chance (as of the writing of this analysis in early February 2019).

2. Forecast Revisions in the UK and Selected Welfare Aspects of BREXIT

It should be noted that the Office for Budget Responsibility's October 2018 Economic and Fiscal Outlook was more optimistic in suggesting modest growth for the United Kingdom in the initial years post-BREXIT (see Figure 1). Such findings may reflect the resilience of the British economy in adjusting and adapting to changing circumstances and/or a more difficult economic environment. One can also note, however, that previous forecasts from the OBR have been revised downwards over time reflecting the impact of BREXIT (WELFENS/HANRAHAN, 2018). Softer BREXIT cases would obviously entail lower costs for the UK due to leaving the European Union but if such rather mild cases should still bring two-thirds or even one half of the cost of a hard BREXIT this still seems to be rather large.

Figure 1:   OBR's 2020 Real GDP Grow Forecast Revision
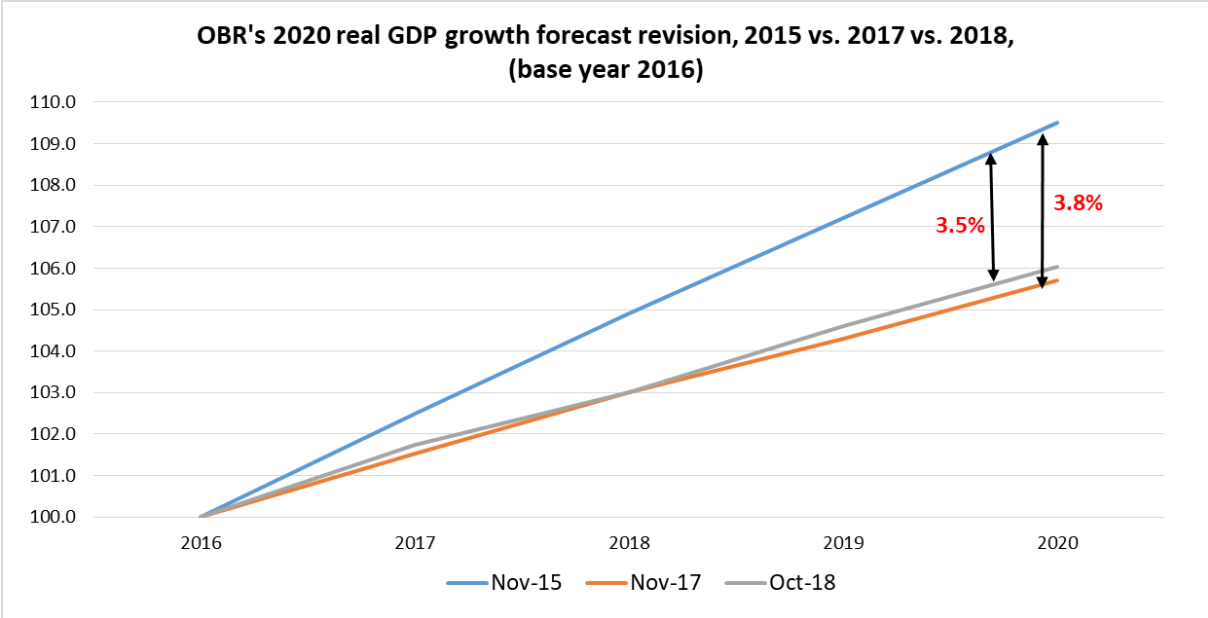
Source: OBR (Nov. 2015, Nov. 2017, Oct. 2018) Economic and Fiscal Outlook

Office for Budget Responsibility Medium-Term GDP Outlook

The OBR forecast of October 2018 did not consider specifically drastic cases of BREXIT such as a No-deal scenario; compared to such a scenario, the medium-term outlook considered is too optimistic. Not considering this case can be criticized as the government itself has declared that such a scenario should not be rule out.

According to the Office for Budget Responsibility (OBR, 2018), it expects GDP growth in 2019 of 1.6 percent, as they considered that the impact of the "discretionary fiscal loosening in this Budget boosts activity" in the coming year (p. 54). The OBR claim the positive effect of the unexpected fiscal loosening will continue but dissipate; therefore, the real GDP growth is expected to fall back to 1.4 percent in 2020 and 2021, and probably

increase again in 2022 (see Figure 1). The authors of the OBR report listed several factors which influence their forecast of real GDP growth in the UK: (1) Discretionary fiscal loosening supports growth. (2) Real household consumption growth is expected to remain relatively subdued in the near term. (3) Brexit-related uncertainty is weighing on investment growth. (4) The positive contribution from net trade seen in recent data declines over the forecast and eventually turns negative, as the effects of the weaker pound and the boost from global demand fade (OBR, 2018, p. 54).

Office for Budget Responsibility Current Account Outlook

From the perspective of the UK's current account, the latest ONS data indicate that the UK had a current account deficit of 3.5 percent of GDP in 2018, the figure is smaller than the 4.1 percent of GDP suggested by the data at the time of the November 2016 forecast (OBR, 2016). However, by comparing the latest OBR forecast (October 2018) with the forecast for the current account deficit in November 2016, it can be see that the latest estimates of the future development in terms of the current account now show the opposite tendency, i.e. current account deficit 0.7 percent lower than the previous prediction in November 2016 between the period of 2019 and 2021. The latest estimates from October 2018 indicate that net investment income is constantly negative over the forecast period (i.e. up to 2023, see Figure 2). This is in sharp contrast to previous expectations in the November 2016 Economic and Fiscal Outlook, in which net investment income was forecast to grow steadily reaching a surplus from 2019. In 2018 forecast, the OBR estimates that the trade deficit is much narrower than the result in 2016 between 2019 and 2021 (in both OBR graphs, the growth of the deficit for the category 'transfers and other' is stable); the net investment is shown to decrease after 2016: From about 3% to about 1% of GDP which is rather surprising if one considers that the Froot-Stein argument of enhanced international mergers & acquisitions post-EU referendum/post-BREXIT suggests a higher future share of foreign investors in the UK capital stock and hence higher UK profits – relative to the UK's GDP – flowing abroad in the future. The UK's current account deficit-GDP ratio is assumed in the OBR forecast to fall over time and to stay at about 3% for several years. This hardly seems to be sustainable as the long run foreign indebtedness to GDP ratio would then move towards 200% if the UK would have a post-BREXIT trend growth rate of 1.5% and a continued current account deficit ratio of 3% (this result follows from as an international analogy from the Domar Rule for debt).

Figure 2:   Current Account Balance as Percentage of GDP (OBR, October 2018)
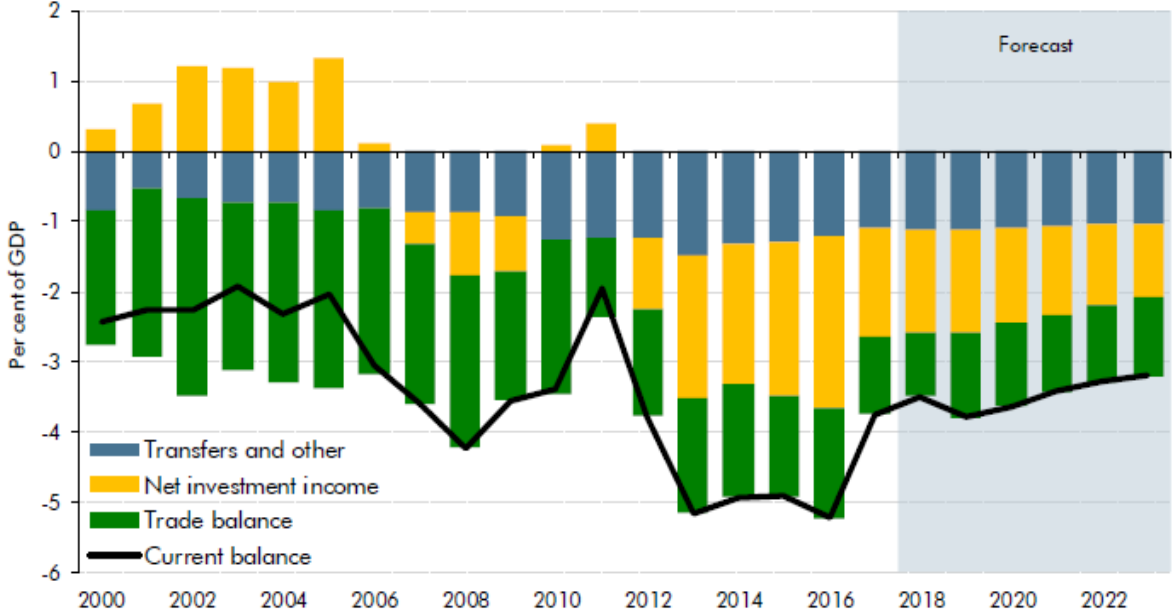
Source: OBR (2018), Economic and Fiscal Outlook, October 2018, Chart 3.29, p. 79

As regards a potential No-deal scenario, it is clear that UK exports to the EU27 would be much weaker than in the OBR analysis. Imports from the EU would also be reduced. However, the decisive point should be that UK firms' European production networks would be undermined considerably which in turn implies weaker global UK export growth: Hence the current account-GDP ratio would be rather high in a No-deal case and this implies a strong medium-term increase of the nominal and real interest rate in the BRANSON model. There also should be a depreciation of the Pound. An integrated macro model can highlight all the core monetary and real effects of BREXIT; both for the UK and for the EU27. However, there were very few simulations published by the UK government and the European Commission, respectively, prior to 2019.

The situation is also particularly strange in the case of the European Systemic Risk Board, established in 2010, which was specifically designed to analyze macro-prudential risk and to make proposals for minimizing such risk. In the critical transition period to BREXIT, this institution – it represents 28 EU countries plus Norway and Iceland with observer status - was mainly conducting research on shadow banking in 2017/18 as the reader can learn from the ESRB's website; and it seems that even prior to the UK's departure, the UK's willingness to cooperate with its partner countries was rather limited. This bodes ill for future regulatory policy cooperation between the EU27 and the UK post-BREXIT:

- All this implies that the prospects for UK's banks to obtain broad regulatory equivalence from the EU are rather modest – as soon as the UK's prudential policy would follow a distinct course and rather follow the US than the EU, little regulatory equivalence might be possible (the UK government could, however, follow US regulation and then argue that it should get the same equivalence status as the US).

- The incentive for the Eurozone to push for financial services to be relocated to the Eurozone and the EU, respectively, will be considerable since otherwise the EU

6

wholesale banking system would be under insufficient control of the ECB and EU supervisory institutions.

It remains to be seen how well post-BREXIT EU-UK cooperation, including cooperation in the G20 and the BIS framework, will be. As regards the stability of banks prior to BREXIT, it is noteworthy that the EBA's banking stress test published in early November 2018 has revealed that several British banks – and German, Spanish and French banks – are rather weak. This suggests that a No-deal case would bring new risks of a banking crisis.

Key Elements of BREXIT

The key elements of BREXIT cost can be summarized through the following main categories:

- There is the output loss in the UK post-BREXIT which could be expected to reach circa 7% of gross domestic product (for this and the following point see HM GOVT, 2016).

- There are the unrealized benefits of Prime Minister Cameron's agreement with the EU from early 2016 which would be realized in the context of EU services markets deepening, including electricity markets and financial markets amongst others. The benefits from this deepening, which would be forgone in the event of BREXIT, is estimated to be an additional 4% of GDP.

- There is the welfare loss from a reduced holding of real money balances which would basically result from the lowering of real income post-BREXIT and hence the reduced demand for real money. This could reach about 6.5% of GDP (WELFENS/XIONG, 2019), while one also has to consider exchange rate aspects and interest rate effects in the context of an enhanced Branson model (WELFENS, 2019a).

- There is also the welfare loss resulting from a lower market share of the UK in the foreign reserves held by central banks worldwide; an assumed 2% reduction of the UK's share in that market amounts to a capitalized loss of 6% of GDP if one assumes a 2% gap between the interest rate paid on reserves held in GBP and the global yield of investment; the capitalization rate used is 3% (WELFENS/XIONG, 2019).

The aggregate total loss could thus amount to 23.5% of GDP in a No-deal setting. Even if only half of these No-deal losses would be realized, this would still be a greater loss than in the two consecutive recession years of the 1930s when the UK's real GDP reduced by 6%. The only advantage of BREXIT compared to the Great Depression is that the expected welfare losses will be spread over more than a decade. As regards the adjustment dynamics, one may point out that BREXIT will deeply affect international portfolio capital inflows as well as foreign direct investment (FDI) inflows plus UK FDI outflows.

EICHENGREEN (2019) shows that a hard BREXIT would mean a reduction of the stock of inward portfolio flows to the UK by 12% and the empirical gravity results of WELFENS/BAIER (2018) imply that leaving the EU will reduce UK FDI inflows by about 30%; however, as a short-term reaction, FDI inflows will positively react to the expected real exchange rate devaluation reflecting the Froot-Stein effect (FROOT/STEIN, 1991) according to which the UK's real devaluation expected in the BREXIT

implementation year of 2019 will stimulate inflows in the form of more international mergers & acquisitions: Firms from abroad have higher equity capital – expressed in Pounds – and thus in imperfect international capital markets will find it easier to finance a leveraged international M&A. A key issue to be considered with respect to capital markets is the question of which sectors in the UK (or in the Eurozone) are negatively affected by BREXIT, namely in the sense that corporate risk premiums are raised by BREXIT. To the extent that the BREXIT expectation – based on the British EU referendum of 2016 – is raising risk premiums in the UK in both financial sectors and in non-financial sectors, the UK's safe haven status could be undermined and those sectors with particularly higher risk premiums might find it difficult to expand at traditional growth rates. A rise of the government interest rate by 0.3% post-BREXIT amounts to a burden for the UK which is the same as the net UK contribution to the EU.

3. Theoretical Perspectives of Capital Market Dynamics in a Post-BREXIT Approach

BREXIT means that the United Kingdom will leave the European Union and the EU single market, respectively, and trade relations between the UK and the EU will be governed by a special cooperation treaty between the UK and the EU and WTO rules. Depending on the exit dynamics of the UK economy, monetary policy will react, for example to fight a recession in the context of a hard BREXIT or primarily to fight the inflationary pressure that would be expected in the context of a depreciation of the Pound. Fiscal policy measures might also be adopted, including changes in tax rates and government expenditure; and a fiscal devaluation – a higher VAT rate and lower social security contributions – could also be considered. The latter could be part of a policy package aimed at improving the UK's current account position: Exports to the EU27 will reduce post-BREXIT due to the reduced single market access on the part of the UK. A higher current account deficit ratio would bring about higher nominal and real interest rates if one takes into account the implications of the BRANSON model; the reaction of the exchange rate is ambiguous in the model, but realistically one should expect a Pound depreciation (WELFENS/XIONG, 2019).

As regards financial services, BREXIT means an end to the existing passporting regime which allowed UK banks largely unfettered access to EU financial markets, so that in many cases City of London banks will have to establish subsidiaries in the EU27 countries – US, Japanese, Chinese and British banks which want to offer services in the Eurozone and the EU27, respectively, will have to relocate certain activities to Ireland or to the continental EU countries unless equivalence agreements between the EU and the UK would allow a rather full continuing of specific service provision to clients in the EU27 from London. Equivalence rules are not a full substitute for passporting rights of a bank, namely the right to serve the whole EU28 market from a location in just one EU country. For the major UK banks which want to invest in the Eurozone and the EU, respectively, competition in the EU wholesale banking market is likely to become more intense and a lack of experience with national regulators in the respective EU host countries also means

new challenges. Thus, the risk premiums on corporate bonds, here namely bank bonds, should go up and this should already be visible after the BREXIT majority at the referendum of June 2016.

Post-BREXIT, banks in the UK are likely to enjoy less regulation and thus could become more innovative in the future. At the same time, banks in the UK will face, at least transitorily, lower profits – partly due to relocation costs and a lower exploitation of economies of scale in London – so that the ability of banks to finance innovations might be restricted in some cases. With the UK leaving the EU, experts expect lower economic growth for many years. This in turn leads one to expect that the UK government will want to lower corporate tax rates and to develop many new policy interventions with the aim of raising growth, at the same time lower tax revenue growth could bring about a changing composition of the major budget lines on the government's expenditure side. Indeed, economic analysis from the British government itself is said to reveal that in the case of a hard BREXIT, the United Kingdom would have to borrow an additional £80 billion per year by 2033/34 compared to a status quo baseline scenario and in the absence of mitigating adjustments (HAMMOND, 2018). On the basis of 2016 UK real gross domestic product, this would stand for circa 4% of GDP. Other reports have suggested the UK would need to borrow an additional £120 billion over the next 15 years- with an estimated £40 billion in gains due to, for example, decreased regulation (including in areas in which the current government has committed to not reducing regulation), this leaves an £80 billion shortfall in public finances (ELGOT/STEWART/WALKER, 2018). Should this be the case, this would have the effect of constraining policy options available to government. From this perspective, there is a more general uncertainty for firms from non-financial sectors and thus risk premiums on non-financial sectors should also have increased after the BREXIT referendum. However, once the uncertainty surrounding future EU-UK trade relations have been eliminated, i.e. via a broad free trade agreement between the European Union and the United Kingdom, risk premiums for non-financial firms could also reduce. As regards the sectoral risk premiums across non-financial sectors, one may expect those sectors that are relatively less dependent on the EU27 market – e.g. the ICT sector which has a rather global orientation – to face lower risk premiums than sectors that are strongly linked with the EU27 single market through European production networks and which are also focused more on EU27 demand, for example the automotive sector.

An interesting question will be to what extent EU27 countries' corporate bonds would also face higher risk premiums post-BREXIT, either through UK-EU27 spillovers or through parallel reactions on the part of international investors – as investors take BREXIT to be an event that justifies special research on sectors and countries in the EU28, in some sectors there could be a parallel, and in others a different, risk premium development in EU27 countries; this should depend on the analytical results and possibly the changing risk perceptions of international investors; naturally, country-specific aspects, for example related to the intensity of trade with the UK, should also play a role. Naturally, these considerations are relevant for firms in the tradables sector of the UK (and possibly of EU27 countries), but companies in the non-tradables sector could also be affected since BREXIT is expected to have a negative macroeconomic effect in the UK (and a modestly negative effect in the EU27). BREXIT-related impacts on financial markets in the Eurozone, Switzerland and the US could be relevant in the context of the response of financial markets and adjustments in the real economy.

From a theoretical perspective, BREXIT should go along with a strong devaluation of the Pound. In the short term, the devaluation will be stronger than in the long run – a familiar exchange rate result (more generally - changes in financial market variables) from models with rational expectations. Moreover, in a Dornbusch-type exchange rate model, monetary policy intervention will also go along with exchange rate overshooting; certain model parameters matter here, particularly the interest elasticity of the demand for money and the learning parameter of expectations adjustment in the case of regressive exchange rate expectations. The latter case should not be disregarded since BREXIT is such a big historical event – with no comparable case in the past 50 years (and bringing more than marginal adjustment) – that rational expectation formation cannot easily be considered to be a realistic setting. Rather regressive expectation formation could stand for economically rational expectations.

In the Dornbusch model (following the simplified approach of GAERTNER, 2001) it is assumed that the expected devaluation rate $d \ln E(e)/dt = \theta(\ln e\# - \ln e)$. Here, θ is an adjustment parameter/"learning coefficient" for the new long run equilibrium exchange rate e#. The smaller the parameter θ is, the slower the change in the exchange rate expectation for a given difference between the long run nominal equilibrium exchange rate e# and the current exchange rate e_t (the time index t is dropped for simplicity) is. A regressive expectation formation could be adequate in the case of a very unusual shock – such as BREXIT; rational expectations, based on a macro model, might not work because there is no model which can analytically integrate the complex step of BREXIT (it should be noted that overshooting could also occur under perfect foresight and in the case of a supply-side shock if -ϕ' + (1-ψ)/δ'<0, but then the interest elasticity does not matter (GAERTNER, 2001, Chapter 2)). The interest parity can be expressed (i is the domestic nominal interest rate and i* is the given foreign interest rate) as

(1) $$i = i* + d \ln E(e)/dt$$

Basic price level dynamics (with P standing for the price level, H is a positive parameter, Y^d is aggregate demand) are covered by a Phillips curve of the following form:

(2) $$d \ln P/dt = H\left(\ln Y^d - \ln Y\right)$$

(3) $$\ln Y^d = \delta'\left(\ln e - \ln P\right) + \psi \ln Y + \ln G$$

Hence

(4) $$\ln P = \ln e + \delta'\ln G - \left((1-\psi)/\delta'\right)\ln Y$$

Money market equilibrium is (with η' denoting the semi-interest elasticity in the demand for money, ϕ' is the income elasticity in the real demand for money)

(5) $$\ln(M/P) = \phi'\ln Y - \eta'i$$

Inserting the interest parity condition along with the exchange rate expectations gives

(6) $$\ln(M/P) = \phi'\ln Y - \eta'i* - \eta'\left(\ln e\# - \ln e\right)$$

This is the curve for the combined monetary and capital market equilibrium which holds at any point of time and thus implies an instantaneous nominal exchange rate adjustment. The

interest elasticity in the demand for money could increase in absolute terms post-BREXIT since BREXIT implies a weaker integration of European bonds markets. If monetary policy follows a Taylor rule the overshooting problem can be avoided.

To the extent that a No-deal BREXIT brings a high rise of UK interest rates, a strong Pound depreciation and a recession, one may anticipate not only the effects in the United Kingdom but there will also be effects in the EU and the Eurozone, respectively:

- If UK output would reduce by 3% in two years of BREXIT-induced recession, output in the EU would be dampened by about 0.5%.

- The EU countries mainly concerned by negative impulses from a UK recession would be Ireland, the Netherlands and Belgium which all have high shares of exports to UK – relative to national GDP. Germany has exports to the Netherlands and Belgium which are a bit higher than to the UK and both the Netherlands and Belgium could face a recession should there be a BREXIT-induced recession in the UK. Italy has faced a modest recession in late 2018, but the country might benefit from post-BREXIT high capital outflows from the UK.

A No-deal case in the UK could happen on March 29, 2019 or a few months later – if the Article 50 procedure is extended by a few months. As regards the EU, there are considerable risks from a No-deal BREXIT:

- the UK would face at least a one year of recession and this would dampen EU27 economic development and global trade;

- the global risk appetite might decline and certainly safe haven capital inflows would increase – this in turn could accelerate deficit financing problems for Italy with its populist government which has adopted an inconsistent fiscal policy in 2018.

One cannot rule out that the UK's political infighting over BREXIT will raise the interest rate on UK government bonds and could undermine the position of the UK as a safe haven; not least if corporate risk premiums should also increase. A rise of 0.3% in the government bond interest rate is equivalent to the net UK government contributions to the EU.

4. Empirical Aspects of BREXIT-Related Risk Premiums in the UK

Since BREXIT represents a critical institutional, economic and political change for the UK and EU, it is of prime importance not only from a corporate finance perspective but also from a policymaker's perspective to understand its impact on capital markets. In this section we study the impact of the BREXIT referendum result on credit spreads in the UK corporate bond market.

We have to emphasize the work by KADIRIC/KORUS (2019) in this field. They study the impact of the BREXIT referendum on corporate bond yield spreads in the UK and Eurozone/Euro Area (EA), respectively, on a daily basis over the period from January 2013 to March 2018. They find a strong statistically significant impact of the BREXIT

referendum on credit spreads in the UK as well as in the EA. Taking 17 different BREXIT-related events (differentiated into bad and good news) into account, they find that only the referendum result itself led to increasing credit spreads suggesting that the UK bond market was more strongly affected than was bond market in the EA. Furthermore, their results indicate that both the financial and non-financial sectors in the UK were highly affected by the announcement of BREXIT referendum result, whereas in the EA only the financial sector was directly influenced by the BREXIT vote. Additionally, their findings indicate that the United Kingdom's safe haven status was weakening and that the role of sovereign credit default risk was playing a much more important role in the post-referendum period. Indeed these two processes could play an important role in the case of a hard BREXIT. S&P and Fitch already downgraded the UK to AA with a negative outlook as a response to the BREXIT vote leaving further downgrades possible due to uncertainty surrounding the outcome of the subsequent UK-EU negotiations. A hard BREXIT would lead to a further slowdown in short-, medium- and long-term GDP growth and pose tremendous challenges considering changes to the legal and regulatory environment. On that account alone, it is realistic to assume that a hard BREXIT would entail further downgrades of the UK by rating agencies.

In our analysis of risk premiums we follow the approach of KADIRIC/KORUS (2019) using daily data over the period between January 1, 2013, and March 30, 2018. We also distinguish between five different maturities, namely 1-3 years, 3-5 years, 5-7 years, 7-10 years and 10+ years. The credit spread in the UK is calculated as the difference between a corporate bond and a government bond yield with the same maturity up to m, for which we use iBoxx indices on corporate and government bonds, provided by IHS Markit. Our approach differs from KADIRIC/KORUS (2019), because we additionally incorporate two rating categories in our analysis (on selected findings of that paper, see Appendix 2 (Table 5)). Speculative grade categories are excluded because data on these bonds were not available and also for most of the AAA rating indices there were considerable data gaps in the time series. We use AA rated bonds as being representative of very good credit quality and BBB rated bonds as representative of lower credit quality, since this is the lowest investment grade category. We apply the ARMA Maximum Likelihood method, using a Gauss-Newton algorithm, estimating the following regression model:

$$(8) \quad \begin{aligned} \Delta CS_{j,r,m,t} &= \alpha + \gamma brexit_t + \beta_1 \Delta ois_{j,t} + \beta_2 \Delta fwdswap_{j,t} + \beta_3 \Delta lrisk_{j,r,t} + \beta_4 \Delta trisk_{j,t} + \beta_5 \Delta cds_{j,t} \\ &+ \beta_6 \Delta stockrtn_{j,t} + \beta_7 \Delta usvix_t + \beta_8 \Delta globav_t + \beta_9 ar(1) + \beta_{10} ma(1) + \varepsilon_t \end{aligned}$$

where $\Delta CS_{j,r,m,t}$ is our dependent variable of interest and represents the daily change of the credit spread in country j, for rating category r and remaining maturity m. The vector $brexit_t$ is an event-dummy which takes the value of one on the day when the referendum result was announced and zero elsewhere. The coefficient of the BREXIT-event dummy should show a positive sign (KADIRIC/KORUS, 2019). By including the three-month OIS rate ($ois_{j,t}$) in the UK, we control for the impact of an increasing risk-free rate and the Bank of England's conventional monetary policies on UK credit spreads. We include a 5-year forward on a 5-year swap rate ($fwdswap_{j,t}$) in the UK in order to control for the impact of investors' expectations about higher future short-term rates and future economic conditions on UK corporate yield spreads. Furthermore, the variable $lrisk_{j,r,t}$ represents

the discounted size of a debt issue and thus controls for the influence of liquidity risk on UK credit spreads. The difference of the 10-year UK benchmark government bond yield and the 2-year UK benchmark government bond yield ($trisk_{j,t}$) captures the impact of the slope of the interest rate term structure on credit spreads. By adding UK government credit default swaps ($cds_{j,t}$) into our regressions we control for the impact of credit default risk on UK corporate bond yield spreads. Moreover, we include the return index of the FTSE 100 ($stockrtn_{j,t}$). This variable should capture the impact of changes in the business climate on credit spreads in the UK. We also control for the impact of global factors on credit by including the US VIX volatility index ($usvix_t$) and the difference between the yield of US BBB corporate bonds and 3-month US Treasury bond yields ($globav_t$). Table 2 summarizes the description of the explanatory variables and gives the expected sign of the correlation between changes in credit spreads and changes in the determining variable. All data were obtained from Datastream with the exception of the global factor variables where the data were obtained from the Federal Reserve Bank of St. Louis.

Table 2:   **Explanatory variables and expected sign**

Variable	Description	Predicted Sign
$\Delta ois_{j,t}$	*Change in risk-free interest rate*	–
$\Delta fwdswap_{j,t}$	*Change in 5 year forward on a 5 year swap rate*	–
$\Delta lrisk_{j,r,t}$	*Change in size of a debt issued*	–
$\Delta trisk_{j,t}$	*Change in 10-year minus 2-year benchmark government bond yield*	–
$\Delta cds_{j,t}$	*Change in credit default swap premium on government bonds*	+
$\Delta stockrtn_{j,t}$	*Change in return on FTSE 100*	–
$\Delta usvix_t$	*Change in implied volatility of S&P 500*	+
$\Delta globav_t$	*Change in US BBB corporate bond index minus 3-month US Treasury bond*	+

Source: KADIRIC/KORUS (2019)

First, we study the impact of the announcement of the BREXIT referendum result on UK corporate bond spreads for the AA indices with a maturity of 1-3 years, 3-5 years, 5-7 years, 7-10 years and 10+ years, respectively. Our benchmark regressions also include the UK three-month OIS rate, the UK five-year-five-year (5y/5y) forward swap rate, the liquidity premium, the slope of the term structure, the CDS premium on UK government bonds with a maturity of up to five years, the return index of the FTSE 100, the volatility index of the S&P 500 index and the global risk aversion variable. The empirical results are reported in Table 3.

Our BREXIT event-dummy has a statistically significant impact on AA corporate bond spreads with a remaining maturity of 3-5 years, 5-7 years and 10+ years. The sign of the coefficient is positive which is in line with our expectation, that BREXIT-related news should lead to increasing credit spreads in the UK. The release of BREXIT-related news should be associated with rising UK corporate yield spreads as market participants expect lower future firm earnings due to BREXIT. We have also checked whether other BREXIT-related events had an impact on AA and BBB credit spreads in the UK. However, our results suggest that only the announcement of the referendum result influenced credit spreads in the UK.

Moreover, we find that the three-month OIS rate negatively affected AA corporate bond spreads with a remaining maturity of 1-3 years, 3-5 years and 5-7 years, respectively. Hence, our empirical results are in line with the credit spread literature (LONGSTAFF/SCHWARTZ, 1995). We also find that the 5y/5y forward swap rate has a highly statistically significant impact on AA corporate bond spreads. Furthermore, our results indicate that the 5y/5y forward swap rate affects AA corporate bond spreads negatively. Our proxy for market liquidity has a highly statistically significant impact on AA credit spreads. The results indicate that our liquidity variable negatively affects AA corporate bond spreads with a maturity of 1-3 years, 3-5 years and 10+ years, and has a positive impact on AA bond spreads with a maturity of 5-7 years and 7-10 years, respectively. The positive impact of the liquidity variable can be partially explained by a "flight-to-liquidity" or "flight-to-quality", since in periods of financial turmoil investors prefer to invest in higher rated bonds which are known to be more liquid (see, e.g., ACHARYA/AMIHUD/BHARATH, 2013; DICK-NIELSEN/FELDHÜTTER/ LANDO, 2012). The slope of the term structure has a statistically significant impact on the credit spread with a remaining maturity of 1-3 years, 3-5 years and 5-7 years. We find that an increase of the slope of the term structure is associated with increasing AA corporate bond yield spreads, which is at odds with theory. Moreover, we find that 5-year sovereign credit default swap spreads have no statistically significant impact on our dependent variables of interest. The return index of the FTSE 100 has a highly significant impact on AA bond spreads and the coefficient shows the predicted sign. Hence, an improvement of the business climate leads to declining credit spreads. Moreover, the US VIX positively effects AA corporate bond spreads with a maturities of 1-3 years, 3-5 years, 5-7 years and 10+ years. The coefficient of the global risk aversion variable has a highly statistically significant impact on the AA corporate bond yield spread with a remaining maturity of 10+ years.

Table 3:   The Impact of the BREXIT Referendum on UK Credit Spreads (Overall Economy), Rating Category AA

Variables	1-3	3-5	5-7	7-10	10+
Constant	-0.0004	-0.0005	-0.0008	-0.0004	-0.0002
	(0.0004)	(0.0008)	(0.0009)	(0.0012)	(0.0006)
Brexit	0.1426	0.1435 ***	0.1909 ***	0.0907	0.1286 ***
	(0.6961)	(0.0466)	(0.0372)	(2.2767)	(0.0178)
UK OIS rate (3M)	-0.1156 **	-0.1248 **	-0.1271 **	-0.0656	0.0029
	(0.0474)	(0.0551)	(0.0574)	(0.1777)	(0.0310)
UK Forward Swap rate (5y/5y)	-0.0632 ***	-0.0738 ***	-0.0459 ***	0.0242	-0.0488 ***
	(0.0086)	(0.0080)	(0.0079)	(0.0313)	(0.0058)
Liquidity premium	-0.0654 ***	-0.0853 ***	0.0099 ***	0.1135 ***	-0.1123 ***
	(0.0041)	(0.0058)	(0.0031)	(0.0039)	(0.0067)
Term risk	0.0407 ***	0.0362 ***	0.0507 ***	0.0085	0.0033
	(0.0124)	(0.0096)	(0.0125)	(0.0518)	(0.0105)
Credit default risk	0.0002	-0.0001	0.0002	-0.0007	0.0001
	(0.0002)	(0.0002)	(0.0003)	(0.0007)	(0.0001)
FTSE 100	-0.3143 ***	-0.2970 ***	-0.374 ***	-0.4122 ***	-0.2334 ***
	(0.0389)	(0.0397)	(0.0392)	(0.1203)	(0.0246)
US VIX	0.0127 **	0.0111 **	0.0097 *	0.0257	0.0135 ***
	(0.0051)	(0.0046)	(0.0051)	(0.0174)	(0.0031)
Global risk aversion	0.0148	-0.0082	-0.0069	0.0191	0.0243 ***
	(0.0106)	(0.0105)	(0.0101)	(0.0372)	(0.0063)
AR(1)	-0.2091	0.9101 ***	0.9143 ***	0.2596	0.9018 ***
	(0.3329)	(0.0343)	(0.0263)	(3.2337)	(0.0255)
MA(1)	0.1329	-0.8175 ***	-0.8050 ***	-0.2499	-0.7660 ***
	(0.3367)	(0.0451)	(0.0376)	(3.2401)	(0.0347)
No. Obs.	1367	1367	1367	1367	1367
R-squared	0.19	0.24	0.28	0.07	0.33
Adjusted R-squared	0.18	0.23	0.27	0.06	0.32

Note: standard errors in parentheses, ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.

Table 4: The Impact of the BREXIT Referendum on UK Credit Spreads (Overall Economy), Rating Category BBB

Variables	1-3	3-5	5-7	7-10	10+
Constant	-0.0012	-0.0014	-0.0015	-0.0012	0.0000
	(0.0012)	(0.0013)	(0.0010)	(0.0011)	(0.0007)
Brexit	0.1970	0.3186 **	0.2371 **	0.2149 ***	0.1835 ***
	(0.2003)	(0.1270)	(0.1194)	(0.0619)	(0.0418)
UK OIS rate (3M)	-0.2676	-0.4421 ***	-0.3257 ***	-0.2424 ***	0.0746 *
	(0.1460)	(0.0898)	(0.1156)	(0.0865)	(0.0445)
UK Forward Swap rate (5y/5y)	-0.3402 ***	-0.1958 ***	-0.2069 ***	-0.1667 ***	-0.1120 ***
	(0.0131)	(0.0129)	(0.0116)	(0.0106)	(0.0088)
Liquidity premium	-1.1114 ***	-0.4635 ***	-0.4472 ***	-0.5494 ***	-0.4950 ***
	(0.0195)	(0.0251)	(0.0132)	(0.0171)	(0.0183)
Term risk	0.2701 ***	-0.0321 **	0.0018	-0.0544 ***	-0.0211 *
	(0.0158)	(0.0152)	(0.0152)	(0.0174)	(0.0128)
Credit default risk	0.0006	0.0007	0.0004	0.0004	0.0002
	(0.0005)	(0.0005)	(0.0004)	(0.0003)	(0.0002)
FTSE 100	-0.5144 ***	-0.5712 ***	-0.5874 ***	-0.5408 ***	-0.3643 ***
	(0.0806)	(0.0729)	(0.0599)	(0.0520)	(0.0371)
US VIX	0.0389 ***	0.0370 ***	0.0321 ***	0.0259 ***	0.0240 ***
	(0.0116)	(0.0096)	(0.0080)	(0.0060)	(0.0046)
Global risk aversion	0.0507 ***	0.0196	0.0145	-0.0072	0.0196 **
	(0.0193)	(0.0179)	(0.0165)	(0.0139)	(0.0096)
AR(1)	0.8992 ***	0.8257 ***	0.7924 ***	0.8681 ***	0.7757 ***
	(0.0337)	(0.0443)	(0.0477)	(0.0239)	(0.0349)
MA(1)	-0.8416 ***	-0.6827 ***	-0.6228 ***	-0.6894 ***	-0.5554 ***
	(0.0442)	(0.0577)	(0.062)	(0.0366)	(0.0446)
No. Obs.	1367	1367	1367	1367	1367
R-squared	0.43	0.42	0.43	0.46	0.42
Adjusted R-squared	0.42	0.41	0.42	0.45	0.41

*Note: standard errors in parentheses, ***, ** and * denote significance at the 1%, 5% and 10% level, respectively.*

Next, we discuss the empirical results for BBB corporate bond spreads in the UK. The results are reported in Table 4. Our results suggest that the announcement of the referendum outcome positively affected BBB corporate bond spreads in the UK. The impact only lacks significance in the case of BBB bonds with a maturity of 1-3 years. Hence, AA and BBB corporate bond spreads were influenced by the BREXIT referendum. Thus our 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.

Furthermore, the three-month OIS rate has a negative impact on BBB corporate bond spreads with a maturity of 3-5 years, 5-7 years and 7-10 years, which is in line with theory. The 5y/5y forward swap rate also negatively influences BBB bond spreads. Moreover, our proxy for market liquidity has a highly statistically significant impact on all dependent variables of interest and the coefficient exhibits the predicted sign. The term spread negatively affects BBB bond spreads with a maturity of 3-5 years, 7-10 years and 10+

years and positively effects BBB corporate bond spreads with a maturity of 1-3 years. Sovereign credit default spreads also have no impact on BBB bond spreads. The return index of the FTSE 100 has a highly statistically significant impact on BBB corporate bond spreads. The sign of the coefficient is also negative which means that positive changes of the business climate are associated with decreasing BBB bond spreads. Furthermore, our results suggest that BBB bond spreads are much strongly affected by the US VIX than AA bond spreads. Higher volatility implies higher uncertainty in financial markets which increases the probability of default (see CAMPBELL/TAKSLER, 2003). This effect is stronger, the lower rating category. The change of the US VIX has a highly statistically significant impact on BBB corporate bond spreads. The coefficient of the US VIX shows the expected positive sign. The global risk aversion variable positively affects BBB bond spreads with a maturity of 1-3 years and 10+ years.

5. Foreign Direct Investment Dynamics: Empirical Findings

In this section, we look at global FDI dynamics and how those are likely to generally change due to BREXIT. As thus far no full member country of the European Union has left the community, changes in terms of FDI dynamics are not straightforward to predict; in order to overcome this challenge, we look at long-term FDI effects when countries join the EU, following STRAATHOF ET AL. (2008), FOURNIER ET AL. (2015) and BRUNO ET AL. (2016). More specifically, we orientate ourselves according to the dyadic fixed gravity model[1] by BRUNO ET AL. (2016) using a Poisson Pseudo Maximum Likelihood (PPML) model as proposed for FDI flow data with many zero flow observations, which became standard in gravity estimations in the past years (see KAREEM ET AL. (2016) for econometric comparisons of the fits of various models).

We use FDI flow data from the OECD for reasons of data quality (see discussion in WELFENS/BAIER, 2018), the bias that the dataset only includes OECD countries and findings can only be reflected on those countries has to be considered. Negative FDI flows are set to zero and missing values are dropped. For further specifications, see WELFENS/BAIER (2018). In order to model a hard BREXIT, we consider the leaving of the European Economic Area (EEA) instead of the leaving of the EU, i.e. we consider the case that the UK will not seek to replicate the status of Norway or Switzerland in terms of their relationship with the EU. Our findings show that a country attracts 42% more FDI inflows in the long term if it participates in the EEA, which is slightly higher than findings in previous studies using EU membership and treating zeroes and negatives differently. We also find that a country which participates in the EEA sends on average 83% more FDI abroad (to EU- and non-EU countries). This is about half of the effect that BRUNO ET AL. (2016) find.

Additionally, we control for the effect of trade openness[2], the average corporate tax rate of the FDI target country (FOLFAS, 2011), the share of the foreign ownership of the national

---

[1] Dyadic fixed effects control for each possible country-pair (direction matters) via fixed effects; additionally, panel is proxied by year fixed effects as PPML cannot be utilized with panel in Stata.
[2] Trade openness defined in a classical way, i.e. Import + Export over GDP.

capital stock[3] and real effective exchange rates to the USD (BARRELL ET AL., 2017). We find a strong correlation between openness and the share of foreign ownership of the capital stock, while the model using only the latter results in a better fit. In order to determine whether trade explains FDI or FDI explains trade, further studies have to examine this issue more closely, using the share of foreign ownership in the capital stock as an explanatory variable, as this was newly introduced by WELFENS/BAIER (2018). Regarding the corporate tax rate, one finds that a decrease of the statutory tax rate of 1 percentage point leads to an increase in FDI inflows of roughly 4 points; the authors find no significant impact of real effective exchange rates on FDI inflows, contradicting the BARRELL/PAIN (1997) argument that a cheap British Pound compared to USD would strongly stimulate brownfield investments due to the decreasing M&A costs of foreign companies.

In order to further analyze the issue of exchange rates and also to make a sectoral FDI split, as well as to tackle the problem that the costs of leaving the EU do not equal the gains of joining, we set up a one-country gravity model where we consider only inflows into the UK, and not global bilateral inflows as suggested by ANDERSON/VAN WINCOOP (2003). In doing so, we lose multilateral resistance, i.e. how the UK is affected by a change in the relationship between the US and GERMANY, but we can make more precise statements about the UK (instead of previous studies who proxy the UK with an average over all EU countries). Bilateral sectoral FDI data does not exist in an internationally aggregated way, therefore we access data of the Bank for International Settlement on bilateral loans and the assets of banks in the foreign banking- and non-banking sector, following BREI/VON PETER (2017) in our treatment of the data. We use quarterly data, but introduce annual average exchange rates as in WELFENS/BAIER (2018); for "leaving the EU" we use a dummy variable which switches on 1 July 2016, expecting that the loans, assets and deposits of banks are more mobile than fixed-asset FDI and will rise quickly with a Pound depreciation (BARRELL/PAIN, 1997) and/or drop quickly with increasing risk and higher (existing or expected) frictions. As control variables, we also introduce whether the UK's interacting partner is a member of the EU27 and/or a member of the Euro Area.

In the basic model we find no aggregated impact of the BREXIT vote on investments in the UK in general, but splitting the sectors reveals increasing investments in the non-banking sector and decreasing investments in the banking sector; whether or not the partner country is an EU27 member only matters when looking at the non-banking sector: EU27 countries invest significantly more in those sectors in the UK than do rest-of-world countries. BAIER/WELFENS (2019) find no significant changes in the investment pattern of UK banks in the EU27, Euro Area and the world.

---

[3] FDI inward stock over capital stock; the variable is lagged by one year to tackle the previously observed endogeneity problem.

6. Economic Policy Conclusions

A No-deal BREXIT would bring a strong long run welfare loss for the UK and also a recession lasting more than a year. The Pound would face a strong nominal and real devaluation, the inflation rate in the UK might reach 3-4 percent within two years. Faced with such challenges, the Bank of England might want to react with two measures:

- A rise of the loan-to-value (LTV) ratio could help to stimulate the volume of loans to firms and private households with projects in the real estate sector so that an expansionary impulse for the construction sector and hence through multiplier effects for the overall economy could result; this macro-prudential reaction would in effect be an expansionary monetary policy in disguise.

- The BoE's interest rate could be reduced at first – to help in fighting the recession - and then be tightened after one or two years post-BREXIT in order to fight the increase of the inflation rate.

The UK government is likely to adopt three measures in the context of BREXIT:

- Reducing the corporate tax rate in order to attract higher FDI inflows, particularly greenfield FDI which would be important for productivity growth and export growth;

- a deregulation of the banking sector in order to attract higher capital inflows into the banking sector and to stimulate the financial services sector as a strategic growth pillar of the UK economy; if the US Administration pursues a parallel deregulation wave, one may anticipate that this means that the seeds of the next Transatlantic Banking Crisis have been planted – with the two globally leading financial centers of New York and London pushing for deregulation, the competitive pressure for banks in the Eurozone will be enormous to also lobby massively for more banking deregulation;

- the adoption of new Free Trade Agreements (FTAs), particularly with the US, Canada, Australia and New Zealand, as well as with China and India. However, with the US undermining the WTO, the UK's 'Global Britain' strategy might look rather complicated.

- The US, in turn, might push for high concessions within the framework of a transatlantic UK-US free trade agreement and since the Trump Administration is undermining the functioning of the World Trade Organization – blocking, for example, the election of judges to the WTO's appellate body so that the WTO dispute settlement mechanism will no longer be effective after 2019 - the UK's Global Britain strategy is rather unconvincing.

A hard BREXIT could create high volatility in European financial markets and indeed could undermine the stability of the Eurozone if the populist Italian government is not capable of finding a compromise with the European Commission in the field of deficit and budget policies.

While the No-deal BREXIT scenario has been discussed by many observers in 2017-2019, this does not seem to be the most likely outcome if one considers the economic logic. The cost for the United Kingdom would be substantial and for EU27 countries and Switzerland this would also bring considerable negative effects – for Switzerland the appreciation of

the Swiss Franc could be quite significant. A No-deal BREXIT would be a very serious challenge for the UK economy and would sour political relations between the UK and the EU for a considerable time.

However, the political situation in the UK is so complex and tense that the opposite scenario, namely the UK halting the BREXIT process through a second referendum with a pro-EU majority, could also happen in early 2019. Such a referendum outcome would almost certainly lead to early elections and could bring a transitory period of political instability.

With Europe facing major adjustment problems after a hard BREXIT, the natural winners will be the US, China and Russia – at least in the field of global power politics. The US could continue to undermine the stability of the EU so that the Trump Administration would anticipate improved prospects for its bilateral approach: The preferred international US policy under President Trump is part of a broadly contradictory economic policy (Welfens, 2019b). At the bottom line, BREXIT is a politically populist UK project of historical dimensions. It takes the UK out of the European Union after more than 45 years, but does not suggest a return to 1973. Many institutional structures of the EU, which the UK itself helped to create, will be devalued through BREXIT and face significant challenges. In the case of a hard BREXIT, the European Union will also need to reassess its budgetary approach in the Multiannual Financial Framework (MFF) and indeed other critical policy fields where continued close EU27 and UK cooperation are required, for example in terms of trade, justice and security.

The number of fields in which new political conflicts between the EU27 and the UK could emerge might strongly increase: Reduced corporate tax rates in the UK and a new deregulation wave in the banking sector will put strong pressure on the EU – all the more so as the US is adopting a parallel policy under the Trump Administration. The EU27 might become more protectionist post-BREXIT since the old group of four free-trade countries, i.e. Germany, the UK, Denmark and the Netherlands, will be losing an influential member that represented almost 20% of EU GDP in 2016. It is noteworthy that the pro-BREXIT majority in the UK in the 2016 referendum caught the EU by surprise and one may also raise the question of why political risk management in Brussels, Berlin, Paris et cetera, has been rather weak for many years.

Capital markets in the OECD area after BREXIT will have a different structure. The role of the UK is likely to weaken and that of the US strengthen – as many US banks will relocate part of their London activities to New York – and that of the Eurozone will also increase; however in an asymmetrical way, since only few countries will benefit strongly through the relocation of City banks' activities to EU27 countries, namely mainly Ireland, France, Germany and the Netherlands.

For those EU countries with rather high dependence on trade, the combination of BREXIT impulses and a protectionist US policy could raise the burden of adjustment considerably. The Trump Administration might want to use BREXIT as a starting point for further EU disintegration and actually seek to actively export populism and protectionism from the US. At the bottom line, EU27 countries face big challenges with regard to institutional reforms where Germany and France have not achieved much in 2018. To the extent that US populism/Trumpism is a structural phenomenon (WELFENS, 2018; 2019b), the

20

international policy challenges for the EU and other countries are much bigger than many observers have argued to date.

References

ACHARYA, V.V.; AMIHUD, Y.; BHARATH, S.T. (2013), Liquidity risk of corporate bond returns: conditional approach, *Journal of Financial Economics*, Vol. 110(2), 358-386.

ANDERSON, J.; VAN WINCOOP, E. (2003), Gravity with Gravitas: A Solution to the Border Puzzle, *American Economic Review*, 93 (1): 170-192.

BAIER, F.; WELFENS, P.J.J. (2019), The UK's banking FDI flows and Total British FDI: a dynamic BREXIT analysis, *International Economics and Economic Policy,* https://doi.org/10.1007/s10368-018-00426-x.

BANK OF ENGLAND (2018), EU withdrawal scenarios and monetary and financial stability - A response to the House of Commons Treasury Committee, November 2018 https://www.bankofengland.co.uk/report/2018/eu-withdrawal-scenarios-and-monetary-and-financial-stability.

BARRELL, R., NAHHAS, A.; HUNTER, J. (2017), Exchange Rates and Bilateral FDI: Gravity Models of Bilateral FDI in High Income Economies, *Economics and Finance Working Paper Series*, Brunel University London, No. 17-07.

BARRELL, R.; PAIN, N. (1997), Foreign Direct Investment, Technological Change, and Economic Growth within Europe, *The Economic Journal*, Vol. 107, 1770-1786.

BERNANKE, B.; BLINDER, A. (1988), Credit, Money, and Aggregate Demand, *American Economic Review*, Amercian Economic Associaition. Vol. 78(2), 435-439.

BREI, M.; VON PETER, G. (2017), The Distance Effect in Banking and Trade, *BIS Working Paper* No. 658.

BRITISH CHAMBER OF COMMERCE IN CHINA (2018), British Business in China – Member Sentiment Survey, 2018/2019, December 2018 https://www.britishchamber.cn/wp-content/uploads/2018/12/181217_BC_Sentiment-Survey_WEB.pdf.

BRUNO, R., ET AL. (2016), Technical Appendix to: 'The Impact of Brexit on Foreign Investment in the UK'. Gravitating Towards Europe: An Econometric Analysis of the FDI effects of EU Membership.

CAMPBELL, J.Y.; TAKSLER, G.B. (2003), Equity Volatility and Corporate Bond Yields, *Journal of Finance*, Vol. 58(6), 2321-2350.

DICK-NIELSEN, J.; FELDHÜTTER, P.; LANDO, D. (2012), Corporate bond liquidity before and after the onset of the subprime crisis, *Journal of Financial Economics*, Vol. 103(3), 471-492.

EICHENGREEN, B. (2019), The International Financial Implications of Brexit, University of California at Berkeley, *International Economics and Economic Policy*, https://doi.org/10.1007/s10368-018-0422-x .

ELGOT, J.; STEWART, H.; WALKER, P. (2018), Hard Brexit would cost public finances £80bn, says secret analysis, The Guardian online edition, Wed 7 February 2018 (18.12 GMT) https://www.theguardian.com/politics/2018/feb/07/brexit-north-east-west-midlands-hardest-secret-analysis accessed 02.11.2018.

FABRINI, F. (2018), The Institutional Condequences of a Hard Brexit, an in-depth study commissioned on behalf of the Committee of Constitutional Affairs, European Parliament: Brussels.

FOLFAS, P. (2011), FDI Between EU Member States: Gravity Model and Taxes, ETSG 2011 conference paper.

FOURNIER, J. ET AL. (2015), Implicit Regulatory Barriers in the EU Single Market: New Empirical Evidence from Gravity Models, *OECD Economics Department Working Papers*, No. 1181, OECD Publishing, Paris 2015.

FROOT, K.; STEIN, J. (1991), Exchange Rates and Foreign Direct Investments, *Quarterly Journal of Economics*, Vol. 106, No. 4, 1191-1217.

GAERTNER, M. (2001), Macroeconomics under Flexible Exchange Rates, Ann Arbor, MI: University of Michigan Press.

HAMMOND, P. (2018), Letter from Chancellor of the Exchequer Philip Hammond to the Rt. Hon. Nicky Morgan MP (House of Commons Treasury Committee), dated 23 August 2018 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/735881/180823_CX_to_Chair_of_TSC_Nicky_Morgan_.pdf.

HM GOVERNMENT (2016), HM Treasury Analysis: the long-term economic impact of EU membership and the alternatives, London, April 2016.

HM GOVERNMENT (2017), The United Kingdom's exit from and new partnership with the European Union, *White Paper*, London, February 2017.

KADIRIC, S.; KORUS, A. (2019), The effects of Brexit on credit spreads: Evidence from UK and Eurozone corporate bond markets, *International Economics and Economic Policy*, https://doi.org/10.1007/s10368-018-00424-z.

KAREEM, F., MARTINEZ-ZARZOSO, I.; BRÜMMER, B. (2016), Fitting the Gravity Model if Zero Trade Flows are Frequent: A Comparison of Estimation Techniques using Africa's Trade Data, *Global Food Discussion Paper* No. 77, Georg-August University Göttingen.

KIERZENKOWSKI, R., ET AL. (2016), The Economic Consequences of Brexit: A Taxing Decision, *OECD Economic Policy Papers*, No. 16, Paris: OECD Publishing.

LONGSTAFF, F.A.; SCHWARTZ, E. (1995), A Simple Approach to Valuing Risky Fixed and Floating Rate Debt, *Journal of Finance*, Vol. 50(3), 789–820.

OBR (2015), Office for Budget Responsibility, Economic and Fiscal Outlook, OBR release November 2015 https://obr.uk/docs/dlm_uploads/EFO_November__2015.pdf.

OBR (2016), Office for Budget Reponsibility, Economic and Fiscal Outlook, OBR release November 2016 http://obr.uk/efo/economic-and-fiscal-outlook-november-2016/.

OBR (2017), Office for Budget Responsibility, Economic and Fiscal Outlook, OBR release November 2017 https://cdn.obr.uk/Nov2017EFOwebversion-2.pdf.

OBR (2018), Office for Budget Responsibility, Economic and Fiscal Outlook, OBR release 29 October 2018 https://cdn.obr.uk/EFO_October-2018.pdf.

OECD (2013), International Migration Outlook, Paris: OECD Publishing.

STRAATHOF, B., ET AL. (2008), The Internal Market and the Dutch Economy. Implications for Trade and Economic Growth, CPB Document No. 168, CPB Den Haag, September 2008.

WELFENS, P.J.J. (2017), An Accidental Brexit: New EU and Transatlantic Economic Perspectives, London: Palgrave Macmillan.

WELFENS, P.J.J. (2018), Explaining Trumpism as a Structural US Problem: New Insights and Transatlantic Plus Global Economic Perspectives, EIIW Discussion Paper No. 253, EIIW at the University of Wuppertal
http://www.eiiw.eu/fileadmin/eiiw/Daten/Publikationen/Gelbe_Reihe/disbei253.pdf

WELFENS, P.J.J. (2019a), Lack of international risk management in Brexit? *International Economics and Economic Policy*, https://doi.org/10.1007/s10368-019-00433-6.

WELFENS, P.J.J. (2019b), The Global Trump – Structural US Populism and Economic Conflicts with Europe & Asia, forthcoming, London: Palgrave

WELFENS, P.J.J.; BAIER, F. (2018), BREXIT and Foreign Direct Investment: Key Issues and New Empirical Findings*, International Journal of Financial Studies*, 2018, 6(2), 46, https://doi.org/10.3390/ijfs6020046.

WELFENS, P.J.J.; HANRAHAN, D. (2018), BREXIT: Key Analytical Issues and Insights from Revised Economic Forecasts, EIIW Discussion Paper No. 235, EIIW at the University of Wuppertal
http://www.eiiw.eu/fileadmin/eiiw/Daten/Publikationen/Gelbe_Reihe/disbei235.pdf

WELFENS, P.J.J.; XIONG, T. (2019), BREXIT perspectives: financial market dynamics, welfare aspects and problems from slower growth, *International Economics and Economic Policy*, https://doi.org/10.1007/s10368-019-00434-5.

Appendix 1: Key Findings of a Legal and Economic Analysis of a Hard BREXIT

Some key findings of an in-depth legal and economic analysis (FABRINI, 2018) which was commissioned by the European Parliament are as follows:

"On the side of trade, the EU could invoke the frontier traffic exception under Article XXIV(3) GATT to declare the whole territory of Northern Ireland as a border region to the EU customs union, thus excluding the need for a customs border. But this solution raises problems and could lead to abuses."

Appendix 2: Selected Findings KADIRIC/KORUS (2019)

Table 5 summarizes the estimation results from KADIRIC/KORUS (2019) for the credit spread indices in the UK and EA corporate bond markets that were not statistically significantly affected by UK vote to leave EU; thus there could be some sectors which are rather robust with respect to BREXIT.

Table 5: **Summary of Estimation Results for Credit Spread Indices in the UK and EA Corporate Bond Markets (maturities as indicated, figures in brackets are standard errors)**

	UK corporate bond market				
	overall economy	economic sector		business sector	
		financials	non-financials	automobiles & parts	chemicals
maturity	1-3 years	3-5 years	1-3 years	all maturities comprised	all maturities comprised
Brexit referendum	0.1881	0.2411	0.1819	0.1681	0.0972
	(1.1164)	(0.1841)	(0.2840)	(0.1919)	(0.9751)

	EA corporate bond market						
	overall economy		economic sector*				business sector
			non-financials				NA
maturity	5-7 years	7-10 yeras	1-3 years	3-5 years	5-7 years	7-10 years	
Brexit referendum	0.0837	0.0718	0.0626	0.0606	0.0626	0.0468	
	(0.0844)	(0.2112)	(0.0795)	(0.0584)	(0.1108)	(0.1422)	

Source: KADIRIC/KORUS (2019)

UK

- Besides automobile and chemicals, two non-financial business sectors were affected by the UK vote to leave the EU, namely industrial goods & services and utilities. All three financial business sectors in the UK (banks, financial services and insurance) were also affected by the BREXIT referendum result.

Euro Area (EA)*

- All five maturities (including > 10 years) in the financial economic sector in the EA were affected by the BREXIT referendum result.

EIIW Diskussionsbeiträge
EIIW Discussion Papers

Die Zusammenfassungen der Beiträge finden Sie im Internet unter:
The abstracts of the publications can be found in the internet under:

http://www.eiiw.eu

No. 178 **Perret J.K.:** A Core-Periphery Pattern in Russia – Twin Peaks or a Rat´s Tail, December 2010

No. 179 **Welfens P.J.J.:** New Open Economy Policy Perspectives: Modified Golden Rule and Hybrid Welfare, December 2010

No. 180 **Welfens P.J.J.:** European and Global Reform Requirements for Overcoming the Banking Crisis, December 2010

No. 181 **Szanyi, M.:** Industrial Clusters: Concepts and Empirical Evidence from East-Central Europe, December 2010

No. 182 **Szalavetz, A.:** The Hungarian automotive sector – a comparative CEE perspective with special emphasis on structural change, December 2010

No. 183 **Welfens, P.J.J.; Perret, K.J.; Erdem, D.:** The Hungarian ICT sector – a comparative CEE perspective with special emphasis on structural change, December 2010

No. 184 **Lengyel, B.:** Regional clustering tendencies of the Hungarian automotive and ICT industries in the first half of the 2000's, December 2010

No. 185 **Schröder, C.:** Regionale und unternehmensspezifische Faktoren einer hohen Wachstumsdynamik von IKT Unternehmen in Deutschland; Dezember 2010

No. 186 **Emons, O.:** Innovation and Specialization Dynamics in the European Automotive Sector: Comparative Analysis of Cooperation & Application Network, October 2010

No. 187 **Welfens, P.J.J.:** The Twin Crisis: From the Transatlantic Banking Crisis to the Euro Crisis? January 2011

No. 188 **Welfens, P.J.J.:** Green ICT Dynamics: Key Issues and Findings for Germany, March 2012

No. 189 **Erdem, D.:** Foreign Direct Investments, Energy Efficiency and Innovation Dynamics, July 2011

No. 190 **Welfens, P.J.J.:** Atomstromkosten und -risiken: Haftpflichtfragen und Optionen rationaler Wirtschaftspolitik, Mai 2011

No. 191 **Welfens, P.J.J.:** Towards a Euro Fiscal Union: Reinforced Fiscal and Macroeconomic Coordination and Surveillance is Not Enough, January 2012

No. 192 **Irawan, T.:** ICT and economic development: Conclusion from IO Analysis for Selected ASEAN Member States, November 2013

No. 193 **Welfens, P.J.J.; Perret, J.:** Information & Communication Technology and True Real GDP: Economic Analysis and Findings for Selected Countries, February 2014

No. 194 **Schröder, C.:** Dynamics of ICT Cooperation Networks in Selected German ICT Clusters, August 2013

No. 195 **Welfens, P.J.J.; Jungmittag, A.:** Telecommunications Dynamics, Output and Employment, September 2013

No. 196 **Feiguine, G.; Solojova, J.:** ICT Investment and Internationalization of the Russian Economy, September 2013

No. 197 **Kubielas, S.; Olender-Skorek, M.:** ICT Modernization in Central and Eastern Europe, May 2014 Trade and Foreign Direct Investment New Theoretical Approach and Empirical Findings for US Exports & European Exports

No. 198 **Feiguine, G.; Solovjova, J.:** Significance of Foreign Direct Investment for the Development of Russian ICT sector, May 2014

No. 199 **Feiguine, G.; Solovjova, J.:** ICT Modernization and Globalization: Russian Perspectives, February 2012

No. 200 **Syraya, O.:** Mobile Telecommunications and Digital Innovations, May 2014

No. 201 **Tan, A.:** Harnessing the Power if ICT and Innovation Case Study Singapore, March 2014

No. 202 **Udalov, V.:** Political-Economic Aspects of Renewable Energy: Voting on the Level of Renewable Energy Support, November 2014

No. 203 **Welfens, P.J.J.:** Overcoming the EU Crisis and Prospects for a Political Union, March 2014

No. 204 **Welfens, P.J.J.; Irawan, T.:** Trade and Foreign Direct Investment: New Theoretical Approach and Empirical Findings for US Exports and European Exports, November 2014

No. 205 **Welfens, P.J.J.:** Competition in Telecommunications and Internet Services: Problems with Asymmetric Regulations, December 2014

No. 206 **Welfens, P.J.J.:** Innovation, Inequality and a Golden Rule for Growth in an Economy with Cobb-Douglas Function and an R&D Sector

No. 207 **Jens K. Perret.:** Comments on the Impact of Knowledge on Economic Growth across the Regions of the Russian Federation

No. 208 **Welfens, P.J.J.; Irawan T.:** European Innovations Dynamics and US Economic Impact: Theory and Empirical Analysis, June 2015

No. 209 **Welfens, P.J.J.:** Transatlantisches Freihandelsabkommen EU-USA: Befunde zu den TTIP-Vorteilen und Anmerkungen zur TTIP-Debatte, Juni 2015

No. 210 **Welfens, P.J.J.:** Overcoming the Euro Crisis and Prospects for a Political Union, July 2015

No. 211 **Welfens, P.J.J.:** Schumpeterian Macroeconomic Production Function for Open Economies: A New Endogenous Knowledge and Output Analysis, January 2016

No. 212 **Jungmittag, A.; Welfens, P.J.J.:** Beyond EU-US Trade Dynamics: TTIP Effects Related to Foreign Direct Investment and Innovation, February 2016

No. 213 **Welfens, P.J.J.:** Misleading TTIP analysis in the 6th/7th May 2016 issue of DER SPIEGEL, May 2016

No. 214 **Welfens, P.J.J.:** TTIP-Fehlanalyse im SPIEGEL Heft 6. Mai 2016, Mai 2016

No. 215 **Welfens, P.J.J.; Irawan, T.; Perret, J.K.:** True Investment-GDP Ratio in a World Economy with Investment in Information & Communication Technology, June 2016

No. 216 **Welfens, P.J.J.:** EU-Osterweiterung: Anpassungsprozesse, Binnenmarktdynamik und Euro-Perspektiven, August 2016

No. 217 **Perret, J.K.:** A Spatial Knowledge Production Function Approach for the Regions of the Russian Federation, June 2016

No. 218 **Korus, A.:** Currency Overvaluation and R&D Spending, September 2016

No. 219 **Welfens, P.J.J.:** Cameron's Information Disaster in the Referendum of 2016: An Exit from Brexit? September 2016

No. 220 **Welfens, P.J.J.:** Qualitätswettbewerb, Produktinnovationen und Schumpetersche Prozesse in internationalen Märkten, October 2016

No. 221 **Jungmittag, A.:** Techno-Globalisierung, October 2016

No. 222 **Dachs, B.:** Techno-Globalisierung als Motor des Aufholprozesses im österreichischen Innovationssystem, October 2016

No. 223 **Perret, J.K.:** Strukturwandel in der Europäischen Union am Beispiel ausgewählter Leitmärkte mit besonderem Bezug auf die Innovationstätigkeit der Mitgliedsländer, October 2016

No. 224 **Irawan, T.; Welfens, P.J.J.:** ICT Dynamics and Regional Trade Bias in Asia: Theory and Empirical Aspects, October 2016

No. 225 **Korus, A.:** Erneuerbare Energien und Leitmärkte in der EU und Deutschland, October 2016

No. 226 **Dachs, B.; Budde, B.:** Fallstudie Nachhaltiges Bauen und Lead Markets in Österreich, October 2016

No. 227 **Welfens, P.J.J.:** eHealth: Grundlagen der Digitalen Gesundheitswirtschaft und Leitmarktperspektiven, October 2016

No. 228 **Korus, A.:** Innovationsorientierte öffentliche Beschaffung und Leitmärkte: Politische Initiativen in der EU, October 2016

No. 230 **Nan, Yu:** Innovation of renewable energy generation technologies at a regional level in China: A study based on patent data analysis, December 2016

No. 231 **Welfens, P.J.J; Debes, C.:** Globale Nachhaltigkeit 2017: Ergebnisse zum EIIW-vita Nachhaltigkeitsindikator, März 2018

No. 232 **Welfens, P.J.J.:** Negative Welfare Effects from Enhanced International M&As in the Post-BREXIT-Referendum UK, April 2017

No. 233 **Udalov, V.; Welfens, P.J.J.:** Digital and Competing Information Sources: Impact on Environmental Concern und Prospects for Cooperation, April 2017

No. 234 **Welfens, P.J.J.:** The True Cost of BREXIT for the UK: A Research Note, October 2017

No. 235 **Welfens, P.J.J.; Hanrahan, D.:** BREXIT: Key Analytical Issues and Insights from Revised Economic Forecasts, January 2018

No. 236 **Welfens, P.J.J.:** Techno-Globalisierung, Leitmärkte und Strukturwandel in wirtschaftspolitischer Sicht, August 2017

No. 238 **Welfens, P.J.J.:** Foreign Financial Deregulation under Flexible and Fixed Exchange Rates, June 2017

No. 239 **Welfens, P.J.J.; Kadiric, S.:** Neuere Finanzmarktaspekte von Bankenkrise, QE-Politik und EU-Bankenaufsicht, July 2017

No. 240 **Welfens, P.J.J.; Hanrahan, D.:** The BREXIT Dynamics: British and EU27 Challenges after the EU Referendum, May 2017

No. 241 **Welfens, P.J.J.; Baier, F.:** BREXIT and FDI: Key Issues and New Empirical Findings, January 2018

No. 242 **Welfens, P.J.J.:** International Risk Management in BREXIT and Policy Options, March 2018

No. 243 **Korus, A.; Celebi, K.:** The Impact of Brexit on the British Pound/Euro Exchange rate The Impact of Brexit on the British Pound/Euro Exchange rate, April 2018

No. 244 **Welfens, P.J.J.; Yushkova, E.:** IKT-Sektor in China und Wirtschaftsbeziehungen zu Deutschland, April 2018

No. 245 **Udalov, V.:** Analysis of Individual Renewable Energy Support: An Enhanced Model, June 2018

No. 246 **Welfens, P.J.J.:** Lack of International Risk Management in BREXIT? July 18 2018

No. 247 **Xiong, T.; Welfens, P.J.J.:** The Effects of Foreign Direct Investment on Regional Innovation Capacity in China, June 2018

No. 248 **Welfens, P.J.J.:** New Marshall-Lerner Conditions for an Economy with Outward and Two-Way Foreign Direct Investment, July 2018, Updated February 2019

No. 249 **Welfens, P.J.J.; Xiong, T.:** BREXIT Perspectives: Financial Market Dynamics, Welfare Aspects and Problems from Slower Growth, September 2018

No. 250 **Welfens, P.J.J.; Udalov, V.:** International Inequality Dynamics: Issues and Evidence of a Redistribution Kuznets Curve, September 2018

No. 251 **Kadiric, S.; Korus, A.:** The Effects of Brexit on Corporate Yield Spreads: Evidence from UK and Eurozone Corporate Bond Markets, September 2018

No. 252 **Welfens, P.J.J.:** Import Tariffs, Foreign Direct Investment and Innovation: A New View on Growth and Protectionism, December 2018

No. 253 **Welfens, P.J.J.:** Explaining Trumpism as a Structural US Problem: New Insights and Transatlantic Plus Global Economic Perspectives, October 2018

No. 254 **Baier, F.J.; Welfens, P.J.J.:** The UK's Banking FDI Flows and Total British FDI: A Dynamic BREXIT Analysis, November 2018

No. 255 **Welfens, P.J.J.; Yu, N.; Hanrahan, D.; Schmuelling, B; Fechtner, H.:** Electrical Bus Mobility in the EU and China: Technological, Ecological and Economic Policy Perspectives, December 2018

Weitere Beiträge von Interesse:

Titels of related interest:

Paul J.J. Welfens (2017), Macro Innovation Dynamics and the Golden Age, New Insights into Schumpeterian Dynamics, Inequality and Economic Growth, Springer Heidelberg

Paul J.J. Welfens (Nov. 2016), Brexit aus Versehen: Europäische Union zwischen Desintegration und neuer EU, Springer Heidelberg

Paul J.J. Welfens; Jens K. Perret; Tony Irawan; Evgeniya Yushkova (2015), Towards Global Sustainability, Springer Berlin Heidelberg

Paul J.J. Welfens; A. Korus; T. Irawan (2014), Transatlantisches Handels- und Investitionsabkommen: Handels-, Wachstums- und industrielle Beschäftigungsdynamik in Deutschland, den USA und Europa**,** Lucius & Lucius Stuttgart

Paul J.J. Welfens (2013), Grundlagen der Wirtschaftspolitik, 5. Auflage, Springer Berlin Heidelberg

Paul J.J. Welfens (2013), Social Security and Economic Globalization, Springer Berlin Heidelberg

Paul J.J. Welfens (2012), Clusters in Automotive and Information & Communication Technology, Springer Berlin Heidelberg

Paul J.J. Welfens (2011), Innovations in Macroeconomics, 3rd revised and enlarged edition, Springer Berlin Heidelberg

Paul J.J. Welfens (2011), Zukunftsfähige Wirtschaftspolitik für Deutschland und Europa, Springer Berlin Heidelberg

Paul J.J. Welfens; Cillian Ryan, eds. (2011), Financial Market Integration and Growth, Springer Berlin Heidelberg

Raimund Bleischwitz; Paul J.J. Welfens; Zhong Xiang Zhang (2011), International Economics of Resource Efficiency, Physica-Verlag Heidelberg

Paul J.J. Welfens; John T. Addison (2009), Innovation, Employment and Growth Policy Issues in the EU and the US, Springer Berlin Heidelberg

Paul J.J. Welfens; Suthiphand Chirathivat; Franz Knipping (2009), EU – ASEAN, Springer Berlin Heidelberg

Paul J.J. Welfens; Ellen Walther-Klaus (2008), Digital Excellence, Springer Berlin Heidelberg

Huub Meijers; Bernhard Dachs; Paul J.J. Welfens (2008), Internationalisation of European ICT Activities, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens; Michael Heise (2007), 50 Years of EU Economic Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Mathias Weske (2007), Digital Economic Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Franz Knipping; Suthiphand Chirathivat (2006), Integration in Asia and Europe, Springer Berlin Heidelberg

Edward M. Graham; Nina Oding; Paul J.J. Welfens (2005), Internationalization and Economic Policy Reforms in Transition Countries, Springer Berlin Heidelberg

Paul J.J. Welfens; Anna Wziatek-Kubiak (2005), Structural Change and Exchange Rate Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; Peter Zoche; Andre Jungmittag; Bernd Beckert; Martina Joisten (2005), Internetwirtschaft 2010, Physica-Verlag Heidelberg

Evgeny Gavrilenkov; Paul J.J. Welfens; Ralf Wiegert (2004), Economic Opening Up and Growth in Russia, Springer Berlin Heidelberg

John T. Addison; Paul J.J. Welfens (2003), Labor Markets and Social Security, Springer Berlin Heidelberg

Timothy Lane; Nina Oding; Paul J.J. Welfens (2003), Real and Financial Economic Dynamics in Russia and Eastern Europe, Springer Berlin Heidelberg

Claude E. Barfield; Günter S. Heiduk; Paul J.J. Welfens (2003), Internet, Economic Growth and Globalization, Springer Berlin Heidelberg

Thomas Gries; Andre Jungmittag; Paul J.J. Welfens (2003), Neue Wachstums- und Innovationspolitik in Deutschland und Europa, Physica-Verlag Heidelberg

Hermann-Josef Bunte; Paul J.J. Welfens (2002), Wettbewerbsdynamik und Marktabgrenzung auf Telekommunikationsmärkten, Springer Berlin Heidelberg

Paul J.J. Welfens; Ralf Wiegert (2002), Transformationskrise und neue Wirtschaftsreformen in Russland, Physica-Verlag Heidelberg

Paul J.J. Welfens; Andre Jungmittag (2002), Internet, Telekomliberalisierung und Wirtschaftswachstum, Springer Berlin Heidelberg

Paul J.J. Welfens (2002), Interneteconomics.net, Springer Berlin Heidelberg

David B. Audretsch; Paul J.J. Welfens (2002), The New Economy and Economic Growth in Europe and the US, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), European Monetary Union and Exchange Rate Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), Internationalization of the Economy and Environmental Policy Options, Springer Berlin Heidelberg

Paul J.J. Welfens (2001), Stabilizing and Integrating the Balkans, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens (2000), Economic Globalization, International Organizations and Crisis Management, Springer Berlin Heidelberg

Paul J.J. Welfens; Evgeny Gavrilenkov (2000), Restructuring, Stabilizing and Modernizing the New Russia, Springer Berlin Heidelberg

Paul J.J. Welfens; Klaus Gloede; Hans Gerhard Strohe; Dieter Wagner (1999), Systemtransformation in Deutschland und Rußland, Physica-Verlag Heidelberg

Paul J.J. Welfens; Cornelius Graack (1999), Technologieorientierte Unternehmensgründungen und Mittelstandspolitik in Europa, Physica-Verlag Heidelberg

Paul J.J. Welfens; George Yarrow; Ruslan Grinberg; Cornelius Graack (1999), Towards Competition in Network Industries, Springer Berlin Heidelberg

Paul J.J. Welfens (1999), Globalization of the Economy, Unemployment and Innovation, Springer Berlin Heidelberg

Paul J.J. Welfens (1999), EU Eastern Enlargement and the Russian Transformation Crisis, Springer Berlin Heidelberg

Paul J.J. Welfens; S. Jungbluth; H. Meyer; John T. Addison; David B. Audretsch; Thomas Gries; Hariolf Grupp (1999), Globalization, Economic Growth and Innovation Dynamics, Springer Berlin Heidelberg

Paul J.J. Welfens; David B. Audretsch; John T. Addison; Hariolf Grupp (1998), Technological Competition, Employment and Innovation Policies in OECD Countries, Springer Berlin Heidelberg

John T. Addison; Paul J.J. Welfens (1998), Labor Markets and Social Security, Springer Berlin Heidelberg

Axel Börsch-Supan; Jürgen von Hagen; Paul J.J. Welfens (1997), Wirtschaftspolitik und Weltwirtschaft, Springer Berlin Heidelberg

Paul J.J. Welfens; George Yarrow (1997), Telecommunications and Energy in Systemic Transformation, Springer Berlin Heidelberg

Jürgen v. Hagen; Paul J.J. Welfens; Axel Börsch-Supan (1997), Springers Handbuch der Volkswirtschaftslehre 2, Springer Berlin Heidelberg

Paul J.J. Welfens; Holger C. Wolf (1997), Banking, International Capital Flows and Growth in Europe, Springer Berlin Heidelberg

Paul J.J. Welfens (1997), European Monetary Union, Springer Berlin Heidelberg

Richard Tilly; Paul J.J. Welfens (1996), European Economic Integration as a Challenge to Industry and Government, Springer Berlin Heidelberg

Jürgen v. Hagen; Axel Börsch-Supan; Paul J.J. Welfens (1996), Springers Handbuch der Volkswirtschaftslehre 1, Springer Berlin Heidelberg

Paul J.J. Welfens (1996), Economic Aspects of German Unification, Springer Berlin Heidelberg

Paul J.J. Welfens; Cornelius Graack (1996), Telekommunikationswirtschaft, Springer Berlin Heidelberg

Paul J.J. Welfens (1996), European Monetary Integration, Springer Berlin Heidelberg

Michael W. Klein; Paul J.J. Welfens (1992), Multinationals in the New Europe and Global Trade, Springer Berlin Heidelberg

Paul J.J. Welfens (1992), Economic Aspects of German Unification, Springer Berlin Heidelberg

Paul J.J. Welfens (1992), Market-oriented Systemic Transformations in Eastern Europe, Springer Berlin Heidelberg

Paul J.J. Welfens (1990), Internationalisierung von Wirtschaft und Wirtschaftspolitik, Springer Berlin Heidelberg

Paul J.J. Welfens; Leszek Balcerowicz (1988), Innovationsdynamik im Systemvergleich, Physica-Verlag Heidelberg