

Irish construction cross border trade and Brexit: Practitioner perceptions on the periphery of Europe

Tara Brooks, Lloyd Scott, John P. Spillane & Katy Hayward

To cite this article: Tara Brooks, Lloyd Scott, John P. Spillane & Katy Hayward (2020) Irish construction cross border trade and Brexit: Practitioner perceptions on the periphery of Europe, Construction Management and Economics, 38:1, 71-90, DOI: [10.1080/01446193.2019.1679382](https://doi.org/10.1080/01446193.2019.1679382)

To link to this article: <https://doi.org/10.1080/01446193.2019.1679382>



© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 24 Oct 2019.



Submit your article to this journal [↗](#)



Article views: 665




View related articles [↗](#)



View Crossmark data [↗](#)

Irish construction cross border trade and Brexit: Practitioner perceptions on the periphery of Europe

Tara Brooks^a , Lloyd Scott^b, John P. Spillane^c and Katy Hayward^d

^aSchool of the Natural and Built Environment, Queens University Belfast, Belfast, UK; ^bCollege of Engineering and Built, Environment Technological University Dublin, Dublin, Ireland; ^cSchool of Engineering, University of Limerick, Limerick, Ireland; ^dSchool of Social Sciences, Education and Social Work, Queen's University Belfast, Belfast, UK

ABSTRACT

The United Kingdom (UK) Brexit vote of June 2016 has created unprecedented uncertainty in the construction industry in Ireland but little research to date has been undertaken on existing construction trading patterns and the potential effects of regulatory divergence and other non-tariff barriers in Ireland in this context. In response, this study uses mixed methods to fill this gap in knowledge. The experience of nine construction industry interviewees is probed – five based in Northern Ireland (in the UK) and four from Ireland, which will remain in the EU after the UK leaves. The researchers' analysis of the qualitative data generated themes which were tested through investigation of the 101 eligible responses gathered through an online questionnaire. Our findings demonstrate that the construction trade in Ireland is highly mobile, currently trading extensively North – South and East – West. The physical barrier of the Irish Sea is less of a hindrance to trade than the regulatory barrier of the Irish border. Trade from peripheral areas is drawn to economic centres in Dublin and GB. In the view of the respondents, Brexit will impose further non-tariff barriers, although it is difficult to predict and plan for these barriers.

ARTICLE HISTORY

Received 30 November 2018
Accepted 7 October 2019

KEYWORDS

Brexit; construction; Ireland; cross-border trade; uncertainty

Introduction

On 23rd June 2016, 51.9% of the UK voting electorate decided to leave the European Union (EU). Northern Ireland, however, was one of the most pro-European Union areas of the UK, with a 56% vote in favour of retaining EU membership. Since the referendum, the Irish land border has assumed a large role in negotiation of the withdrawal accord between the UK government and the EU. At the time of writing, the negotiations regarding the withdrawal agreement and the accompanying political declaration continue, between the UK and the EU, and internally within the UK government. The prolongation of negotiations indicates the complexity of the task undertaken, where a decades long trading relationship between the UK and EU within a common, single market is to be unpicked and replaced with a looser arrangement which should permit the UK to pursue its own multilateral and bilateral worldwide trading arrangements, whilst containing sufficient alignment between the North and South of Ireland that checks at the land border are not required.

Even the term 'Brexit' is malleable and open to interpretation depending on one's identity and

understanding of geopolitics and trade (Adler-Nissen *et al.* 2017). However, regardless of the form of Brexit adopted, unless article 50 is revoked, any form of Brexit will entail a change to existing political, commercial and legal relationships between Ireland, North and South, and Great Britain, erecting potential barriers to North – South and East – West cross border trade (de Mars *et al.* 2016) when detailed trading arrangements and the future trading relationship are determined. Reaching agreement on a Brexit 'divorce deal' will not put an end to negotiations; a post Brexit free trade agreement must be negotiated after the UK leaves the EU. To quote the Irish Taoiseach Leo Varadkar when he met UK Prime Minister Boris Johnston on the 9th September 2019 "... the story of Brexit won't end if the United Kingdom leaves the EU on the 31st October, or even the 31st January ... we'll just move on to a new phase."

The risks and challenges of Brexit to the Irish land border region are evident, thanks to the importance of cross-border trade and the movement of labour and supply chains across it (Doherty *et al.* 2017). At present, construction employees cross the 500 km wide Irish land border freely, part of the 30,000 people

CONTACT Tara Brooks  t.brooks@qub.ac.uk  School of the Natural and Built Environment, Queens University Belfast, Belfast, UK.

© 2019 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivatives License (<http://creativecommons.org/licenses/by-nc-nd/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited, and is not altered, transformed, or built upon in any way.

who do so daily (NIAC 2018). Businesses trade across the land border; two-thirds of cross-border trade involves supply chain activities and there are over 1 million cross-border deliveries per year (NISRA 2018). In addition to its importance to trade, the open land border holds a symbolic place in the peace process (Durrant and Stojanovic, 2018).

Irish Cross-border cooperation has been credited as making a vital contribution to building prosperity and peace on the island of Ireland, particularly in the under-developed border region (Hayward and Magennis 2014). Cooperation between companies also reaps other benefits towards development, such as knowledge exchange and increased innovation (Roper 2006). This is not to say that the Irish land border does not act as a fault line dividing the economies of the North and South of Ireland in economic terms; it separates the more dynamic South, the Republic of Ireland from Northern Ireland (de Mars *et al.* 2016). The Northern economy has growth levels which lag behind those of the more dynamic south (Hayward and Magennis 2014). In 2003, public spending was 67% of GDP in the North, compared to 34.5% in the South (CSO 2003). Although many of the assumptions in Hubner's 2015 paper 'modelling Irish reunification' have been challenged as overly optimistic, its characterisation of the North as "inward orientated...[with] a small private sector, and an over-reliance on the public sector" (Hübner and van Nieuwkoop 2015, p. 3) concurs with the majority view.

Given the relative importance of construction to the health of Ireland's finances and the uncertainty regarding the outworking of Brexit, there has been little peer reviewed research regarding the potential impact of Brexit on this vital part of the Island's economy. PWC and the Republic of Ireland's Construction Industry Federation (CIF) published a survey of Southern Irish construction companies' Brexit preparedness in March 2019, the results of which have been used to complement this research where appropriate; however, the survey only covers the South of Ireland and has been used with caution as the robustness of the survey method cannot be verified from the published description. The guidance given in the 'Trading with the EU if there's no Brexit deal' technical notice to organisations which trade across the border is to contact the Irish Government for advice (HM Revenue and Customs 2018). The UK Government's construction-focussed Brexit analysis was published on 21 December 2017, but it notably contains no primary research. More recently, the UK Government has given more detailed advice to business, including their "What you need to do now to prepare for Brexit"

website (UK Government, 2019). However, although actions are suggested - for instance check if conformity assessments or markings need to be changed - the extent of hedging language used ("in most cases" ... "in some cases" ... "you may need to") points to ongoing uncertainty for business.

Ireland (North or South) did not vote for Brexit. 56% of voters in Northern Ireland opted to remain in the EU, while it should be acknowledged that the Brexit referendum did not include citizens from the Republic of Ireland, so those in the Republic of Ireland were not able to vote. Although Ireland is at the periphery of Europe, with a European land border it risks being disproportionately affected by Brexit. There is a dearth of extant peer reviewed literature examining Irish Construction Trade in the context of Brexit. In this knowledge gap, the research aims to examine existing trade patterns in Irish construction companies, and to capture practitioner perceptions regarding new barriers and risks to this trade created by Brexit.

To avoid politicisation of the geographical areas thus described, the term 'Ireland' is used to refer to both North and South of Ireland. NI refers to Northern Ireland, and ROI refers to the Republic of Ireland. The UK is the United Kingdom of Great Britain and Northern Ireland; whereas Great Britain (GB) refers to England, Wales and Scotland. The term 'land border' refers to the border between the North and South of Ireland, also referred to as the Irish border; whereas 'sea border' denotes the border between Ireland (North and South) and Great Britain. Within the restrictions of our backgrounds and prejudices, the authors of this paper do not intend to take a position regarding the outcome of the Brexit vote, or the position or status of the border in Ireland.

In the following section, the extent and history of cross border cooperation in Ireland is explored. We then review the barriers and drivers of cross border trade. Possible impacts of Brexit are examined and in this context, the formulation of key concepts for this study are set out. Next, the methodology and research method are explained. The qualitative results are analysed and discussed, followed by discussion of the quantitative results. The final section entails brief conclusions and recommendations for further research.

Background

Cross border cooperation in Ireland – from partition to today

The Irish border was first drawn in 1920, with partition (considered a temporary solution to the clash of

opinions regarding the legitimacy of British rule in Ireland) confirmed in the 1921 Anglo-Irish Treaty. The new Northern Ireland parliament concentrated on consolidating its power in the six counties, reliant on a carefully-carved Protestant (and thus predominantly unionist) majority in the jurisdiction of the state. Meanwhile, the Irish Free State engaged in active nation-state building efforts, even if these had the effect of deepening the distinction between north and south on the island of Ireland.

The creation of the Common Travel Area (CTA) in 1923 was largely in recognition of the difficulty (and apparent pointlessness) of imposing immigration controls on the Irish land border (Ryan 2001). The treatment of British and Irish citizens as if they were, in effect, naturalised citizens in all parts of the UK and Ireland (even after the creation of the Republic of Ireland in 1949) shows the closeness of this relationship. The CTA therefore predates, and is distinct from, EU membership.

In terms of trade, a pattern of so-called 'back to back' development emerged, with Northern Ireland traders facing towards Britain and those in the Republic of Ireland turning away from the north as a potential market or source of business collaboration. This was deeply exacerbated by the impact of violent conflict (known as 'the Troubles') from the late 1960s to late 1990s, which were manifest around the Irish border, including in attacks on customs posts and officers and in the heavily fortified border crossing posts established by the British Army (Mulroe 2017). The Irish border was like a litmus paper for the wider British-Irish relationship, both in terms of political and economic health.

The accession of both Ireland and the UK to the then-European Economic Community in the mid 1970's played a pivotal role in shifting the bilateral dynamics of UK-Ireland relations away from extremist antagonism by creating formal structures for compromise-based agreements to take place (de Mars *et al.* 2018). The enabling role of European institutions could be clearly seen as early as the 1985 Anglo-Irish Agreement – which managed to coax out an unprecedented joint statement on the "determination of both governments to develop close cooperation as partners in the European Community".

In the early years of European Economic Community (EEC) membership, the reduction of tariffs and participation in the Single European Market (SEM) led to a brief export boom as Northern Ireland's exports to both the south and to Europe expanded dramatically (Murphy, 2014). In the mid-1990s, as the

intergovernmental relationship further improved, and the Irish economy began to swing up, so too did trade around and across the Irish border (Hayward and Magennis 2014). The 1998 Good Friday (Belfast) Agreement marked a watershed in British-Irish and Irish cross-border relations. It provided for institutions specifically intended to facilitate and enhance north/south cooperation and trade on the island of Ireland (Tannam 2006). Common membership of the European Union (since 1973) was a vital context for this, given that it centres on a process of integration across national borders for mutual benefit (Keating 2004).

The 1998 Agreement was followed by rapid growth in the South of Ireland followed by economic recession which started in 2008. Construction in ROI fell by 76% from its peak output in 2006 to 2012 (SCSI 2015). Irish cross border trade, particularly in products that were "tied to the construction boom," fell between 2007 and 2010, leading to a fall in almost one third in the value of cross border business during this period (Hayward and Magennis 2014, p. 160.) Tansey *et al.* (2018) found that the post-recession Irish construction industry is still susceptible to uncertainty and economic shock.

Barriers and drivers of Irish cross border trade

Hitchens *et al.* (1996) found that NI and ROI businesses were insular in nature, with 88 and 85% respectively of their business conducted in their own jurisdiction with little Irish cross border transaction (4% of turnover for ROI businesses and 3% for those in NI). Barriers to greater cross border trade were cited as travel time, travel cost, lack of experience and knowledge of the alternative markets, cultural differences and an absence of networks in these new markets. Hitchens *et al.* (1996) suggested that enhanced cross-border trade would reduce dependence on local markets, producing a competitive advantage in larger, global markets.

Ten years later, Tannam (2006) looked from a 'bottom up' perspective to examine whether economic cooperation could build from informal relationships to develop formal networks of cooperation and hence reinforce political cooperation across the Irish border. She used data from organisations who were involved in administering EU funds or in schemes designed to foster cross border cooperation. She found that many regulatory and policy positions on either side of the land border had been integrated through mutual membership of the single European market, increasing

shared economic interest on either side of the border and enhancing the conditions for cooperation. However, she found barriers in the form of “perceptions of conflicts of interests among civil service departments, compartmentalisation, business perceptions of conflicts of interest, insufficient information provision and the need for institutionalisation of cross-border arrangements” (Tannam 2006, p. 259).

Roper’s (2006) study of cross border trade found that local cooperation and trade in Ireland was occurring to a far greater extent than that of cross-border cooperation. He cited the historic effect of the troubles in discouraging businesses in the Republic from pursuing business opportunities in the North; and higher labour costs in the South which suppressed the appetite of Northern companies for work in the South. Hayward and Magennis in 2014 found barriers to Irish cross-border trade include material impediments, such as differing currencies, taxation and regulatory regimes; and psychological barriers, including an asymmetric knowledge base regarding the home and the target market.

Exchange rate instability has been found to drive trade across the Irish border, the direction dependent on the relative fluctuating strengths of the two currencies (Roper 2006). Brexit has already brought severe change in the value of sterling to euro, which has had immediate effects on those trading and working across the Irish border. Longer-term, it proffers the possibility not only of the return of tariffs (if the UK as a whole leaves the customs union), but also the re-emergence of many non-tariff barriers to trade that had been considered long left-behind by the process of European integration and cross-border cooperation (Tonge 2016).

Bearing the push – pull factors influencing Irish cross – border trade and Irish – GB trade in mind, this study seeks to survey and interview practitioners about their perceptions of possible scenarios of an all-Ireland construction economy (pre- and post-Brexit). To achieve this aim, two interrelated areas of inquiry are addressed: firstly, to provide a pre-Brexit baseline of trade in terms of contracts, materials, employees, subcontractors and Joint Ventures. Secondly, to ascertain the practitioners’ assessment of possible outcomes of Brexit and how they might affect their organisations.

Whilst it is beyond the scope of this paper to cover in detail the possible options which may be adopted for the relationship between the UK and the EU – hence Northern Ireland and the Republic of

Ireland – post Brexit, it is worth covering in broad terms possible scenarios and associated implications of Brexit and its impact on Ireland in order to define and justify areas for investigation in the primary research.

The border and tariffs

The Irish land border will become an external border of the EU if, as currently planned, the UK government opts out of the EU single market and customs union (Basheska *et al.* 2017), generating issues unique to the Irish and Northern Irish economies (Brownlow and Budd 2019). In this case, EU regulations and tariffs must apply in some form (de Mars *et al.* 2016). Any ‘technological’ solution put in place to mitigate the effect on transactions at the border must be agreed by all 27 members of the EU (Basheska *et al.* 2017). In the event of a ‘no deal’ Brexit entailing application of World Trade Organisation (WTO) tariffs, a levy of 4–8% could be levied on basic construction materials crossing the border, with associated administration further erecting new barriers to trade (de Mars *et al.* 2016, Brownlow and Budd 2019). As Lawless and Morgenroth (2019) explain, calculation of WTO tariffs depends on the exact nature of the product, and the patterns of trade flow for each product between the UK and Ireland, making the exact tariff difficult to predict for any one product. This further demonstrates the problems faced by those in the construction industry trying to make plans in the face of Brexit.

Financial impact scenarios

Although it is predicted that all of Ireland will be affected negatively by Brexit, Barrett *et al.* (2015) and Mac Flynn (2016) speculate that the North will be the worst impacted region. Brownlow’s 2016 analysis suggests that trade and investment could reduce, inducing economic slowdown and economic uncertainty in labour, materials and financial markets. Although economists’ predictions tend to vary according to the baseline assumptions used, in 2016, Oxford Economics modelled nine different Brexit scenarios and found that, relative to other EU countries, the economy of Ireland is disproportionately affected in every case (Oxford Economics 2016). This study predicts on average across all scenarios a 4.9% drop in output for construction in NI. The UK in general, and in particular Northern Ireland, suffers from low productivity (Brownlow 2016); hence lacks the resilience and policy flexibility that the South might have (Hayward and Magennis 2014) to weather a potential Brexit

economic shock. Mac Flynn (2016) suggests that the medium and long-term impact of Brexit on trade in Ireland cannot yet be measured, as the UK has not yet left the EU. More recently, Ramiah *et al.* (2017) analysed stock market reaction in certain sectors in the UK to the Brexit vote (from June to July 2016). Their finding that construction was negatively affected (household goods and construction moved -8.2% , real estate investment trusts -6% and construction and materials -2.9%) was labelled as unexpected, as the impact on the construction sector had not received the extensive media output as other sectors examined (these other sectors include food producers, banks, travel and leisure providers.) The UK construction sector is identified by Cambridge econometrics in their 2018 report as particularly vulnerable to high tariffs and non-tariff barriers and therefore likely to be negatively impacted by Brexit. The research modelled scenarios ranging between a 7% drop and 21% drop by 2020 in construction productivity as a result of Brexit. It should be noted however, that this report, 'Preparing for Brexit,' was commissioned by the Greater London Authority therefore focusses on the UK and London market in particular (Cambridge Econometrics 2018).

Regulatory divergence

Construction in the UK and Ireland currently operate within a common regulatory framework. In order to gain more freedom to pursue trading relationships with the rest of the world, the UK would need to be able to diverge from the regulatory frameworks required by the EU (Brakman *et al.* 2018). Complying with multiple sets of rules has the potential to add cost to business and stifle cross jurisdiction competition (North – South across the land border and East – West across the sea border). With this in mind the interview and questionnaire respondents were asked what effect they think regulatory divergence with the opposite Irish Jurisdiction, and with GB, would have on their organisation.

Movement of goods

Durrant and Stojanovic (2018) suggest that regulatory divergence across the Irish Land border would entail checking of goods deliveries – to check for contraband, to inspect their origin, and that the goods complied with the regulations of the importing country. This checking, whether undertaken at the border itself, or some distance away, would contribute to barriers to trade. Transaction costs will rise as additional paperwork is required to satisfy 'rules of origin'

regulations for transportation of good across borders (Cambridge Econometrics 2018). Reliance on WTO rules could reduce Irish cross border trade generally by between 9% and 17%, according to Lawless and Studnicka (2017). The respondents are therefore asked what they predict the effect of regulatory cheques at the Irish land border, and the sea border between Ireland and GB, would have on their organisation.

Movement of people

Construction requires a mobile workforce, as (with the exception of modular offsite construction) the product is stationary, therefore the operatives must travel (Fellini *et al.* 2007). Ireland has for many years been the largest provider of immigrant construction labour in Britain, however, many workers have returned to work in Ireland, attracted by the increasing sophistication, output and opportunities in the construction industry back home. Fellini *et al.* (2007) conducted cross country comparison and found that those workers who have become 'lost' to the British have been replaced by those from recent EU accession countries.

Mohamed *et al.* (2017), looking at the UK construction industry, found that UK construction relies on EU labour. Cambridge Econometrics (2018) reports that 25% of construction employees in London and the South East of England were born in the EU. "Building on Brexit", the report from the UK all Parliamentary working group (Colville 2017) found that the five most common non-UK countries of birth of construction workers were Poland (55.5k), Romania (27k), India (19.4k), Lithuania (17.9k) and ROI (15.k). It is unlikely that free movement of people and labour for EU citizens would remain in place post Brexit (Rolfe and Hudson – Sharpe 2016). With the lack of local talent entering the construction industry in Britain (CIOB 2013) restriction of freedom of movement for EU workers into the UK will most likely present a pressing recruitment problem for the construction industry. There is uncertainty as to whether workers would still be able to cross the Irish border (in both directions) freely after Brexit (Oliver 2016, Mohamed *et al.* 2017). This study then sets out to investigate how this might affect NI and ROI construction contractors, their workers, and their supply chains.

Potential future UK – EU trading relationships

It is notable that despite the result of the Brexit referendum in June 2016, to date nothing has legally changed. Until the withdrawal negotiations have come to an end, the UK remains a part of the EU, with

continued regulatory compliance. If a withdrawal agreement is signed before the UK leaves the EU, there will be a 'transition period' or 'implementation phase' during which trading rules do not change, and business can prepare for the change in trading regime (Lea 2018).

The following are possible scenarios for a post Brexit trading regime: A trade deal based on the 'chequers agreement' (negotiated by then UK Prime Minister Theresa May in July 2018) may be signed. This has proved difficult to gain approval from the UK parliament, controversy surrounds the 'Irish back stop' which guarantees that any trade rules will not lead to cheques at the Irish border (Chang 2018). A different trade deal may be struck between the EU and the UK. The UK government has suggested that a 'Canada style' free trade deal was desirable, although Lea (2018) suggests that politically it is unlikely that this model would be accepted by the EU. Lea also cites a trade deal based on continued UK membership of the single market and/or the customs union as possible, but unlikely. If no agreement can be reached between the UK and the EU, the UK will leave the EU, there is unlikely to be a transition period, and the UK and EU would rely on international trade rules administered by the World Trade Organisation (Chang 2018).

Regardless of the Brexit position finally adopted by the UK and EU, the signing of a withdrawal agreement (or no deal exit) does not mean the end of negotiations. It will mark the start of a new phase of talks where the detailed future trading relationship between the UK and the EU is codified.

European economic integration theory

The process of integration and disintegration in Europe is not static, "it has been going on all through modern European history" Molle (2006, p. 27). Economic integration occurs through the removal of economic barriers between states such that they move towards trading as one unit. This leads to greater competition and efficiency in the larger unit as regional specialisation increases (Krugman and Venables 1996), and productivity gains are achieved, leading to lower prices for consumers (Haas 1958, Balassa 1986, Molle 2006). Technical progress drives integration – production becomes more efficient, transport easier, communication gets easier and the movement of capital more seamless. Increased competition in turn drives innovation.

Stages of economic integration start with free trade areas (with no internal barriers to the movement of

goods), moving to customs union (with common external protection measures), then common markets (with a similar regulatory environment), then a single market, which then moves to economic and monetary union, finally to political union (Balassa 1976). As integration progresses, trade within the block becomes easier, protection from those outside the block remains.

Geographical barriers to trade reduce with increased technological innovation, better communication and more efficient transport networks. As geographical and tariff barriers decrease, non-tariff barriers become more important. Protection in the form of non-tariff barriers includes legal and safety regulation, non-recognition of qualifications and differing taxation regimes, these barriers are often erected to give preference to domestic operators (Robson 1980).

Beckfield (2006) finds that regional economic integration is correlated with increasing income inequality. Myrdal (1957) Hirschman (1958) and Kaldor (1970) described the effect of 'polarisation' where a centre of gravity in a market attracts investment, technology, and concentrates innovation and expertise. Ambitious workers and financial investment move away from peripheral areas towards the centre, where higher returns and wages are available. This is exacerbated by technical progress including advances in communication, transport and the transfer of capital (Balassa 1976). Capital moves easily, however the movement of labour entails economic, social and psychological cost (Molle 2006). Barriers to movement include standards and technical regulations (Li and Beghin 2012), residence/work permits, recognition of qualifications, cultural differences and language; however, Werner (1996) found fewer barriers to movement in cross border commuting citing the example of the French/German border region.

The EU cohesion policy's aim is to foster the acceptance of European integration through redistribution of funds to peripheral areas (Gross and Debus 2018). It accounts for around 33% of the EU total budget (George and Bache 2001) and aims to reduce regional difference and assist in job creation. EU structural funds are used for investment in physical and social infrastructure including "ports, roads, industrial sites training of workers, public utilities and innovation" (Yuill *et al.* 1993), attempting to create a viable base for industry for 'traditionally backwards regions' which remain heavily dependent on agriculture (Molle 2006). In his assessment of the EU structural fund's success in this aim, Molle (2006, p. 457)

suggests that its “contribution to growth of employment appears to be unsatisfactory.”

Turning to emerging theories of European disintegration, Schimmelfennig's (2018, p. 1156) examination of ‘differentiated disintegration’ may be useful in the context of the North and South of Ireland – he defines this as “a process of unequal reduction in the level, scope or membership of the EU.” Rosamond (2016) finds that few theories of European disintegration have been developed – Leruth *et al.* (2019) suggest in part this is due to the lack of empirical evidence to date. However, Rosamond (2016, p. 868) suggests that Brexit related disintegration is likely to be a process which will be “messy, drawn out and unpredictable.”

Research method

This research takes a sequential mixed method approach to fill an established gap in knowledge through the identification, recording and analysis of both qualitative and quantitative data. Initially, the literature review used a wide pool of source material including so-called ‘grey’ literature, and that on cross border business and trading more generally, as few peer reviewed journal papers are available on the specific topic of the construction industry in Ireland and the impact of Brexit. The subsequent semi structured individual interviews were analysed, factors identified, and examined further in the following industry circulated online questionnaire. This combination of methods facilitates and informs discussion through the comparison and validation of both sets of results (Denzin 1978). Equal weight is placed on the qualitative and quantitative phase, thus attempting ‘true’ mixed methods research (Johnson *et al.*, 2007). The combination of qualitative and quantitative methods rejects the assertion of paradigm incompatibility and attempts to counter the partiality of each method on its own, and to build an image of the complex, emerging picture of the construction industry's reaction to the unfolding Brexit debate from a variety of perspectives in an embrace of ‘methodological pluralism’ (Dainty, 2007). Through the examination of rich, deep data from the 9 interviews, and a wide range of perspectives from the 101 eligible questionnaire responses, we can test the perceptions and experiences of industry participants to generate a picture of events which has ‘practical adequacy’ (Johnson and Duberley 2000).

Interview design and analysis

In order to investigate further and corroborate the concepts identified in the literature review,

the interview questions were designed as follows. The interviewees were first asked about their organisation, its turnover, number of employees and number of years trading. The respondents were then asked to explain their own position and responsibilities in the organisation. The extent of regional and cross border trading and integration was tested through questions relating to the participant's company's existing trade patterns including the number and value of current contracts and recent patterns of cross border trade, trade with GB, and related drivers and barriers. Employment patterns regarding non-indigenous workers, and employment of subcontractors, both in home and cross border markets, were probed. Next, the price and location of construction materials and components were explored. The respondents were asked about barriers to trade including non-tariff barriers such as safety regulations, mutual recognition of qualifications and protectionist behaviour encountered when competing in cross border markets. These questions established a baseline of existing cross Irish land border and cross Irish – GB sea border trade before the effect of Brexit was explored. The interviewees were then asked to discuss the impact that border controls, at the Irish border or in the Irish sea, might have on their business, in terms of the movement of goods, people and trade, and other risks or opportunities that were presented by Brexit. The final questions asked the interviewee to try to make predictions for the future regarding the changes that Brexit might bring.

The semi structured interview technique allowed themes to be covered consistently across all interviews, whilst permitting the freedom to fully explore the first-hand experience and concerns of the selected industry respondents, generating rich, deep data (Creswell 2009).

A two-tiered selection process was used to choose the interviewees; based on convenience and subsequent criteria. Using samples of convenience overcomes low response rates in applied settings and allows subgroups of interest to be included (Abowitz and Toole 2010). Secondary criteria include seniority of respondents (senior management with the knowledge and ability to talk about the potential impact of Brexit on their firms, or the wider industry, at a high level) and those from firms with recent experience (in the last 5 years) of cross border transactions. Within the sample selected for interview, the researchers endeavoured to encompass a wide cross section of industry in terms of type and size of organisation. Each respondent gave informed written consent prior

Table 1. Summary of Northern interviewees' organisations.

Northern Ireland interviews	Type of organisation	Interviewee position	Size (employees)	Turnover (€ equiv /year)	Current cross-border trade (% of turnover)	Current trade in GB (% of turnover)
Interviewee 1	Industry representative body	Director	N/A	N/A	N/A	N/A
Interviewee 2	Modular/off site construction co	Director and innovation manager	250	€75 million	10% of turnover	90% of turnover
Interviewee 3	Contractor and property developer	Director	100	€33 million	<1% of turnover	1% of turnover
Interviewee 4	Contractor and FM provider	Procurement manager	1800	€562 million	2% of turnover	60% of turnover
Interviewee 5	Contractor building and civil	Procurement manager	500	€281 million	2% of turnover	75% of turnover

Table 2. Summary of Southern interviewees' organisations.

Republic of Ireland Interviews	Type of organisation	Interviewee position	Size (employees)	Turnover (€/year)	Current cross-border trade	Current trade in GB
Interviewee 1	Civils and general contractor	Director	350	€600 million	7% of Turnover	NA
Interviewee 2	General contractor	Director	300	€300 million	NA	2 contracts (England)
Interviewee 3	General contractor	Director	385	€750 million	15%	5 contracts (England)
Interviewee 4	Building and civil contractor	Director	1208	€1.3 billion	NA	26% of Turnover

to the interview, which was audio recorded and fully transcribed. The agreed participants include eight industry professionals, four from either side of the Irish Border. In addition, the director of the Construction Employers' Federation Northern Ireland was interviewed. Characteristics of the interviewee participants and their organisations are shown in Tables 1 and 2.

The interview transcripts were analysed - structural and descriptive coding (Saldaña 2015) was rigorously and actively generated by the researchers (Braun and Clarke 2006), then calibrated and collated by the lead author to ensure a consistency of approach. The information was compared across all interviews, to justify the emerging themes and to ensure that they were "internally coherent, consistent, and distinctive" (Braun and Clarke 2006, p. 36). The subsequent factors were then categorised, analysed, and this analysis used as the basis for generation of questions in the questionnaire survey.

Questionnaire design and analysis

The self-administered questionnaire questions were closed ended and measured on a 5-point Likert scale where 1 represents strongly disagree and 5 represents strongly agree, with the exception of the initial categorical variables. Questions were developed from themes that were generated from the qualitative analysis and the literature review. The questionnaire is divided into eight sections. Section 1 explored the

respondents' background, their experience and the location, type and size of their organisation and was measured through categorical variables. Sections 2 and 3 examined the extent to which the respondent's company engaged in trade in the opposite Irish jurisdiction, how competitive they found the environment, and to what extent they found tendering in these jurisdictions to be a regulatory burden. Sections 4 and 5 tested the extent to which their organisation traded in the UK and similarly asked about the associated competition and regulatory burden. Section 6 probed the respondent's perceptions of the effect of regulatory barriers in the Irish Sea or across the Irish land border, changes to procurement rules and regulatory divergence in the UK and the opposite Irish jurisdiction, and exchange rate fluctuation. Section 7 covered the perceived importance of the free movement of goods and workers to the respondent's organisation, whether the respondent felt that Brexit presented risks and/or opportunities to their organisation, and whether they felt that their organisation had made adequate preparation for Brexit. The final section asked the participant to respond to the statements "in 10 years' time the construction industry in England, Wales and Scotland will be largely unchanged by Brexit" and "in 10 years' time the construction industry in Ireland, North and South, will be largely unchanged by Brexit".

A link to the questionnaire was posted on social media (LinkedIn and Twitter) between July and October 2018. In addition, emails were sent to eligible

individuals and a snowball sampling method was employed (where the respondents referred the researchers to other potential candidates.) The criteria for participation in the questionnaire survey were that participants should be working in an organisation whose head office was based in Ireland, North and South, and that they should be working for an architecture, engineering or construction organisation.

101 eligible responses were received; 56% from the North of Ireland and 44% from the South. 51% described themselves as contractors, the remainder are categorised as project managers (12%), consultants (23%) client/developers (11%) or other (3%). 23% of respondents worked for firms with less than 20 employees, 35% worked in organisations with 20–99 employees, and the remainder (42%) worked for organisations of 100 or more employees. 55% of respondents had less than 20 years' experience, the remainder had been in the construction industry for 20 years or more. Thus, the themes generated by the 9 interviews are tested on a wider sample to assess if they may be generalisable to the wider Irish Construction Industry.

The data generated by the self-administered questionnaire survey is examined and transferred into statistical analysis software, where Exploratory Factor Analysis (EFA) is undertaken. It is apparent from the interview analysis that the many of the themes generated examined intercorrelated issues; for instance, issues relating to the competitiveness of markets in GB and the opposite Irish jurisdiction are interrelated with barriers to trade into those markets, hence use of EFA for “orderly simplification of interrelated measures” (Suhr 2006, p. 66) is appropriate. EFA explores the data without overlaying any preconceived theories or structure (Child 1990); an approach thought particularly suitable in an area where little extant data exists, as is the case regarding Brexit and Construction. It allows the underlying themes to be extracted and reduced, or simplified, to enhance interpretation of the raw data. Field (2009) describes the purpose of data reduction is “to reduce a data set to a more manageable size while retaining as much of the original information as possible”. The data is first tested for its suitability for analysis, using the Kaiser – Meyer – Olkin test (KMO) and Bartlett's test of sphericity. The KMO tests the adequacy of the sample size for generation of reliable results. Bartlett's test looks at the strength of connection between the variables to ensure they are neither insufficiently, or too highly correlated, for successful data reduction. Factors are then extracted and tested using a Scree plot of

eigenvalues to determine which should be retained. Finally, a varimax rotation groups factors into components based on the loading which each factor has on the underlying theme. The variable loading is displayed as a numeral from + to –1: loadings closer to the + or –1 value shows the relatively high importance of a variable to the factor. The Factors generated by the EFA are shown in Table 3.

Qualitative findings

Existing North-South and East-West cross-border trade of workers and materials

Contractors on both sides of the border use complex supply chains which include materials, employees and suppliers from the opposite Irish jurisdiction, in addition to employees who regularly cross the land border for work – either at head office or site. There is currently no requirement for records to be kept on an employee's origin, beyond ascertaining their right to work for a company, hence interviewees have estimated numbers of employees from the opposite Irish jurisdiction. Belfast and Dublin and their hinterlands form the primary regions for development in the North and South respectively. However, the size of the Belfast market is small in comparison to that of Dublin, and the entire market in Ireland is small in comparison with GB. The main direction of travel is east – west; where key members of staff from Ireland travel to GB to deliver contracts there. Some of the organisations have established administrative operations in GB, using local staff to navigate the regulatory and cultural landscape. One interviewee from a large NI company described the challenges operating in GB, in terms of developing a long-term strategy for embedding the company in a new area. He described one means of overcoming the perception that an Irish company is ‘parachuted in’ to a region in GB, as putting down roots and establishing regional bases to build loyalty amongst local employees, subcontractors and the wider community. Besides indicating a long-term intent to remain in a community; these regional offices give Irish companies flexibility, with the ability to “upscale or downscale dependent on how the markets are reflecting.” In addition to a physical presence in GB, one ROI interviewee's organisation has established a UK trading division to control currency and regulatory risk, which to some extent hedges against potential Brexit impact.

Gypsum and steel products come to Ireland from destinations including GB, Spain, France and Turkey. One southern contractor ordered 60% of materials

Table 3. Factors 1–5.

Variable	Factor loading
<i>Factor 1</i>	
Freedom of movement for workers across the Irish border without border cheques is not important to my organisation	.899
Freedom of movement of goods from the EU without customs cheques is not important to my organisation	.835
Freedom of movement of goods across the Irish border without customs cheques is not important to my organisation	.824
Freedom of movement for workers from the EU is not important to my organisation	.777
Brexit presents opportunities for my organisation	.506
<i>Factor 2</i>	
In 10 years' time the construction industry in Ireland, North and South, will be largely unchanged by Brexit	.893
In 10 years' time the construction industry in England, Wales and Scotland will be largely unchanged by Brexit	.821
Brexit presents risks for my organisation	–.586
<i>Factor 3</i>	
Variable	
My Organisation finds complying with regulations in England, Wales or Scotland to be an administrative burden	.882
My Organisation finds the market in England, Wales or Scotland too competitive to justify future tendering for work there	.881
<i>Factor 4</i>	
Recent exchange rate fluctuation has caused material prices to rise for my organisation.	.781
Exchange rate fluctuation will cause material prices to rise in the next year for my organisation.	.707
My Organisation finds the market in the opposite Irish jurisdiction too competitive to justify future tendering for work there	.611
The uncertainty surrounding Brexit has stopped my organisation from tendering for some projects.	.604
My Organisation finds complying with regulations in the opposite Irish jurisdiction to be an administrative burden	.504
<i>Factor 5</i>	
My organisation would be negatively affected by regulatory divergence between the North and South of Ireland	.707
My Organisation would be negatively affected by customs cheques at the border in Ireland	.674
My Organisation would be negatively affected by customs cheques in the Irish sea (between England, Wales and Scotland and the North and South of Ireland)	.673

from outside Ireland, of which 40% came from the UK. At present, few products are ordered from outside the EU, although the complexity of current goods routes and EU regulations can be exemplified thus: steel tubes from Turkey have been ordered for a project in Scotland, delivered by an NI headquartered company, procured under EU procurement rules as “where we have been buying the piles from is considered a part of the EU.” Dublin port is a key importation route for EU materials, specialist systems and goods entering NI, and the UK is an important inward route for EU materials for ROI contractors. Consistent quality of imported material was a key factor for repeat orders, with EU kitemarking cited as a good indicator of quality.

Employment of EU workers

An issue which is well known in the construction industry – the aging workforce as a result of fewer new entrants and apprentices joining the construction industry – is apparent in the Irish organisations interviewed. The director of the NI industry body gave the example of a member company where the average bricklayer age is 52. This dearth of talent was exacerbated during the recent recession, which hit construction in Ireland particularly badly, creating a ‘drain’ of skilled and unskilled workers who emigrated to

Australia and Canada, where construction workers were still in demand. In some measure these workers have been replaced by a small, but important number of EU workers, mainly from recent EU accession countries (Spain, Portugal, Italy, Romania, Poland and the Czech Republic were named in the interviews.) The companies in question relied to a greater extent on Eastern European countries for labour for the projects which they deliver in GB; echoing the findings of Fellini *et al.* in 2007. One NI interviewee stated of their operations in GB, “we’re highly dependent on EU labour to deliver our infrastructure projects, we’re highly dependent on our supply chain of subcontractors who employ EU migrant labour”. Another NI interviewee said of a subcontractor “if they didn’t have the foreign labour, they wouldn’t be able to operate, they’ve told me that.”

All those interviewed reported an overall positive experience of working with EU operatives and subcontractors, “if anything the productivity and work ethic is fantastic.” Issues which were raised in connection to EU workers included lack of ability in English which prevented their integration with local workers. One of the larger contractors in NI had developed several Polish operatives through investment in their training and mentoring; these operatives had started as labourers and were working as site engineers at the time of interview.

Factors restraining North-South cross-border trade at present

Given the fact that there are no physical impediments at the land border, and that both North and South of Ireland are supposed to currently operate in an EU aligned regulatory regime, it is unexpected that more Irish cross-border construction trade is not undertaken. All tender opportunities are advertised in the Official Journal of the European Union (OJEU), and accreditations and qualifications should be mutually recognised; and yet two of the four Southern contractors interviewed had no live contracts in the North, similarly three of the Northern contractors had very limited cross-border trade.

Although both regions of Ireland are aligned in terms of regulation at EU level, at local level differences in regulation and administration do exist. Both regions have differing rules and accounting periods for the submission of company accounts. There is some resistance to the requirement to mutually recognise equivalent qualifications, with interviewees reporting issues with basic Health and Safety card recognition (CSR in the north and CSCS in the South). These factors add an administrative burden which disincentivises small and medium firms from tendering across the border.

As found by Hitchens et al. in 1996, and Hayward and Magennis in 2014, cultural barriers to North-South trade still exist. A comparative lack of knowledge of the market in the opposite jurisdiction has in the past put some interviewees' companies off tendering, with some describing it as "difficult to penetrate" and a perception that in some areas they are "trying to keep outsiders out of the equation." Social impact procurement clauses measure the extent of 'pay back' from a construction project to the local community, through job creation, use of local labour and subcontractors. This input is an easier 'sell' coming from a local contractor; or at least from a contractor with a branch office or base close to the project. As suggested by one interviewee, "...if you aren't local and you are not doing that...you are at a disadvantage." Collectively these regulatory and cultural, protectionist non-tariff barriers are an important brake on the integration of North and South Irish construction trade.

In terms of market forces, a southern contractor remarked that northern subcontractors tended to be "a little more expensive on the pricing side of things." All of the Southern contractors have focussed less on the North as a potential market in recent years, as the economy in the south has recovered from its deep recession. From the Northern contractors' perspective,

the southern market has become too competitive to justify a sustained effort in winning work there. Pay rates are high, and profit margins low compared to those in GB (although comparable with those in NI). Three quarters of all the contractors interviewed conduct a significant proportion of their business across the Irish Sea – Great Britain is clearly a hugely attractive market for experienced, competent contractors from both sides of the Irish border.

Business confidence, tendering and material prices

Since June 2016, all interviewees have noticed a decrease in business confidence and investment, as ventures are parked and a 'wait and see' approach is adopted, with one interviewee noting an "air of pessimism" and another observing that there is "less long-term focus and planning" in the market. As Ireland starts to emerge from the grim realities of the recession, a break has been put on the industry's continued expansion "until the dust settles." Construction companies are used to uncertainty – "uncertainty is pretty much a fact of life but over the last 10 years, the degree of uncertainty has increased, perhaps more than at any point in our generation." This doubt feeds into the climate for business and appetite for risk on both sides of the border. However, a minority of respondents reported opportunity for their organisation in the context of Brexit, in particular the offsite modular prefabrication company. In this case, they were capitalising on the rapid need for facilities such as laboratories and head offices to enable companies to have a footprint on both sides of the prospective EU/UK border, a demand which they suggest could increase tenfold, depending on the outcome of Brexit negotiations.

The value of sterling has fallen dramatically since Brexit, from £1.29 to the Euro on the 23rd of June 2016, to £1.12 to the Euro, at the time of writing; however, according to the interviewees there has not been a corresponding increase in orders for construction goods and materials from North to South; contrary to Roper's 2006 findings. However, goods imported into Northern Ireland have increased dramatically in price, with interviewees reporting a 60% increase in the price for steel with a further 20% expected, and a 25% increase in the price for timber. This has led to a requirement for client expectation management regarding rising material prices and the consequent impact on tender prices, particularly in multiyear and framework contracts where there is little

flexibility to adjust rates once agreed. Tender pricing has become complex, with the addition of currency fluctuation risk for consideration. One NI contractor has entered a company wide purchasing agreement with several of its key suppliers. The expectation is that suppliers “will be loyal to that supply chain agreement and try and hold prices regardless of Brexit.” Although the exchange rate movements have made some UK manufactured systems and components cheaper to buy for some ROI based contractors, these gains are small in the context of the risk posed by Brexit and its chilling effect on the investment, hence construction, market.

Quantitative findings

109 responses were received from the questionnaire survey. Of these 109, 8 were removed from the analysis as they did not meet the inclusion criteria (respondents working in construction in Ireland), leaving 101 valid responses for analysis. Of the 101 valid respondents, 51% are from contractors, 23% from Design Consultants, 11% from client/developers, 12% from Project Management Consultants and the remaining 3% from suppliers and other consultants who do not fit into the categories above. 42% of respondents worked in an organisation with 100 or more employees, the remainder worked for smaller organisations. In terms of experience, 45% of respondents had 20 years’ or more working in the construction industry. 69% of respondents worked in organisations which were currently conducting business in the opposite Irish Jurisdiction; 66.3% of respondents’ organisations were currently working in England, Scotland or Wales. 66% of responses were from those whose company head office is based in Northern Ireland; the remainder from those whose company is headquartered in the South.

The KMO and Bartlett’s test were first undertaken to check that the data was acceptable for factor analysis. The KMO of 0.738 is ‘good’ according to Field (2009) and the Bartlett’s test of sphericity of 0.00 indicates that the variables are likely to have a correlation, as shown in Table 4.

In addition, all variables on the anti-image correlation matrix are above 0.5, indicating that the data has passed the pre-analysis checks on quality and is suitable for further examination.

Factor Analysis is undertaken and the factors with eigenvalues above 1 are retained, with a varimax rotation. This produces five factors which together account for 70.2% of all variance in the data. Table 3

Table 4. KMO and Bartlett’s test.

Kaiser-Meyer-Olkin measure of sampling adequacy		.738
Bartlett’s test of sphericity	Approx. Chi-Square	596.428
	df	190
	Sig.	.000

shows which variables contribute to the identified factors. The factor loadings, which are measured on a scale between ± 1.0 , indicate the strength of contribution of a variable to the factor. Factor loadings below ± 0.5 are considered insignificant and have been suppressed.

Freedom of movement of goods and workers

The first group identified in the factor analysis includes five factors relating to freedom of movement for goods and workers accounting for 32.2% of the total variance of all data gathered; thus indicating the importance of this theme to the discussion. 49.5% of respondents strongly disagree and 19.3 disagree with the first statement, that freedom of movement of workers is not important to their business. 42.2% and 23.9% of respondents strongly disagree or disagree with the second statement regarding movement of goods within the EU.

Predicted long-term impact of Brexit on the construction industry in both Ireland and Great Britain

The second group to emerge from the Factor Analysis incorporates three factors, one of which is negatively correlated; “Brexit presents risks for my organisation”. Each of these questions was negatively ranked on the five point Likert Scale, where, 63.3% of respondents either strongly disagreed (34.9%) or disagreed (28.4%) that Brexit would not have a long lasting (10 years +) effect on the construction industry. These three factors combined account for 11.7% of the total variance of the factors. In this context, 27.4% disagree, and 34.9% strongly disagree with the premise that in 10 years’ time, the construction industry in both Great Britain and Ireland will be largely unchanged by Brexit.

81.7% of respondents agreed or strongly agreed with the premise that Brexit presents risks to their organisation. This adds to the picture of uncertainty and doubt surrounding Brexit and any future trading arrangements; it is difficult to envisage a resolution to the gordian knot created by conflicting demands for sovereignty and freedom to make trade deals on one hand, and the need for continued unfettered trade

across the Irish border on the other. Transaction costs and uncertainty will likely increase.

Competitiveness and administrative burden at present

Two factors, similarly loaded, account for the third theme emerging from the factor analysis, of which 10.9% of the variance is explained. Each of the two factors focus on complying with regulations, and increased competition to justify future tendering for work. The data shows that the respondents disagree with the proposition that their organisations find existing regulation of England, Wales and Scotland an administrative burden, and likewise reject the assertion that this market is too competitive to justify tendering for work there. The PWC/CIF (2019) survey of Southern Irish contractors found their exposure to the UK market limited, with only 40% of responding businesses with current contracts in the UK. When the questionnaire responses are compared between the North and South of Ireland, the level of disagreement with the proposition differs to some extent. To the issue of regulatory burden in GB, the mean response from the North is 2.1, the mean from the South is 2.6, (so Southern respondents find compliance with regulation in GB marginally more of a burden than those in the North) although the difference, when put through a sample T test in SPSS, is not statistically significant. This echoes the findings of the qualitative analysis, where the UK market is described as vital for the continued business of many of the organisations surveyed in both the North and South.

Fluctuations and uncertainty in market conditions

One of the leading factors that resonates from the interviews is the fluctuation and uncertainty that Brexit has brought, not just to the construction sector in Ireland, but the economy as a whole. Within this theme, five factors emerge, explaining 9.1% of the total variance. However, the key factor that resonated with the questionnaire respondents is the exchange rate fluctuation and the subsequent effect on material costs.

Increased regulatory and customs checks

The fifth and final theme that has emerged from the analysis is increased regulatory and customs checks. Three factors are included in this theme, focussing on regulatory divergence, customs checks at both the

land border in Ireland and in the Irish Sea, with 67.9%, 66.1% and 52.3% of respondents agreeing or strongly agreeing respectively. This theme explains 6.1% of the variance and resonates strongly with both the interviewees and literature on the subject.

Discussion

Construction trade across the Irish border

There are no physical barriers at present across the Irish border, and the North and South of Ireland's construction markets should currently be in regulatory alignment under EU rules, so the relative lack of Irish cross border trade was a surprising finding of this study. The qualitative analysis suggested that Irish cross border trade is not truly integrated, and 69% of questionnaire respondents reported that cross border trade accounted for 25% or less of their company turnover. The Irish border, which divides two governmental and cultural spheres, does act as a barrier to completely open all Ireland construction trade. Protectionist behaviour, including non-recognition of equivalent qualifications, and imposition of social clauses rewarding a local presence, was found in the study – erected to favour domestic producers as posited by Robson (1980). Protectionist behaviour in terms of erection of non-tariff barriers ultimately reduces competition and innovation and increases prices for consumers (Molle 2006). The two adjacent markets of NI – population 1.88 m (NISRA 2019) and ROI – population 4.9 m (Eurostat 2019) are geographically coherent but are economically fragmented in terms of construction trade. The integration of the two markets is incomplete, even though both are within the European customs union and single market, challenging an idealistic view of European economic integration.

Despite the relatively low extent of cross land border contracts, the freedom of movement of workers across the Irish border is hugely important to the interview and questionnaire respondents: this was the top-rated factor within the first group generated by the factor analysis. Within the EU, Ireland has the highest visa-free travel of citizens (Mau *et al.* 2012). Carrera (2005) reiterates the importance of this aspect, arguing that “the right to move and reside freely throughout the territory of the Union is a precondition for the exercise of most of the other basic rights conferred by European Community (EC) law”. The Irish border accommodates 30,000 individual border crossings daily (NIAC 2018).

The construction sector in Ireland is also heavily reliant on the freedom of movement of goods within and around the island. 80% of cement products used in Northern Ireland come from three cement quarries in the Irish Republic, according to The Mineral Products Association Northern Ireland (2019); and Studnicka and Lawless (2018) observe a high degree of North – South supply chain integration in all sectors including construction products. This aspect is of concern throughout the sector, but particularly in the border counties, described by Hayward and Magennis (2014) as underdeveloped. Drawing on European Integration theory, they are peripheral areas as defined by Balassa (1976) and Kaldor (1970), which suffer as investment and resources are attracted to core areas like Belfast and Dublin. In this area the movement of goods both north and south is an everyday occurrence, often taken for granted; with over 1 million barrier free business deliveries per year (NISRA 2018). Sampson and Snape (1985) assert the importance of facilitating the free movement in goods and services to trade. Favell, *et al.* (2007) reiterates this in highlighting that one of the core benefits of membership of the EU is the genuine freedom of movement of goods within its jurisdiction.

Construction trade across the Irish sea

The Irish Sea, although a physical barrier, is less of a hindrance to trade than the Irish Land border, given the magnetism and size of the GB market. The size of the market in GB acts as a huge draw for Irish contractors. Irish workers travel regularly to work in England, Scotland and Wales. Three quarters of interviewees have active contracts in GB. Factor 3 generated by the quantitative analysis shows that the market in GB is not so competitive that contractors are deterred from tendering from work there, and that the regulatory burdens similarly do not put potential tenderers off. Owen *et al.* (2017) suggest that “there is a significant amount of trade across the Irish Sea”. Lawless and Studnicka (2017) found that ROI businesses who traded with the UK had notably higher productivity rates than those who traded only within the Republic of Ireland. As for Northern Irish construction products, the Mineral Products Association Northern Ireland (2019) estimates that 80% of the precast concrete produced in Northern Ireland is destined for the Great British market. A position paper by the United Kingdom on Northern Ireland and Ireland (HM Government 2017) affirms a “number of specific and very significant issues which are unique to Ireland, in

particular in relation to Northern Ireland, the border and the Common Travel Area”.

The importance of the GB market, and to a lesser extent Dublin, to Irish contractors reflects the ‘polarisation’ of the relative markets in GB and Ireland as suggested by Myrdal (1957), Hirschman (1958) and Kaldor (1970). From the interviews, it is found that the peripheral areas have benefited to some extent from upskilling of workers who commute to GB and Dublin, and remittances back from core to peripheral areas. However, as suggested by Petrakos *et al.* (2016) and Molle (2006) regional disparity between and within the construction markets of Ireland and GB might be increased through deeper integration, where resources, skills and capital travel to the ‘centre’ at the expense of the peripheral area. This suggests that, in accordance with Molle’s 2006 assertion, EU structural funds have not made a sufficient impact in the infrastructure of peripheral areas like the Irish land border region to enable them to compete with economic hubs like London and Dublin.

Increased regulatory and customs cheques

Factor 5 of the quantitative analysis focussed on the concerns of the participants regarding the negative effect to their business of regulatory divergence or customs cheques, either in the Irish sea or at the Irish land border. 66.1% of respondents agreed or strongly agreed that customs cheques at the Irish land border would negatively affect their business. Regarding the context of the border in the Irish Sea; although not as critical to those surveyed, 52.3% of respondents agreed that it would be an issue. This study confirms with qualitative and quantitative data the concerns raised regarding the risk of increased regulatory cheques by the Northern Ireland Construction group, an umbrella group comprising construction industry professional and trade bodies, in their position paper of 2018 (NICG 2018). It also confirms fears raised by Gardiner (2018) in his commentary article, warning of potential ‘significant barriers to cross border trade’ in construction. Owen *et al.* (2017) argue that customs concerns relative to Brexit, particularly on the island of Ireland are significant and in particular, recognise the challenge of regulation specific to the land border. Busch and Matthes (2016) argue that as a direct consequence of Brexit, increased regulatory revisions, amendments and adherence requirements will need to be drafted, resulting in increased regulatory barriers for all concerned. Ciuriak *et al.* (2017) reiterate and provide further argument to this premise, highlighting

that there are four possible UK exit strategies from the EU that present themselves; however, each have varying and significant cost implications for trade, relative to regulatory and custom cheques, among other factors. The Copenhagen Economics report (2018) finds that there is a real and substantial possibility of increased burden of administrative tasks, due to the possibility of either trade and customs tariffs being introduced or requiring amendment to realign with the changing trade agreements. They conclude that ultimately, Brexit would invariably result in “extra administration and delays”; thus, increasing costs for all parties concerned. It is imperative that potential increased regulatory and customs cheques are addressed, and where possible, avoided, to maintain and further encourage cross-border activity in the construction sector in Ireland.

Freedom of movement

In relation to the freedom of movement of goods and workers within Ireland, both the interviewees and questionnaire respondents voiced concerns relative to this aspect. The respondents expressed concern that supply chain deliveries would be held up at the border, echoed by Malik *et al.* (2019) and RICS (2018) albeit the focus of these reports is on the UK construction industry. Chen *et al.* (2018), describing trade in general (not specific to construction) suggests that a ‘no deal’ Brexit will heavily disrupt or completely sever complex knowledge intensive EU – UK supply chains. 68.8% of respondents disagreed or strongly disagreed that freedom of movement for workers across the Irish land border was not important to their organisation. When the proposition related to movement of workers from the EU, 67% of respondents disagreed or strongly disagreed. Malik *et al.* (2019), RICS (2018) and Mohamed *et al.* (2017) find that the UK construction industry will suffer without freedom of movement, although the UK and Irish situations are not directly comparable, due to the volume and frequency of movement of workers across the Irish land border.

Interviewees echoed the concerns of Fellini *et al.* (2007) concerning doubts for the sustainability of their labour force without an injection of young, non-indigenous employees. Considering Brexit, this basic right suddenly comes under scrutiny. Carrera (2005) concludes by arguing that the key beneficiaries to those who facilitate the free movement of people are the economies themselves. This is reiterated through the experience of the interviewees who collectively employ workers from Spain, Portugal, Italy, Romania,

Poland and the Czech Republic amongst others, and have praised the contribution of this workforce. The loss of EU workers to the UK may be the Republic of Ireland’s gain: The PWC/CIF (2019) survey suggests that the South of Ireland may benefit from an influx of foreign multinationals relocating post Brexit.

Increase in transaction costs and uncertainty presented by Brexit

In the perception of the interview respondents, Brexit is adding to environmental uncertainty and transaction costs are high, limiting investment as firms adopt a ‘wait and see’ approach. The survey findings echo these concerns, with a respondent adding in the open comment section “there is maintained uncertainty in the market place” and another saying, “the risk of shortages and increased costs affects the decision-making process in the construction industry from the bottom up.” This provides an Irish construction sector specific echo of the findings of Chang (2018) who finds that Brexit has created uncertainty in UK markets generally. In terms of material prices, the UK Department for Business, Energy and Industrial Strategy’s Monthly Statistics of Building bulletin showed that the material price index has increased 20% between 2010 and January 2019 (BEIS 2019). Uncertainty and higher transaction costs hinder business expansion; however, as Lee and Swagel (1997) suggest, trade barriers are both politically and economically determined. One key element leading to increased costs has been fluctuation in the sterling – euro exchange rate. Although Roper (2006) found that fluctuating exchange rates drove cross border trade in the direction relevant to the respective currency strengths, the picture emerging here is of exchange rate uncertainty in both jurisdictions. Forbes *et al.* (2018) use the example of sterling fluctuations post-Brexit as an exemplar for exaggerated market fluctuations and subsequent uncertainty, explaining why sterling’s post-crisis depreciation caused a sharper increase in prices than expected. Plakandaras *et al.* (2017) continues this argument by debating whether the depreciation of the pound post-Brexit could have been predicted. This work concluded that, to arrive at any accurate result, due to the uncertainty caused by Brexit, such depreciation would have been envisaged, but the rate at which this occurred, would have been speculative. This further verifies the arguments and supporting viewpoints of those interviewed, all of whom highlighted the increased pressures posed by

Brexit due to the uncertainty in market conditions, primarily related to fluctuations in currency.

Nasir and Morgan (2018) together with the vast majority of interviewees are of the viewpoint that both the period of uncertainty created by the referendum, prior to and subsequent to the result, has resulted in sustained and long-term (10 years or more) sharp depreciation of Sterling, with ensuing difficulty for the construction sector, particularly those locked into long term contracts.

Opportunities presented by Brexit

From the qualitative data, a minority of respondents (particularly in the offsite modular sector) saw opportunity for their organisations arising from Brexit. However, more questionnaire respondents (40.4%) agreed or strongly agreed than disagreed or strongly disagreed (37.6%) that Brexit presents opportunities for their organisations. This is unexpected, particularly given the weight of peer reviewed literature and industry position papers focussing on the negative impact of Brexit (Chang 2018, Copenhagen Economics report 2018, NICG 2018, PWC/CIF 2019). Further research is needed to explore what these opportunities might be; however, some commentators have suggested that the Policy divergence enabled by Brexit may in fact benefit sectors of Industry (Gravey *et al.* 2018). Culkin and Simmons (2019) feed into this debate, suggesting that innovation is not best fostered by a 'bonfire of regulation', rather by targeted financial support for innovation and growth in business.

Potential long-term outcomes for Ireland

The respondents express a view that Brexit is likely to increase regulatory barriers in Ireland, North and South, it will increase transaction costs and add to uncertainty, and risks cutting Ireland off from European trade routes, accentuating its geographical position at the periphery of Europe.

Factor 2 from the quantitative analysis confirms that the majority of those asked agreed that Brexit will have a long-term impact on the construction industry in Ireland, and in England, Scotland and Wales. The Copenhagen Economics report (2018) commissioned by the Government of Ireland argues that, based on a 2030 non-Brexit baseline, "Brexit will have negative impacts on the Irish economy in all scenarios analysed" regardless of the short, medium or long-term viewpoint adopted. This Economics report

continues by illustrating that the construction industry would be one of the worst affected sectors throughout Ireland, anticipating that more than 6000 jobs over 10 years may be lost, which equates to approximately one per cent of the Irish labour force. Furthermore, this report argues that construction output is estimated to contract between 2% and 5%, depending on the various scenarios that materialise post-Brexit.

Conclusions

This study uses qualitative and quantitative analyses to probe construction trade patterns in the construction industry in both parts of Ireland, and to examine how the respondents feel these patterns could be altered by various Brexit scenarios. At present, the media attention around Brexit has not focussed particularly on the construction industry, and academic research has focussed on construction in the UK (Ramiah *et al.* 2017, Mohamed *et al.* 2017) or trade in general across the Irish land border (Studnicka and Lawless 2018, Brownlow and Budd 2019). This study is the first academic peer reviewed research to combine these areas.

The main pattern of findings shows that, whilst the respondents feel overwhelmingly that Brexit will have a negative impact on the construction industry in Ireland, they are ready to respond with resilience and adaptability. Of those surveyed, some organisations are actively strategizing for Brexit, for instance setting up companies in new jurisdictions, and others looking to forward buy materials and widen their potential supply chains to ensure continued capacity. Some respondents point to the unprecedented levels of unpredictability wrought by Brexit. The construction industry is used to dealing with risk but the problem arising from this research is that organisations that are dealing with this risk find it unpredictable, difficult to plan for and mitigate. Those organisations not actively preparing for the possible changes that Brexit may bring are planning to adapt as necessary on an ad hoc basis until the outcome of Brexit negotiations is crystallised and more permanent measures can be put in place.

This study finds that the economic markets in the construction trade between the North and South of Ireland are only partially integrated, although both markets at the time of writing are within the European single market and customs union, thus challenging a neofunctionalist view (Haas 1958), or an idealistic view of the effectiveness of European

Integration. The differentiated economic disintegration (Schimmelfennig 2018) wrought by Brexit stands to push these markets yet further apart.

At present there are no customs borders between the North and South of Ireland on the land border, or between Northern Ireland and the UK. The construction organisations of those surveyed depend on travel and trade across land and sea borders. The research has shown that any customs border, barrier or regulatory divergence between the North and South of Ireland will, in the view of the respondents, negatively affect Irish cross border trade. Likewise, England Wales and Scotland forms a vital market for the Irish construction companies surveyed. Although a slightly smaller proportion of respondents agreed or strongly agreed that their business would be negatively affected by customs cheques in the Irish Sea, there is not a clear 'winner' in terms of the importance of North – South or East – West trading routes, making the choice more difficult for those who have to decide where the new regulatory and trade cheques and barriers must be located in the event of Brexit.

Limitations

The limitations of this study include the challenges presented when attempting to research an area which is in constant flux, and the subject of intense debate and passion. In the course of writing this paper, the context shifted on several occasions leading to reframing of the issues under discussion. The qualitative phase included 9 participants, all from medium to large sized construction organisations. Clearly the perspective from small contractors would have given a more rounded viewpoint. In addition, the 101 questionnaire responses included in the quantitative analysis are a small proportion of the potential pool of respondents, however the KMO result of 0.738 indicates that the sample is suitable for generation of reliable results.

Recommendations for further research

Given the limitations of the study, and the fast-moving developments in the area of Brexit, it is vital that further research is conducted regarding the potential impact of Brexit on the construction industry, to arm decision makers with information that they may be cognisant of the results of their actions on industry. The questionnaire survey is based on the perceptions of a range of participants encompassing contractors, design consultants and clients. The differences in

perceptions between these constituent groups regarding Brexit would merit further study. The finding that the majority of questionnaire respondents suggest that Brexit presents opportunities for their organisation merits further exploration, to determine what these opportunities are and how they may be exploited. It would be of benefit to repeat this research post Brexit (once any transition period is over) to ascertain if the fears of the respondents have been realised, and to uncover impacts which have not been predicted. Regarding the practical contribution of this study, although written in the context of Ireland and Brexit, the authors contend that the issues of cross border trading and economic core and peripheral patterns of trade apply more widely. The authors hope that these results arm the construction industry in Ireland, and those working on the negotiation of future trading relationships, with new information regarding industry views on current trading patterns, and the economic pitfalls and opportunities that are presented by closer market integration, North – South and East – West; integration which would be made more difficult by Brexit.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Tara Brooks  <http://orcid.org/0000-0003-3734-4416>

References

- Abowitz, D.A., and Toole, T.M., 2010. Mixed method research: fundamental issues of design, validity, and reliability in construction research. *Journal of construction engineering and management*, 136 (1), 108–118.
- Adler-Nissen, R., Galpin, C., and Rosamond, B., 2017. Performing Brexit: how a post-Brexit world is imagined outside the United Kingdom. *The British journal of politics and international relations*, 19 (3), 573–591.
- BEIS., 2019. *Monthly statistics of building materials and components – January 2019*. London: Department for Business, Energy and Industrial Strategy. Available from <https://bit.ly/2MRraau> [Accessed 24 September 2019].
- Barrett, A., et al., 2015. *Scoping the possible economic implications of Brexit on Ireland*. Dublin: Economic and Social Research Institute.
- Basheska, E., Clavero, S., and Schiek, D., 2017. 'Brexit' means 'Brexit', but where is the (un)United Kingdom heading? *With special emphasis on the Northern Ireland question*. Brussels: Jean Monnet Centre of Excellence 'Tension at the Fringes of the European Union'.

- Balassa, B., 1976. Types of economic integration. In: F. Machlup, ed. *Economic integration, worldwide, regional, sectoral*. London: Macmillan, 17–31.
- Balassa, B., 1986. Intra Industry trade among exporters of manufactured goods. In: D. Greenaway and P.K.M. Thakaran, eds. *Imperfect competition and international trade*. Wheatsheaf: Brighton, 108–128.
- Beckfield, J., 2006. European integration and income inequality. *American sociological review*, 71 (6), 964–985.
- Brakman, S., Garretsen, H., and Kohl, T., 2018. Consequences of Brexit and options for a 'Global Britain'. *Papers in regional science*, 97 (1), 55–72.
- Braun, V., and Clarke, V., 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3 (2), 77–101.
- Brownlow, G., 2016. *Opportunity Brexit? Institutional economic implications for Northern Ireland*. Knowledge Exchange Seminar Series (KESS), vol. 2016-17. Belfast: Northern Ireland Assembly.
- Brownlow, G., and Budd, L., 2019. Sense making of Brexit for economic citizenship in Northern Ireland. *Contemporary social science*, 14, 294–311.
- Busch, B., and Matthes, J., 2016. *Brexit – the economic impact: a meta-analysis*. Köln: Institut der deutschen Wirtschaft Köln (IW), IW-Report, No. 10/2016.
- Cambridge Econometrics. 2018. *Preparing for Brexit*. Report for Greater London Authority, January.
- Carrera, S., 2005. What does free movement mean in theory and practice in an Enlarged EU? *European law journal*, 11 (6), 699–721.
- Chang, W. W., 2018. Brexit and its economic consequences. *The world economy*, 41 (9), 2349–2373. doi:10.1111/twec.12685
- Chen, W., et al., 2018. The continental divide? Economic exposure to Brexit in regions and countries on both sides of The Channel. *Papers in regional science*, 97 (1), 25–54.
- Child, D., 1990. *The essentials of factor analysis*. 2nd ed. London: Cassell.
- CIOB. 2013. *A report exploring skills in the UK construction industry*. Ascot: Chartered Institute of Building.
- Ciuriak, D., Dadkhah, A., and Xiao, J., 2017. *Brexit trade impacts: alternative scenarios*. Ottawa: Ciuriak Consulting Inc.
- Colville, O., 2017. *Building on Brexit*. London: All Party Parliamentary Group for Excellence in the Built Environment.
- Copenhagen Economics report. 2018. *Ireland and the impacts of Brexit: strategic implications for Ireland arising from changing EU-UK trading relations*. Copenhagen Economics for the Department of Business, Enterprise and Innovation, for the Government of Ireland; February 2018.
- Creswell, J. W., 2009. *Research design: Qualitative, quantitative, and mixed methods approaches*. Los Angeles, CA: Sage.
- CSO. 2003. *Ireland North and South—a statistical profile—2003*. Dublin: Central Statistics Office. Available at <https://bit.ly/2rdB6RG> [Accessed 11 October 2018].
- Culkin, N., and Simmons, R., 2019. Shock therapy and entrepreneurial flare# Brexit. *International journal of entrepreneurial behavior & research*, 25 (2), 338–352.
- Dainty, A., 2007. A call for methodological pluralism in built environment research. In: *Proceedings of the third Scottish Conference for postgraduate researchers of the built and natural environment*, 20–22 November. Glasgow: Glasgow Caledonian University, 1–10.
- de Mars, S., et al., 2016. *Brexit, Northern Ireland and Ireland*. Available from: <https://dx.doi.org/10.2139/ssrn.2797948> [Accessed 18th July 2018].
- de Mars, S., et al., 2018. *Bordering two unions: Northern Ireland and Brexit*. Bristol: Policy Press.
- Denzin, N. K., 1978. *The research act*. 2nd ed. New York: McGraw Hill.
- Doherty, B., et al., 2017. *Northern Ireland and Brexit: The European economic area option*. Brussels: European Policy Centre.
- Durrant, T. and Stojanovic, A., 2018. *The Irish border after Brexit*. London: The Institute for Government. Available at <https://bit.ly/2li2x2E> [Accessed 26 September 2018].
- Eurostat. 2019. *Population on 1 January/Ireland*. Available from: <https://bit.ly/2OhuU7I> [Accessed 2 October 2019].
- Favell, A., Feldblum, M., and Smith, M.P., 2007. The human face of global mobility: a research agenda. *Society*, 44 (2), 15–25.
- Fellini, I., Ferro, A., and Fullin, G., 2007. Recruitment processes and labour mobility: the construction industry in Europe. *Work, employment and society*, 21 (2), 277–298.
- Field, A., 2009. *Discovering statistics using SPSS*. 3rd ed. London: Sage.
- Forbes, K., Hjortsoe, I., and Nenova, T., 2018. The shocks matter: improving our estimates of exchange rate pass-through. *Journal of international economics*, 114, 255–275.
- Gardiner, J., 2018. *Deal or no deal: construction's post-Brexit future hangs in the balance*. Available from: <https://ubm.io/2lWQceH> [Accessed 28 August 2019].
- George, S., and Bache, I., 2001. *Politics in the European Union*. Oxford: Oxford University Press.
- Gravey, V., et al., 2018. *Northern Ireland: Challenges and opportunities for post-Brexit environmental governance*. Belfast: Brexit & Environment.
- Gross, M., and Debus, M., 2018. Does EU regional policy increase parties' support for European integration? *West European politics*, 41 (3), 594–614.
- Haas, E. B., 1958. *The uniting of Europe; political, social and economic forces 1950–1957*. London: Stevens.
- Hayward, K., and Magennis, E., 2014. The business of building peace: private sector cooperation across the Irish border. *Irish political studies*, 29 (1), 154–175.
- Hirschman, A. O., 1958. *The strategy of economic development* (No. 04; HD82, H5). New Haven: Yale University Press.
- Hitchens, D.M., O'Farrell, P.N., and Conway, C.D., 1996. The comparative performance of business services in Northern Ireland and the Republic of Ireland. *Urban studies*, 33 (7), 1093–1110.
- HM Government. 2017. *Northern Ireland and Ireland – position paper*. Available from: <https://bit.ly/2v0UZuG> [Accessed 1 November 2018].
- HM Revenue and Customs. 2018. *Trading with the EU if there's no Brexit deal*. London: UK Government. Available from: <https://bit.ly/2LpAhNn> [Accessed 18 October 2018].
- Hübner, C., and van Nieuwkoop, R., 2015. *Modelling Irish Unification*. New York: KFC Consulting.
- Johnson, P., and Duberley, J., 2000. *Understanding management research: an introduction to epistemology*. London: Sage.

- Johnson, R.B., Onwuegbuzie, A.J., and Turner, L.A., 2007. Toward a definition of mixed methods research. *Journal of mixed methods research*, 1 (2), 112–133.
- Kaldor, N., 1970. The case for regional policies. *Scottish journal of political economy*, 17 (3), 337–348.
- Keating, M., 2004. European integration and the nationalities question. *Politics & society*, 32 (3), 367–388.
- Krugman, P., and Venables, A.J., 1996. Integration, specialization, and adjustment. *European economic review*, 40 (3–5), 959–967.
- Lawless, M., and Morgenroth, E.L., 2019. The product and sector level impact of a hard Brexit across the EU. *Contemporary social science*, 14 (2), 189–207.
- Lawless, M., and Studnicka, Z., 2017. *The potential impact of WTO tariffs on cross border trade*. InterTrade Ireland. Available from: <https://bit.ly/2kNFZRN> [Accessed 28 August 2019].
- Lee, J.W., and Swagel, P., 1997. Trade barriers and trade flows across countries and industries. *Review of economics and statistics*, 79 (3), 372–382.
- Leruth, B., Ganzle, S., and Trondal, J., 2019. Exploring differentiated disintegration in a post-Brexit European Union. *JCMS: journal of common market studies*, 57 (5), 1013–1030.
- Li, Y., and Beghin, J.C., 2012. A meta-analysis of estimates of the impact of technical barriers to trade. *Journal of policy modeling* 34 (3), 497–511.
- Mac Flynn, P., 2016. The economic implications of Brexit for Northern Ireland. NERI Working Paper Series, Dublin.
- Malik, A., et al., 2019. Investigating the Potential Economic Impact of Brexit Decisions on Business Performance in the United Kingdom: A Case Study of the UK Construction Industry. *International journal of management, accounting and economics*, 6 (4), 347–367.
- Mau, S., et al., 2012. *Liberal States and the freedom of movement: selective borders, unequal mobility*. Basingstoke, UK: Palgrave MacMillan.
- Mohamed, M., Pärn, E.A., and Edwards, D.J., 2017. Brexit: measuring the impact upon skilled labour in the UK construction industry. *International journal of building pathology and adaptation*, 35 (3), 264–279. doi:10.1108/IJBPA-05-2017-0023
- Molle, W., 2006. *The economics of European integration: theory, practice, policy*. 3rd ed. Aldershot: Ashgate Publishing Company.
- Mineral Products Association Northern Ireland. 2019. *MPANI submission to the ACC Interim Report*. Available from: <https://bit.ly/2lOleFR> [Accessed 5 September 2019].
- Mulroe, P., 2017. *Bombs, bullets and the border*. Dublin: Irish Academic Press.
- Murphy, M. C., 2014. *Northern Ireland and the European Union: the dynamics of a changing relationship*. Manchester: Manchester University Press.
- Myrdal, G., 1957. *Economic theory and underdeveloped regions*. London: Duckworth and Co.
- Nasir, M.A., and Morgan, J., 2018. Pre-Brexit: the EU referendum as an illustration of the effects of uncertainty on the Sterling exchange rate. *Journal of economic studies*, 45 (5), 910–921.
- NIAC. 2018. *The Land Border between Northern Ireland and Ireland*. (HC 329). London: HMSO.
- NICG. 2018. *Brexit position paper of the NI Construction Group*. Available from: <https://bit.ly/2kC2IAj> [Accessed 28 August 2019].
- NISRA. 2018. *EU exit analysis publications Belfast, Northern Ireland Statistical Research Agency*. Available from: <https://bit.ly/2KIFelk> [Accessed 26 September 2018].
- NISRA. 2019. *2018 mid year population estimates for Northern Ireland*. Available from: <https://bit.ly/2xc9wqR> [Accessed 2 October 2019].
- NISRA and DfE. 2018. *Cross-border supply chain report*. Belfast: Northern Ireland Statistical Research Agency and the Department for the Economy (Northern Ireland). Available from: <https://bit.ly/2Qn49Ao> [accessed 26 September 2018].
- Oliver, T., 2016. *Brexit: What happens next*. LSE IDEAS Strategic Update, 16. London: LSE ideas.
- Owen, J., Shepherd, M., and Stojanovic, A., 2017. *Implementing Brexit – customs*. London, UK: Institute for Government Analysis.
- Oxford Economics. 2016. *The economic implications of a UK exit from the EU for Northern Ireland, a briefing paper*. London: Oxford Economics.
- Petrakos, G., Tsiapa, M., and Kallioras, D., 2016. Regional inequalities in the European Neighborhood: policy countries: the effects of growth and integration. *Environment and planning C: government and policy*, 34, 698–716.
- Plakandaras, V., Gupta, R., and Wohar, M.E., 2017. The depreciation of the pound post-Brexit: could it have been predicted? *Finance research letters*, 21 (4), 206–213.
- Ramiah, V., Pham, H., and Moosa, I., 2017. The sectoral effects of Brexit on the British economy: early evidence from the reaction of the stock market. *Applied economics*, 49 (26), 2508–2514. 10.1080/00036846.2016.1240352
- PWC/CIF. 2019. *Brexit and the Irish construction sector*. Available from: <https://bit.ly/2vAue2H> [Accessed 24 April 2019].
- Robson, P., 1980. *The economics of international integration*. London: George Allen and Unwin.
- Roper, S., 2006. *Cross-border and local cooperation on the Island of Ireland: an economic perspective. Mapping frontiers, crossing pathways, working paper 7*. Belfast: Queen's University Belfast. Available from: <https://bit.ly/2Rn5TqH> [Accessed 1 February 2018].
- Rosamond, B., 2016. Brexit and the problem of European disintegration. *Journal of contemporary European research*, 12 (4), 864–871.
- Royal Institution of Chartered Surveyors. 2018. *Brexit: all the latest news about Brexit for our industry and professionals*. Available from: <https://bit.ly/2lPJ4Rs> [Accessed 27 August 2019].
- Ryan, B., 2001. The common travel area between Britain and Ireland. *Modern law review*, 64 (6), 855–874.
- Saldaña, J., 2015. *The coding manual for qualitative researchers*. 3rd ed. London: Sage
- Sampson, G.P., and Snape, R.H., 1985. Identifying the issues in trade in services. *The world economy*, 8 (2), 171–182.
- SCSI 2015., *Irish Construction Prospects to 2016*. Dublin: Society of Chartered Surveyors Ireland. Available from: <http://bit.ly/1RmRmUp> [Accessed 14 February 2018].
- Schimmelfennig, F., 2018. Brexit: differentiated disintegration in the European Union. *Journal of European public policy*, 25 (8), 1154–1173.

- Studnicka, Z., and Lawless, M., 2018. *Cross-border trade & supply chain linkages report*. Dublin: Economic and Social Research Institute (ESRI).
- Suhr, D. 2006. Exploratory or confirmatory factor analysis? In: *proceedings of the thirty-first annual SAS users group international conference*, San Francisco, California, 26-29 March, 2006, 66–83.
- Tannam, E., 2006. Cross-border co-operation between Northern Ireland and the Republic of Ireland: neo-functionalism revisited. *The British journal of politics and international relations*, 8 (2), 256–276.
- Tansey, P., Spillane, J.P., and Brooks, T., 2018. Creating opportunities in the face of an environmental jolt: exploring turnaround strategizing practices within large Irish construction contractors. *Construction management and economics*, 36 (4), 217–241.
- Tonge, J., 2016. The impact of withdrawal from the European Union upon Northern Ireland. *The political quarterly*, 87 (3), 338–342.
- UK Government. 2019. Get ready for Brexit: check what you need to do. Available from: <https://www.gov.uk/get-ready-brexit-check> [Accessed 16 September 2019].
- Werner, H., 1996. European economic integration: employment, unemployment and migration. In: *European economic integration as a challenge to industry and government*. Berlin, Heidelberg: Springer, 71–96.
- Yuill, D., et al., 1993. *European regional incentives, 1993–1994*. London: Bowker-Saur.