

Title: Investigation as to whether the Brexit negotiation period impacted the Irish start-up arena

[This content remains the property of Alison McMurtrie, at Idunn Consulting]

Table of Contents

| | |
|---|-------------------------------------|
| Dissertation Cover Sheet | Error! Bookmark not defined. |
| List of Figures | 3 |
| List of Tables | 3 |
| Abstract..... | 4 |
| Introduction | 5 |
| What is the scope of this paper? | 5 |
| Literary Review | 6 |
| Policy..... | 6 |
| Regional | 7 |
| Risk Propensity..... | 8 |
| Brexit | 9 |
| Hypothesis..... | 10 |
| Methodology..... | 11 |
| Data Gathering..... | 11 |
| Why collect the data in this way? | 13 |
| Results..... | 13 |
| Data and Survey Driven Results | 13 |
| Interview Driven Results | 24 |
| Paula Fitzsimons – co-author of Ireland GEM report, interview synopsis..... | 24 |
| Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal, interview synopsis | 25 |
| Professor Ron Davies, Head of Economics, University College Dublin, interview synopsis | 26 |
| Mark Christal, Manager of Enterprise Ireland’s Regions and Entrepreneurship Division, interview synopsis..... | 26 |
| Discussion..... | 27 |
| Hypothesis Outcome..... | 28 |
| Hypothesis 1..... | 28 |
| Hypothesis 2..... | 29 |
| Hypothesis 3..... | 31 |
| Hypothesis 4..... | 33 |
| Conclusion..... | 34 |
| Critique of research methodology and findings | 35 |
| Suggested areas for further research | 36 |
| References | 37 |

| | |
|---|----|
| Appendix A – Data Reference List..... | 41 |
| Appendix B – Interview Questions..... | 42 |
| Appendix C - Survey Questions..... | 43 |
| Appendix D – Email Communication for Respondents & Interviews | 47 |
| Interview Request Email | 47 |
| Survey Request Email..... | 48 |

List of Figures

| | |
|--|----|
| Figure 1: Region of Residence of new businesses (Fitzsimons and O'Gorman 2020) | 7 |
| Figure 2: Ireland State GDP from 2010 - 2019, Euro Millions, Report NQQ44 | 16 |
| Figure 3: Company births over time, data from BRA20 & BRA15..... | 16 |
| Figure 4: Deaths as a percentage of company start-ups, data from BRA20 & BRA15..... | 17 |
| Figure 5: All active enterprises, BRA18, by year and region | 18 |
| Figure 6: Active enterprise by sector evolution from BRA19 | 19 |
| Figure 7: Manufacturing deaths and births, BRA20,15&14 | 20 |
| Figure 8: Logistics deaths and births, BRA20,15&14 | 20 |
| Figure 9: Construction deaths and births, BRA20,15&14 | 21 |
| Figure 10: Hospitality births and deaths, BRA20,15&14..... | 21 |
| Figure 11: Probability tree mapping relationship of the sector to risk perception, from survey data. | 22 |
| Figure 12:Enterprise count and value of exports from 2015 to 2017 from EEA01 | 23 |
| Figure 13: Working population by region, PEA04, PEA07 CSO reports, graphic www.regionalskills.ie | 24 |

List of Tables

| | |
|---|----|
| Table 1: Selected entrepreneurship indicators in 2005 (Heinonen, Huttu et al. 2010)..... | 6 |
| Table 2: Summary of respondents from the survey that followed Brexit in the media | 14 |
| Table 3: Key Brexit events followed in the media by survey respondents..... | 14 |
| Table 4: Survey opinion of the start-up environment in Ireland pre and post-referendum | 14 |
| Table 5: Survey respondent perception of start-up environment over time linked to media interest | 15 |
| Table 6: 2008-2015 total enterprise number vs. 2016-2018 total enterprise number percentage..... | 18 |
| Table 7: Key to sector definitions | 19 |
| Table 8: Perception of how Brexit will or has impacted business from survey respondents..... | 23 |
| Table 9: Gender breakdown of survey respondents compared to Ireland total population gender breakdown, data from PEA04 & PEA07 | 24 |

Abstract

This research paper investigates whether the Brexit negotiation period from June 2016 until December 2019 impacted the Irish start-up arena. Specifically dividing the start-up space into four investigations:

- Irish entrepreneurs approach risk during the negotiation period
- The potential impact of creating a start-up in a regional area versus in the Dublin hub
- Change in the export market, and if this is sensitive in specific industry sectors
- Fewer women to become founders during this period due to perceived uncertainty.

Many academic papers have developed models for the impact of Brexit on the Irish economy; the 2019 GEM report also touches lightly on the topic. However, there is no current research on the prolonged negotiation period and its impact on the growing Irish start-up environment.

Data obtained from the Irish Central Statistics Office was triangulated with survey respondents' opinions and interviews from Paula Fitzsimons, co-author of GEM report, Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal, Professor Ron Davies, Head of Economics, UCD and Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division.

On a macro level, it can be concluded that despite regular 'get ready' communications from the media and Government agencies, the uncertainties during the negotiation period had no impact on the Irish start-up arena. It is cautionary to note that some data limitations were identified. This topic would warrant further investigation, as some of the impacts may be masked by the buoyant economy and growth period Ireland was in at the time.

Recommendations highlighting gaps in data ranges and areas for future research have been made.

On a micro-level. The risk propensity of Irish entrepreneurs did not change during the negotiation period. The Irish are inclined to take informed risks when it comes to business decisions. The impact of the regulation changes on the regions and their start-up environment is inconclusive. Exportation appeared to increase overall, and the number of enterprises exporting each year increased sequentially. There seems to be no direct negative impact for exporting sectors. The number of female founders continued to grow each year, and the level of risk associated with the potential but unclear changes related to Brexit and the uncertainty of the negotiation period did not appear strong enough to convince the nascent female population that their enterprise would potentially fail, and therefore prevent them from starting.

Introduction

In June 2016, the United Kingdom and Northern Ireland (UK) citizens voted to leave the European Union (EU). Ireland is the only country in the EU that shares a border with the leaving UK and has a strong trading relationship with the UK, with over 30% of exports to the UK annually (Ireland 2019), it is believed to be significantly impacted if not sufficiently prepared and has created a country-specific Action Plan,

'Even with all the work that has been done, there will be severe disruption' (Ireland 2020).

The disruption is communicated and reinforced in the media in Ireland (McMonnell 2020), with articles appearing in all new agency websites, social media, and newspapers frequently since 2016.

The possible impact on the currently trading business is well documented and covered. However, the potential impact of Brexit uncertainty from the 2016 referendum until December 2019 for start-ups is unclear. Start-ups being defined for the purpose of this paper as being any enterprise that has registered with the Central Registration Office (CRO) as a private or limited company, of any size, up until 31 December 2019.

Ireland has a reputation internationally as being favourable to start-ups and nascent entrepreneurs (Sanyal 2018), with favourable tax incentives and access to seed and venture capital funding.

'You'd have to be nuts not to take advantage of the unique investment opportunity presented by one of the most business-friendly countries in the world, with the youngest, best-educated workforce in Europe' Bill Clinton at Invest in Ireland Forum in New York February 2012.

What is the scope of this paper?

This paper shall investigate if the start-up environment is impacted by the published uncertainty and change during the transition period from June 2016 until December 2019. 2020 data is excluded due to the impact of the COVID-19 pandemic, which influences the later data heavily. Comparisons of raw data from 2010 until 2015 shall be used against the data available from 2016 to 2019.

Data and opinion will be investigated at gender, regional and sector components, mapped against key dates during the negotiation period to understand if the start-up communities approach to risk changes in response. It is well appreciated that in Ireland, the Dublin region is the hub for innovation, new company start-up, and skill base. The regions will be investigated to understand if they perceive they benefit from the same support levels during the negotiation period as the Hub region.

Literary Review

The country of Ireland has a reputation as a feeder country for innovative ideas across multiple sectors driven by an educated, flexible workforce and relatively favourable tax rates (Haider 2016). In the 1990s, the country was named the 'Celtic Tiger' (Gardiner 1994). However, the global financial crisis (GFC) on the Tiger was significant, and Ireland had to look internally to recover (Fund 2018).

'Globalisation and internationalisation have intensified competition as companies from low-cost base environments threaten manufacturing sectors, a rise in business costs has arisen from an increase in inflation, and many businesses now have difficulty finding and maintaining appropriately skilled, affordable employees' (Cooney and Kidney 2008).

Policy

Ireland did recover, an early nod to their business resilience attitude. With an increased focus on their internal market and homegrown start-ups, the government introduced their first Entrepreneurial policy (Lundstrom and Stevenson 2005, Department of Jobs 2014). The formalisation of entrepreneurship within the economy enabled it to become a breeding ground, somewhat in line with what other countries like Singapore had experienced when a formal Entrepreneurial Policy was put in place (Lerner 2010). It has been identified that policies favourable to allow increased venture capital (VC) stimulate new company start-ups more than the VC's are investing in (Samila and Sorenson 2011). A paper comparing Finland and Ireland in the early 2000s provides clear justification for a strong Entrepreneurial policy to be put in place. Both countries were compared on the basis that they share a similar history; both rely heavily on external markets and are perceived to have relatively low entrepreneurial cultures and attitudes (Heinonen, Hutti et al. 2010). This concept is further supported in the Autio et al. paper (Autio and Rannikko 2016).

Table 1: Selected entrepreneurship indicators in 2005 (Heinonen, Hutti et al. 2010)

| | Finland % | Ireland % |
|--|------------------|------------------|
| Failure rate (% of enterprises) | 7.3 | 34 |
| SMEs per 1,000 inhabitants | 42.4 | 24.6 |

The change and formalisation of policy should certainly have had a direct impact on the favourability of the start-up environment. However, there is a suggestion that perhaps individuals are forced into entrepreneurial start-ups due to the lack of other options explored in the paper by Koellinger and Thurik (Koellinger and Thurik 2012). This economic environment would have been experienced with the bust 'The Celtic Tiger.' This suggestion is

further supported when investigating nascent entrepreneurs during the GFC. In the paper by Davidsson and Gordon, they identified that contrary to the perception that during macro-economic instability, the propensity is for nascent entrepreneurs to disengage or delay their endeavour, insufficient evidence of this was found (Davidsson and Gordon 2016). However, it is important to also highlight that, specifically in Irish history, there has been no clear link made with an increase in economic growth and a rise in start-up activity (Anyadike-Danes, Hart et al. 2011).

Regional

The economic hub of Ireland is centered around Dublin, and similar to other countries where rural populations exist, it is fundamental to ensure that the Policies and support to new business and start-ups include all regions (Ring, Peredo et al. 2009).

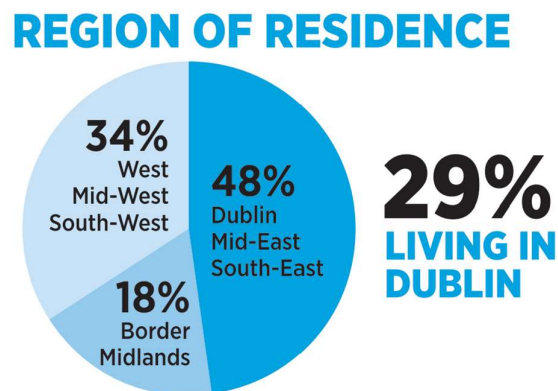


Figure 1: Region of Residence of new businesses (Fitzsimons and O’Gorman 2020)

This is further supported from studies in rural USA, where,

‘alumni who live in a rural location after college are more likely to become entrepreneurs compared with their urban peers. Rural origin of individuals significantly predicts the likelihood of rural entrepreneurship. We also find evidence that, all else equal, the entrepreneurship choice of rural alumni is motivated by a combination of preference for location and productive factors’ (Yu and Artz 2019).

Earlier work in this area concludes that it combines the entrepreneurial characteristics and the innovative regional environment (Capello and Lenzi 2016), leading to rural start-ups. However, it has been suggested that not all industries demonstrate the same level of success as one would expect. A start-up that is labour intensive in a rural environment may be less likely to survive compared to being based in a semi-rural environment (Dejardin and Fritsch 2011). Further to this, it has been identified that,

'regions with a relatively low level of start-ups may benefit more from an increase in the start-up rate than regions in which the start-up rate is already rather high. Our analysis clearly shows that the positive effects of new business formation on employment growth are more pronounced in high-density areas than in rural regions. Moreover, regions with a large share of medium-skilled workers and a high level of innovative activity benefit significantly more from new business formation than do other regions.' (Fritsch and Schroeter 2011).

A direct link to this is female entrepreneurship. It has been suggested that due to smaller networks and more costs due to lengthy commutes driven by additional responsibilities, a higher percentage of the rural entrepreneurs are female (Rosenthal and Strange 2012). Policy and its coverage of gender equality at a national level have been found to be directly favourably linked to the ratio of self-employed females (Klyver, Nielsen et al. 2013). However, it has been found in the UK, a roughly similar market to Ireland, which also was impacted heavily from the GFC, that females, when compared to males, are more sensitive to market changes,

'there are strong statistical associations between changing economic factors and both the short and long-run changes in female self-employment. Accordingly, it is valid to infer that women are significantly influenced in their self-employment choices by economic considerations, such as the state of the economy and access to finance' (Saridakis, Marlow et al. 2014).

Risk Propensity

The perception of Ireland in the last decade as an incubator for start-ups is supported by the Global Entrepreneurship Monitor (GEM) reports (Fitzsimons and O'Gorman 2020) when compared at an OECD country level. The recent post-GFC recovery in this environment can also be explained by the concept of the 'invisible hand' (Smith 2014) and the opportunities which if identified under these economic market conditions, can be taken advantage of. The highly educated and skilled workforce is a contributor to the start-up environment, and this has been identified as a contributing factor also in the paper on Entrepreneurial Intention,

'We find that people's entrepreneurial intention is promoted by their risk propensity, opportunity awareness and especially their perceived capabilities. This entrepreneurial mindset is variously shaped by demographics, notable gender in the way that men more often than women consider themselves capable, risk-willing and aware of opportunities. People's entrepreneurial attitude is also shaped by their cultural context in the way that traditionality, more than secular-rationalistic culture, promotes perceived capabilities, and also in the way that self-expressionism, more than materialistic culture, enhances perceived

capabilities and opportunity awareness.' (Kreiser, Marino et al. 2010, Townsend, Busenitz et al. 2010, Ebrahim and Schott 2014).

However, it is not education alone that will guarantee the entrepreneurial market's growth; the individual's characteristics are equally important. The study performed by Vaghely and Julien identified that,

'entrepreneurs discover and enact opportunities..... are more adept at switching between algorithmic and heuristic modes of thought as the need arises' (Vaghely and Julien 2010).

Assuming the individual or group of individuals are in the right market environment, can spot an opportunity and have traits towards both algorithmic and heuristic modes of thought, how they perceive risk is a major contributing factor to success or failure. Risk is a combination of an individual's propensity to risk and the risk capacity. Still, it is suggested that these are not linear characterisations but can change over time or concerning a certain situation.

Therefore it is suggested by McCarthy that it is impossible to characterise a population's risk profile as a static statement (McCarthy 2000). The risk propensity on an individual can be linked to their past experiences. It has also been found that start-up failures can lead to being more confident and more likely to take risks (Hayward, Forster et al. 2010, Ucbasaran, Westhead et al. 2010). When looking at the data for these trends, it is important to understand how failure is defined. The non-trading of a business for two years is the definition used by the Ireland Central Statistics Office. However, the non-trading could be for voluntary or involuntary reasons. This idea is further explored, with respect to gender, as it has been suggested that more female start-ups fail. The paper by Justo et al. found that females do not fail more often than males in the same area; however, they are more likely to exit voluntarily for personal reasons (Justo, DeTienne et al. 2015). This conclusion is further supported by an investigation by Filippin and Crosetto, which identified similar results. There was no data-driven conclusion as to the risk propensity link to gender (Filippin and Crosetto 2016).

Brexit

With more than 30% of exports from Ireland to the UK (Ireland 2019), the referendum in June 2016 has had the propensity to impact Ireland greatly from an economic perspective, based on the level of export reliance and currency impact (Ireland 2016). Although the actual impacts cannot be known at the time of writing this paper (Duarte, Kok et al. 2019), several scenarios have been modeled, based on the UK National Institute of Economic and Social Research (NIESR) models, and all have collaborated on a drop of Irish GDP by between 1-3.8% (Bergin, Garcia-Rodriguez et al. 2017). There appears to be a bit of a split camp, with supporters of an Irexit, which would be focused on maintaining the links to the UK. However,

it is not frequently in the media, but may reappear if Brexit is deemed a success, and Ireland struggles to manage the export changes (Davies and Francois 2018).

Hypothesis

The literature would suggest that during times of economic and market uncertainty contrary to what is perceived by the public due to the news and 'businesses get ready' communications from government-related agencies (O'Connell 2019, Affairs 2020), the start-up environment is resilient to this uncertainty. This period is deemed an opportunity, across all sectors, in the remotes and Dublin hub and is not sensitive to gender. I base my approach on the deductive analysis method, using literature recommendations (Heun 2018) and (Economist 2005).

Hypothesis 1. Entrepreneurs in Ireland became more risk-averse, leading up to Brexit.

Due to a perceived uncertainty around the new rules and legislation, the timeline and the communications from the government bodies to 'get Brexit ready,' did this period from 2016 onwards cause the usually risk favourable Irish to become more risk-averse or more calculated risks?

Hypothesis 2. The number of start-ups created in the regions reduced during the Brexit negotiation period.

With a number of the regions sharing a border with the UK, the unclear and undefined regulations with the timeline would reinforce instability and insecurity in these areas. Therefore, this could put off nascent entrepreneurs to start new businesses in these areas and other regional parts.

Hypothesis 3. The number of start-ups that are exporters will reduce during the Brexit negotiation period.

Due to the media message, Enterprise Ireland and Local Enterprise Offices that the regulations around exportation and customs will change, there will be fewer start-ups of enterprises that do export products and services due to the lack of clarification of the changes of the regulations during the Brexit negotiation period.

Hypothesis 4. Fewer start-ups will be created by female founders than the historical norm.

Literature mentions that females have an increased sensitivity to market uncertainty. During this negotiation period, fewer start-ups will be created by female founders than the historical norm due to this uncertainty.

Methodology

This paper will investigate data in the positivism paradigm utilising the deductive, pragmatic methodology collected in quantitative and qualitative research methods (Dawson 2019). Quantitative data will be in the form of raw data collected from the Ireland Central Statistics Office (CSO) and the Ireland Central Registration Office (CRO) and analysed. Qualitative data will be gathered from interviews. Midway through the investigation, it was identified that insufficient raw data was freely available. An additional layer of qualitative research in the form of a survey was added.

Data Gathering

Public data from the CSO was identified, providing annual data on the total number of enterprises, enterprise deaths, enterprise count regional and industry type data. A 10 year period of data was required to identify trends pre-Brexit referendum and negotiation period, to identify any changes. A list of all the raw data downloads used within the analysis can be found in Appendix A. This data was initially used as descriptive models to set the scene and explain the start-up environment within Ireland. The data would then be triangulated against interviews and survey data.

Contact was made with the CSO on whether monthly data was available offline for the period 2010 – 2019 to correlate the data against main Brexit related events during the period and their coverage in the media. The availability of monthly data would have enabled the analysis of trends and changes such as around key event dates and their coverage by the Irish media. However, they did not have this information available to the public without charges. Weekly reports on enterprise deaths were available from the CRO; however, they utilised a different definition of death to the CSO, and as such, could not be used in direct data triangulation.

- CRO: Any voluntary strike-off and validated liquidations
- CSO: Any enterprise that has not traded for the past two years

The public data was initially planned to contrast against the key Brexit events post-June-2016 (Parliament 2020), to draw any relationship between these events documented in the Irish media and an impact on the start-up propensity, success tendency, regional start-up rate, gender impact and by sector. This is a potential area for future investigation and research as the data can be made available.

The raw data investigation was planned to be in conjunction with 8-10 interviews. The raw data triangulated with the interview responses to conclude the hypothesis.

Interviews followed a semi-structured approach, in so much that open questions are prepared, Appendix B, but the discussion would take a fluid approach. Where the interviewee mentioned points of interest, these would be probed further, rather than sticking firmly to the prepared questions. The interviews would be recorded and transcribed for investigation. The disadvantage of this approach is that it can be challenging to compare responses between interviewees in a structured methodology and ensuring the same questions are asked of all the interviewees. There is also the concern that the interviewee would be inadvertently guided by the interviewer during the development and probing outside the set questions. Key persons were identified from Enterprise Ireland, Managers from the Local Enterprise Offices, leaders of Innovation Hubs, GEM Report authors, established entrepreneurs and individuals involved in Venture Capital and Angel funding. A total of 19 individuals were directly contacted by email. A follow-up reminder email was sent to those that did not respond. Four individuals agreed to be interviewed:

- 1- Paula Fitzsimons – co-author of Ireland GEM report
- 2- Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal
- 3- Professor Ron Davies, Head of Economics, University College Dublin
- 4- Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division

Interviews were conducted via Zoom and transcribed for later investigation.

The inability to access monthly data meant that I was unable to identify clear data links between the timing of the media reports of key negotiation events and impacts on start-ups, from only the raw data and interviews collected.

A survey was initiated, Appendix C, to add a further data set and gather perceived sensitivity to event dates and perceived risk propensities of the individual. The survey, formed on Quadratics, was anonymous but did collect demographic information on age range and gender identification. The survey was circulated in several ways:

- 1- Direct messaging on LinkedIn to profiles of founders of enterprises that successfully received Enterprise Ireland funding between 2010 and 2019. Twenty-two individuals were contacted directly, with zero responses, email draft Appendix D.
- 2- Direct email to profiles who were founders of enterprises that successfully received Enterprise Ireland funding between 2010 and 2019. One hundred thirty-seven individuals were contacted directly, estimated to have ten responses, email draft Appendix D.

3- Sharing of the link to Irish networking organisations; Network Ireland (<https://networkireland.ie/>) and Ireland Together (<https://irelandtogether.ie/>). An additional four responses were logged.

The online survey was open for 14 days, with one reminder sent to each group. A total of 14 complete responses were logged, and additional five incomplete responses were logged and disregarded. This is estimated to be around a 10% response rate due to the population accessed through networking organisations. The survey was circulated during the Ireland wide Level 5 COVID lock-down, which was unavoidable due to the project's timeline.

By introducing the survey, bias was introduced inadvertently. Enterprise Ireland funding was available only to 'successful' enterprises, therefore possibly with a higher propensity to risk-takers and have enterprises that did not die, or for them to be serial entrepreneurs. One of the network groups is specifically for females, and as such may have increased disproportionately the results with an increased female response rather than what would have been expected. The benefit of circulating through the network organisations is the reach beyond the Dublin area, into the regions of Ireland. The Enterprise Ireland contacts are organised in such a way that it is not obvious as to whether they are Dublin based or regional; however, some inadvertent bias may have been introduced here, as Dublin is the major hub for incubators and start-ups in Ireland.

The survey data was triangulated against raw data and opinions from interviews. A probability tree was mapped from the responses to evaluate the risk perception given certain situations.

Why collect the data in this way?

Initially, it was perceived that raw data from the CSO would be available with start-up, deaths, gender, regional location and sector in a monthly format, enabling identifying the impact of media events during the period. This, combined with interviewee data, would provide sufficient source data to enable the hypothesis to be proved true or false.

Changing the methodology to raw data, interviews and surveys enabled probability analysis and central limit theorem to be utilised to identify relationships pre and post-referendum and split into the gender, regional, sector buckets. Using annual data alone would not have provided sufficient investigation depth and could have provided generalised trends only.

Results

Data and Survey Driven Results

Table 2: Summary of respondents from the survey that followed Brexit in the media

| | | |
|------------------------------|---|-------|
| Yes | 5 | 35.7% |
| Yes, but not actively | 7 | 50.0% |
| No, not actively | 2 | 14.3% |
| No | 0 | 0.0% |

Table 3: Key Brexit events followed in the media by survey respondents

| | Count | % |
|--|--------------|----------|
| 12-Apr-2019 Deadline for leaving pushed to 31-oct-2019 | 1 | 5.3% |
| 23-Jun-2016 UK votes Leave | 8 | 42.1% |
| 24-Jul-2019 Johnson becomes new Prime Minister | 1 | 5.3% |
| 24-Jun-2019 May resigns | 3 | 15.8% |
| 25-Nov-2018 Draft Withdrawal Agreement published | 1 | 5.3% |
| 29-Mar-2017 Article 50 of the Lisbon Treaty triggered | 2 | 10.5% |
| 2-Oct-2019 Compromise Brexit proposal published | 1 | 5.3% |
| 6-Oct-2019 No support from Germany | 1 | 5.3% |
| 8-Jun-2017 General election in the UK | 1 | 5.3% |

Table 4: Survey opinion of the start-up environment in Ireland pre and post-referendum

| Start-up environment | 2010 -2015 Start-Up Environment | | 2016 -2019 Start-Up Environment | |
|------------------------------|--|-------------------|--|-------------------|
| | Survey count | Percentage | Survey count | Percentage |
| Very Positive | 1 | 7.1% | 1 | 7.1% |
| Positive | 3 | 21.4% | 7 | 50.0% |
| Neutral | 5 | 35.7% | 2 | 14.3% |
| Somewhat Unfavourable | 5 | 35.7% | 2 | 14.3% |
| Very Unfavourable | 0 | 0.0% | 2 | 14.3% |

Table 5: Survey respondent perception of start-up environment over time linked to media interest

| Respondent | 2010 -2015 Start-Up Environment | 2016 -2019 Start-Up Environment | Change in Perception | Followed Brexit in Media |
|-------------------|--|--|-----------------------------|---------------------------------|
| 1 | Positive | Positive | Same | Yes |
| 2 | Somewhat unfavourable | Somewhat unfavourable | Same | Yes |
| 3 | Somewhat unfavourable | Somewhat unfavourable | Same | Yes |
| 4 | Neutral | Positive | Positive | Yes |
| 5 | Somewhat unfavourable | Very unfavourable | Negative | Yes |
| 6 | Neutral | Positive | Positive | No, not actively |
| 7 | Very positive | Positive | Negative | No, not actively |
| 8 | Neutral | Neutral | Same | Yes, but not actively |
| 9 | Neutral | Neutral | Same | Yes, but not actively |
| 10 | Positive | Positive | Same | Yes, but not actively |
| 11 | Somewhat unfavourable | Positive | Positive | Yes, but not actively |
| 12 | Neutral | Positive | Positive | Yes, but not actively |
| 13 | Positive | Very positive | Positive | Yes, but not actively |
| 14 | Somewhat unfavourable | Very unfavourable | Negative | Yes, but not actively |

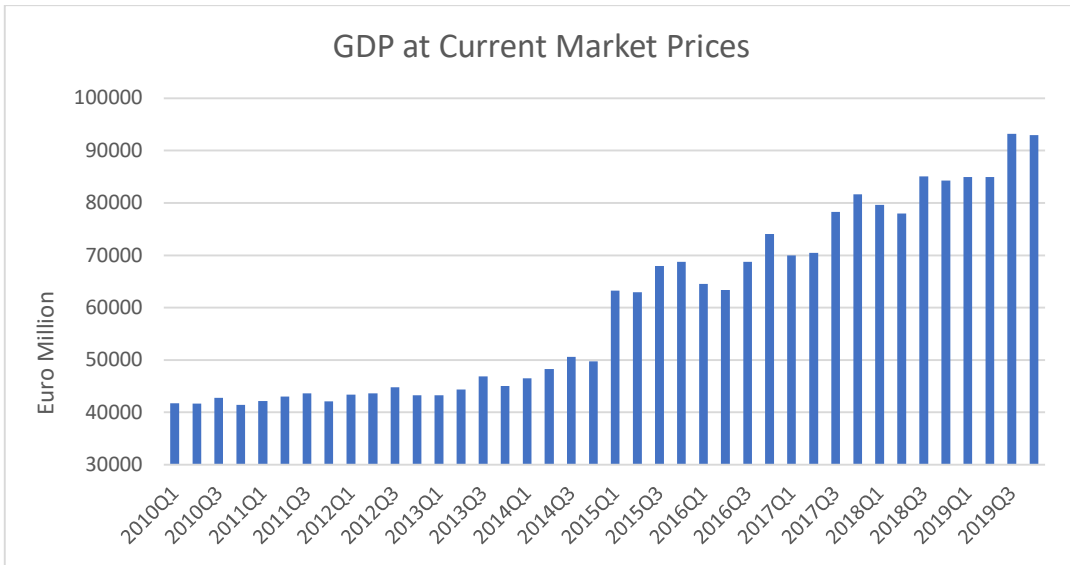


Figure 2: Ireland State GDP from 2010 - 2019, Euro Millions, Report NQQ44

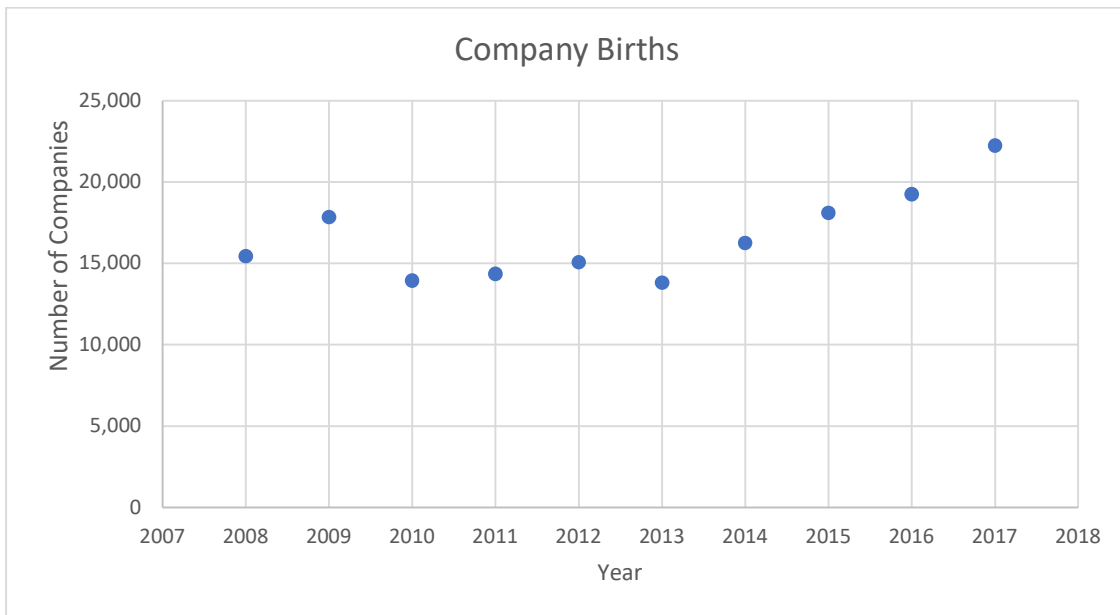


Figure 3: Company births over time, data from BRA20 & BRA15

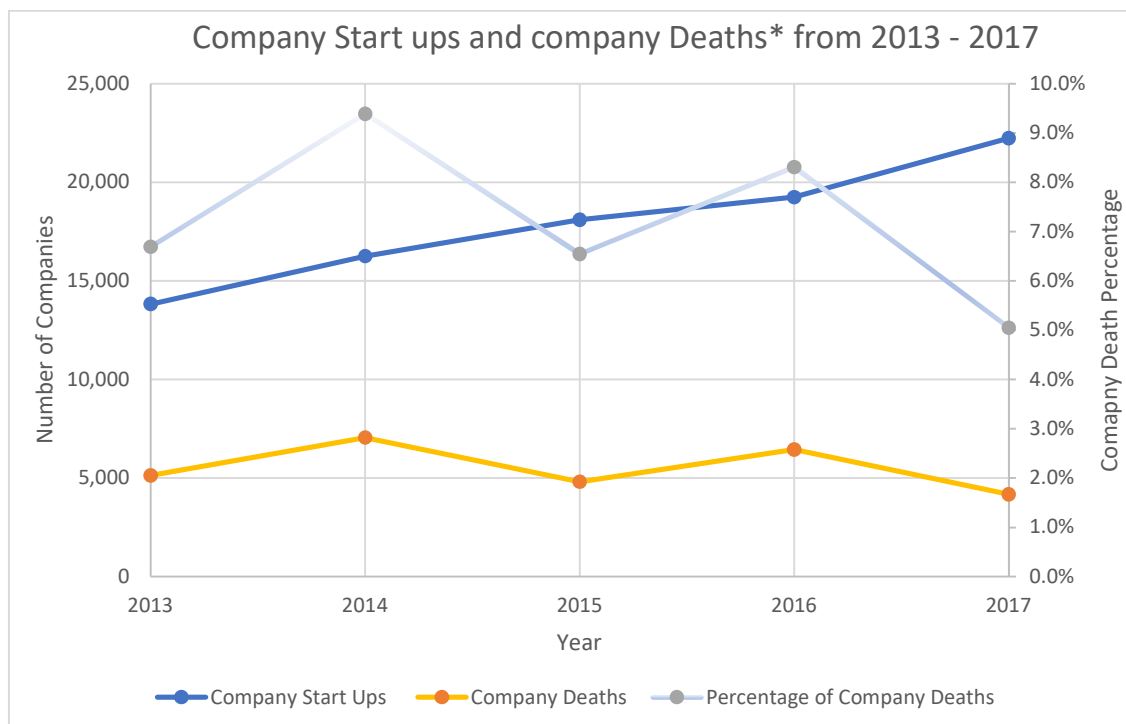


Figure 4: Deaths as a percentage of company start-ups, data from BRA20 & BRA15

* Deaths 5 year rolling of start-ups, i.e., deaths in 2013 are of companies started in the years 2008, 2009, 2010, 2011 & 2012

Data presented in Figure 3 and Figure 4 is summarised from CSO data extract BRA20 and BRA15. The exact total number of operating companies (and company deaths) in Ireland is not available, as described above. However, CSO started publishing yearly data from 2008 of company births, and in subsequent years company deaths based on the company birth lasting one year, two years up to five years. Starting in 2013, it is possible to evaluate the company births in the preceding five years, how many survived. Also, how many ceased trading. These are not absolute active companies nor total company deaths in the Irish economy, but rather an analogy of births and deaths in the start-up environment.

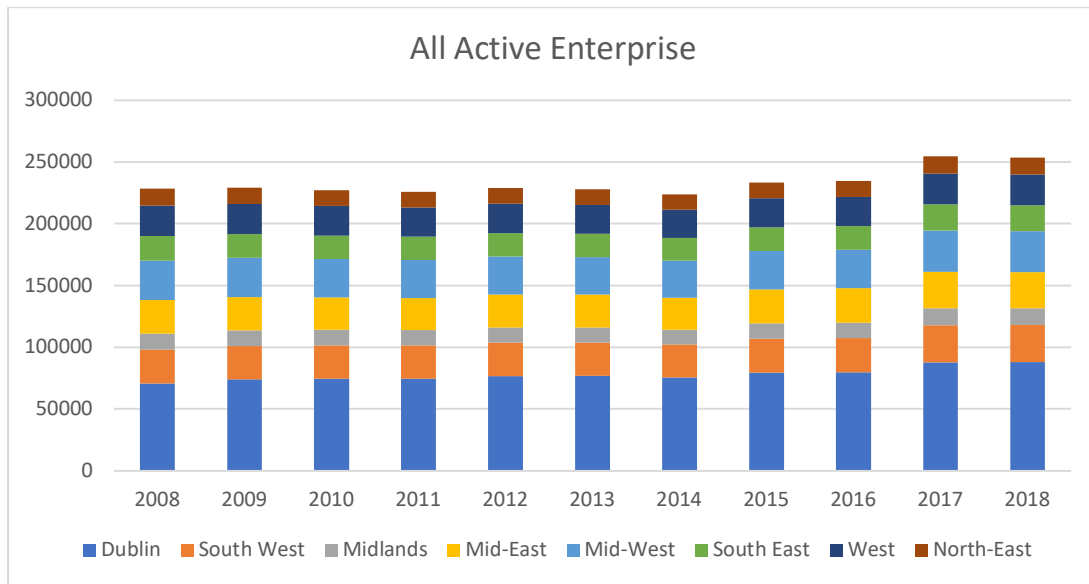


Figure 5: All active enterprises, BRA18, by year and region

Table 6: 2008-2015 total enterprise number vs. 2016-2018 total enterprise number percentage

| | 2008-2015 Count | 2016-2018 Count | % difference |
|-------------------|-----------------|-----------------|--------------|
| Dublin | 75,264 | 85,270 | 13% |
| South West | 27,089 | 29,203 | 8% |
| Midlands | 12,405 | 13,092 | 6% |
| Mid-East | 26,643 | 28,985 | 9% |
| Mid-West | 30,969 | 32,568 | 5% |
| South East | 19,084 | 20,416 | 7% |
| West | 23,685 | 24,436 | 3% |
| North-East | 12,840 | 13,671 | 6% |

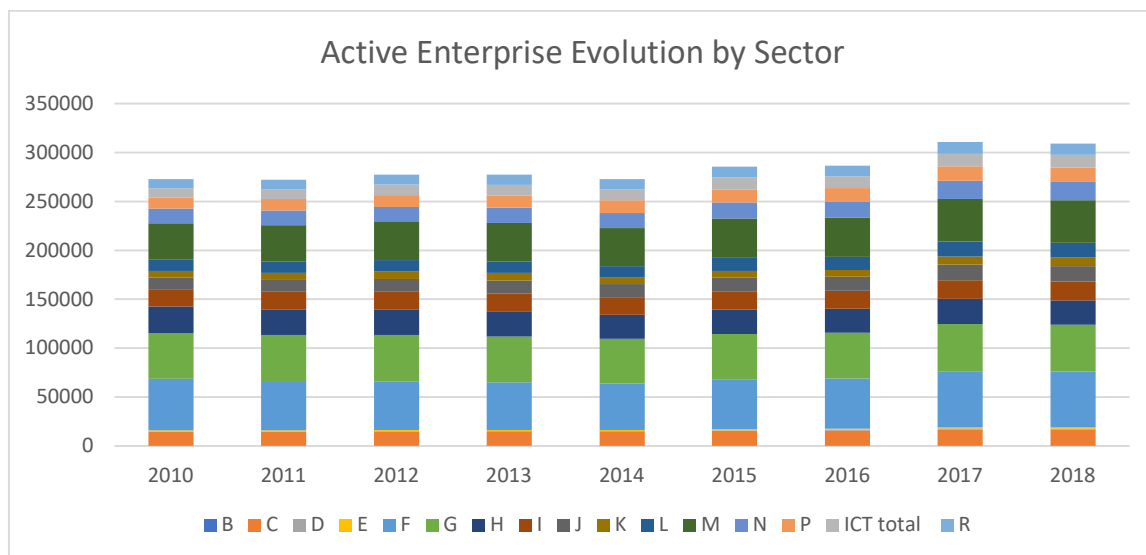


Figure 6: Active enterprise by sector evolution from BRA19

Table 7: Key to sector definitions

| | |
|---|--|
| B | Mining and quarrying (B) |
| C | Manufacturing (C) |
| D | Electricity, gas, steam and air conditioning supply (D) |
| E | Water supply, sewerage, waste management and remediation activities (E) |
| F | Construction (F) |
| G | Wholesale and retail trade, repair of motor vehicles and motorcycles (G) |
| H | Transportation and storage (H) |
| I | Accommodation and food service activities (I) |
| J | Information and communication (J) |
| L | Real estate activities (L) |
| M | Professional, scientific and technical activities (M) |
| N | Administrative and support service activities (N) |
| P | Education (P) |
| Q | Human Health and Social Work Activities (Q) |
| R | Arts, Entertainment and Recreation (R) |
| S | Other Service Activities (S) |

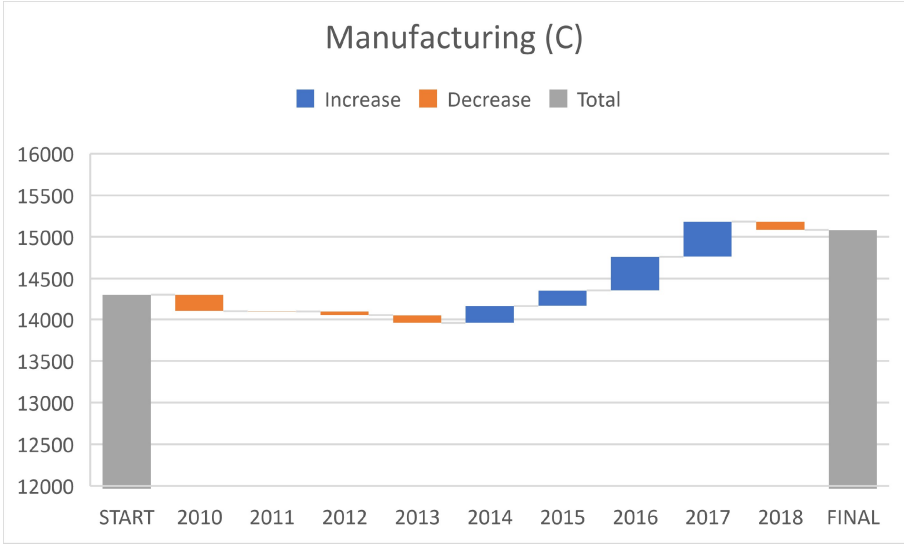


Figure 7: Manufacturing deaths and births, BRA20,15&14

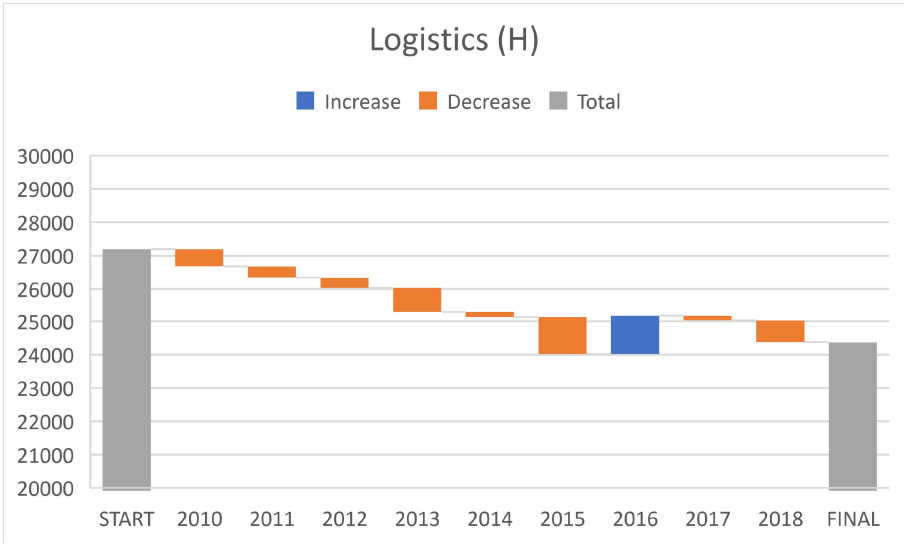


Figure 8: Logistics deaths and births, BRA20,15&14

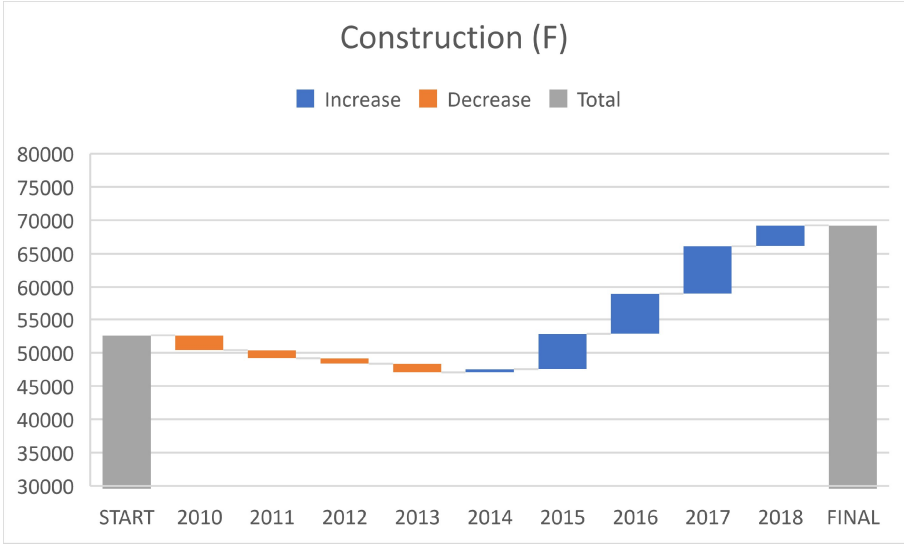


Figure 9: Construction deaths and births, BRA20,15&14



Figure 10: Hospitality births and deaths, BRA20,15&14

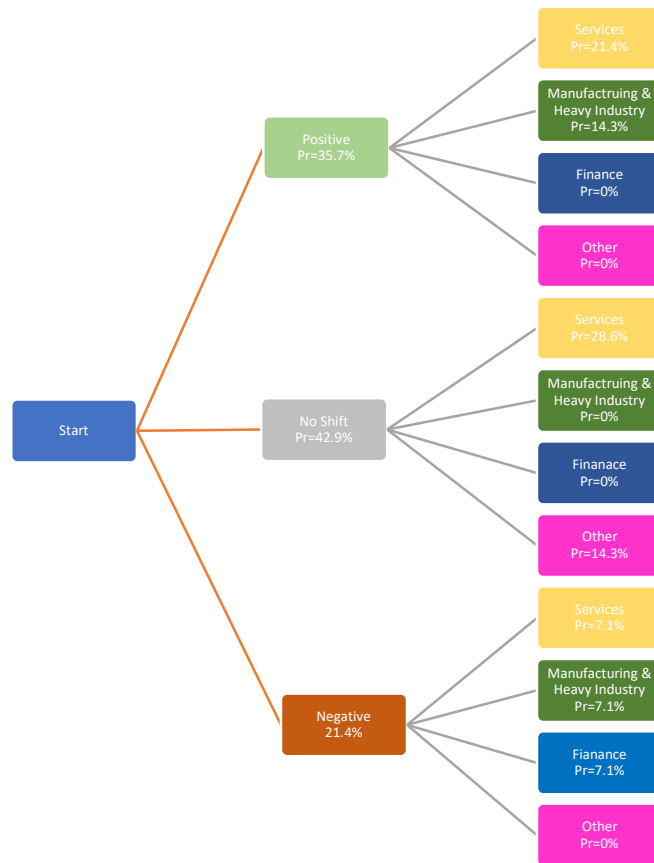


Figure 11: Probability tree mapping relationship of the sector to risk perception, from survey data

Figure 11 is a probability tree of survey respondent's perception of the start-up business environment in Ireland before and after the Brexit Referendum, correlated to their business industry. The Binomial Theorem can be used to determine success, given a known outcome, for example, The probability of the respondent having a negative change in perception, given they had businesses in the Financial Sector? $Pr = 0.071 / (0 + 0 + 0.071) = 1$ (100%). The probability of a respondent having a positive change in perception, given they have businesses in the Services Sector? $Pr = 0.214 / (0.214 + 0.286 + 0.071) = 0.375$ or 37.5%.

Table 8: Perception of how Brexit will or has impacted business from survey respondents

| How has Brexit affected your business? (1 most important five least important) | | |
|--|-----------------|-----------------------|
| | Average Ranking | |
| Financing availability | 2.0 | |
| Ability to expand internationally | 2.8 | |
| Importation of goods or services | 3.2 | Decreasing Importance |
| Ability to expand nationally | 3.4 | |
| Exportation of goods or services | 3.6 | |

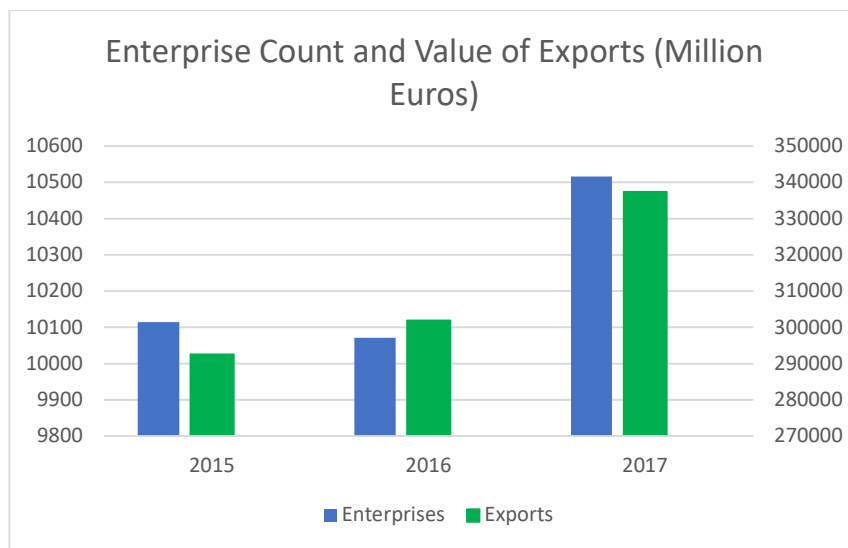


Figure 12: Enterprise count and value of exports from 2015 to 2017 from EEA01

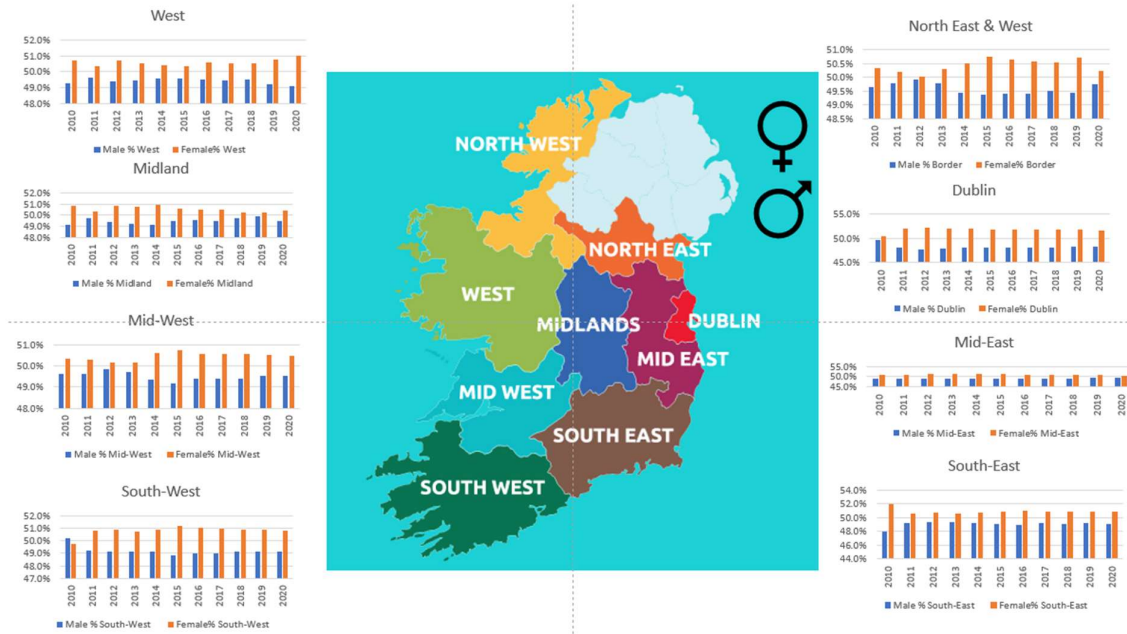


Figure 13: Working population by region, PEA04, PEA07 CSO reports, graphic www.regionalskills.ie

Table 9: Gender breakdown of survey respondents compared to Ireland total population gender breakdown, data from PEA04 & PEA07

| | Survey Respondents | Percentage of total respondents | Expected lower range | Expected upper range |
|--------|--------------------|---------------------------------|----------------------|----------------------|
| Female | 7 | 50% | 49.5% | 49.6% |
| Male | 7 | 50% | 50.4% | 50.5% |

From the statistical data for Irish county populations from 2010 to 2020, Figure 13, the expected upper and lower percentages of a sample being male or female was calculated at 95% confidence interval using the standard deviations of the county data, and the central limit theorem to allow the use of standard normal Z scores with the sample. The result of the above was to validate the sample of respondents was not gender-biased.

Interview Driven Results

Paula Fitzsimons – co-author of Ireland GEM report, interview synopsis

Paula’s perception of Brexit’s pre-referendum and post-referendum effect on the SME and entrepreneurs start-ups in Ireland was negligible. Paula’s opinion is backed by GEMs data and reports proving the links to SME and entrepreneurs start-ups in Ireland are based on the buoyancy in the economy and the end of the post-GFC recession, rather than uncertainty caused by Brexit. Paula points to the steep decreases in export from Irish start-ups with a buoyant Irish economy, where customers and money are readily available in the domestic

market, reducing the need to explore externally for markets. The Brexit uncertainty did not affect entrepreneurs as they saw it not relevant to them as they were either non-exporters, or there was always uncertainty on how the future negotiations would play out.

Paula acknowledged the traditional Irish spirit of entrepreneurialism but was careful to distinguish between entrepreneurialism from opportunity vs. necessity. A large portion of the entrepreneurs produce are in the day-to-day services industries, seeing an opportunity in their local community to start a business, generally not companies who identify an international opportunity, hence less likely to be affected by pending Brexit issues.

When discussing the number of start-ups in the regions, Paula noted a continued strong take-up and oversubscription on the Acorns program, indicating start-ups in the regions are still strong. However, Paula brought a key point that regional start-ups are often based on reducing commuting times to Dublin or abroad.

Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal, interview synopsis
Michael had not noted any increase or decrease in the number of start-ups or deaths of companies in his area of Donegal that he could attribute to the lead up to or post-Brexit. With strong company start-up numbers in the post-referendum years 2018 and 2019 and with few company closures. Initially, the region had seen a strong uptake in training offered for getting Brexit ready; this interest coincided with Brexit deadlines, but with the repeated Brexit extensions, interest waned. Although initially thought, the companies of Donegal would be impacted with Brexit due to it being a border county with Northern Ireland. ±75% of companies were known to trade with the UK. However, closer inspection of the actual value of this trade had companies on average only trading 10% of their business with the UK. This low volume of trade and Brexit-fatigue lead to a 'wait and see' position for most companies.

On the start-up levels in Ireland's regions, Michael noted companies were based on community and not on hard and fast business, which may differ from the Dublin start-up hub. Companies pushing to stay open through bad times, potentially against better economic judgment. Micheal noted regional companies were generally risk-takers, but this could sometimes be unknowing by focussing on acquiring business assets ahead of market research and utilisation of said assets. A time to payback approach rather than an NPV approach.

Lastly, Micheal expressed surprise at the quoted death and attrition rates of companies in Ireland, with his own experience on the regional areas not matching the high company failures often quoted in the media. Noting that although the same high attrition rates were not materialised in the region, also the growth of a small to a medium or large company was also slower.

Professor Ron Davies, Head of Economics, University College Dublin, interview synopsis
Professor Davies has written papers on Irexit. He believes Brexit will be damaging for the Irish economy and Irish consumers. It could be at least half as bad as the GFC, with the only hope of recovery to pre BREXIT levels if the UK rejoins the EU. Professor Davies points to the lack of Agriculture processing in Ireland as one example, with many of the Irish raw agricultural produce being sent to the UK for processing. A lack of investment in this infrastructure leading up to Brexit will severely affect the agricultural sector. This will be hardest felt in the border regions where wages are traditionally lower. Although some well-paid jobs will relocate to Dublin post-Brexit, this will be accompanied by a relocation of the personnel who held these jobs in London and will offer little to the local Irish workforce.

Professor Davies discussed the churn of local businesses. With many businesses on the brink of collapse, the additional tariffs and charges for businesses in border regions that rely on cross-border trade will be too much. The collapse of these businesses will, however, be replaced by entrepreneurs who see the new opportunity and are not carrying post-Celtic Tiger debts; hence new business will spring up, but this will not be sustainable year on year growth, but replacing the old with the new. 'Ultimately uncertainty will kill existing businesses, and other people will step into their premises'.

Overall, Brexit will bring divergence with the UK pursuing lower standards than the EU. The regions of Ireland will be affected by higher consumer processes, coupled with a downturn in traditionally regional industries such as agriculture, due to no access to agricultural processing, reducing the sector's profitability.

Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division, interview synopsis

Mark's view on the implications of Brexit is that they are not fully understood at any level, government, advisors, new business owners or potential start-up entrepreneurs. None of whom fully comprehend or understand the implications of Brexit. Hence it is impossible to delineate any pre or post-Brexit effects of Brexit from the churn of business. Previously Mark has seen spikes in interest in starting up your own business, and entrepreneurial workshops stem from economic events, be it recessions, localised plant closures, etc. However, this uptake in workshop/training interest does not correlate to any key Brexit events.

Mark discussed how entrepreneurship is critical to the enterprise fabric of Ireland and how the rural regions of Ireland are highly exposed to the Brexit outcome, although not fully comprehended yet. The constant extensions to Brexit lulled companies into a sense 'it would be worked out by the time it arrives' approach, but also fatigued business owners, almost like the boy who cried wolf. For start-ups and entrepreneurship to be successful, Mark

discussed the concept of an 'Ecosystem' to be in place, containing: financing, support, mentorship etc. A concentrated set of ingredients to bolster the success of start-ups. However, this probably only exists in Dublin and perhaps Galway. It is not a dispersed enough network throughout Ireland, leaving the remainder of the country, especially the rural centers lacking this ecosystem. Addressing this 'infrastructure gap' more may be the key to fostering more growth in the regions. Mark highlighted specific EI funding in border regions ahead of Brexit to build this ecosystem, and also specific funding targeting Women in Business.

Discussion

It is clear from the media in Ireland from 2016 until the present and communications from government agencies that a high level of uncertainty and disruption is expected post-Brexit in Jan-2021. Although this has been assessed and scenarios suggested by the government agencies in their reports, how this translates and the feeling of entrepreneurs and nascent entrepreneurs is unclear. The media is consumed highly and readily available in Ireland, in both paper, online, radio and television. From the interviews, there was a mixed response, ranging from 'fair coverage' to 'fairly negative' perceptions.

'generally, I think it has been fair... the issue of Brexit is that ..the media and government on our side have failed to get a lot of businesses to address the potential challenges' Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal.

'Within Ireland is going to be fairly negative. I would say universally negative.' Professor Ron Davies, Head of Economics, University College Dublin.

'it's hard to separate one's own view from what one reads? ...so my view is that it was properly portrayed as the UK being intransigent.' Paula Fitzsimons, co-author of Ireland GEM report.

Due to the continued regular coverage by the media, along with the availability of media to the population, the majority of the respondents of the survey followed, to some degree, intentionally or not intentionally the media coverage and milestone reporting during the Brexit negotiation. From Table 2 and Table 3, it can be summarised that only the headline-grabbing, easily consumable reports were followed, and those that contained details of the negotiations and agreements were not reviewed in depth. This also correlated to the comment by Michael Tunney and Mark Christal that due to the lack of clarity, the confusion of events and the long timeline, the Irish entrepreneur population tended to act as 'business as normal' and wait until Brexit had occurred to take any actions.

'all sorts of Brexit events, the only time we ever get that level of interest for those events, in the last couple years is when there was a deadline, and then as soon as they kick it back just decided not to bother coming up, because it's not a big issue.' Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal.

'with Brexit there is genuinely a weariness out.... and we knew from our own surveys, ... particularly the clients, the smaller SMEs, we were deeply concerned that as the year went on about the level of preparedness.... you get this, 'Oh, yeah, yeah. Well, it'll be okay. In the nightjar. Yeah, I've talked to a distributor and I think that'll be fine. Or I've talked to a customer with a supplier in the UK or in China, and I haven't really got around to think about that yet' Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division.

Ireland is documented in literature reports and supported by senior public figures as being a positive country to start-up a business. The survey data was more split on this Table 4, the majority of respondents identifying as 2010-2015 being more positive or neutral, to post Brexit referendum the same respondents identifying as a more positive environment. By analysing each respondent choice and linking to their following of Brexit in the media, it can be related to of those that followed the Brexit events actively, none of them changed their perception of the start-up environment, however, of those that did not actively follow the Brexit negotiation events their opinion was generally positively affected or neutral, Table 5. This would reinforce the situation mentioned above that the Irish entrepreneur and start-up community were generally not proactively changing behaviours ahead of Brexit but happier to wait and see what changes would need to be put in place.

Hypothesis Outcome

Hypothesis 1. **Entrepreneurs in Ireland became more risk-averse, leading up to Brexit.**

The risk propensity of the Irish entrepreneur was measured through the opinions of the survey participants, with 57% reporting that it didn't change their attitude to risk. Of the population, 50% considered themselves as risk-takers, and 42% as ambivalent to risk. However, the bias highlighted earlier may be a contributing factor.

In the case of becoming more risk-averse in response to the media and communication surrounding the Brexit negotiation period, it would be expected that the number of start-ups would decrease post-2016 vs. the period before. Which if this uncertainty impacted the economy, Gross Domestic Product (GDP) of Ireland, then it would result in a drop of start-ups, as identified by the GEM Report analysis.

'Because we have seen over time, that the growth in the economy is followed by an upturn in entrepreneurship, and a downturn in the economy, entrepreneurship or starting a new business fall that year. And we've drawn the analogy for that in the introduction (GEM Report) with the sort of financial crisis... about 19% aspirations to start a business, very, very high, early stage entrepreneurs.' Paula Fitzsimons, co-author of Ireland GEM report.

However, as shown in Figure 2, Ireland was in a growth period. The number of start-ups is stagnant post GFC, then increases year on year after 2013, Figure 3. Despite the possible uncertainty in the lead-up to the Brexit vote and the agreement to leave in 2016, company births' growth is unaffected. Company death rates of newly formed companies (as a percentage) are approximately stable at $\pm 7.0\%$ for the measured period from 2013 – 2017. Still, in the year following the Brexit referendum, death rates fall to 5.0%, the lowest over the measured period, indicating a better business environment, Figure 4. This growth may mask any influence of uncertainty and be favourable to nascent entrepreneurs driving them to start an enterprise. This can be identified by looking at the number of start-ups per year, which aligns with these findings. For the period after 2016, the number of start-ups increased year on year, supporting not only a stronger economic environment in Ireland but suggesting that the uncertainty of the Brexit negotiation period did not change the risk perception of nascent entrepreneurs sufficiently for them not to create a start-up. This is also aligned with literature findings and identifying opportunities during economic change, as identified in 'the invisible hand' (Smith 2014). Further support is with construction data; it can be seen from Figure 9 that year on year from 2014 when it was identified that this was the recovery year from the Celtic Tiger, there was a net gain of construction enterprises.

Therefore this hypothesis has been proved incorrect, as the risk propensity of the nascent and existing entrepreneurs does not appear to have changed, despite the communications from government agencies to 'get ready' nor the negative media commentary. However, this could be investigated further and more in-depth, as Ireland was in a period of growth and opportunity, potentially masking any Brexit negotiation impact on the data.

Hypothesis 2. The number of start-ups created in the regions reduced during the Brexit negotiation period.

The literature suggested that depending on the policy direction and the government support for enterprises in the regions, combined with the ability to access the workforce, will impact the actual level of start-ups. From Table 6, the Dublin region grew 13%, with the South West being the second highest growth region, 8%, for the same period. This is not surprising as South West includes Cork, Ireland's second-biggest city, by population. Enterprise Ireland

works with a number of incubators (Ireland 2020). From this list, 40% are Dublin based, Galway, having 16% and Cork 13%.

The survey was circulated at an all-Ireland level, and candidates who received it by email were not filtered by locations, yet 85% of the respondents were from the Dublin area. This may also influence their perception of support; more incubators and more start-up peer support groups in the Dublin area, We-Work, Huckletree coworking spaces offer start-up support and peer learning. It is pertinent to note that both Huckletree and We-Work only have Dublin premises.

Additional initiatives were put in place in border regions to foster and continue cross border trade and enterprise with Northern Ireland. However, these initiatives were only extended to border regions and not at all country level. Paula Fitzsimons formed Acorns and highlighted that each intake they have five times the applications versus the number of places and has not changed over time.

'in November of 2019. There was a package put in place for the six border enterprise offices to develop and deliver a suite of six programmes to apply and brace for Brexit.' Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal.

However, with respect to the policy,

'our biggest challenge for the likes of Donegal is to have more of a pipeline of indigenous entrepreneurs coming forward and ... ourselves to grant aid and assist. And then we get a cohort of them to move up and become exporters and ... get money in. ... I don't think we've got the ecosystem right yet at all.' Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal.

'if Brexit is bad, and Brexit brings to the least an economic shock..., unemployment and lost production and loss of business. ... that's when you want to have your infrastructure ready to go ... to support your entrepreneurs, to help them.... I'd say I wouldn't be able to do it's nowhere near as robust enough as as dispersed enough.' Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division.

'we know that our start-up activity differs greatly between the urban centres and the regional rural centres, ... we can see big differences between what happens in Dublin, Galway, versus maybe what happens in Limerick and Waterford.' Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division.

Therefore, it would be concluded that this hypothesis is proved inconclusive. There is insufficient detailed data for regional start-ups and death rates available from the Central

Statistics Office, and survey respondents were from a cluster area. It is correct that there is a definite entrepreneurial and nascent incubator hub around Dublin. Additional Enterprise Ireland directives and policy changes would be required to extend funding and support to regions to help individuals identify opportunities and create start-ups. The impact of the Brexit negotiations does not appear at this time to have any significant effect, outside of some targeted initiatives in the border regions.

Hypothesis 3. The number of start-ups that are exporters will reduce during the Brexit negotiation period.

GEMs recorded domestic customer focus numbers for early-stage entrepreneurs (Fitzsimons and O'Gorman 2020) range from 56% in 2006 to 26% in 2018, which then jumped significantly to 59% in 2019, attributed to the increased buoyancy in the economy at the time.

'53% expected not to have revenues from customers outside the country. So 50-50 and thereabouts. ... many of the businesses set up are locally traded, so Brexit isn't going to affect them, what will affect them is whether the economy's buoyant' Paula Fitzsimons, co-author of Ireland GEM report.

Michael Tunney further reinforces this,

'the figure I was using, when I was talking anything publicly was, over the last few years, ...was always somewhere between 72 to 75% of our client base..... the 200, almost 250 clients of ours, the average sales into the UK counted for only 10% of their overall sales.'

Michael Tunney, Head of Enterprise, Local Enterprise Office Donegal.

These opinions from interviews would suggest that for the majority of firms they focus on internal sales, with a small portion of their revenue coming from exports, and this has grown since 2014 due to the economic buoyancy of the island, rather than the uncertainty perceived from media coverage of the Brexit negotiation. However, the message passed by Enterprise Ireland is to switch focus from UK markets to Eurozone markets for new start-ups.

'it would be focusing them on the eurozone markets, and getting away their dependence on UK markets. ... the UK markets, in many respects, we both speak the same language..... encouraging people to bridge very quickly across the fact that at UK isn't in the Eurozone stage, ... you have to manage your fluctuation in currencies, Stirling versus Euro. So in some ways... it's easier to sell into the eurozone, at least the money stays the same, but you have the language' Paula Fitzsimons, co-author of Ireland GEM report.

This can also be seen in **Error! Reference source not found.** and **Error! Reference source not found.**, which show construction and hospitality net numbers growing year on year due to the Irish economy's growth. Manufacturing data, which includes agriculture, **Error! Reference source not found.** does show a net increase, but at a lower rate. Ireland has historically been a service-focused island, supported by the survey respondents, 60% of which identified as Services Sector, without significant manufacturing, which is reflected in less than 20% of start-ups being in this sector 'slightly below the OECD average' (Fitzsimons and O'Gorman 2020). Logistics **Error! Reference source not found.** net data has decreased sequentially over time since 2010; however, there is insufficient data to conclude that this has any relation to the Brexit negotiation period.

Analysing the probability tree, **Error! Reference source not found.** The probability of having a POSITIVE change in risk perception with a background in the services sector is 37%. In comparison, the probability of having a NEGATIVE shift in risk perception with an experience in the service sector is 12.5%. The probability of having a NEGATIVE change in risk perception with a background in the financial sector is 100%. This can be correlated with how the respondents perceive how Brexit has impacted their business, with financing being the highest risk and exportation of goods being of least concern, Table 8. This is further support by Figure 12, although there is limited annualised data freely available, from 2015 to 2017, the absolute number of enterprises that exported increased by 400 over the three years, the value of those exports also increase each year, by 44Million Euro over the three years. This would reinforce the interviewees' message that start-ups and businesses are continuing as normal until such times as Brexit regulations are put in place, then they will adapt. An import part is highlighted in that start-ups take several years to reach export readiness. As such, any press reports on export confusion and customs may not be relevant to most start-ups creating their enterprise post-2016. There is insufficient data available to break the export data down by sector and region, as data from the TSA11 CSO report is only available for 2017 and 2018.

Hypothesis 3 is proved false. The net number of companies registered by the CSO as exporters have increased year on year during the negotiation period, and the export value per enterprise has risen from 28Million euros per enterprise to 32Million euros over the three years that data is available EEA01 CSO report. This proves that there are start-ups that do export. They are continuing to enter that space, despite the caution and 'warnings' from the government agencies that the Brexit event will most impact their businesses once it is finalised.

Hypothesis 4. Fewer start-ups will be created by female founders than the historical norm.

Ireland population split, within working ages, is almost 50-50, across all regions, **Error! Reference source not found.**, which should indicate that females create 50% of enterprise owners and start-ups. This is somewhat further reinforced by the survey respondents, with exactly 50% being female Table 9. GEM reports that 41% of men are in the early stage entrepreneur phase compared to 32% of females (Fitzsimons and O'Gorman 2020).

'female at start-ups every year, it's probably somewhere between 16 and 20%' Mark Christal, Manager of Enterprise Ireland's Regions and Entrepreneurship Division.

In 2019 Enterprise Ireland revisited their Female Entrepreneurs plan and renamed the Women in Business Action Plan. It was noted by Paula Fitzsimons, Mark Christie and Michael Tunney that there was no noticeable decline in female entrepreneurial numbers, and they believed them to be improving year on year due to the different projects and targeted funding. However, all three mentioned that this was an opinion, as they had not seen all of the data. It is believed by all that the reasons for females to create a start-up remain consistent; managing childcare, reduce commute etc., as well documented in the literature. Despite all agreeing that female entrepreneurs can be more risk cautious, the buoyant economic situation would be sufficient to counter any concern and uncertainty from the Brexit negotiations.

'I would generally think that female entrepreneurs are slightly more cautioustraditionally, women tend to be in certain jobs, or a service sector. And so, ... I think the service sector may be a little bit more resilient here' Professor Ron Davies, Head of Economics, University College Dublin.

'women with are much more risk averse.... So there's a question which is basically to do with fear of failure, with fear of failure, you stop, you're actually starting right. And women answer yes, much, much to a greater extent than men, its an inhibitor' Paula Fitzsimons, co-author of Ireland GEM report.

Based on the data gathered, it can be concluded that this hypothesis (4) has been proved incorrect. There appears to be no link to reducing female entrepreneurs creating start-ups between 2016 and 2019, the Brexit negotiation periods due to an increased level of uncertainty caused by such. The data and feedback would indicate, though further investigation would be advised, that the number of start-ups lead by female entrepreneurs are increasing year on year, and they are taking a more cautious outlook on the performance, scale and export capability of their business.

Conclusion

This paper has investigated if the Brexit negotiation period has impacted the Irish start-up arena. The Brexit negotiation period from June 2016 until December 2019 for this research was, for all, a prolonged and uncertain period. Media and Irish government messages were aimed at passing a message of 'we don't know how, but this will impact your business.'

Ireland has been in a period of growth since 2015, having recovered from the recession following the Celtic Tiger era. Despite this growth, it was investigated whether the misinformation, lack of information, duration and 'be prepared' messages during the negotiation period might have been sufficiently strong to impact the start-up community.

Ireland has historically been advertised and well documented in literature as a strong economic environment to start a business, with a skilled workforce and favourable tax regulations. There are high support levels for start-up enterprises around the country, from the Enterprise Ireland offices, Local Enterprise Offices, Incubator Hubs and start-up accelerator groups; Going-For-Growth and Acorns.ie, as examples. The Irish themselves are risk favourable with a positive outlook, likely to take calculated risks rather than informed risks, translating to them not having to be experts in an area if they believe the opportunity is good business sense. This did not change during the negotiation period.

During the negotiation period, the number of start-ups continued to increase. The nascent entrepreneurs were not put off by the uncertainty of regulations during this period. LEO's scheduled 'Getting Brexit Ready' training, the uptake of this training was poor, up until late 2020 when it was clear Brexit would happen, and changes to regulations were clearer, indicating that the Irish start-ups were of the mind to start and adapt if needed. The data collected was in line with GEM reports' findings and reinforced by the interviewees.

Across Ireland, there are varying levels of support, with several hubs favourable to start-up activity; Dublin, Galway and Cork being the main ones. Enterprise Ireland has identified this, and they have a regional plan being put in place. A decreased number of start-ups within the regions versus the Dublin hub during the negotiation period is inconclusive. Several specific initiatives were put in place by the LEO's that share a border with Northern Ireland to provide additional support to cross border and exporting new enterprises, which may have masked any decrease in inclination to start-up and enterprise due to the uncertainties of regulation change during this period.

With yearly averages of 30% of total Irish exports heading to the UK, the Irish government agencies were concerned about the potential impact. As such, they ran programs to encourage exports to mainland Europe. From the data, the number of enterprises that export

increased year on year, indicating a net increase in start-up activity or enterprises that were entering into the export market. As highlighted by the interviewees, it is common for start-ups to enter the export market only after 2 or 3 years. The value of each export also increases each year, indicating a higher value of product. There was no indication of a slow down in this area from the data, nor the feedback from interviewees. However, all agreed that, most likely, an impact would be seen in early 2021 attributed solely to Brexit regulation change. The GEM data for 2019 did suggest a drop in new enterprises that would be inclined to export, as mentioned and reinforced by Paula Fitzsimons. However, this was not attributed to regulatory uncertainty but the Irish market's buoyancy. From the survey respondents, there was a concern from the Financial Sector that it would become harder to access funding; however, this has not been seen in the data, nor by the interviewees.

Female entrepreneurship in Ireland receives a lot of publicity, and several start-up supports cater specifically to females. Enterprise Ireland in 2018/2019 revamped their program to 'Women in Business' and acknowledged the importance of STEM topic takeup at the school level. There is much literature surrounding the female approach to risk and triggers. The GEM report, as highlighted by Paula Fitzsimons, also concluded that women continue to be adverse to failure and less likely to start something if they deem it has a great chance of failure when compared to men. Women also are more realistic when they do create an enterprise on targets, as highlighted by Mark Christie, which makes them more credible business partners, but the perceived lack of ambition due to them setting realistic targets does not always support them to access funding. Based on the available data points and the opinions from the survey respondents and interviewees, nascent females during the negotiation period were not sufficiently concerned to not create an enterprise. The buoyant Irish economy and the continued levels of support and funding for females were sufficient to offset any failure or risk concern the founder may have had. Therefore, it was found that the uncertainty did not impact female entrepreneurship during the Brexit negotiation period.

Critique of research methodology and findings

Initially, it was presumed that monthly data from the CSO would have been available covering start-up numbers, founder gender, sector breakdown and regional data sets. In having that granularity of data, the main key events during the negotiation period could have been mapped against the raw data to identify any empirical impact from the media and government reporting. These data sets could then have been triangulated against a wide demographic of interviewees to determine if the data matched the sample population's perception. Further investigation with the CSO and CRO could have identified more robust data on actual numbers of start-ups and actual numbers of deaths, rather than having to compare some empirical relationships and manage the changing definitions of such data.

The data on exports, regional start-ups and founder gender, in particular, were not complete data sets. The hypothesis conclusions are formulated using the dataset that could be identified, combining g heavily with the opinions gathered from the survey and interviewees. A more robust data set would have helped cement the hypothesis findings, with the survey and interview opinions simply verifying the raw data's conclusions.

Due to the Irish economy's growth during the period that matched the negotiation period, it was difficult to separate impacts on start-ups from this growth or Brexit negotiation uncertainty. The survey and interview data were used to balance this out, using the perceptions of the respondents and interviewees to indicate if they saw any impact from Brexit. A wider selection of survey respondents and interviewees could have resulted in a more robust conclusion. Populations from incubators, accelerator hubs and LEO clients who could be in the nascent stage of the start-up process could be valuable in combination with the respondents identified as part of this research.

This research was conducted in 2020, during prolonged lock-downs in Ireland. The lock-downs resulted in fatigue within the population and may have contributed to the high level of no responses to both requests to partake in the survey and to be interviewed.

[Suggested areas for further research](#)

- The monthly data sets mentioned above exist but are not freely available to the public. This further investigation would help understand the media and messaging impact at a granular and event-level on the start-up community.
- Further investigation on the export market within Ireland to eliminate the growth from the buoyant Irish market. For example, a focus on exports to Northern Ireland from the border counties and expanding this out to the country-level could help understand definitively if any county is particularly sensitive to the uncertainty of regulations during the negotiation period.
- Further investigation as to the reasons behind enterprise deaths during the negotiation period as compared to pre Brexit referendum. Through interviews and surveys of enterprises that voluntarily closed and those that went through liquidation, data points could identify any common Brexit negotiation or uncertainty in the market reasons for the enterprise's death.

References

- Affairs, D. o. F. (2020). "Brexit Update." Retrieved 23-November-2020, 2020, from <https://www.dfa.ie/brexit/about/>.
- Anyadike-Danes, M., et al. (2011). "New business formation in a rapidly growing economy: the Irish experience." Small Business Economics **36**: 503-516.
- Autio, E. and H. Rannikko (2016). "Retaining winners: Can policy boost high-growth entrepreneurship?" Research Policy **45**: 42-55.
- Bergin, A., et al. (2017). "Modelling the Medium- to Long-Term Potential Macroeconomic Impact of Brexit on Ireland." The Economic and Social Review **48**(3): 305-316.
- Capello, R. and C. Lenzi (2016). "Innovation modes and entrepreneurial behavioural characteristics in regional growth." Small Business Economics **2016**(47): 875-893.
- Cooney, T. and E. Kidney (2008). A mapping of entrepreneurship and innovation policy in Ireland. Dublin, Ireland, Institute for Minority Entrepreneurship at Dublin Institute of Technology: 91.
- Davidsson, P. and S. R. Gordon (2016). "Much ado about nothing? The surprising persistence of nascent entrepreneurs through macroeconomic crisis." Entrepreneurship Theory and Practice **July**: 915-941.
- Davies, R. and J. Francois (2018). "Making the Worst of a Bad Situation: A Note on Irexit." The Economic and Social Review **49**(4): 455-462.
- Dawson, C. (2019). Introduction to Research Methods. UK, How To Books Ltd.
- Dejardin, M. and M. Fritsch (2011). "Entrepreneurial dynamics and regional growth." Small Business Economics **36**: 377-382.
- Department of Jobs, E., and Innovation (2014). National Policy Statement on Entrepreneurship in Ireland. Dublin, Ireland, Department of Jobs, Enterprise, and Innovation.
- Duarte, A., et al. (2019). "Uncertainty and adaptation in the context of Brexit." European Business Review **31**(6): 885-909.
- Ebrahim, M. and T. Schott (2014). "Entrepreneurial intention promoted by perceived capabilities, risk propensity and opportunity awareness: a global study
" Academia.edu.

Economist, T. (2005). Style Guide. London, UK, Profile Books Ltd.

Filippin, A. and P. Crosetto (2016). "A Reconsideration of Gender Differences in Risk Attitudes." Management Science **62**(11): 3138-3160.

Fitzsimons, P. and C. O'Gorman (2020). A SURVEY OF ENTREPRENEURSHIP IN IRELAND, Global Entrepreneurship Monitor (GEM).

Fritsch, M. and A. Schroeter (2011). "Why does the effect of new business formation differ across regions?" Small Business Economics **36**: 383-400.

Fund, I. M. (2018). "Ireland: From Tiger to Phoenix." Retrieved 15-oct-20, 2020, from <https://www.imf.org/en/Countries/IRL/ireland-from-tiger-to-phoenix>.

Gardiner, K. (1994). The Irish Economy: A Celtic Tiger. Morgan Stanley Euroletter, Morgan Stanley.

Haider, D. (2016). "Ireland: Celtic Tiger." Kellogg School of Management Cases.

Hayward, M. L. A., et al. (2010). "Beyond hubris: How highly confident entrepreneurs rebound to venture again." Journal of Business Venturing **25**: 569-578.

Heinonen, J., et al. (2010). "The context matters Understanding the evolution of Finnish and Irish entrepreneurship policies." Management Research Review **33**(12): 1158-1173.

Heun, R. (2018). "How to write a scientific paper: A hypothesis-based approach." Global Psychiatry **1**(1): 3-6.

Ireland, E. (2016). Exporting to the UK? A new guide to Irish business post UK Referendum, Enterprise Ireland.

Ireland, E. (2019). Export Performance in Global Markets Ireland, Enterprise Ireland.

Ireland, E. (2020). "Incubation Centres." Retrieved 6 February 2021, 2021, from <https://www.enterprise-ireland.com/en/Researchers/Spin-Outs/Incubation-Centers-Maps-and-Contacts.html>.

Ireland, G. o. (2020). Preparing for the End of the Transition Period Brexit Readiness Action Plan. Government of Ireland website.

Justo, R., et al. (2015). Failure or voluntary exit? Reassessing the female underperformance hypothesis." Journal of Business Venturing **30**: 755-792.

- Klyver, K., et al. (2013). "Women's self-employment: An act of institutional (dis)integration? A multilevel, cross-country study." Journal of Business Venturing **28**: 474-488.
- Koellinger, P. D. and A. R. Thurik (2012). "Entrepreneurship and the Business Cycle." The Review of Economics and Statistics **94**(4): 1143-1156.
- Kreiser, P. M., et al. (2010). "Cultural Influences on Entrepreneurial Orientation: The Impact of National Culture on Risk Taking and Proactiveness in SMEs." Entrepreneurship Theory and Practice **2010**(September): 959-984.
- Lerner, J. (2010). "The future of public efforts to boost entrepreneurship and venture capital." Small Business Economics **2010**(35): 255-264.
- Lundstrom, A. and L. Stevenson (2005). Entrepreneurship Policy Theory and Practice. New York, Boston, Dordrecht, London, Moscow, Kluwer Academic Publishers.
- McCarthy, B. (2000). "The cult of risk taking and social learning: a study of Irish entrepreneurs." Management Decision **38**(8): 563-574.
- McMonnell, D. (2020). Brexit: Deal or no deal, major disruption is coming to our lives. Irish Examiner.
- O'Connell, S. (2019). "Brexit: 'We don't know what the new normal will look like'." Retrieved 23-November-2020, 2020, from <https://www.irishtimes.com/special-reports/brexit-ready/brexit-we-don-t-know-what-the-new-normal-will-look-like-1.3852359>.
- Parliament, U. (2020). "Brexit timeline: events leading to the UK's exit from the European Union." Retrieved 19 October, 2020, from <https://commonslibrary.parliament.uk/research-briefings/cbp-7960/>.
- Ring, J. K., et al. (2009). "Business Networks and Economic Development in Rural Communities in the United States." Entrepreneurship Theory and Practice(January 2010): 171-195.
- Rosenthal, S. S. and W. C. Strange (2012). "Female Entrepreneurship, Agglomeration, and a New Spatial Mismatch." The Review of Economics and Statistics **94**(3): 764-788.
- Samila, S. and O. Sorenson (2011). "Venture Capital, Entrepreneurship, and Economic Growth." The Review of Economics and Statistics **93**(1): 338-349.
- Sanyal, S. (2018). Is Ireland Really a Start-up Nation? Forbes, Forbes.
- Saridakis, G., et al. (2014). "Do different factors explain male and female self-employment rates?" Journal of Business Venturing **29**: 345-362.

Smith, A. (2014). The Wealth of Nations, Shine Classics.

Townsend, D. M., et al. (2010). "To start or not to start: Outcome and ability expectations in the decision to start a new venture." Journal of Business Venturing **25**: 192-202.

Ucbasaran, D., et al. (2010). "The nature of entrepreneurial experience, business failure and comparative optimism." Journal of Business Venturing **25**: 541-555.

Vaghely, I. P. and P.-A. Julien (2010). "Are opportunities recognized or constructed?

An information perspective on entrepreneurial opportunity identification." Journal of Business Venturing **25**: 73-86.

Yu, L. and G. M. Artz (2019). "Does rural entrepreneurship pay?" Small Business Economics **53**: 647-668.

Appendix A – Data Reference List

All raw data was collected from the CSO website, and the CRO Gazettes. The below list of reports was downloaded to aid with the included analysis.

- 1- Gross Domestic Product: NQQ44
- 2- Company births: BRA20 & BRA15
- 3- All active enterprises: BRA18
- 4- Active enterprises by sector: BRA19
- 5- Sector births and deaths: BRA20, BRA15, BRA14
- 6- Export enterprise count and value: EEA01
- 7- Working population by region: PEA04 & PEA07

Appendix B – Interview Questions

Interviews took a semi-structured approach, a list of prompt questions were used as a guide only, and the interviews took more of a conversational and exploratory tone.

- Did you follow Brexit in the media, and how did you perceive the coverage?
- How would you describe the Irish entrepreneurs approach to risk? For example: risk adverse, calculated, risk favourable?
- The Irish Entrepreneurship Policy was introduced in 2014, what kind of impact do you feel this had on the start-up arena if any?
- The media and Government are highlighting changes in regulations for export and customs. This has been communicated for some time now, with no definite details. Do you feel, or have seen, that this has impacted an enterprises propensity to start or continue exporting? Do you believe this is more relevant to certain sectors than others?
- Dublin is well documented as a start-up hub for Ireland, do you feel this has been impacted by the levels of uncertainty during the negotiation period?
- How do you feel the uncertainty of regulation change is perceived in the regions, and do you feel this is impacting potential entrepreneurs from starting an enterprise?
- Female's react to different triggers with respect to risk, and potential failure. Do you feel the uncertainty and the communication around Brexit during this period could be a potential trigger for a nascent female?

Appendix C - Survey Questions

Consensus

I understand that data collected during this study is anonymous and will be used for statistical purposes only. (1)

Q1 Are you the founder of a business in Ireland between 2010 and 2019 inclusive?

- Yes (1)
- No (2)

Q3 What county in Ireland did you start your business? (If you have started multiple businesses, please select each appropriate county)

Q4 What age range were you in when you started your business?

- 17-29 (1)
- 30-49 (2)
- 50+ (3)
- Prefer not to say (4)

Q5 What gender do you identify with?

- Male (1)
- Female (2)
- Other (3)
- Prefer not to say (4)

Q13 Pre 2016 how would you describe your risk profile?

- Risk adverse (1)
- Somewhere in the middle (2)
- Risk taker (3)

Q6 During the period 2010-2019 inclusive how many businesses did you start (births)?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6+ (6)

Q7 Of the business births between 2010-2019 inclusive how many do you consider successful ?

- 1 (1)
- 2 (2)
- 3 (3)
- 4 (4)
- 5 (5)
- 6+ (6)

Q8 Considering all of your business, how would you describe the market environment they are in?

- Majority national businesses (1)
- Majority international businesses (2)
- Mixed national and international (3)

Q17 What sector were your business births in?

- Financial services (1)
- Construction (2)
- Manufacturing and heavy industry (3)
- Logistics and distribution (4)
- Services (5)

Q9 In the period 2010-2015 inclusive, how would you describe the start-up business environment in Ireland

- Very unfavourable (1)
- Somewhat unfavourable (2)
- Neutral (3)
- Positive (4)
- Very positive (5)

Q10 After the UK Brexit referendum in June 2016 until 2019 inclusive, how would you describe the start-up business environment in Ireland?

- Very unfavourable (1)
- Somewhat unfavourable (2)
- Neutral (3)
- Positive (4)
- Very positive (5)

Q11 Did you follow the media commentary on the Brexit events?

- Yes (1)
- Yes but not actively (2)
- Might or might not (3)
- No not actively (4)
- No (5)

Q16 During the media coverage, is there a specific event or date which pivoted the start-up market for you? (dates from: <https://commonslibrary.parliament.uk/research-briefings/cbp-7960/>)

- 23-jun-2016 UK votes Leave (4)
- 13-jul-2016 Change of Prime Minister (5)
- 17-jan-2017 May: Brexit means Brexit speech (6)
- 29-mar-2017 Article 50 of the Lisbon Treaty triggered (7)
- 8-jun-2017 General election in UK (8)
- 8-dec-2017 Creation of Northern Ireland 'backstop' (9)
- 25-nov-2018 Draft Withdrawal Agreement published (10)
- 15-jan till 12-mar-2019 Unsuccessful votes in parliament with lack of support for May (11)
- 12-apr-2019 Deadline for leaving pushed to 31-oct-2019 (12)
- 24-jun-2019 May resigns (13)
- 24-jul-2019 Johnson becomes new Prime Minister (14)
- 2-oct-2019 Compromise Brexit proposal published (15)
- 6-oct-2019 No support from Germany (16)
- 19-oct-2019 3 month extension requested (17)

Q12 During the period post June 2016, did your approach to risk change from risk adverse to risk taker or vice versa?

- Definitely no (1)
- Not really (2)
- Remained the same (3)
- A little (4)
- Definitely yes (5)

Q14 During the period post June 2016, can you rank by impact size, if any, how Brexit has affected your business? (Please drag and drop options in order of preference)

_____ Financing availability (1)

_____ Ability to expand nationally (2)

_____ Ability to expand internationally (3)

_____ Importation of goods or services (4)

_____ Exportation of goods or services (5)

Q15 Have any of your businesses, successes or deaths had to make changes for Brexit? Please detail

Appendix D – Email Communication for Respondents & Interviews

Interview Request Email

Email's were sent from my assigned Warwick email address.

Dear xxxxx

I do hope all is well.

I am currently writing up my dissertation on 'Investigating if Brexit negotiations have had an impact on the Irish business creation and startup arena?', and **have referenced one of the papers you coauthored: Making the worst of a bad situation: A note on Irexit.** (highlighted section personalised for each candidate)

I am investigating data available from CSO and will combine with interview perspectives of industry experts.

Could you be available for a 30-45 min interview over the next 2 weeks, on your perspective of the startup arena in Ireland and hope you feel the Brexit negotiation period has impacted if at all?

I do appreciate your feedback and input, and look forward to hearing from you.

Many thanks

Alison McMurtrie

<https://www.linkedin.com/in/alison-wilson-mcmurtrie-88266a1a>

Survey Request Email

Email's were sent from my assigned Warwick email address.

Dear xxxx-

I hope you and your family are well and safe during these latest restrictions.

I am completing my MBA at Warwick Business School, and writing my Dissertation on 'Investigating if Brexit has had an impact on the Irish business creation and startup arena?'

I found your company details through Enterprise Ireland.

I would very much appreciate if you could take 5 minutes to complete the below survey?

Completion is anonymous and entries will be used for statistical purposes only. Please note this email is NOT a virus, the survey is managed through the Qualtrics online platform. Please click on the link, or scan the QR code.

https://wbs.qualtrics.com/jfe/form/SV_eg2WhYShqgUKavX



I look very much to receiving your data

Many thanks

Alison McMurtrie

087 057 1115

[linkedin.com/in/alison-wilson-mcmurtrie-88266a1a](https://www.linkedin.com/in/alison-wilson-mcmurtrie-88266a1a)

<https://www.wbs.ac.uk/>