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# The Heterogeneous Impact of Brexit: Early Indications from the FTSE

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The presentation is based on a paper co-authored with Zuzanna Studnicka (UCD).

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# The Heterogeneous Impact of Brexit: Early Indications from the FTSE

Ronald B. Davies (UCD)  
and  
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November 14, 2017

- The 23 June 2016 referendum to leave the EU was shocking
- Widespread concerns over the impact of increasing barriers to trade, FDI, and migration
  - Dhingra, et al. (2016): 1.3% - 2.6% loss in GDP in the short run; 6.3% - 9.5% in long run.
  - PWC (2016), Fraser of Allander (2016), HM Treasury (2016), NIESR (2016), OECD (2016)
  - Minford, et al. (2016): positive effects
- Worries over UK's place in global value chains (GVCs)
  - Tariffs and non-tariff barriers against trade
  - Change in the value of the Sterling
- Impact on GVCs has knock-on effects for other economies

# Our Contribution

- Despite all sorts of guessing about what *will* happen, to date nothing *has* happened
- One exception is changes to the stock price of UK-listed firms
  - In the two days following the result, the FTSE 350 lost 7% of its value
  - It had mostly recovered by 30 June
  - However, different firms had different experiences



# Our Contribution

- We analyze these changes using an event study to compare how firms did relative to expectations
- We further examine how these performances vary according to the firm's GVC (Blonigen, Tomlin, and Wilson (2004, CJE))
- We find that:
  - Firms with a greater UK and/or EU presence did worse
  - Firms involved in markets where the Sterling fell more did better
  - Larger firms did better
- Understanding these changes gives indications for where investors anticipate disruption
- If we believe that such expectations are accurate, this allows us to prepare a policy response prior to Brexit

# Existing Literature

- Event studies for trade policy: Ries (1993, JIE), Mahdavi and Bhagwati (1994, ITJ), Hughes et al. (1997, CJE), Liebman and Tomlin (2007 CJE, 2008 JLE), Desai and Hines (2004, JIE), Blonigen, Tomlin, and Wilson (2004, CJE), Liebman and Tomlin (2015, EE), Davies, Liebman, and Tomlin (2015).
  - Mostly for US policies
- Ramiah, Pham, and Moosa (2017, AE): Finds that the CAR following the referendum varies by industry, but no explanation why
- GVCs
  - Descriptions: Dedrick, Kramer, and Linden (2010, ICC); Baldwin and Lopez-Gonzalez (2015, WE); Timmer, et al. (2014a); Dietzenbacher, et al. (2013, ESR)
    - Timmer, et al. (2014, JEP) gives a survey
  - Productivity: Amiti, Itskhoki, and Konings (2014, AER), Halpern, Koren, and Szeidl (2015, AER) Altomonte, Aquilante, Bekes, and Ottaviano (2013, EP), Nickerson and Konings (2007, AER)

# Hypotheses: Trade Barriers

- All indications are that Brexit will increase trade barriers
- This should lower trade, both in finished products and in intermediates
  - Tariffs could go as high as WTO MFN rates
  - Existing regulations will instantly create barriers as UK no longer an EU member
  - With diverging regulation, NTMs will become a much bigger issue
  - Feestra (1989, JEP) and Amador and Cabral (2016, JES): This will lower trade in intermediates
- *Hypothesis: The more vulnerable the firm's GVC, the worse the Brexit impact*
  - Share of affiliates in the UK
  - Share of affiliates in EU (but not UK)

# Hypotheses: Exchange Rates

- With a weaker British economy, the Sterling will depreciate
- This makes Pound priced exports cheaper, increasing value of affiliate
- This makes non-Pound priced imports more costly, reducing value of affiliate
- *Hypothesis: An ambiguous Brexit impact via the exchange rate channel*
  - Affiliate weighted change in the Sterling
  - OECD value chain index measuring importance of imported/exported intermediates



# Hypotheses: Firm Size

- Bigger firms overall may be able to ride the storm better
- Access to alternative sources of funding, inputs, etc.
- Internal transactions may be less influenced by trade barrier/exchange rate fluctuations
  - Davies, et al. (forthcoming, REStat): internal prices less responsive to tariffs and trade costs
  - Amiti, Itskhoki, and Konings (2014, AER): trade within a MNE's GVC less affected by exchange rates
- *Hypothesis: Larger firms will see smaller impacts from Brexit*
  - Market Capitalization
  - Number of Affiliates – but more affiliates, bigger GVC?

- Stock data: FTSE 350 from Yahoo Finance
  - FTSE 100: 85% of the London Stock Exchange
  - FTSE 250: 12.5% of the LSE
  - Membership determined by market capitalization; we use as of October 2016 and trim the sample for a consistent set of firms
  - Also provides ownership information
- GVC data: Orbis
  - Contains ownership information for EU, Americas, and Asia-Pacific
  - Firms linked to global ultimate owner
  - We construct the number of affiliates in each country by GUO who is linked to FTSE firm
  - Size information often missing, hence numbers
  - Construct the share of affiliates in UK and EU (not counting UK)
  - Also use OECD's GVC index
    - Forward Participation:  $\text{exports of inputs} / \text{total exports}$
    - Backward Participation:  $\text{imports of inputs} / \text{total exports}$

- Exchange rate data: Financial Times
  - Construct a weighted exchange rate change between the Sterling and other currencies
  - Weight by share of GUO's affiliates in each country
  - In other results, we tried the change relative to biggest non-UK location

# Summary statistics for ownership

	Obs.	Mean	Std. Dev.	Min	Max
No of affiliates	339	173.4	304.1	1	3392
No of EU affiliates	339	28.4	67.3	0	908
No of non-EU affiliates	339	74.6	181.6	0	1909
No of UK affiliates	339	70.3	106.3	0	892
Share of affiliates in the UK	339	55.1%	34.4%	0.0%	100.0%
Share of affiliates in the EU	339	14.3%	17.7%	0.0%	100.0%
Share of affiliates non-EU	339	30.6%	30.0%	0.0%	100.0%

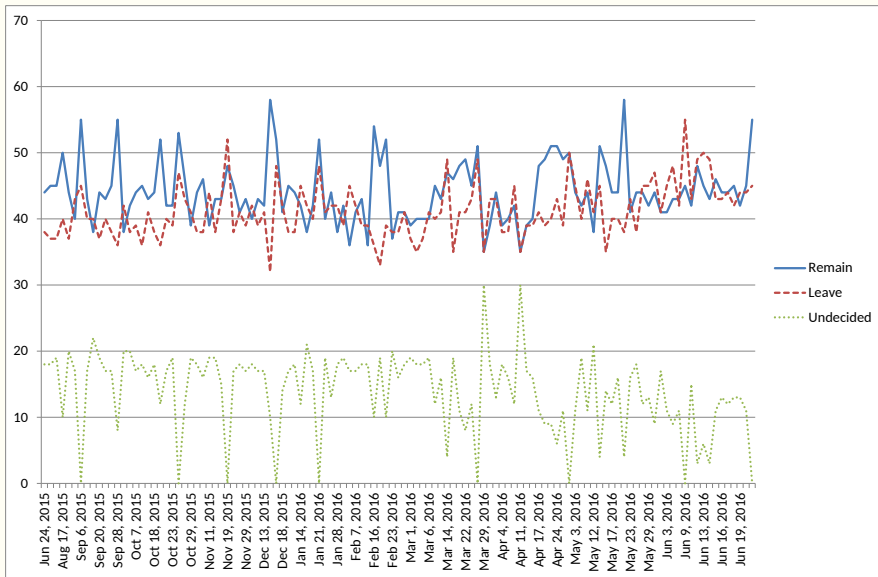
# Event Study Analysis

- An event study compares the firm's return in the wake of an event compared to its predicted return
- The prediction is based on the market return
  - Market model: see e.g. MacKinlay (1997)
- If the return is significantly higher/lower than predicted, it provides an indication of investor's perception of its impact
- You can look at this "abnormal return" day by day or over a longer horizon (cumulative abnormal return)
- Typically, the event is idiosyncratic to the firm (or a small group of firms)
- Since the event hits all of our firms, our results are interpreted as "relative to the overall hit to the FTSE, how does a given firm fare?"

# Event Study Analysis: Anticipation

- The event should be unexpected, otherwise returns will reflect expectations before it occurs
- Even though the referendum date was known, it's outcome was not
- If it is expected, we should not find anything
- On the day of the referendum, Paddy Powers' odds were 1/12 remain, 7/1 exit

# Event Study Analysis: Anticipation



# Event Study Analysis

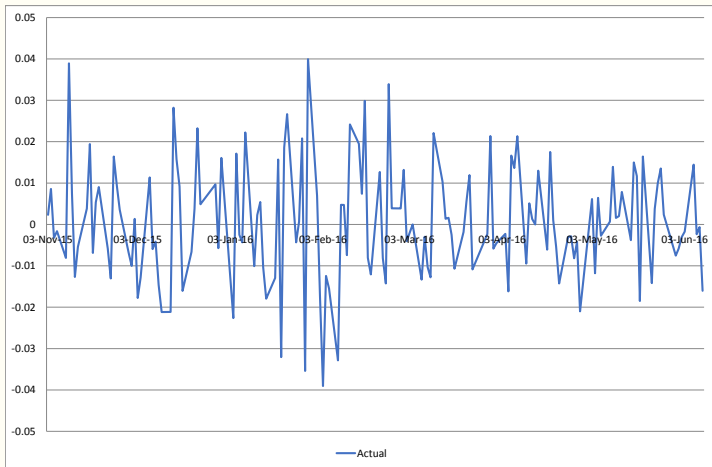
- Firm by firm, run  $R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$
- Do this for the “estimation window”, 160-10 days before the event.
- The abnormal return is then  $\widehat{R}_{i\tau} = R_{i\tau} - (\widehat{\alpha}_i + \widehat{\beta}_i R_{m\tau})$
- Under the assumption that all firms are hit equally:

$$\sigma^2(\widehat{AR}_{i\tau}) = \sigma_{\varepsilon_i}^2 + \frac{1}{L_1} \left[ 1 + \frac{(R_{m\tau} - \widehat{\mu}_m)^2}{\widehat{\sigma}_m^2} \right] \quad (1)$$

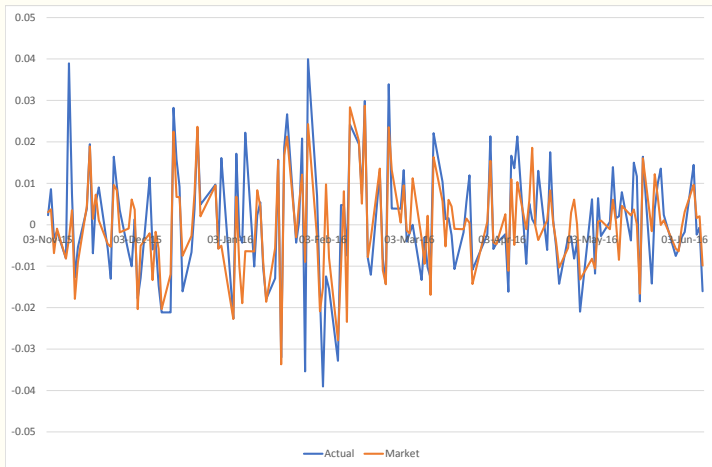
- So that the test statistic for a significantly abnormal return is  $Z_{i\tau} = \frac{AR_{i\tau}}{\sigma(\widehat{AR}_{i\tau})}$



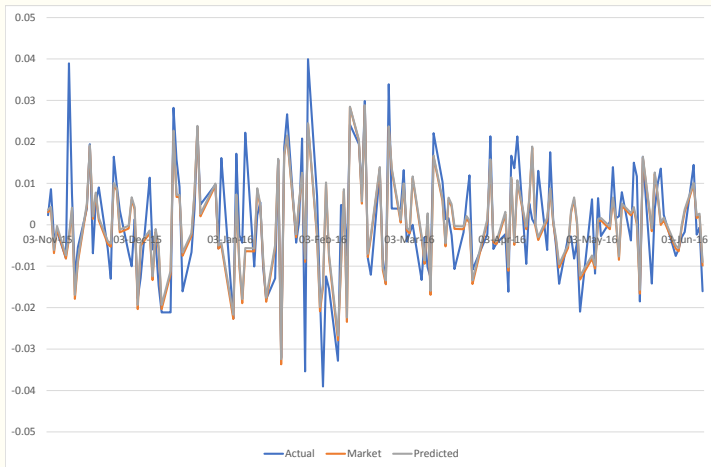
# Event Study Analysis in Pictures



# Event Study Analysis in Pictures



# Event Study Analysis in Pictures



# Event Study Analysis in Pictures



# Abnormal Returns

	Mean	St. Dev.	Min	Max
20-Jun-16	0.74%	2.28%	-6.53%	13.15%
21-Jun-16	-0.09%	1.70%	-13.13%	13.06%
22-Jun-16	0.04%	1.48%	-8.26%	8.19%
23-Jun-16	0.44%	1.44%	-5.88%	5.34%
24-Jun-16	-3.41%	7.49%	-28.28%	13.53%
27-Jun-16	-3.80%	5.96%	-27.68%	8.37%
28-Jun-16	0.92%	2.95%	-15.79%	12.87%
29-Jun-16	0.36%	2.88%	-6.75%	19.34%
30-Jun-16	0.08%	2.37%	-7.44%	15.05%
01-Jul-16	0.30%	2.28%	-13.68%	9.82%
14-July-16	0.27%	2.01%	-10.97%	16.71%
21-July-16	0.12%	2.65%	-13.68%	28.21%

- The impact was felt in the first two trading days

# Abnormal Returns

Date	AR	Positive AR	Negative AR
20-Jun-16	61	53	8
21-Jun-16	17	11	6
22-Jun-16	13	6	7
23-Jun-16	17	13	4
24-Jun-16	216	58	158
27-Jun-16	205	32	173
28-Jun-16	79	69	10
29-Jun-16	64	45	19
30-Jun-16	57	32	25
01-Jul-16	44	33	11
14-July-16	28	19	9
21-July-16	19	9	10

- 61 firms saw a positive return, 278 saw a negative return
- Loss can still mean positive AR if you did *better than the market would suggest*

# Regression Specification

$$AR_i = f(\beta_0 + \beta_1 UK_i + \beta_2 EU_i + \beta_3 Depreciation_i + \beta_4 MktCap_i + \beta_5 NumAff_i + \alpha_s + \epsilon_i) \quad (2)$$

$$CAR_{i,t} = \beta_0 + \beta_1 UK_i + \beta_2 EU_i + \beta_3 Depreciation_{i,t} + \beta_4 MktCap_i + \beta_5 NumAff_i + \alpha_s + \epsilon_i \quad (3)$$

- Lewis and Linzer (2005), Karafiath (1994): As dep. var is estimated, deal with heteroskedasticity
- Karafiath (1994): OLS works fine for  $N \geq 50$
- Also consider significance of ARs using ordered probit [here](#)

# CAR: All firms

	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	-0.104*** (0.0153)	-0.156*** (0.0255)	-0.133*** (0.0238)	-0.129*** (0.0236)	-0.132*** (0.0262)	-0.133*** (0.0262)	-0.150*** (0.0282)
Share of EU Affiliates	-0.0933*** (0.0205)	-0.138*** (0.0344)	-0.124*** (0.0313)	-0.134*** (0.0326)	-0.137*** (0.0365)	-0.132*** (0.0359)	-0.100** (0.0389)
Depreciation	0.635** (0.308)	0.736* (0.385)	0.836* (0.439)	0.816* (0.460)	0.832* (0.445)	0.698* (0.370)	0.557 (0.382)
Market Capitalization	0.00777* (0.00419)	0.0209*** (0.00704)	0.0205*** (0.00692)	0.0204*** (0.00686)	0.0195** (0.00799)	0.0195** (0.00794)	0.00926 (0.00694)
Number of Affiliates	-0.0116** (0.00453)	-0.0189** (0.00789)	-0.0194** (0.00803)	-0.0199** (0.00787)	-0.0223** (0.00905)	-0.0214** (0.00863)	-0.0192** (0.00807)
Constant	0.00747 (0.0325)	-0.0823 (0.0527)	-0.0824 (0.0514)	-0.0653 (0.0499)	-0.0546 (0.0569)	-0.0520 (0.0557)	0.0634 (0.0558)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.400	0.389	0.349	0.329	0.293	0.291	0.272

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Depreciation refers to the depreciation within each event window.



# Summary of Baseline Results

- A 10% shift from non-EU to UK: CAR falls by 14.4%
- A 10% shift from non-EU to EU: CAR falls by 12.9%
- A 10% smaller fall in the exchange rate: CAR falls by 4.2%
- A 10% larger firm: CAR rises by .08%
- A 10% increase in affiliates: CAR falls by .12%
- Results robust for gainers only [here](#), losers only [here](#), omitting financial firms [here](#), controlling for return variance [here](#), and longer event windows [here](#).

# Daily Abnormal Returns

	June 24	June 27	June 28	June 29	June 30	July 14	July 21
Share of UK Affiliates	-0.0972*** (0.0162)	-0.0524*** (0.0134)	0.0206*** (0.00711)	0.00138 (0.00897)	-0.00313 (0.00676)	-0.00032 (0.00541)	0.0128 (0.00850)
Share of EU Affiliates	-0.0933*** (0.0217)	-0.0450** (0.0180)	0.0163* (0.00889)	-0.0119 (0.00979)	-0.00118 (0.00795)	0.0173* (0.00902)	0.000545 (0.0100)
Depreciation	0.731** (0.309)	0.257 (0.193)	-0.0240 (0.116)	-0.154 (0.139)	0.120 (0.0847)	0.0419 (0.0523)	0.145* (0.0810)
Market Capitalization	0.0121*** (0.00437)	0.0131*** (0.00336)	-0.000406 (0.00151)	-3.09e-05 (0.00142)	-0.000950 (0.00148)	-0.00012 (0.000882)	-0.00274*** (0.00101)
Number of Affiliates	-0.0140*** (0.00471)	-0.00715* (0.00378)	4.26e-05 (0.00160)	-0.000348 (0.00169)	-0.00229 (0.00157)	0.00068 (0.000944)	0.00298* (0.00155)
Constant	-0.0279 (0.0337)	-0.0895*** (0.0271)	0.00297 (0.0142)	0.0194 (0.0162)	0.0110 (0.0134)	-0.000310 (0.00891)	-0.00141 (0.0147)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
R-squared	0.415	0.286	0.165	0.064	0.029	0.063	0.083

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Depreciation refers to the depreciation between 23 June and the day in question.

- Bulk of changes in first 2 days.
- Some correction on day 3, but only partial (CARs still negative).
- After day 3, who you are no longer matters.
- Thus, the market was ready, reacted swiftly, and did not retreat: vulnerable GVC firms did not regain ground relatively even a month later.

# CAR: All firms; OECD participation in GVCs

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	-0.103*** (0.0145)	-0.152*** (0.0257)	-0.128*** (0.0252)	-0.125*** (0.0256)	-0.127*** (0.0265)	-0.172*** (0.0274)	-0.145*** (0.0282)
Share of EU Affiliates	-0.0964*** (0.0248)	-0.142*** (0.0367)	-0.125*** (0.0352)	-0.137*** (0.0381)	-0.139*** (0.0409)	-0.129** (0.0544)	-0.102* (0.0516)
Depreciation	1.617** (0.690)	1.791* (0.895)	1.891* (0.949)	2.096** (0.867)	2.102** (0.809)	1.349** (0.624)	1.143* (0.649)
Forwards	-0.000365 (0.00536)	0.00277 (0.00852)	0.00580 (0.00820)	0.00488 (0.00644)	0.00921 (0.00684)	0.00573 (0.00622)	0.00710 (0.00644)
Forwards*Depreciation	-0.0523 (0.0956)	-0.0802 (0.111)	-0.110 (0.117)	-0.103 (0.107)	-0.141 (0.0960)	-0.0464 (0.0916)	-0.0549 (0.0951)
Backwards	0.0619** (0.0263)	0.0890* (0.0468)	0.0761 (0.0460)	0.0874*** (0.0308)	0.0912*** (0.0332)	0.0724** (0.0290)	0.0494 (0.0313)
Backwards*Depreciation	-0.957** (0.416)	-0.947* (0.546)	-0.853 (0.588)	-1.131** (0.431)	-1.001** (0.396)	-0.812** (0.345)	-0.475 (0.362)
Market Capitalization	0.00657 (0.00411)	0.0193** (0.00766)	0.0191*** (0.00704)	0.0189** (0.00776)	0.0178* (0.00924)	0.0114 (0.00869)	0.00872 (0.00785)
Number of Affiliates	-0.00994** (0.00400)	-0.0165** (0.00674)	-0.0172** (0.00658)	-0.0175** (0.00716)	-0.0196** (0.00831)	-0.0209** (0.00865)	-0.0182** (0.00839)
Constant	-0.0459 (0.0432)	-0.172** (0.0761)	-0.170** (0.0738)	-0.158** (0.0661)	-0.162** (0.0743)	-0.0113 (0.0666)	-0.000706 (0.0643)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.423	0.407	0.369	0.354	0.324	0.343	0.282

Robust standard errors clustered by industry in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Depreciation refers to the depreciation within each event window.

# Additional Events

We also consider five additional events:

- 5 Oct. 2016: May's Brexit framework speech to Conservative convention
- 3 Nov. 2016: Case against Brexit forwarded to High Court
- 17 Jan. 2017: May's "Hard Brexit" speech
  - Leaked and was published the day before
- 24 Jan. 2017: High Court rules Parliament gets to vote
  - Date of announcement was known
- 29 March 2017: Triggering of Article 50
  - Date of event announced well ahead
- We repeat the process for these additional events (including using a new estimation window)
- In short, not much action: CARs are smaller, less significant, and largely unexplained by our controls. [here](#)

# Conclusion

- Brexit is expected to have severe effects on the British, EU, and global economies
  - Ireland in particular is likely to suffer [here](#)
- Although nothing has happened yet, returns give us an indication of where investors expect the largest impacts to be
  - Most of the changes were very swift and followed the referendum
- Our results are consistent with Brexit interrupting global value chains, especially for heavily European firms
- This may be tempered somewhat for firms that export from the UK more
  - British plan to cut the corporate tax rate?
- Recognizing these patterns gives suggestions about where intervention will be needed

# Thank you!

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# Ordered Probit Results: June 24 AR

	(1) All	(2) Gains	(3) Losses
Share of UK Affiliates	-2.172*** (0.356) <i>1.151</i>	-1.761** (0.869) <i>0.511</i>	-2.106*** (0.456) <i>0.931</i>
Share of EU Affiliates	-1.666*** (0.452) <i>0.228</i>	-2.365 (1.548) <i>0.687</i>	-1.674*** (0.526) <i>0.181</i>
Depreciation	1.941 (6.044) <i>-0.089</i>	-19.29 (20.91) <i>5.600</i>	4.393 (6.607) <i>-0.152</i>
Market Capitalization	0.321*** (0.0987) <i>-2.415</i>	0.257 (0.238) <i>-0.074</i>	0.120 (0.116) <i>-0.689</i>
Number of Affiliates	-0.214** <i>0.857</i>	0.0206 <i>-0.006</i>	-0.141 <i>0.441</i>
Cutoff 1	1.444** (0.710)		1.049 (0.818)
Cutoff 2	0.0319 (0.682)	-0.562 (2.590)	-0.873 (0.824)
Observations	339	61	278



# Longer Event Window

	(1) (-2,0)	(2) (-2,+1)	(3) (-2,+2)	(4) (-2,+3)	(5) (-2,+4)	(6) (-1,+14)	(7) (-2,+19)
Share of UK Affiliates	-0.103*** (0.0149)	-0.154*** (0.0250)	-0.131*** (0.0232)	-0.127*** (0.0233)	-0.130*** (0.0258)	-0.172*** (0.0271)	-0.146*** (0.0277)
Share of EU Affiliates	-0.0973*** (0.0209)	-0.143*** (0.0349)	-0.128*** (0.0315)	-0.139*** (0.0329)	-0.142*** (0.0368)	-0.126*** (0.0368)	-0.105*** (0.0381)
Depreciation	0.555* (0.324)	0.685* (0.398)	0.785* (0.455)	0.756 (0.483)	0.788* (0.463)	0.412 (0.355)	0.539 (0.397)
Market Capitalization	0.00764* (0.00408)	0.0208*** (0.00693)	0.0204*** (0.00678)	0.0203*** (0.00674)	0.0194** (0.00787)	0.0124* (0.00730)	0.00922 (0.00677)
Number of Affiliates	-0.00984** (0.00436)	-0.0172** (0.00771)	-0.0176** (0.00784)	-0.0181** (0.00770)	-0.0205** (0.00888)	-0.0205** (0.00804)	-0.0178** (0.00791)
Constant	0.00179 (0.0330)	-0.0884* (0.0533)	-0.0885* (0.0516)	-0.0712 (0.0505)	-0.0610 (0.0575)	0.0568 (0.0540)	0.0549 (0.0550)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.367	0.374	0.334	0.309	0.274	0.316	0.257

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

● [Back](#)

# Including Return Variance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,+1)	(-1,+2)	(-1,+3)	(-1,+4)	(-1,+14)	(-1,+19)
Share of UK Affiliates	-0.0987*** (0.0156)	-0.146*** (0.0257)	-0.127*** (0.0252)	-0.127*** (0.0245)	-0.128*** (0.0282)	-0.129*** (0.0273)	-0.145*** (0.0302)
Share of EU Affiliates	-0.0882*** (0.0211)	-0.129*** (0.0345)	-0.118*** (0.0328)	-0.133*** (0.0334)	-0.134*** (0.0383)	-0.128*** (0.0384)	-0.0956** (0.0409)
Depreciation	0.647** (0.299)	0.750** (0.378)	0.843* (0.430)	0.818* (0.463)	0.835* (0.435)	0.704* (0.372)	0.558 (0.377)
Market Capitalization	0.00891** (0.00404)	0.0231*** (0.00693)	0.0217*** (0.00670)	0.0208*** (0.00668)	0.0203*** (0.00766)	0.0203*** (0.00770)	0.0103 (0.00721)
Number of Affiliates	-0.0113** (0.00445)	-0.0183** (0.00775)	-0.0190** (0.00799)	-0.0198** (0.00778)	-0.0220** (0.00880)	-0.0212** (0.00862)	-0.0188** (0.00780)
Return Variance	0.532* (0.297)	1.027* (0.524)	0.561 (0.465)	0.177 (0.462)	0.370 (0.649)	0.392 (0.622)	0.500 (0.784)
Constant	-0.0163 (0.0339)	-0.128** (0.0588)	-0.107** (0.0544)	-0.0731 (0.0538)	-0.0709 (0.0624)	-0.0696 (0.0628)	0.0417 (0.0687)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.403	0.393	0.350	0.327	0.291	0.290	0.272

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,+1)	(-1,+2)	(-1,+3)	(-1,+4)	(-1,+14)	(-1,+19)
Share of UK Affiliates	-0.0608*** (0.0179)	-0.0772** (0.0320)	-0.0701** (0.0271)	-0.0676*** (0.0253)	-0.0619** (0.0261)	-0.0635** (0.0275)	-0.0644** (0.0302)
Share of EU Affiliates	-0.118*** (0.0311)	-0.140*** (0.0441)	-0.131*** (0.0340)	-0.0898** (0.0344)	-0.0728** (0.0316)	-0.0850*** (0.0285)	-0.0633* (0.0338)
Depreciation	-0.145 (0.367)	0.0933 (0.511)	0.122 (0.453)	0.108 (0.390)	0.117 (0.367)	0.0876 (0.352)	0.128 (0.377)
Market Capitalization	0.000663 (0.00300)	0.00399 (0.00694)	0.00648* (0.00326)	0.0110*** (0.00333)	0.0138*** (0.00377)	0.0202*** (0.00439)	0.00380 (0.00493)
Number of Affiliates	-0.00421 (0.00287)	-0.0118** (0.00525)	-0.00979** (0.00424)	-0.0130*** (0.00458)	-0.0180*** (0.00518)	-0.0147*** (0.00538)	-0.0153** (0.00677)
Constant	0.118*** (0.0329)	0.158** (0.0781)	0.106*** (0.0390)	0.0665** (0.0323)	0.0571 (0.0406)	-0.0304 (0.0447)	0.130** (0.0528)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	61	52	67	96	125	164	175
Adjusted R-squared	0.628	0.525	0.541	0.333	0.252	0.223	0.094

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

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	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,+1)	(-1,+2)	(-1,+3)	(-1,+4)	(-1,+14)	(-1,+19)
Share of UK Affiliates	-0.0855*** (0.0175)	-0.130*** (0.0264)	-0.113*** (0.0245)	-0.0898*** (0.0272)	-0.0692** (0.0327)	-0.0787* (0.0428)	-0.0486 (0.0364)
Share of EU Affiliates	-0.0720*** (0.0226)	-0.106*** (0.0367)	-0.0913** (0.0359)	-0.0750* (0.0402)	-0.0669 (0.0485)	-0.112* (0.0659)	-0.0542 (0.0597)
Depreciation	0.699** (0.303)	0.751** (0.371)	0.657 (0.438)	0.682 (0.457)	0.642 (0.446)	0.531 (0.396)	0.342 (0.391)
Market Capitalization	0.000197 (0.00472)	0.00984 (0.00771)	0.00580 (0.00849)	0.000791 (0.00875)	-0.00970 (0.0103)	-0.00735 (0.0111)	-0.00750 (0.00919)
Number of Affiliates	-0.00688 (0.00448)	-0.0104 (0.00782)	-0.00680 (0.00843)	-0.00705 (0.00815)	-0.00920 (0.00899)	-0.00594 (0.0101)	-0.00684 (0.00817)
Constant	0.0173 (0.0360)	-0.0718 (0.0556)	-0.0528 (0.0587)	-0.0403 (0.0576)	0.0130 (0.0635)	-0.0154 (0.0683)	-0.0135 (0.0636)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	278	287	272	241	214	175	164
Adjusted R-squared	0.327	0.327	0.262	0.180	0.161	0.158	0.074

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

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# Omitting Financial Firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,+1)	(-1,+2)	(-1,+3)	(-1,+4)	(-1,+14)	(-1,+19)
Share of UK Affiliates	-0.112*** (0.0180)	-0.168*** (0.0278)	-0.150*** (0.0257)	-0.147*** (0.0270)	-0.155*** (0.0297)	-0.158*** (0.0285)	-0.178*** (0.0346)
Share of EU Affiliates	-0.107*** (0.0226)	-0.161*** (0.0377)	-0.151*** (0.0330)	-0.169*** (0.0354)	-0.175*** (0.0388)	-0.171*** (0.0386)	-0.146*** (0.0423)
Depreciation	0.848** (0.333)	0.843** (0.401)	0.892** (0.447)	0.922* (0.507)	0.901* (0.482)	0.773* (0.409)	0.518 (0.430)
Market Capitalization	0.0129*** (0.00352)	0.0311*** (0.00566)	0.0300*** (0.00506)	0.0318*** (0.00516)	0.0335*** (0.00575)	0.0332*** (0.00566)	0.0228*** (0.00584)
Number of Affiliates	-0.0127*** (0.00429)	-0.0191** (0.00754)	-0.0206*** (0.00725)	-0.0227*** (0.00735)	-0.0273*** (0.00798)	-0.0265*** (0.00760)	-0.0266*** (0.00842)
Constant	-0.0357 (0.0332)	-0.164*** (0.0505)	-0.147*** (0.0475)	-0.139*** (0.0493)	-0.135** (0.0540)	-0.129** (0.0518)	0.0102 (0.0587)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	251	251	251	251	251	251	251
Adjusted R-squared	0.503	0.516	0.484	0.450	0.416	0.415	0.348

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

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# Other events: Abnormal returns

	05-Oct-16			03-Nov-16		
Date	Mean	St. Dev.	# with AR	Mean	St. Dev.	# with AR
t-4	-0.53%	2.43%	11	0.16%	1.48%	11
t-3	0.20%	1.37%	2	0.10%	1.42%	8
t-2	0.15%	1.69%	7	0.48%	1.68%	13
t-1	-0.42%	1.56%	10	0.61%	1.64%	12
t	-0.05%	1.74%	19	0.74%	5.10%	38
t+1	-0.11%	1.25%	8	-0.36%	5.70%	15
t+2	-0.95%	4.19%	44	-0.46%	1.60%	8
t+3	-0.91%	2.65%	9	-0.43%	1.24%	6
t+4	0.82%	1.97%	20	-0.06%	2.49%	45
t+14	-0.65%	1.54%	12	-0.16%	1.35%	8
t+19	0.44%	1.67%	13	-0.15%	2.29%	27

# Other events: Abnormal returns

	17-Jan-17			24-Jan-17			29-Mar-17		
Date	Mean	St. Dev.	# with AR	Mean	St. Dev.	# with AR	Mean	St. Dev.	# with AR
t-4	-0.27%	1.91%	9	-0.15%	2.12%	8	-0.32%	1.28%	6
t-3	-0.25%	1.88%	15	0.24%	1.57%	13	0.50%	1.54%	19
t-2	-0.10%	1.49%	5	-0.11%	1.53%	8	-0.18%	1.66%	21
t-1	-0.05%	1.09%	3	0.53%	1.45%	9	-0.12%	1.13%	8
t	1.02%	2.04%	34	-0.04%	2.05%	14	-0.15%	1.10%	5
t+1	-0.15%	2.12%	8	-0.12%	1.63%	10	0.21%	1.40%	10
t+2	0.23%	1.57%	13	0.04%	1.60%	14	0.44%	2.29%	31
t+3	-0.12%	1.54%	8	-0.17%	1.61%	7	0.19%	2.53%	7
t+4	0.51%	1.45%	9	0.53%	1.46%	7	-0.06%	1.93%	9
t+14	0.07%	1.04%	1	-0.01%	1.05%	4	-0.15%	1.24%	8
t+19	-0.01%	1.05%	4	0.20%	1.33%	9	-0.23%	7.80%	19

# CAR: Oct. 5; All firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	-0.00116 (0.00567)	-0.00194 (0.00796)	-0.0368*** (0.00921)	-0.0520*** (0.0102)	-0.0389*** (0.0114)	-0.0219 (0.0196)	0.00100 (0.0224)
Share of EU Affiliates	0.0172 (0.0107)	0.0225* (0.0126)	0.00666 (0.0137)	-0.00335 (0.0157)	0.00481 (0.0170)	0.00610 (0.0262)	0.00387 (0.0340)
Depreciation	-1.119 (1.395)	-0.771 (0.949)	-0.896** (0.453)	-0.318 (0.359)	-0.0924 (0.310)	0.0450 (0.483)	0.384 (0.572)
Market Capitalization	-0.00115 (0.00120)	-0.00211 (0.00161)	-0.000476 (0.00181)	0.000928 (0.00203)	-0.00318 (0.00215)	0.00334 (0.00549)	0.00439 (0.00631)
Number of Affiliates	0.00244*** (0.000929)	0.00408*** (0.00154)	0.00173 (0.00275)	0.00146 (0.00219)	0.00150 (0.00230)	0.000652 (0.00553)	0.00407 (0.00571)
Constant	-0.00907 (0.0121)	-0.00603 (0.0155)	0.0166 (0.0204)	0.00124 (0.0202)	0.0269 (0.0224)	-0.0681 (0.0503)	-0.113** (0.0568)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.044	0.046	0.101	0.255	0.134	0.031	0.015

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Depreciation refers to the depreciation within each event window.



# CAR: Nov. 03; All firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	0.0165 (0.0101)	0.0203 (0.0182)	0.0110 (0.0116)	0.00255 (0.0113)	-0.0171 (0.0125)	0.0208 (0.0258)	0.0700 (0.0454)
Share of EU Affiliates	0.0128 (0.0171)	0.0263 (0.0182)	0.0173 (0.0178)	0.00655 (0.0180)	-0.0198 (0.0207)	0.0864** (0.0405)	0.101** (0.0489)
Depreciation	0.428 (0.491)	0.699 (1.257)	0.615** (0.262)	0.557** (0.251)	0.835** (0.399)	1.309*** (0.448)	0.0892 (0.871)
Market Capitalization	-0.00517*** (0.00176)	-0.00723*** (0.00260)	-0.00761*** (0.00225)	-0.00494** (0.00228)	-0.00639** (0.00267)	-0.0186*** (0.00550)	-0.0167** (0.00736)
Number of Affiliates	0.00239 (0.00170)	0.00904* (0.00480)	0.00835* (0.00451)	0.00769* (0.00450)	0.00891* (0.00468)	0.0230*** (0.00665)	0.0211** (0.00875)
Constant	0.0373** (0.0155)	0.0215 (0.0323)	0.0234 (0.0187)	0.00529 (0.0186)	0.0421* (0.0223)	0.0789* (0.0463)	0.00211 (0.0746)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.009	0.014	0.002	-0.005	0.004	0.045	-0.001

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Depreciation refers to the depreciation within each event window.

# CAR: Jan. 17; All firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	0.0109** (0.00503)	0.0105 (0.00892)	0.0144 (0.00962)	0.0156 (0.0113)	0.0221* (0.0126)	0.0285* (0.0153)	0.0186 (0.0186)
Share of EU Affiliates	0.0127* (0.00666)	0.0145 (0.0110)	0.0154 (0.0108)	0.0215 (0.0134)	0.0258* (0.0151)	0.0323 (0.0232)	0.0372 (0.0313)
Depreciation	0.595** (0.295)	0.293 (0.347)	0.179 (0.409)	0.181 (0.562)	0.221 (0.401)	0.482 (0.670)	0.864 (0.581)
Market Capitalization	-0.00141 (0.00110)	-0.00138 (0.00112)	-0.00236* (0.00135)	-0.00360** (0.00169)	-0.00494** (0.00205)	-0.00806** (0.00358)	-0.0110** (0.00443)
Number of Affiliates	0.00193 (0.00134)	-0.000744 (0.00106)	-0.000460 (0.00140)	0.000775 (0.00190)	0.00154 (0.00211)	0.00115 (0.00279)	0.00358 (0.00357)
Constant	0.0102 (0.00912)	0.0200** (0.00914)	0.0250** (0.0120)	0.0289* (0.0154)	0.0408** (0.0180)	0.0771** (0.0305)	0.108*** (0.0369)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.100	0.023	0.031	0.015	0.038	0.032	0.027

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Depreciation refers to the depreciation within each event window.

# CAR: Jan. 24; All firms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	0.00344 (0.00510)	0.00134 (0.00654)	-0.000799 (0.00739)	0.00678 (0.00746)	0.0171** (0.00777)	0.0190 (0.0141)	0.0216 (0.0219)
Share of EU Affiliates	0.000856 (0.00947)	0.0155 (0.0106)	0.0149 (0.0136)	0.0109 (0.0128)	0.0190 (0.0149)	0.0243 (0.0361)	0.00969 (0.0391)
Depreciation	0.715 (1.345)	1.522** (0.771)	1.034 (0.747)	0.937 (1.159)	1.126 (1.172)	1.359 (1.290)	0.285 (1.620)
Market Capitalization	-0.00387** (0.00182)	-0.00358* (0.00201)	-0.00434* (0.00225)	-0.00161 (0.00234)	-0.00199 (0.00231)	-0.00758* (0.00390)	-0.00308 (0.00428)
Number of Affiliates	0.00112 (0.000830)	0.00381*** (0.00141)	0.00389*** (0.00144)	0.00288** (0.00139)	0.00149 (0.00144)	0.00118 (0.00252)	-0.00170 (0.00312)
Constant	0.0333** (0.0158)	0.0248 (0.0175)	0.0262 (0.0188)	0.00149 (0.0197)	0.00622 (0.0195)	0.0639** (0.0298)	0.0421 (0.0367)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	339	339	339	339	339	339	339
Adjusted R-squared	0.055	0.026	0.016	-0.010	-0.001	0.007	0.006

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Exchange rate change refers to the change within each event window.

# CAR: March 29; All firms

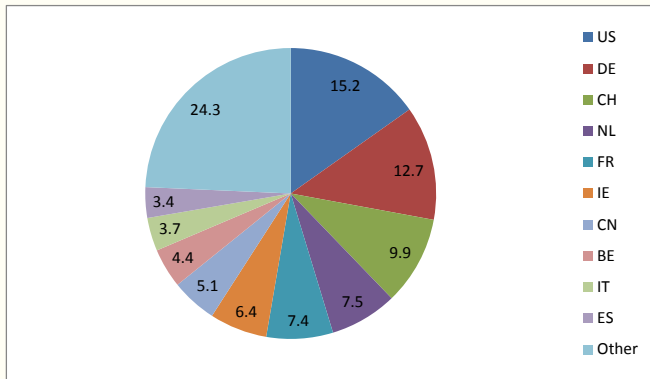
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	(-1,0)	(-1,1)	(-1,2)	(-1,3)	(-1,4)	(-1,14)	(-1,19)
Share of UK Affiliates	-0.0128** (0.00563)	-0.0126** (0.00601)	-0.00117 (0.00663)	-0.00265 (0.00870)	-0.00546 (0.00987)	0.0153 (0.0308)	0.00712 (0.0375)
Share of EU Affiliates	-0.0128 (0.00893)	-0.00438 (0.0122)	-0.00766 (0.0147)	-0.00923 (0.0161)	-0.00636 (0.0177)	0.0184 (0.0204)	0.0295 (0.0285)
Depreciation	-0.689 (0.570)	0.435 (0.583)	0.452 (0.657)	0.529 (0.568)	0.448 (0.708)	0.656 (0.865)	0.387 (1.009)
Market Capitalization	-0.00103 (0.000796)	-0.00252** (0.00103)	-0.00223 (0.00150)	-0.00272 (0.00179)	-0.00300 (0.00185)	-0.00570 (0.00370)	-0.00542 (0.00447)
Number of Affiliates	0.00109* (0.000595)	0.000974 (0.000759)	0.00121 (0.00142)	7.89e-05 (0.00198)	-0.000746 (0.00161)	0.000194 (0.00295)	0.00745 (0.00599)
Constant	0.0133 (0.00890)	0.0251** (0.00977)	0.0175 (0.0118)	0.0311** (0.0148)	0.0373** (0.0162)	0.0722 (0.0490)	0.0332 (0.0616)
Sector FE	YES	YES	YES	YES	YES	YES	YES
Observations	338	338	338	338	338	338	338
Adjusted R-squared	0.063	0.143	0.019	0.004	0.025	0.043	0.030

Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

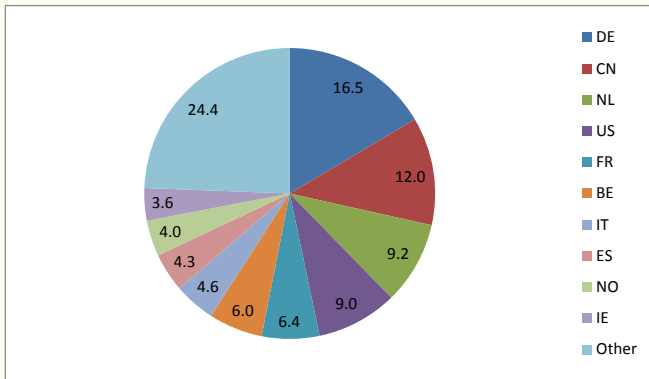
Exchange rate change refers to the change within each event window.

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# UK export destinations



# UK import origins



- Ireland is not a major trading partner for the UK
- The UK, however, is a big deal for Ireland
  - 2016 Exports: 11.4% of Irish exports (US first with 25.8%)
  - 2016 Imports: 22.3% of Irish imports (US second with 16.5%)
- Trade with the UK may fall 20%; agri-food by 50% (ESRI, 2015)
- Brexit is not good news for Ireland, even if UK firms relocate
- Irish exit is a very real possibility [Back](#)