Ex-post evaluation of mobile telecommunication entry: the Italian case

INTRODUCTION

- Policy of interest: **new structural remedy** imposed on merger request
- Research design: **Difference in Differences estimation**
- Peculiarities: a more appropriate control country, **United Kingdom**

1.

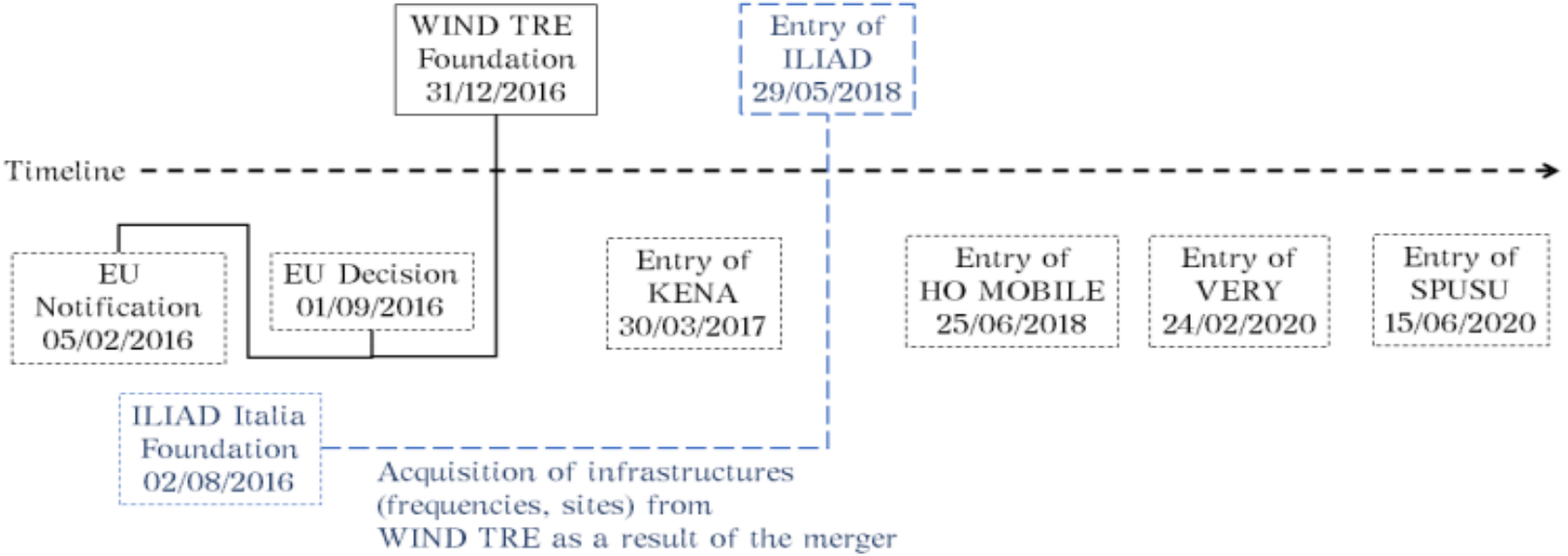
MARKET CONTEXT

Telecommunication market developments. What happened in **Europe** and what makes **Italy** differ.

EUROPEAN MARKET

- What characterizes the mobile telecommunication market?
- How it has been regulated in Europe?
- The European Commission approach to mergers requests

ITALIAN MARKET



2.

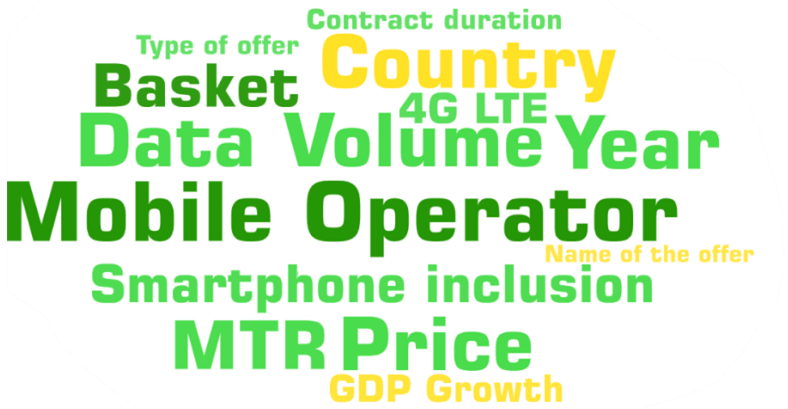
DATA

How the dataset we created fit our aim.
Bundles and **Baskets**.

DATASET DESCRIPTION

- Bundles and Baskets: how to compare different mobile plans.

- Dataset composition:
  Repeated cross-sectional data from 35 countries.



3.

MODEL DEFINITION

What we want to estimate and how the **regression equation** is defined in our setting.

WHAT ARE WE ESTIMATING?

1. The effect of a merger followed by an MNO entry instead of having the request blocked;

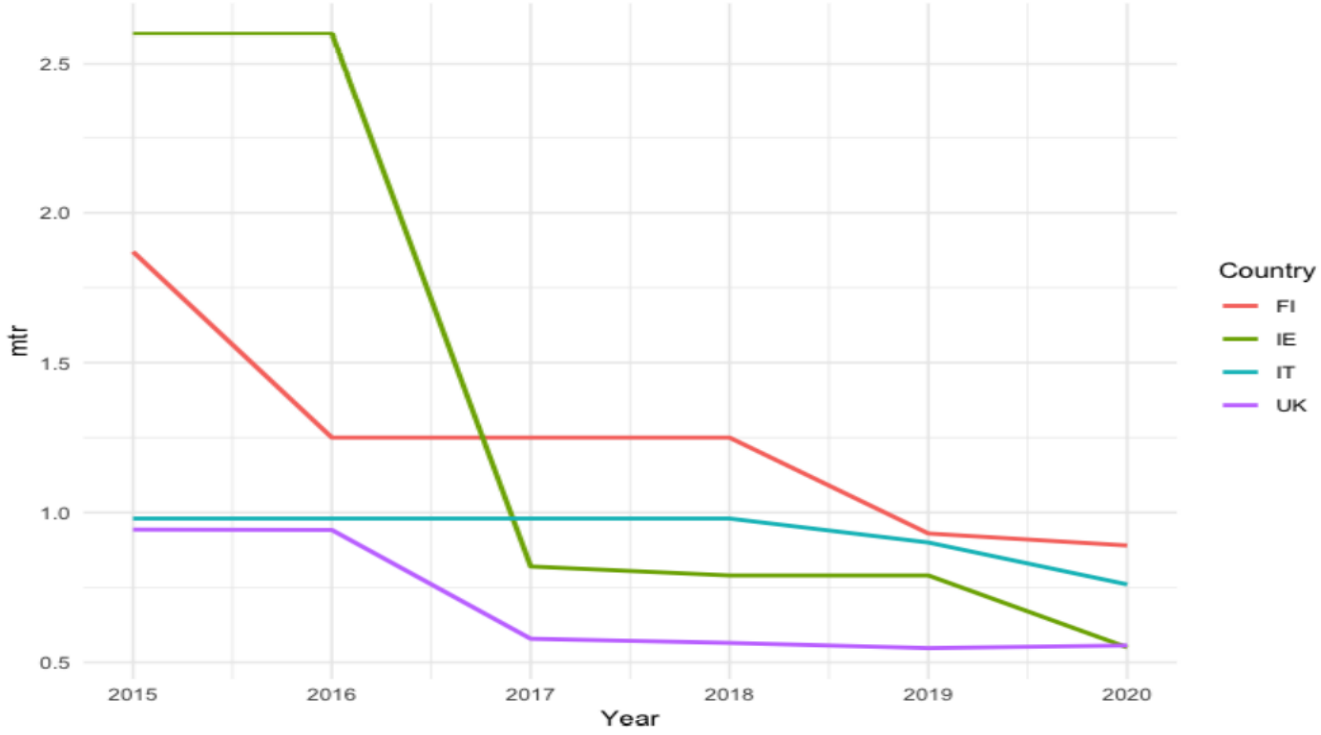
2. The effect of a MNO entry instead of the classical remedies as condition for the merger;

3. The effect of a merger followed by an MNO entry against no variation at all.

MODEL DEFINITION

$$\begin{aligned}\log price = \alpha &+ \gamma treated\_country_s + \lambda treatment\_year_t + \\ &+ \delta(treated\_country_s * treatment\_year_t) + \\ &+ \beta year2016_t + \eta gdp\_growth\_rate_{st} \\ &+ \theta mtr_{st} + \mu data\_included\_month + \\ &+ \rho smartphone\_included + \varepsilon_{st}\end{aligned}$$

MTR EXCLUSION



4.

CONTROL COUNTRY CHOICE

Different **candidates** for each effect we want to estimate. **Multidimensional scaling** to select the most similar.

TO EACH EFFECT ITS CANDIDATES

1. United Kingdom and Denmark;

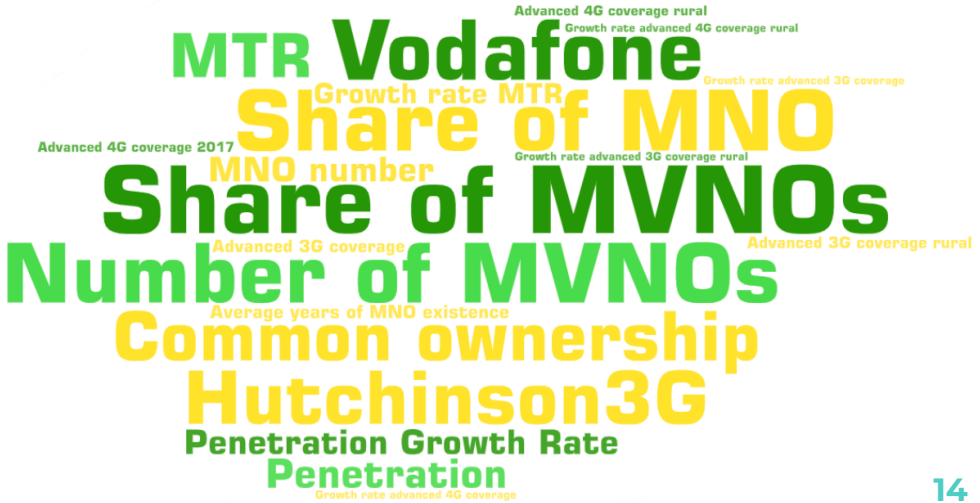
2. Germany, Ireland and Norway

3. Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Finland, Malta, Portugal, Romania and Spain.

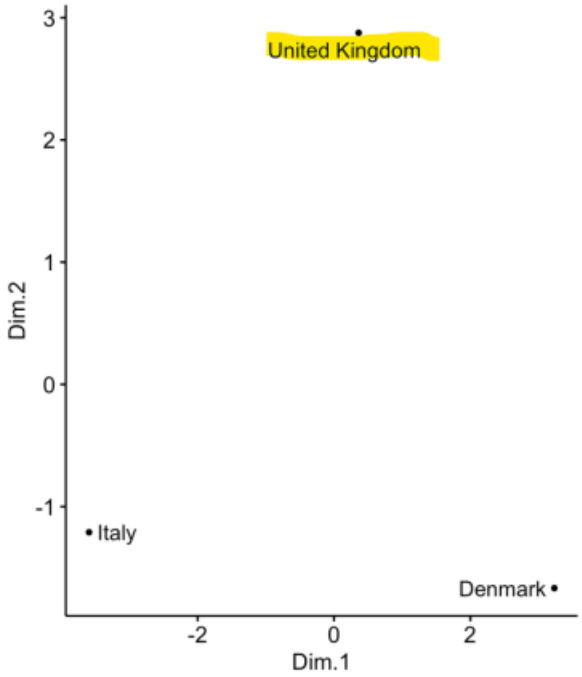
MULTIDIMENSIONAL SCALING

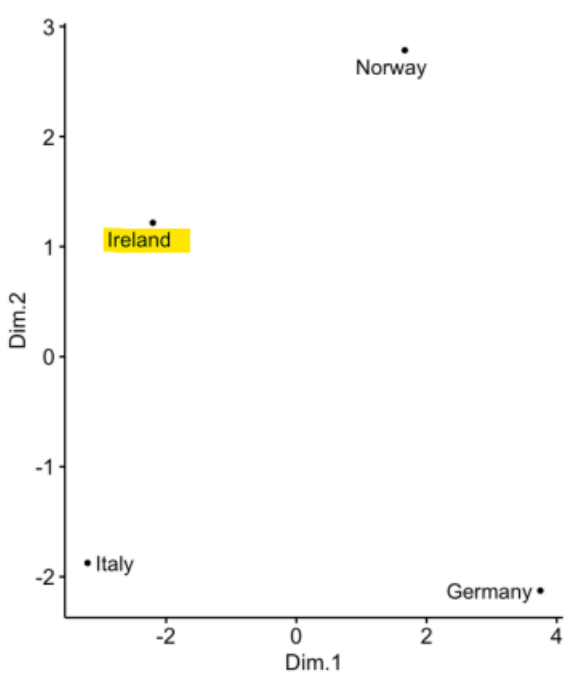
- The best control country for each effect we want to estimate should be the one with the most similar Mobile Telecommunication Market.

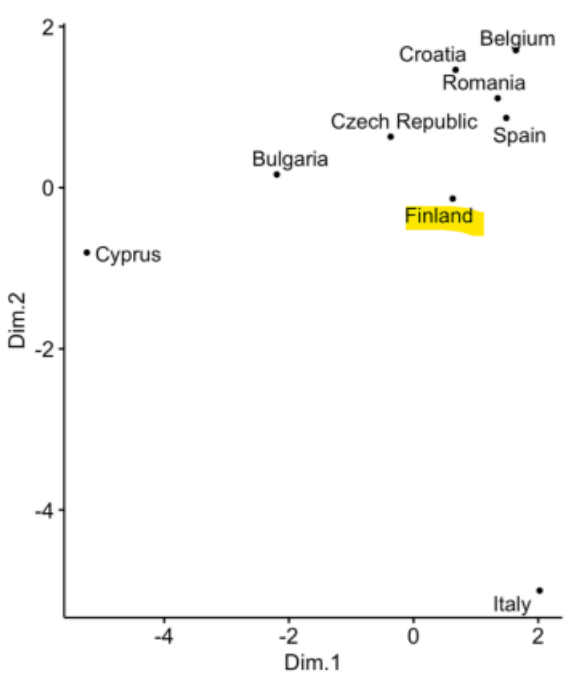
- We then apply Multidimensional Scaling on the relevant market features



THE WINNERS


United Kingdom
Italy
Denmark
Dim.1
Dim.2


Norway
Ireland
Italy
Germany
Dim.1
Dim.2

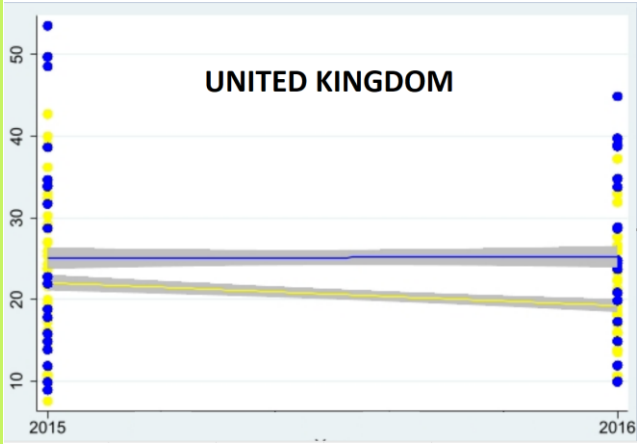

Belgium
Croatia
Romania
Czech Republic
Spain
Bulgaria
Finland
Cyprus
Italy
Dim.1
Dim.2

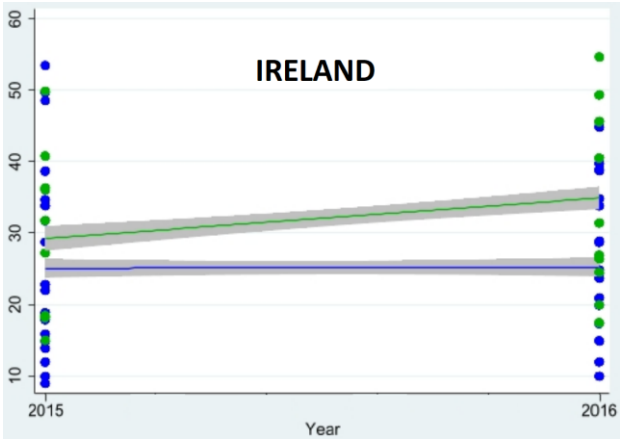
5.

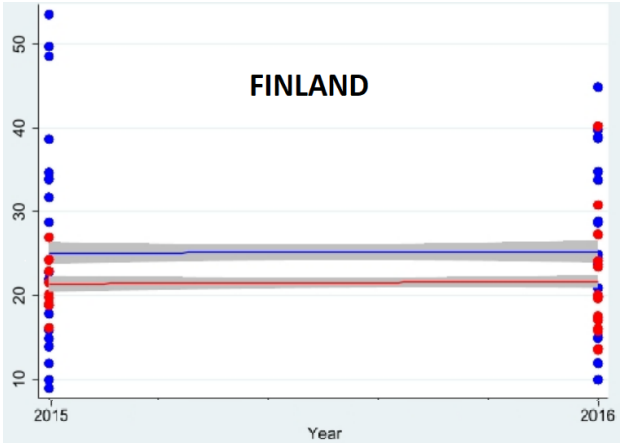
ASSUMPTIONS

Three fundamental **assumptions** underlie this research design. They need to be **discussed**.

COMMON TREND ASSUMPTION







COMMON TREND ASSUMPTION

- Slope comparison

Country	Slope	SE	CI left	CI right
Italy	0.0291	0.0959	-0.1611	0.2192
UK	-0.0977	0.0734	-0.2431	0.0477
Ireland	0.1752	0.0636	0.0492	0.3012
Finland	-0.0262	0.0427	-0.1107	0.0582

- Placebo test

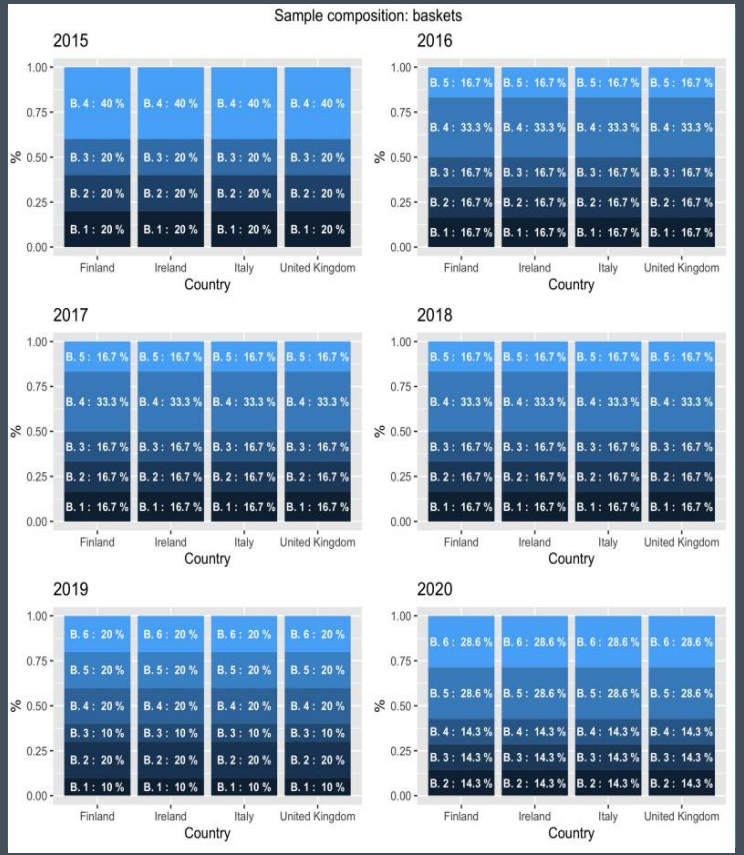
Country	Causal Effect	SE	t	Pvalue	CI left	CI right
UK	0.0155	0.0404	0.3800	0.7010	-0.0638	0.0948
Ireland	-0.2123	0.0541	-3.9200	0.0000	-0.3186	-0.1061
Finland	0.0554	0.0534	1.0400	0.3000	-0.0494	0.1601

NO SELECTION ON IDIOSYNCRATIC SHOCKS

- Are the treatments exogenous?
- How is it usually justified in the literature?
- We are convinced that the assumption is met at different levels in each of the three estimations.

ABSENCE OF COMPOSITIONAL CHANGES BETWEEN GROUPS

- Why do we need this additional assumption?



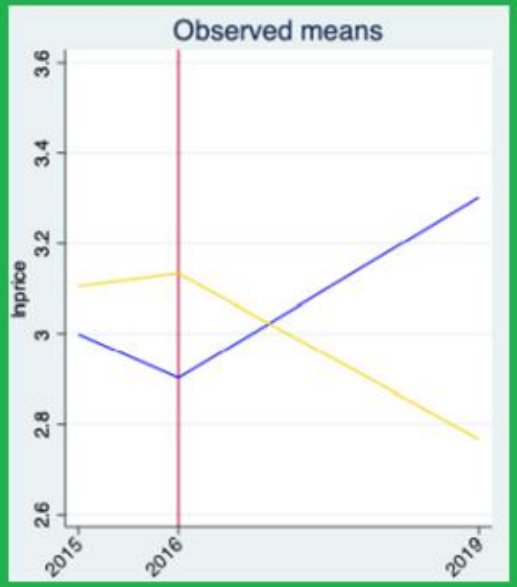
6.

ECONOMETRIC RESULTS

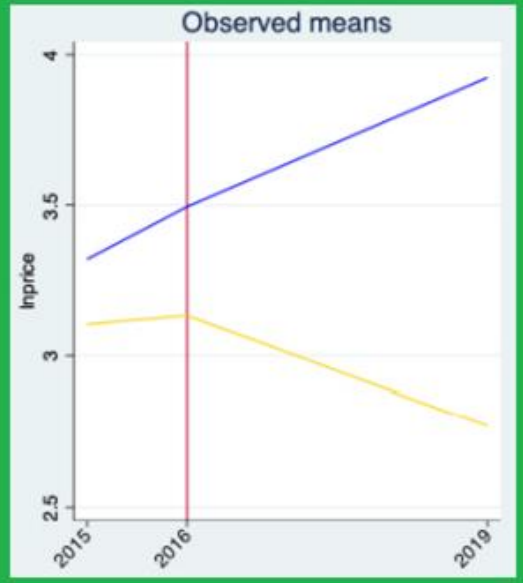
Let's **apply** what we discussed!

DID GRAPHICAL REPRESENTATION

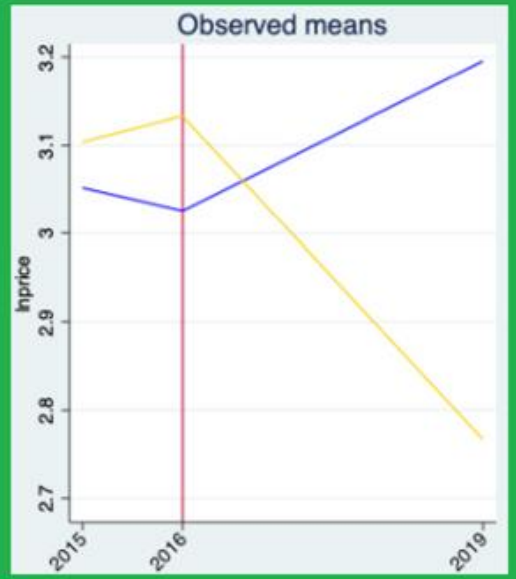
United Kingdom



Ireland



Finland



ECONOMETRIC RESULTS

	United Kingdom		Ireland		Finland	
lnprice	**1-2-3-4**	All	**1-2-3-4**	All	**1-2-3-4**	All
Causal Effect	**-0.5461*** **	-0.5378***	**-0.7267*** **	-0.7061***	**-0.4560*** **	-0.4431***
	(0.0570)	(0.0532)	(0.0546)	(0.0467)	(0.0408)	(0.0341)
Country	0.6255***	0.6308***	-0.4203***	-0.4160***	-0.0369	-0.0428
	(0.1693)	(0.1556)	(0.0638)	(0.0567)	(0.0934)	(0.0898)
2016	0.0888*	0.0922**	0.0369	0.0406	0.0345	0.0377
	(0.0486)	(0.0450)	(0.0348)	(0.0320)	(0.0298)	(0.0278)
2019	0.8555***	0.8671***	0.2871***	0.2839***	0.0143	0.0101
	(0.2201)	(0.2037)	(0.0625)	(0.0556)	(0.1311)	(0.1238)
GDP Growth	1.7970***	1.8172***	-0.0355**	-0.0351***	-0.3980	-0.4034
	(0.6551)	(0.6101)	(0.0141)	(0.0130)	(0.3663)	(0.3435)
Data Volume	0.0000***	0.0000***	0.0000***	0.0000***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
Smartphone	0.3988***	0.4470***	0.3026***	0.3586***	0.2612***	0.3190***
	(0.0166)	(0.0135)	(0.0207)	(0.0171)	(0.0200)	(0.0167)
_cons	1.5605	1.5161	3.3233	3.2820	3.1089	3.0782

7.

ROBUSTNESS CHECKS

Are our findings robust?
Let's **test** them!

ESTIMATION WITH SINGLE BASKETS

lnprice	Basket 1	Basket 2	Basket 3	Basket 4	Basket 5
Causal Effect	**-0.5503*** **	**-0.5356*** **	**-0.5503*** **	**-0.5502*** **	**-0.7257*** **
	(0.1318)	(0.1199)	(0.1318)	(0.0928)	(0.0807)
Country	0.6229	0.6323*	0.6229	0.6229**	0.2358***
	(0.3850)	(0.3685)	(0.3850)	(0.2711)	(0.0716)
2016	0.0870	0.0932	0.0870	0.0870	
	(0.1105)	(0.1057)	(0.1105)	(0.0778)	
2019	0.8495*	0.8702*	0.8495*	0.8495**	0.3170***
	(0.5008)	(0.4786)	(0.5008)	(0.3525)	(0.0519)
GDP Growth	1.7870	1.8228	1.7870	1.7870*	
	(1.4901)	(1.4262)	(1.4901)	(1.0490)	
Data volume	0.0000***	0.0000***	0.0000***	0.0000***	0.0000***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Smartphone	0.3752***	0.4606***	0.3752***	0.3752***	0.5093***
	(0.0396)	(0.0307)	(0.0396)	(0.0279)	(0.0315)
_cons	1.5822	1.5036	1.5822	1.5822	2.5707

ROBUSTNESS TO OUTLIERS

	United Kingdom		Ireland		Finland	
lnprice	**1-2-3-4**	All	**1-2-3-4**	All	**1-2-3-4**	All
Causal Effect	**-0.5036***** (0.0662)	-0.4948*** (0.0625)	**-0.6547***** (0.0608)	-0.6328*** (0.0526)	**-0.1431**** (0.0629)	-0.0782 (0.0609)
Country	0.5930*** (0.1954)	0.5981*** (0.1813)	-0.4207*** (0.0712)	-0.4156*** (0.0642)	-0.0749 (0.1408)	-0.1019 (0.1567)
2016	0.0874 (0.0568)	0.0914* (0.0531)	0.0368 (0.0407)	0.0410 (0.0379)	0.0382 (0.0477)	0.0425 (0.0516)
2019	0.7823*** (0.2545)	0.7949*** (0.2379)	0.1935*** (0.0702)	0.1904*** (0.0635)	-0.2695 (0.1965)	-0.3403 (0.2146)
GDP Growth	1.6881** (0.7584)	1.7079** (0.7132)	-0.0357** (0.0161)	-0.0352** (0.0151)	-0.4356 (0.5601)	-0.4973 (0.6079)
Data Volume	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)	0.0000*** (0.0000)		
Smartphone	0.4467*** (0.0190)	0.5035*** (0.0156)	0.3623*** (0.0233)	0.4274*** (0.0193)	0.3415*** (0.0308)	0.4416*** (0.0300)
_cons	1.5981	1.5483	3.2791	3.2311	3.1068	3.0891

ANTICIPATORY EFFECT

	United Kingdom		Ireland		Finland	
lnprice	**1-2-3-4**	All	**1-2-3-4**	All	**1-2-3-4**	All
Causal Effect	**-0.5301*** **	**-0.5380*** **	**-0.6845*** **	**-0.6822*** **	**-0.3786*** **	**-0.3867*** **
	(0.0539)	(0.0510)	(0.0525)	(0.0453)	(0.0362)	(0.0314)
Country	0.5282***	0.5208***	-0.3855***	-0.3801***	0.0801	0.0940
	(0.1584)	(0.1466)	(0.0615)	(0.0550)	(0.0867)	(0.0833)
2016	0.0646	0.0646	0.0506	0.0551*	0.0173	0.0186
	(0.0456)	(0.0426)	(0.0336)	(0.0311)	(0.0284)	(0.0266)
2018	0.8025***	0.7831***	0.5883***	0.5762***	0.5103***	0.5096***
	(0.1233)	(0.1146)	(0.0671)	(0.0597)	(0.0899)	(0.0844)
2019	0.7180***	0.7141***	0.2934***	0.2982***	0.1380	0.1699
	(0.2052)	(0.1914)	(0.0603)	(0.0540)	(0.2338)	(0.1162)
GDP Growth	1.4160**	1.3808**	-0.0271**	-0.0260**	0.0830	0.1434
	(0.6130)	(0.5746)	(0.0136)	(0.0126)	(0.3389)	(0.3178)
Data volume	0.0000***	0.0000***	0.0000***	0.0000***		
	(0.0000)	(0.0000)	(0.0000)	(0.0000)		
Smartphone	0.4016***	0.4494***	0.3181***	0.3720***	0.2657***	0.3230***
	(0.0157)	(0.0129)	(0.0199)	(0.0165)	(0.0191)	(0.0161)
_cons	1.7992	1.7891	3.2700	3.2277	2.8300	2.7594

DATA VOLUME AS OUTCOME VARIABLE

	United Kingdom		Ireland	
Data Volume	**1-2-3-4**	All	**1-2-3-4**	All
Causal Effect	**9411***** (2339)	10407*** (2408)	**11341***** (1631)	12131*** (1559)
Country	-4552 (6863)	-5962 (6974)	3864** (1861)	4384** (1854)
2016	246 (1965)	0 (2016)	859 (1004)	782 (1036)
2019	7035 (8924)	4882 (9135)	9050*** (1801)	8589*** (1801)
GDP Growth	-12001 (26528)	-16128 (27318)	361 (408)	405 (422)
Smartphone	-4343*** (739)	-5798*** (684)	-1110* (632)	-1807*** (598)
lnprice	10897*** (781)	12996*** (721)	6655*** (666)	7971*** (627)
_cons	-20609	-23269	-22431	-26586

8.

UNDERESTIMATION

Because of the **dataset** we are using it is **very likely** we are underestimating the general effect on prices.

SOURCES OF UNDERESTIMATION

- Subsidiary **fighting brands** and Iliad not included in the dataset
- **Win back** offers not included
- No basket in the actual **high volume** section

Thanks!

Any questions?

Luca Donghi

Elisabetta Rocchetti