



INFRAPONT

Benchmarking large-screen mobile broadband prices: 4 is better than 3?

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Does the number or the composition of players matter on the mobile broadband markets? – Lessons from a benchmarking study of the large-screen mobile broadband prices in the European Union

27th European Regional ITS Conference, Cambridge, 7-9 September, 2016

Motivation

1. Competition and regulatory decisions require reliable and solid understanding of how the mobile markets work in practice
 - spectrum auction design concerning facilitating entry or positive discrimination for the weakest/smallest players
 - in-country mergers between MNOs
 - in-country mergers between FNOs and MNOs
 - competition policy judgement on network sharing agreements
 - ...
2. Lack of good information and knowledge on the comparative performance of the mobile markets in general and especially of the mobile broadband markets

Is there a difference in competitive performance between 3 and 4 player mobile markets?

or put it differently

What factors are behind the observed differences between the performances of the national mobile broadband markets?

Aim of the paper

1. Propose a workable, coherent and relatively simple methodology for mobile broadband market price performance benchmarking
2. Present the results of the application of the proposed methodology
3. Show the overall picture of large-screen mobile broadband prices in the EU28, between 2013 and 2015
4. Look behind the differences with the help of simple statistics and econometrics
 - results are preliminary

The benchmarking challenge

Mobile broadband is a complex service - is a bundle of services with different quality features

- for small-screen each plan is a combination of voice, sms, and data
- for large-screen it is „simply“ data
 - but they are package deals with different quantity-price combinations
 - in case of smartphone plans quantities of the voice, sms and data service ingredients may differ from package to package
- price increasing with quantity, but nonlinear
- quality feature differentiation (especially connection speed, 4G vs 3G) may also play)

Cutting the Gordian Knot (half)

we chose to study and benchmark

publicly available

large-screen mobile broadband plans only

- it is difficult enough in itself,
- but may work as a proxy of the performance

The data

year	2013	2014	2015
number of countries	27	27	28
number of operators	90	92	95
number of plans	331	334	356

- data on public Ismbb offers was conducted from EU ms MNOs' websites
- in March each year, 2013-2015

Making the offers comparable

- Focus on data quantity (allowance)
- Requirement: functional broadband
 - Connection speed threshold
- Problem of comparability of unlimited tariffs
 - Truly unlimited may be differentiated by connection speed
 - Untruly unlimited, when there is a data limit above which the service still continues but with degraded speed which is not a functional broadband
- Plans offered are functional for different usage purposes
 - from basic (browsing, e-mail, facebook) – ... – intensive (downloading large files regularly, video, gaming)
 - what are the characteristic usage purposes?

First step : basket methodology

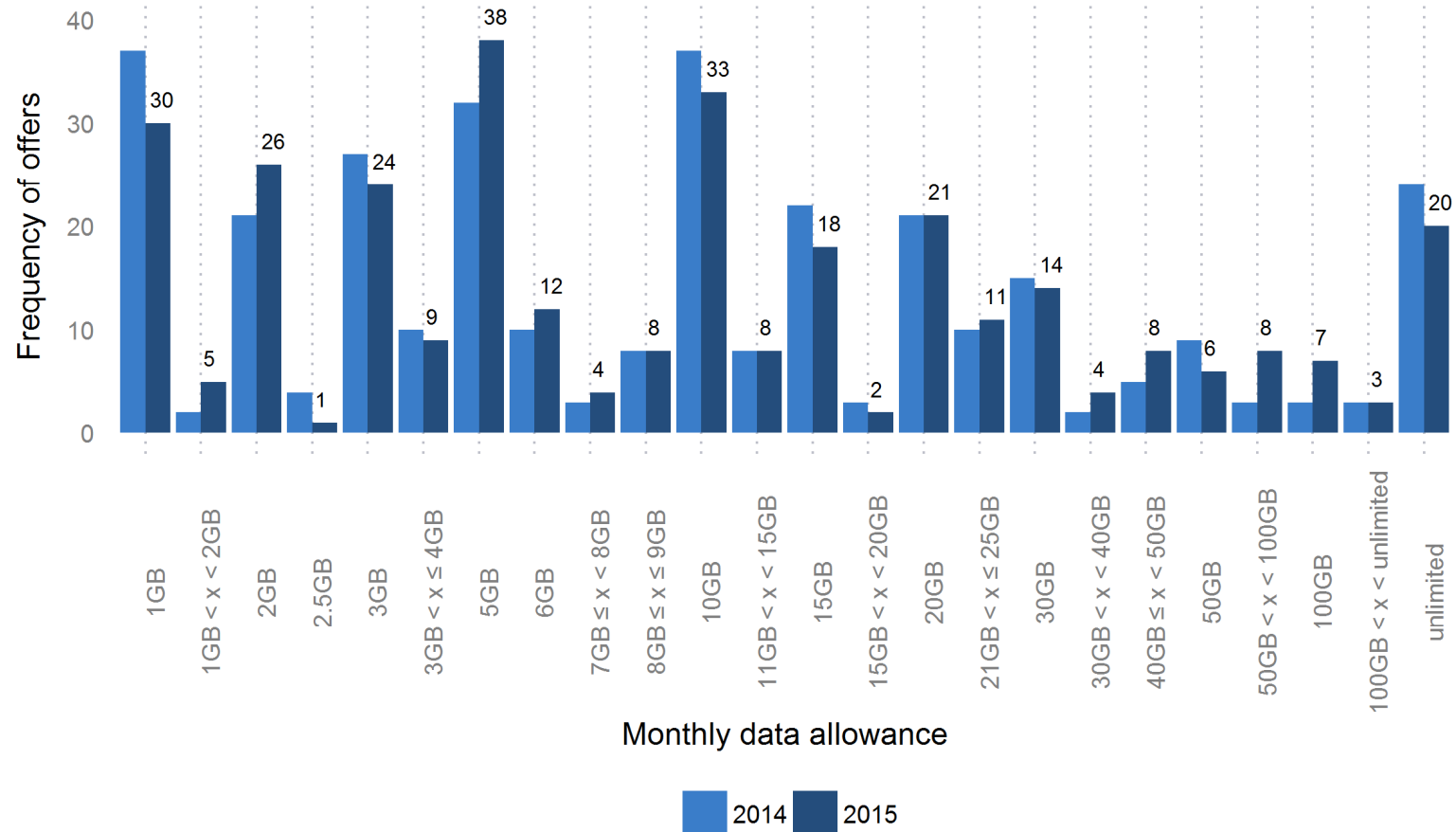
„There is nothing new under the sun“

- The known basket method can serve well for our purposes
- Fixed data quantity – corresponds to different user/usage characteristics
- Quality as threshold for usage functionality only
- Calculation of a single price
- Which baskets are relevant?
 - low user /medium user / large user
 - this can change in time as the market develops,
 - the meaning of low/medium/high may differ between markets
 - relevant = widely used
 - but no take up information available
 - we have information at least on the supply side

Which baskets?

- Basket choice criteria:
 - must fit to realistic usage patterns
 - must be empirically relevant: they must be one of the modes of the frequency distribution of the offered packages
 - it is preferable to use baskets similar to OECD-defined LSMBB baskets if there is no particular reason not to

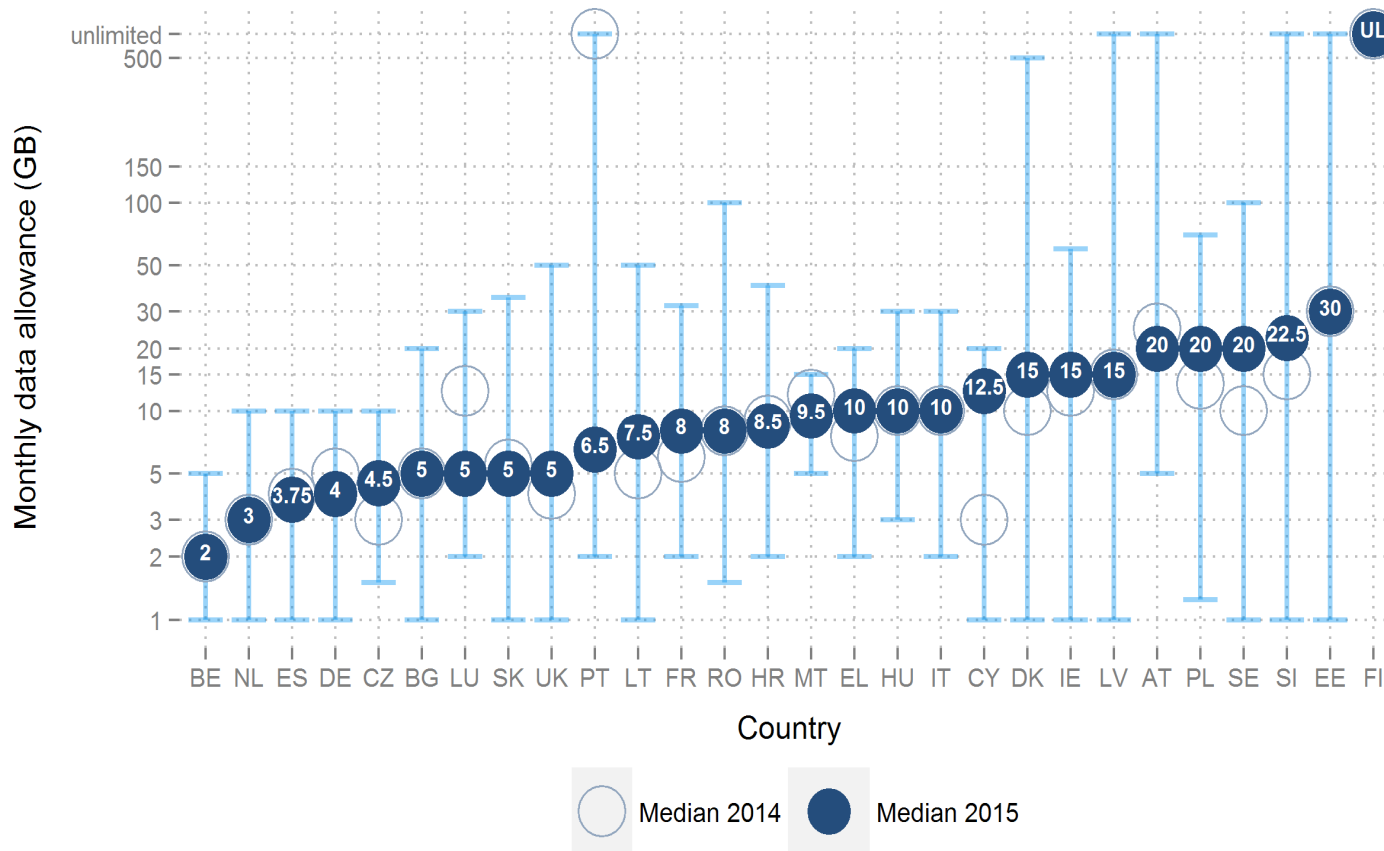
Frequency of the plans by monthly data allowance (GB; number of plans)



Source: Infrapont, based on operators' websites, Labels are for 2015 frequencies.

Large differences between countries

The minimum, maximum and median offers by country



Source: Infrapont, based on operators' websites

Consumer baskets by monthly data allowance

- low user baskets:
 - 1GB, 2GB and 3 GB;
- medium user baskets:
 - 5GB and 10 GB;
- high user baskets:
 - 15GB, 20GB and 30 GB

Calculation of the monthly prices of individual plans

Monthly price =

- + monthly paid subscription price of the plan,
- + one time fees (activation, administrative, service fees, etc.)
- + price of the stick/modem
- unambiguously quantifiable discounts

- (one time elements are depreciated according to the contract length, usually 12 or 24 month)

Matching rules of plans and consumer baskets

- Match each operator's most affordable plan to each user basket whenever possible
- When an operator does not have an offer corresponding exactly to the size of the predefined basket, apply the cheaper one of the following two options:
 - the price of the plan with the closest, but higher data allowance,
 - the price of the package with the closest, but smaller data allowance + the charge of the extra data volume
- If there is no exactly matching offer for the smaller user baskets, choose the plan with the smallest data allowance
 - relevant where only large, perhaps unlimited plans are available

Basket prices for countries

Two options

1. **average** of the MNOs' corresponding basket prices
 2. **minimum** of the MNOs' corresponding basket prices
- Merits and drawbacks
 - the first represents the mass
 - the second represents the competitive edge
 - They are informative together

Prices for comparison

Two options:

1. **nominal Euro price**

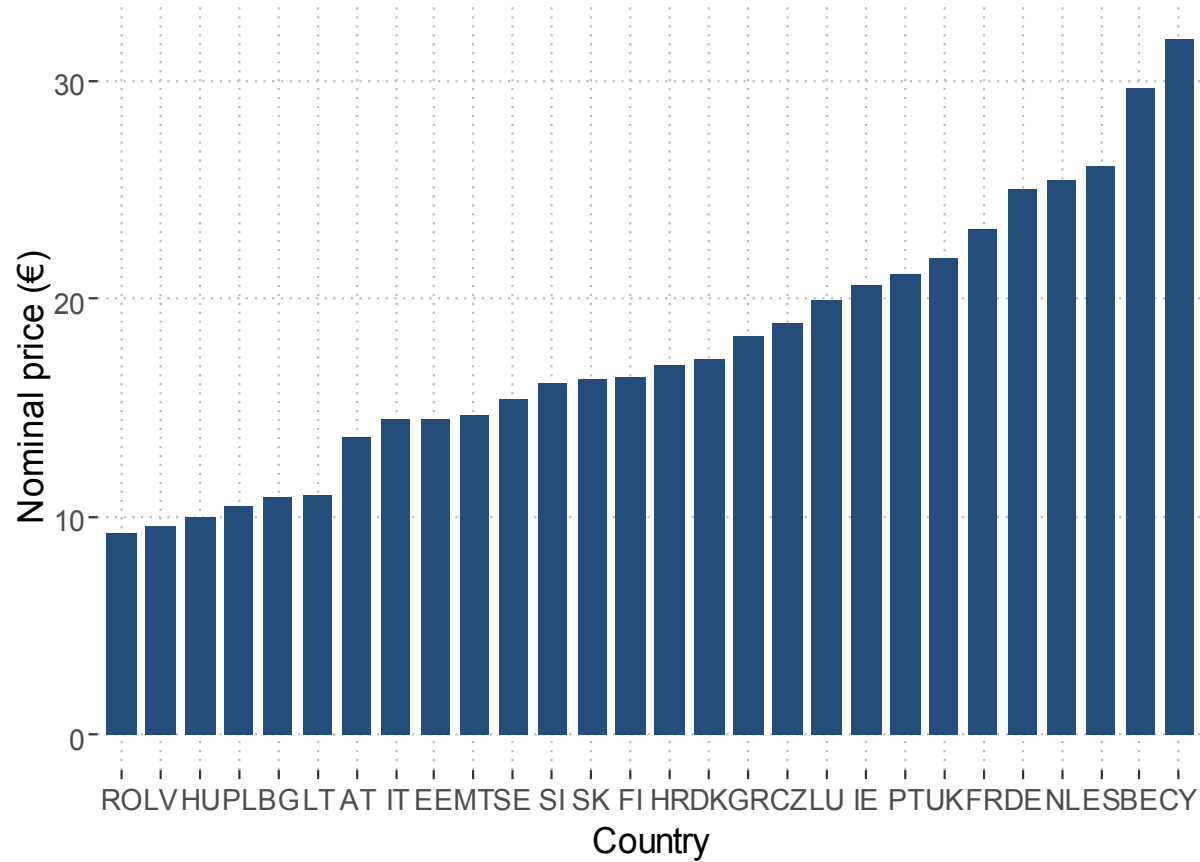
- calculated with relevant exchange rates for non-eurozone countries

2. **PPP adjusted price**

- Both solution have its merits and drawbacks
- PPP is preferred for comparison of consumer prices, because it handles the countries' price level differences

Basket comparison – nothing special

Average price of the 3GB basket (2015)



Second step

Basket price index with „Normalization“, i.e. Min-max scaling of the basket prices to the [0-100]

- 2013 highest basket price = 100
- basket price index for an entity (operator or country) =
$$100 \times \text{price} / \text{max price}$$

2013 is base year, so intetemporal comparability is ensured by fixing the max of the basket index on the max level of 2013

- index value a bit above 100 may occur

Price indices for each basket:

- operator basket price index
- country basket price index

Third step

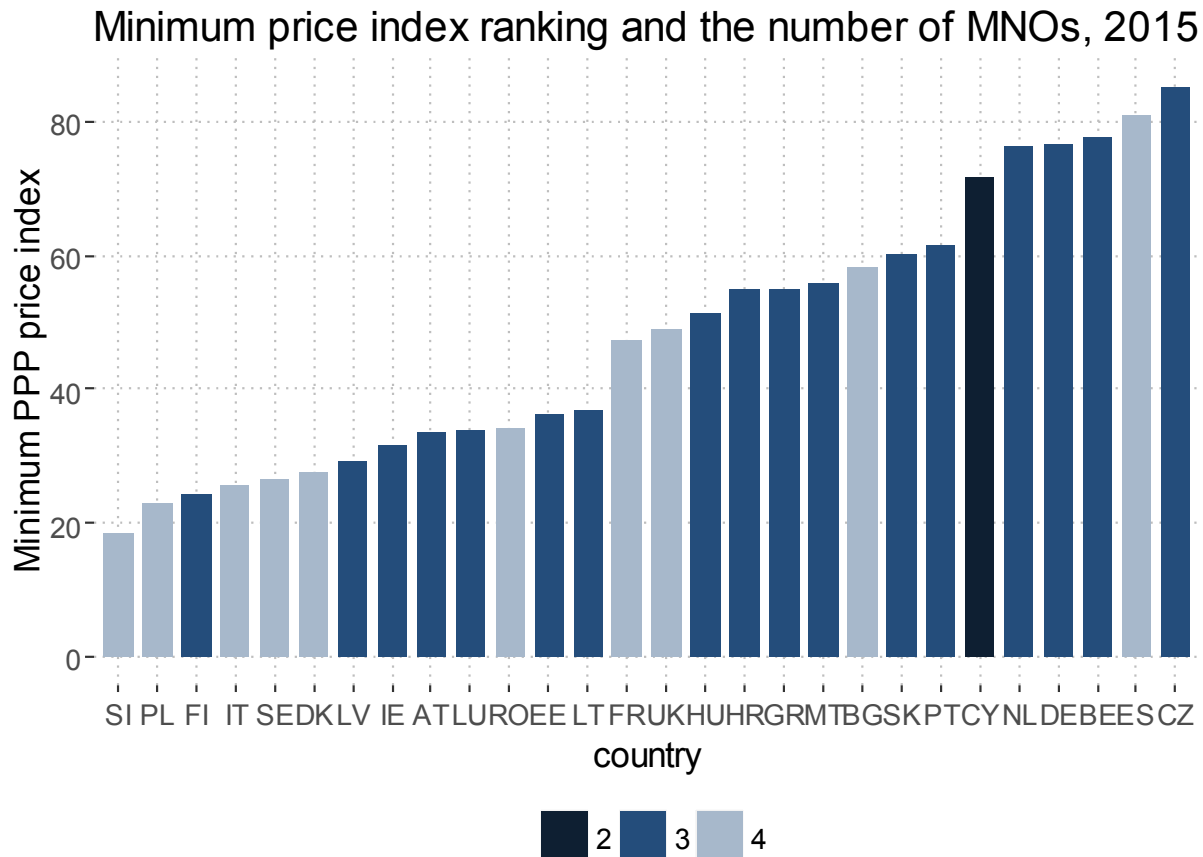
Entity (operator or country)

overall price index =
simple arithmetic average of the basket price indices

Two options for handling missing baskets on the high end of the menu:

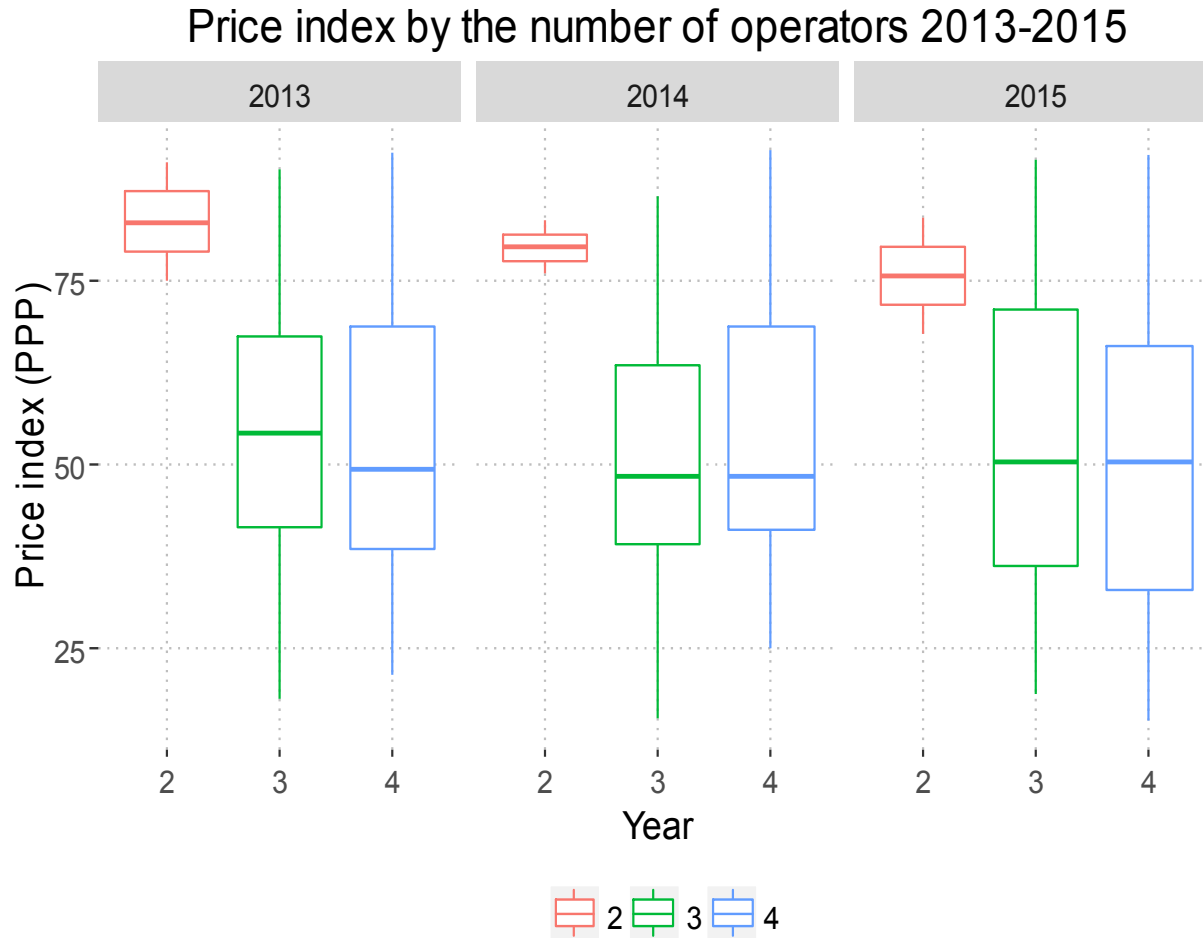
- a) assign index score of 100 where a basket is missing
- b) calculate the average only for the really existing baskets
 - a) is punishing entities without the full range of the basket menu, but b) might favor them
 - most of the entities are not affected
 - the correlation between the two types of the index is above 0.95

LSMBB Price Index comparison of countries & Does the number of operators matter?

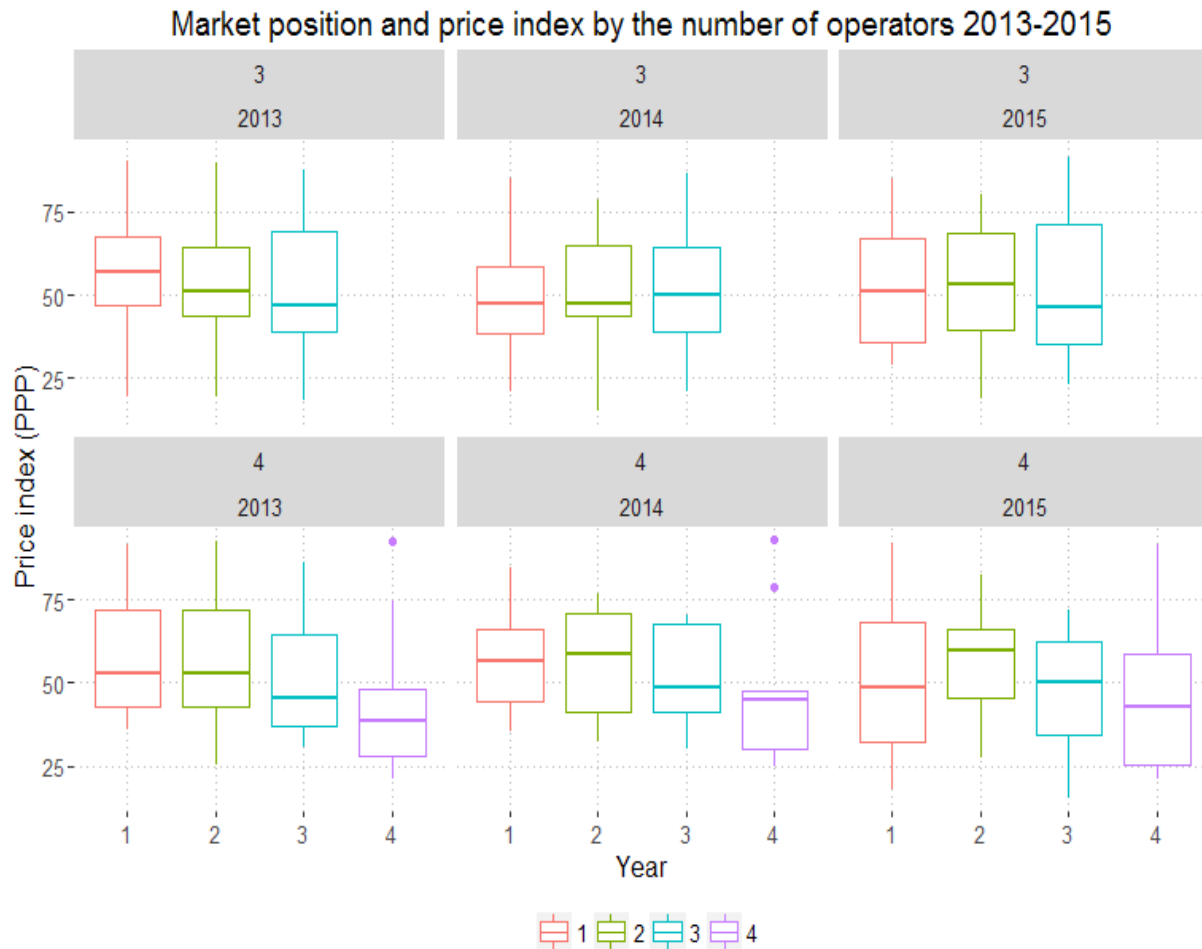


- majority of the 4 players markets are in the first half of the ranking order
- majority of the 3 player markets are in the second half

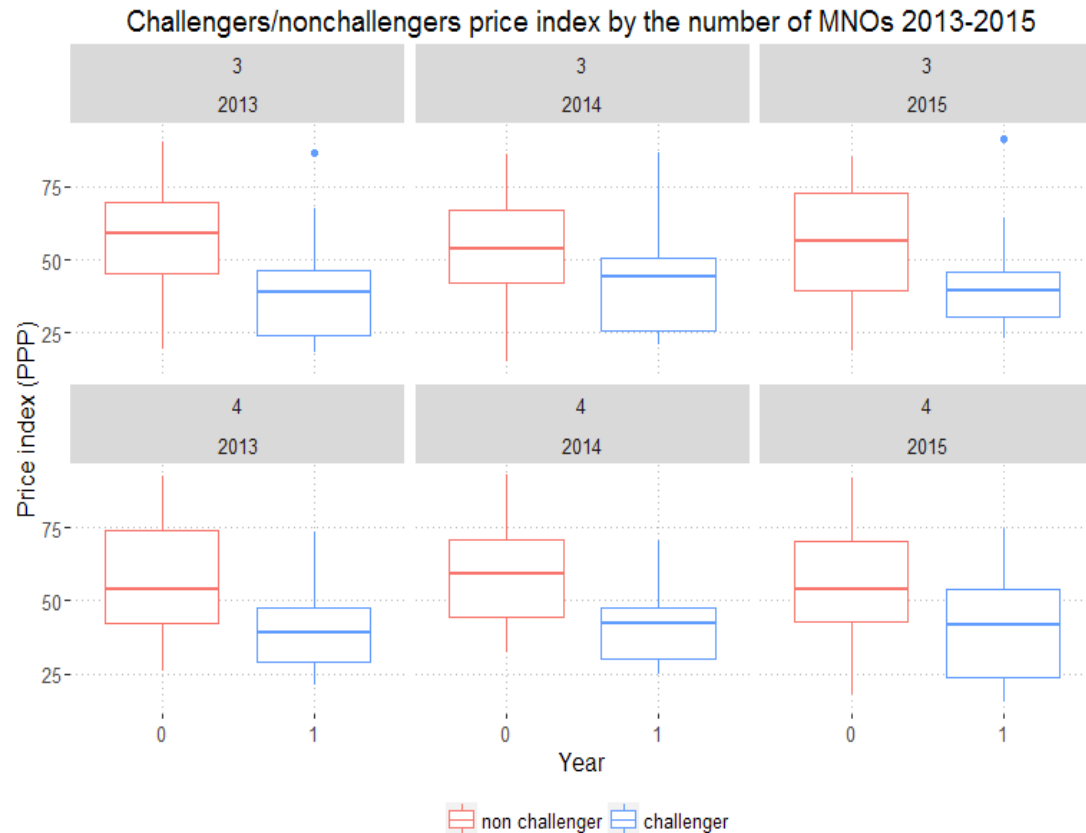
Or not?



Only the fourth players seem pricing markedly lower



In vain, the challengers are those players who are pricing more aggressively



challenger definition (now plainly): those players whose current parent was not any of the first two operator on any of the EEA countries' mobile markets

- the definition does not involve judgement
- they are usually the 3rd or 4th players on the markets, but not always because mergers could change the ranking

Cross-section regressions models with the PPP based price index, 2015

	Dependent variable:			
	op_agrindex		op_agrindex2	
	(1)	(2)	(3)	(4)
log(gdppopppp)	-12.8*	-13.1*	-14.7**	-13.5**
	(7.5)	(7.4)	(5.7)	(5.3)
log(popdens)	6.1**	5.7**	2.2	2.1
	(2.8)	(2.8)	(2.2)	(2.1)
opnum4	-0.2		-2.1	
	(3.7)		(2.8)	
challenger	-7.3*	-10.8**	-5.6*	-4.2
	(4.1)	(4.8)	(3.1)	(3.7)
posifact2		2.5		-3.0
		(4.5)		(3.5)
posifact3		5.9		-1.2
		(5.0)		(3.8)
posifact4		8.8		-6.7
		(7.2)		(5.5)
is_lte	5.9	6.7	6.4	7.3
	(5.9)	(6.1)	(4.5)	(4.6)
mbbpen	-0.2	-0.2	-0.1	-0.1*
	(0.1)	(0.1)	(0.1)	(0.1)
mob_penet	-0.1	-0.1	-0.1	-0.1
	(0.1)	(0.1)	(0.1)	(0.1)
bb_penet	0.7	0.7*	0.4	0.5
	(0.4)	(0.4)	(0.3)	(0.3)
mbb_ltecov	-12.0	-13.1	5.4	
	(16.3)	(16.3)	(12.4)	
Constant	164.9**	166.2***	182.3***	173.3***
	(62.9)	(62.3)	(48.1)	(45.7)
Observations	90	90	90	90
R ²	0.4	0.4	0.3	0.3
Adjusted R ²	0.3	0.3	0.2	0.3
Residual Std. Error	16.0 (df = 80)	16.0 (df = 78)	12.2 (df = 80)	12.2 (df = 79)
F Statistic	5.9*** (df = 9; 80)	5.0*** (df = 11; 78)	4.3*** (df = 9; 80)	4.0*** (df = 10; 79)

Note:

*p<0.1; **p<0.05; ***p<0.01



LS country and time dummy variable regression results				
	Dependent variable:			
	op_agrindex		op_agrindex2	
	(1)	(2)	(3)	(4)
log(gdppopppp)	39.9*	40.0*	20.4	20.7
	(23.5)	(24.0)	(25.9)	(26.9)
opnum3	-347.6		-181.2	
	(247.2)		(271.7)	
opnum4	-346.9		-179.5	
	(247.3)		(271.7)	
fix_incumbent		1.6		4.0**
		(1.7)		(1.7)
challenger	-5.1**	-4.2*	-5.0***	-2.4
	(2.0)	(2.3)	(1.8)	(2.1)
is_lte	-2.5	-2.7		0.8
	(2.1)	(2.1)		(2.0)
bb_penet	-1.3	-1.3		
	(1.3)	(1.3)		
mhb_ltecov	-4.0	-4.0	-3.5	-4.0
	(6.0)	(5.9)	(5.7)	(5.6)
factor(year)2014	0.6	0.7	-0.9	-1.1
	(2.4)	(2.4)	(2.0)	(1.9)
factor(year)2015	1.7	1.8	-0.5	-0.7
	(4.3)	(4.3)	(3.0)	(2.9)
Observations	268	268	268	268
R ²	0.969	0.969	0.958	0.959
Adjusted R ²	0.965	0.965	0.952	0.954
Residual Std. Error	10.536 (df = 233)	10.516 (df = 233)	9.713 (df = 235)	9.587 (df = 234)
F Statistic	209.173*** (df = 35; 233)	210.023*** (df = 35; 233)	163.425*** (df = 33; 235)	163.028*** (df = 34; 234)
Note:	*p<0.1; **p<0.05; ***p<0.01			

- Fixed effects LSDV model
- country coefficients are not reported
- robust standard errors

Summary of the operator level findings

- number of players not relevant in itself
- type of the player matters: *challengers* are pricing lower,
 - this is not conditional on the number of players
- affiliates of the fix incumbents are pricing higher?
 - what about fix-mobile bb bundles?
 - effects of deploying LTE network and launching LTE service is not significant