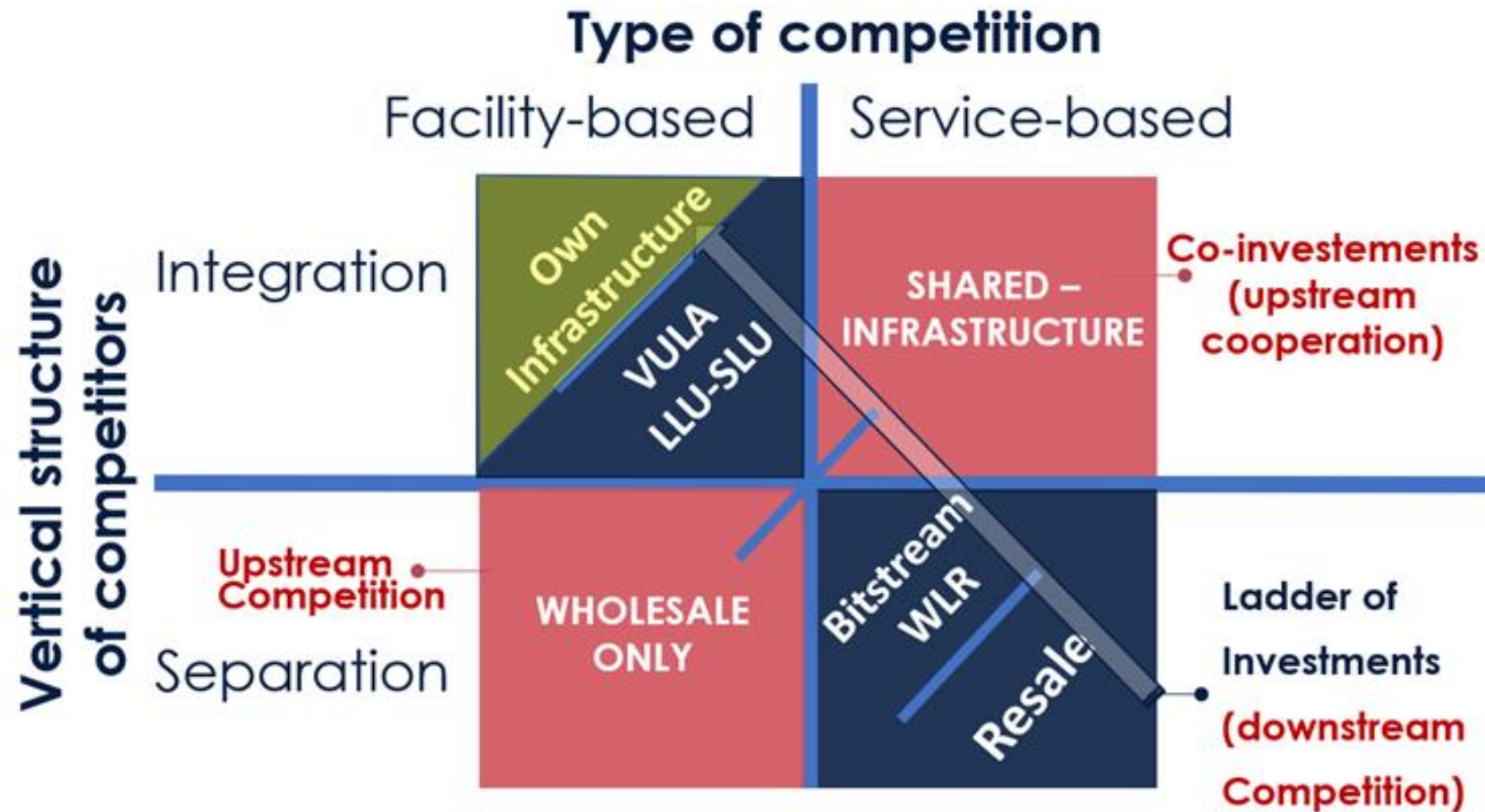


Co-opetition in the 5G ecosystem: general considerations and the italian case

Antonio Manganelli



A complex and complex ec(h)o-system



Where do we stand?

5G

ECHO- SYSTEM



ECOSYSTEM

- As the «good old days», just a mobile approach
- 4.5 and local optimization
- Horizontal/vertical boundaries uncertainties
- Rivalry vs cooperation in enhancing total (social and societal) value
- Fight for on standards

Where should we go?

- Harmonization
- New horizontal/vertical digital ecosystem
- Spectrum and Infrastructure Sharing
- Co-investments
- Club use
- Ne(x)t neutrality
- Open Standardization
- Interoperability



Co-opetition

Defining boundaries for competition and cooperation

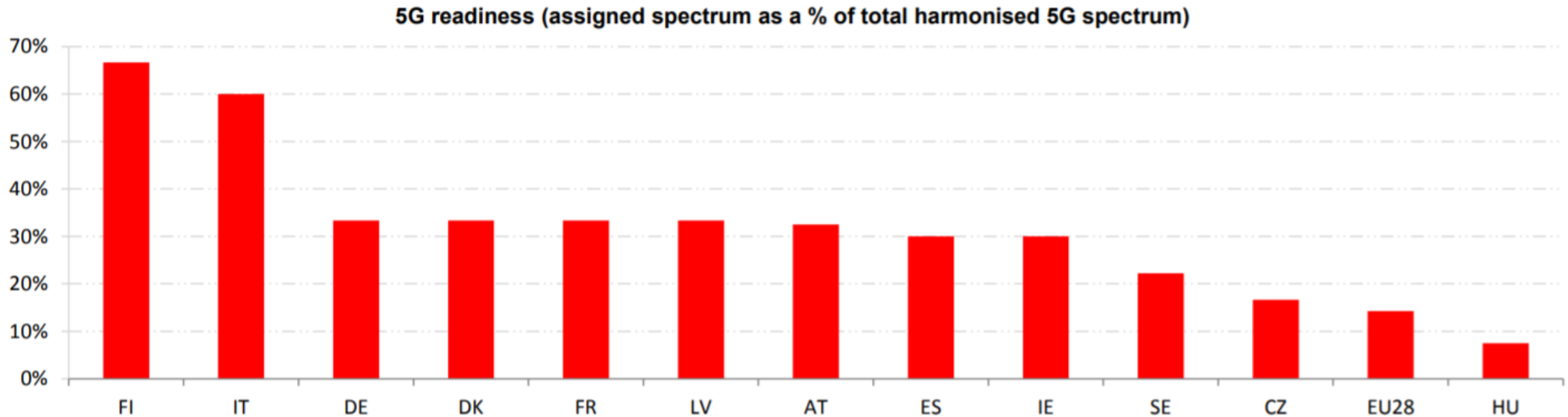
5G and Net Neutrality

- Is Net neutrality a problem for enabling 5G?
 - ⇒ BEREC and some NRAs have clarified that net neutrality per se is not an obstacle.
- Implementation of 5G business models, slicing, orchestration as specialised services (Better connectivity QoS)
- Reasonable traffic management

From Net to Ne(x)t Neutrality

- Regulation for enabling 5G and its expanded ecosystem
- Embracing all value chain and getting to digital platforms
- Neutrality rules to be applied in specific «context of non-discrimination» to be defined and verified case by case in relation substitutability of demand and offer of services
- Net neutrality implementation much closer to market analysis

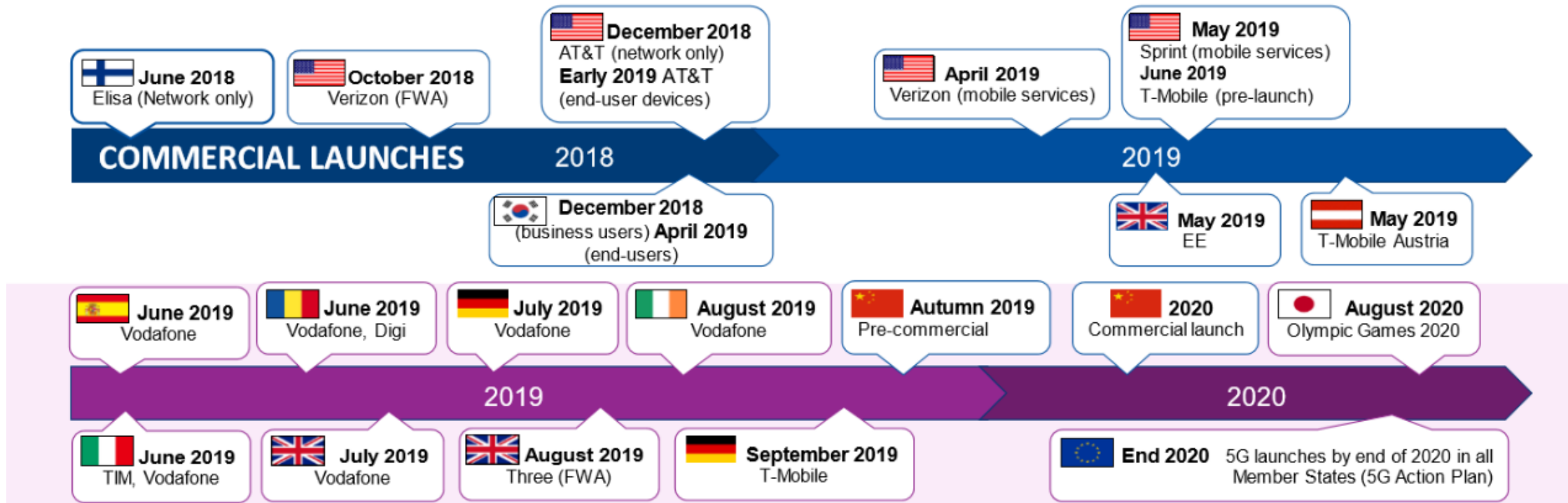
5G readiness – DESI 2019



The percentage score of the 5G readiness indicator is based on the amount of spectrum that has been assigned in a specific Member State and ready for 5G use by the end of 2020 within the so-called 5G pioneer bands identified in Europe

Source: DESI Index 2019

5G Commercial Launches



Source: 5G Observatory

Auction format

Italy auctioned 1275MHz of spectrum in the 5G pioneer bands:

Band	Spectrum offered
700 MHz	Six lots of 2x5 MHz (FDD) Three lots of 5 MHz (SDL)
3.6-3.8 GHz	Two lots of 80 MHz (TDD) Two lots of 20 MHz (TDD)
26.5-27.5 GHz	Five lots of 200 MHz

- 75MHz in the 700MHz band

- 200MHz in the 3.6-3.8GHz

- 1000MHz in the 26.5-27.5GHz

Award procedure

- Simultaneous multi-band award procedure
 - All the assignments (for all the bands) as part of a single award procedure
 - Auction format: *simultaneous multiple round auction* (SMRA)
 - The assignment of the reserved lot (i.e. 2 blocks of 2x5 MHz FDD in the 700 MHz band) is performed before the other assignments

Obligations

- Obligations of spectrum usage
- Coverage obligations
 - excluding 700 MHz SDL and 26 GHz bands
- Access obligations

- Spectrum trading is not allowed within 2 years from the award

Club-use model:

- Access obligations: 26 GHz
- “each licensee can dynamically use all the awarded spectrum (up to 1 GHz) in areas where frequencies are not used by other licensees.
- To this aim, licensees can stipulate commercial reasonable and non-discriminatory agreements, proportionally sharing the costs

“Use-it-or-lease-it”

- Other operators without frequencies in bands up to 3.6-3.8 GHz can use the frequencies in the 3.6-3.8 GHz band not used by the licensees in any communes of the “free list” by leasing them
- “free list”: the set of municipalities with less than 5,000 inhabitants not included in the obligation lists of all licensees

Reserve price

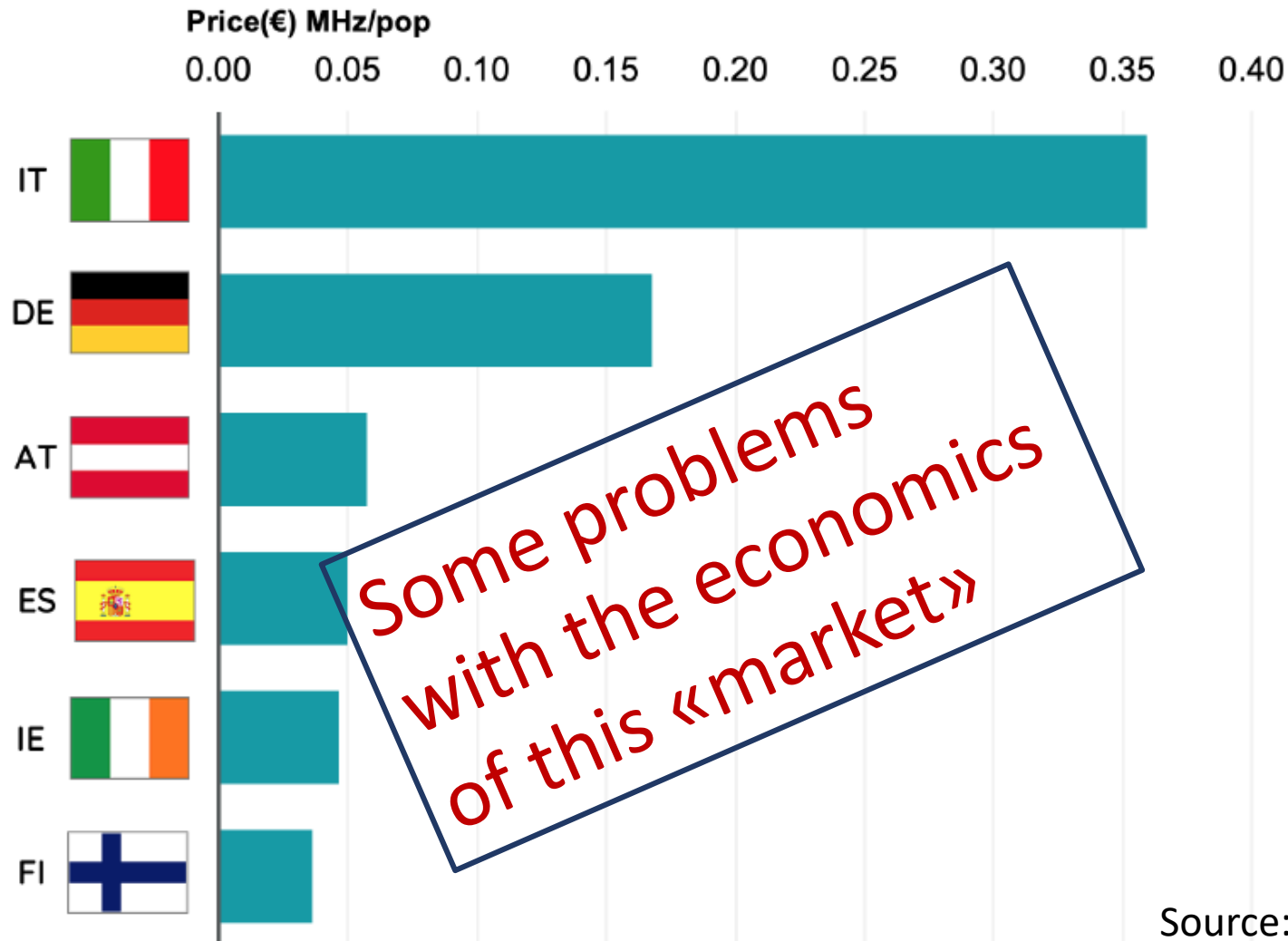
Sigla del lotto	Banda (MHz)	Sistema duplex	Ampiezza Blocco (MHz)	Tipo di lotto	Denominazione	Numero lotti	Importo minimo
700_R	700	FDD	2 x 10	generico	A1-A2	1	€ 676.472.792,00
700_FDD	700	FDD	2 x 5	generico	A3-A6 (A1-A6) ²	4(6) ²	€ 338.236.396,00
700_SDL	700	FDD-SDL	1 x 5	generico	B1-B3	3	€ 84.559.099,00
3700_C1	3700	TDD	1 x 80	specifico	C1	1	€ 158.374.470,00
3700_C2	3700	TDD	1 x 80	generico	C2	1	€ 158.696.043,00
3700_C3-C4	3700	TDD	1 x 20	generico	C3-C4	2	€ 39.674.011,00
26G	26000	TDD	1 x 200	generico	D1-D5	5	€ 32.586.535,00

The reserve prices of all the spectrum to be awarded (excluding SDL band) ensure to reach the minimum target set by the budget law (i.e. **2,5 billion €**)

Final award prices

Band	Lot	Spectrum [MHz]	Winner	Price [€]	+% vs reserve price
700 MHz FDD	700_R	2x10	Iliad	676.472.792	0%
	700_FDD	2x5	Vodafone	345.000.000	2%
	700_FDD	2x5	Vodafone	338.236.396	0%
	700_FDD	2x5	TIM	340.100.000	0,6%
	700_FDD	2x5	TIM	340.100.000	0,6%
			2x30		2.039.909.188
3.7 GHz	3700_C1	80	TIM	1.694.000.000	970%
	3700_C2	80	Vodafone	1.685.000.000	962%
	3700_C3	20	Wind Tre	483.920.000	1120%
	3700_C4	20	Iliad	483.900.000	1120%
			200		4.346.820.000
26 GHz	26G	200	TIM	33.020.000	1,3%
	26G	200	Iliad	32.900.000	1,0%
	26G	200	Fastweb	32.600.000	0,04%
	26G	200	Wind Tre	32.586.535	0%
	26G	200	Vodafone	32.586.535	0%
			1000		163.693.070
ALL		1260		6.550.422.258	162,0%

Pricing -Italy has the highest price (€) per MHz and population in the 3.4–3.8GHz band



Source: Cullen International

Crucial Public Policy

- Re-investing partially 5g Auctions income
- Administrative burdens
- Supporting and enhancing users' demand
- Funding local projects aimed at reducing digital divide

Thanks!

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