Co-Investment: Economics and Welfare Effects

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Economic rational for co-investment/1

- Continuous and large investment necessary for competitive success and welfare-enhancing outcomes
  - Cost of providing 100 Mbps to 50% of households in EU Member States = 180-260 bln€ (Cullen International, 2011)
  - Cost to deploy FTTP/H networks in EU27 around 660 bln€ and 25 years to complete a FTTP network (Boston Consulting, 2016)
- Co-investment as a solution: sharing of fixed cost (passive infrastructure) *and* investment risk. Different kind of agreements (voluntary vs. regulated)
- Welfare perspective:
  - less duplication of fixed cost …. But more coverage/investment?
  - more or less intense competition?
  - trade off between dynamic vs. static efficiency: Welfare?

Economic rational for co-investment/2

- Public policy is encouraging co-investment in infrastructures
  - "Better Regulation Directive" (2009): "where it is justified on the grounds that duplication of infrastructure is economically inefficient or physically impracticable, Member States may also impose obligations of reciprocal sharing of facilities on undertakings operating an electronic communications network…."
  - Incentives also in the recent proposal for a new regulatory package (September, 2016): consider co-investment as an alternative to standard access for NGA networks. In an annex (Annex IV, "Criteria for Assessing Co-investment Offers") also condition to enter the co-investment agreements
- What is the impact of co-investment?
- Some results from the literature ...

The impact of co-investment

- Does co-investment lead to higher investment and more competition?
  - Nitsche and Wiethaus (2011, IJIO): comparison of different regulatory schemes (TSLRIC access, co-investment and regulatory holiday) in terms of investment and consumer welfare outcomes.
  - Co-investment option (*risk sharing* in their terminology) is treated in a reduced form: parties share the fixed cost of investment through some agreement and then they can use the NGN network without further side payments. The investment is done by the incumbent (no co-build)
  - Result: co-investment can be particularly beneficial in terms of investment incentives: larger investment than with access regulation, though lower than regulatory holiday

The impact of co-investment

- Does co-investment lead to higher investment and more competition?
  - Cambini and Silvestri (2012, IEP) extends Nitsche and Wiethaus (2011) by introducing an additional regulatory mode: partial deregulation (i.e. independent fiber deployment is not regulated).
  - Results show that:
    - In all regulatory regimes investment is always undertaken later than the social optimum, due to demand uncertainty;
    - Investment under partial deregulation is higher than in any other regulatory regimes, but competition is less intense;
    - Co-investment instead leads to relatively less incentives to invest but a higher intensity of competition.
  - .

The impact of co-investment

- Does co-investment lead to higher investment and more competition?

  - Inderst and Peitz (2013, IEP) analyse cost-sharing agreements between an incumbent firm and an entrant, in the form of long term contracts concluded *before* the investment is made, as opposed to contracting taking place *after* the network has been constructed.
  - The authors show that the former type of agreement reduces the duplication of investment and may lead to more investment.
  - Coordination at the investment level may come at a cost: reduced competition in the covered areas (assumed by the authors though)

The impact of co-investment

- Does co-investment lead to higher investment and more competition?
  - Krämer and Vogelsang (2017, RNE) performed a laboratory experiment to study the effect of cooperation in broadband markets, with an underlying model where not cooperating would be the individually optimal choice.
  - They found that, still, cooperation arises due to communication between players, and that it facilitates collusion
  - Moreover, no stimulus to further investment

The impact of co-investment

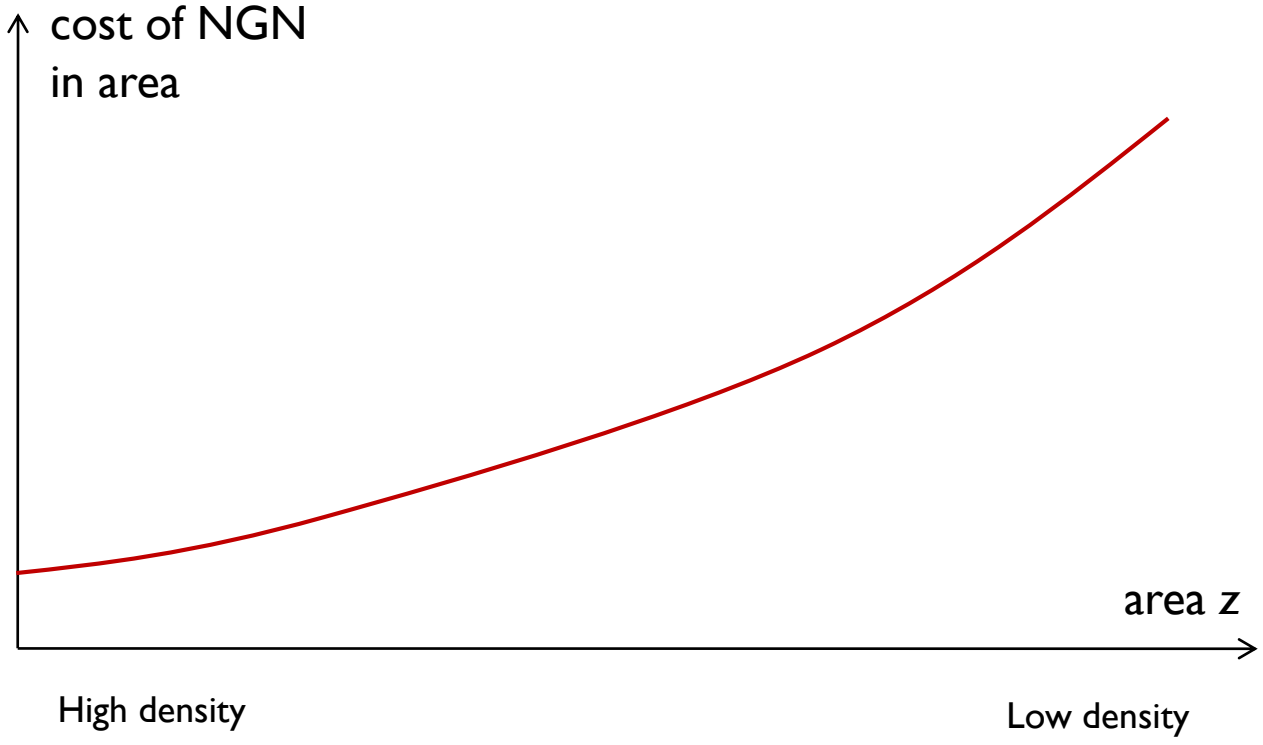
- Does the co-investment lead to higher welfare?
  - Nitsche and Wiethaus (2011): consumer (not social) welfare; more intense competition with co-investment at retail level with respect to access regulation and regulatory holiday
  - Cambini and Silvestri (2012) show that co-investment leads to higher social welfare even than partial deregulation due to a balanced between investment incentive sand intensity of competition
- However, any of these models incorporates the real «geographical» dimension of NGA and their peculiar structure in terms of investment cost

A more general analysis

- An incumbent firm rolls out a new infrastructure in areas which differ in terms of deployment costs.
- An entrant can decide to enter in areas where an infrastructure has been deployed to compete with the incumbent.
- Obligation to co-invest in case of entrant's request → "regulated" agreement
- Bourreau, Cambini and Hoernig (2016) compare three regulatory regimes:
  - the "pure access" regime with a linear access tariff;
  - the "pure co-investment" regime: the entrant can ask the incumbent to share its infrastructure (paying an access to cost), but access is not available outside the agreement;
  - the "co-investment with access" regime allows the entrant to decide whether to ask for access or to co-invest. Access always available in uncovered areas.

Investment Cost

- Each local market is composed of different areas, ordered according to the cost of deploying the NGN



Main results: Investment

- Compared to the "pure access" regime, pure co-investment leads to higher total coverage (i.e. higher investment).
- Co-investment increases total coverage by either decoupling the coverage decision from access provision (when there are monopoly areas), or by dividing the investment costs.
- Moreover, co-investment also intensifies retail competition in low-cost areas, since access is priced at cost and thus lowering the entrant's marginal cost.

Main results: Welfare

- Welfare comparison in the three scenarios trading-off investment incentives and static welfare.

- «Co-investment» emerges as a more efficient regulatory instrument than «pure access»
- "Co-investment with access" always dominates "pure access".
- If the access charge is at cost or if services are sufficiently differentiated, social welfare is higher with "pure co-investment" rather than with "pure co-investment with access".

Demand uncertainty

- When operators invest in a new infrastructure, they may face uncertainty about the demand for the services supported by the new network.
- Demand is uncertain *ex ante*, hence firms make their investment and/or co-investment decisions. However, access provides an *option* to entrant, which can wait for demand to be realized before asking for access.
- Demand uncertainty negatively impact on total coverage and this effect increases when access is an option.

- To the extent that the regulator favors investment, a high degree of demand uncertainty then makes the "pure co-investment" regime *more socially desirable* compared to the other regimes.

Conclusions / 1

- Policy issues (see Briglauer and Cambini, 2017):
- 1) Co-investment performs better in terms of total coverage than the standard access regime.
  - Offering access to the entrant, too, leads to both lower total coverage and lower co-investment coverage → the access option constitutes an *opportunity cost* that makes co-investment less attractive.
- Given the standard access regime, welfare is strictly increased if a co-investment obligation is added
  - Adding access to co-investment, instead, reduces welfare if the access price is relatively low, even more if demand is uncertain.
- 2) The organizational mode of the co-investment agreement seems less relevant → the decision on the kind of agreement can be left to the market in order to reduce the administrative burdens on co-investors.

Conclusions/2

- 3) Investment incentives critically depends on the *ex ante* commitment to deploy by co-investors (i.e. on sharing the *risk* of demand)
- Open co-investment agreements aiming at giving later entrants the chance to enter the agreement give entrants the possibility to 'wait and see' and invite cream-skimming behavior diluting the incentives to invest.
- 4) Voluntary vs. regulated co-investment: the decision depends whether cost savings from co-investment are expected to be larger (or not) than the incumbent's lost profits due to the competition in a larger share of the country.
- If this is true, no need of any obligation. If not, a regulatory intervention is necessary for co-investment to emerge.

Conclusions/3

- 5) Potential drawback: risk of ex post collusion (Kramer and Vogelsang, 2017). Evidence?
- Co-investment has not triggered collusion between market players:
  - (i) regulators and competition authorities are well aware of the risk of collusion and these agreements are heavily scrutinized;
  - (ii) NGA network operators face competition from xDSL technology, which limits the possibility of collusion on NGA prices;
  - (iii) co-investment, when designed as an alternative to access, does not involve coordination.
  - (iv) Open agreement may limit collusion because of the (relatively) low barrier to entry. In this case, the access charge should reflect the addition cost of capital due to risk → this should not be interpreted as a *discriminatory rule* … However, extremely difficult to assess this risk ex ante, while the detrimental effect on investment is certain

References: Academic Papers

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