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Boosting growth and competitiveness through digitalisation: the model and the role of the wholesale-only fiber company¹

When the telecommunications sector was liberalized about 30 years ago, opposition from the incumbent telecom operators was exceptionally weak. On the contrary, many operators even supported liberalization. In retrospect, this may appear astonishing looking for example at the current opposition of taxi-drivers against Uber.

The explanation is however quite simple. Since its 1987 Green Paper, the Commission promised that liberalization would not encompass ‘line of business’ restrictions. With other words, telecom operators would not be prevented to be active at all levels: wholesale, retail and even new markets. Therefore, despite the entry of new operators, the incumbent operators could retain a huge competitive advantage: their network, their physical presence over the whole territory.

Since then, we have witnessed a succession of battles to ensure that the new entrants could get access to incumbent’s networks. The main beneficiaries of these battles have been competition lawyers and consultants, who billed their clients impressive amounts to prove margin squeezes and design margin squeeze tests.

The British Case

The British OFCOM was among the first to understand the difficulty to ensure non-discriminatory treatment of new entrants using BTs network. This led to the creation of Openreach.

Separating Openreach from BT meant a step forward: the investment incentives of the incumbent telecom company and those of the new retail company could

¹ A shorter version of this paper was presented to the XI Digital Regulation Forum 2017, Hyatt Regency - The Churchill, London, 28-29 March 2017.

have been dissociated, at least in principle. But separating Openreach from the rest of BT and replacing one set of management with another did not change the ownership of both companies and did not change (from the shareholders point of view) the incentives to consent long term CAPEX in fibre deployment. The majority of BT's owners did not change their preference for short-term returns and to delay investments in fibre where only long-term returns can be envisaged. Thus, it was soon clear that functional separation did not foster, by itself, network investment.

Moreover, it appeared just as soon that functional separation was not sufficient to prevent the retail arm of BT to obtain privileged access to the network and to avoid that the NGN deployment strategy could be delayed by the legacy of the past (the copper network). So, competing operators continued complaining. For example, last year CityFibre alleged that BT refused granting access to its ducts and poles. And Ofcom confirmed that Openreach “still has an incentive to make decisions in the interests of BT, rather than BT’s competitors, which can lead to competition problems“, and that “other telecoms companies have not been consulted sufficiently on investment plans that affect them“.

In conclusion: OFCOM took a courageous initiative. Its success is however not guaranteed. Legal separation and wholesale-only are not sufficient to incentivise fiber deployment. What is needed is that the wholesale company is controlled by investors

- who do not own a legacy network,
- who have no interest in the retail markets and
- who are committed to long-term and stable returns.

From legal to structural separation

Legal separation of incumbent players is nevertheless helpful in as much as it constitutes the groundwork for the emergence of a fully independent wholesale-only operator. Legal separation could be an intermediate step to full separation, as implemented three years ago by the Czech incumbent operator.

Structural separation in the telecommunications sector has been successfully implemented in a number of countries around the world, for instance in New Zealand and Australia.

In New Zealand the incumbent fixed line operator Telecom New Zealand adopted, in 2008, the functional separation model, creating Chorus, a Telecom business unit operating at arm's length from the rest of the organisation, in order to give all service providers access to the local fixed line network. At the end of 2011, the transition from functional to structural separation was the object of an agreement with the Government in the framework of a Government funded programme of investment for the roll out Ultra-Fast Broadband (a Government-funded programme of investment): consequently, Chorus became a separate entity, listed on the New Zealand stock exchange and responsible for the network and the wholesale business.

After just five years, several important results have already been achieved, such as greater investment and innovation, enhanced competition in retail broadband and reduced need for complex regulation. As observed by the New Zealand's Ministry of Business, the creation of Chorus as a stand-alone wholesale network operator of both copper and UFB networks means that New Zealand now has a level playing field amongst retail fixed line operators. *“Retailers now face strong incentives to differentiate their offerings through affordable, innovative and quality service offerings – including bundling with voice, mobile, fixed and content packages”*.

Similarly, the establishment of NBN Co in Australia, a wholly-owned Government Business Enterprise formed to build and operate a wholesale-only national broadband network across Australia, is proving its ability to have a strong long term impact on network layer competition across a range of already competitive sectors.

Two different business models

It is well known that the law of increasing functional specialization and division of labor, which is at the core of the evolution theory in natural sciences, also applies in the business world. Deploying fibre networks means committing substantial capital and other resources without short-term guaranteed revenues. This is a completely different DNA – if you allow me to continue using the terminology of natural sciences – than providing high-speed internet access services, video content or mobile communications services. In the latter cases, the expectations of the investors is that ARPU increases year on year. Such expectations are at odds with fibre investment. Fiber investment will translate in

higher ARPUs on the retail market only after several years, when the user's availability to pay for enhanced quality will have increased, thanks to new applications and usage patterns.

Deploying fiber network is a relatively secure investment, but long-term. It belongs to the asset class of the investment in infrastructures, not to the asset class of the supply of telecommunications services. The distinction between the two business models has increased over time, due to the financial crisis and to the recent changes in prudential and accounting regulations (Basel III-CRD IV, Solvency II, IFRS etc.) Different are the investors, different are the lenders, different are their expectations. That is the reason why the wholesale only business model – as the EU Commission highlighted - can be more “attractive to potential financial investors in less volatile infrastructure assets and with longer term perspectives on deployment of very high capacity networks”.

This approach to the problem is crucial from the point of view of public policies. Most European countries, and Europe as a whole, do not have today only a problem of fiscal consolidation. First of all they have the problem of strengthening the growth, the productivity and the competitiveness of their economies. By enhancing growth and productivity they will also achieve a sound reduction of the debt/GDP ratio, by the denominator side. Of course, for enhancing growth, productivity and competitiveness, they need to increase investments, and especially long-term investments, favoring those that have a more rapid and long standing effect on productivity, such as the investments in infrastructures, R&D, technologies, education and high-productivity companies. First of all, the investments in digital infrastructures, digital economy, artificial intelligence and hi-tech innovative companies.

Measures to boost the digital infrastructures and the digitization of economy and public administration have therefore a central place in the government policies. Smart cities, internet of things, cloud computing, robotics, big data, artificial intelligence, data-driven scientific research, smart cars, e-banking and e-payment systems, e-health services etc., all require a rapid deployment of the fiber network. Even for the mobile communications, access to pervasive fiber networks becomes increasingly crucial. Data usage on mobile communications networks is skyrocketing and the only way for mobile operators to cope, is to expand their high capacity fiber backbone, or to buy passive network elements from a fiber company. 5G and its small cell technology, will even require more

capillarity from the underlying backbone fiber network. This capillarity is required to enable connecting the thousands of transmitters that the mobile operators need to install at short distances from each other to ensure higher capacity and lower latency. So, what should we go for?

The Italian example: the Government Ultra broadband Plan

The Italian example illustrates the way forward. A large set of measures to boost the digital infrastructures and the digitization of economy (Industry 4.0) and public administration have a central place in the Italian government policies of these last years.

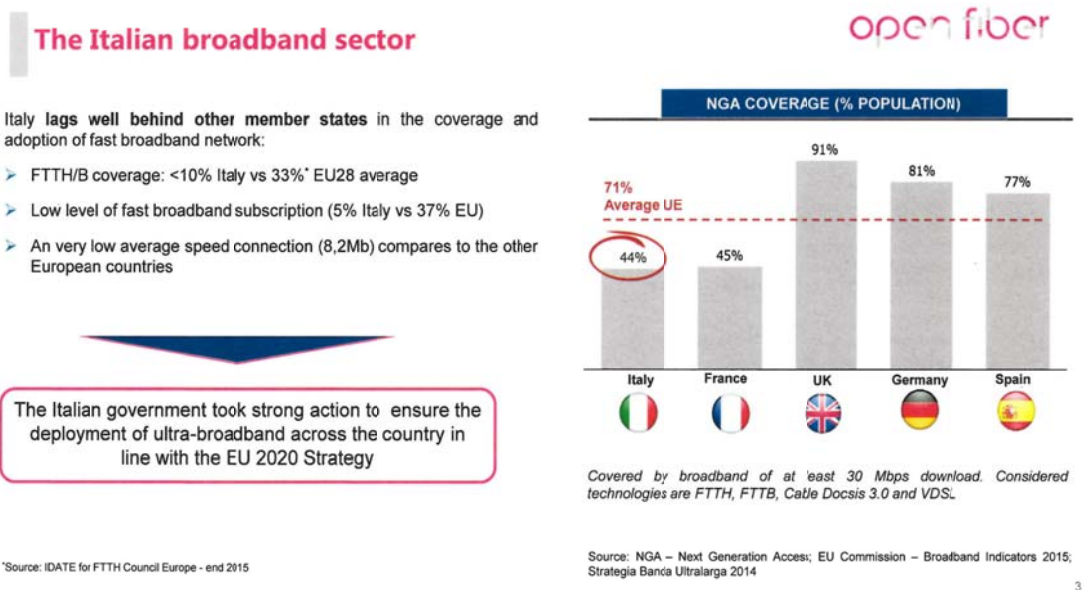
Our starting point is not very good:

- in terms of digitalization of the economy and society, according to the *Digital Economy and Society Index 2016*, Italy ranks 25th out of the 28 EU Member States, followed only by Greece, Bulgaria and Romania;
- as far as connectivity is concerned, following the *Europe's Digital Progress Report 2016*, Italy ranks 13th, before France and UK, in term of 4G mobile broadband availability, 20th, before France and Germany, in term of fiber to the premises (FTTP) coverage, but only 26th, before Greece and Croatia, in term of fast broadband (>30Mbps) household penetration, 27th, just before Greece, in term of next generation access (FTTH, VDSL and Docsis 3.0) coverage, and 28th (the last) in term of households with a fixed broadband subscription²;
- fixed broadband subscription which exceed 10 Mbps is equal to 21% vis-à-vis 51% of the European average (Cisco). Connections between 30 and 100 Mbps in Italy is equal to 3% vis-à-vis 17% of the European average;

² The poor performance of Italy in terms of connectivity is partly due to some specific reasons, including the following:

- i. Demographic distribution: only 16% of the population lives in towns with more than 250,000 inhabitants, while 50% lives in villages with less than 25,000 inhabitants, hence increasing the cost per household of the network roll out;
- ii. Wide spread presence of archaeological sites: 16% of towns with more than 250,000 inhabitants have numerous archaeological sites that increase the cost of deployment of broadband infrastructure;
- iii. Lack of cable providers: see *infra*.

- in Italy Internet users are only 64% of the entire population against 80% in the whole of Europe (Cisco, 2014) and 20% of households use uniquely mobile connection (1 out of 5 vis-à-vis 1 out of 20 of the European average);
- 18 million Italians have never used Internet (equal to 31% of total population).
- There are 6 PCs for every 100 student (against 16 in the EU).
- Only 6% of Italian enterprises uses E-commerce against 17% of the EU average.



However, important improvements occurred in recent times which are reported in the *Europe's Digital Progress Report (EDPR) 2016*, which, not by chance, included Italy among the countries of the so-called *catching up cluster of countries*: according to this Report “*although it still performs below EU average, Italy has progressed faster than average over the last year* .

Very consistent, according to this Report and to other recent researches (CISCO IBSG), are the improvements on the demand side:

- the share of surfers engaging in online shopping has improved significantly, by 4 percentage points in one year, in line with the progress experienced by enterprises with their online sales.

- 30% of Italian firms considers IoT and M2M their next innovation projects.
- 56% of Italian firms is convinced that M2M enables new business and operative models.
- more and more Italians (63%) are using Internet services, and digital content services, like music, videos and games are enjoyed by more Italian Internet surfers (52%) than the EU average.
- The consumption of data is rapidly growing: in 2015 Italian networks have generated approximately 800 petabyte of daily monthly traffic, which is estimated to grow up by a factor of 2.6x within 2019, overpassing 2.000 monthly petabyte (CISCO).
- The consumption/download of shows/movies on smartphones grows at an annual rate of 20% and by over 70% on tablet.
- mobile broadband take-up is actually in line with the EU average (75 subscriptions per 100 people).
- In Human Capital, Italy's performance is below EU average but is making good progress
- Italy shows average performance in Digital Public Services.

Even more important, in my view, is the strong commitment shown in the recent times by the Italian Government in promoting and pushing the investments in material and immaterial digital infrastructures, in the digitization of public administration and public services, in the digital economy. Furthermore the Italian Government seems now very strongly committed in creating the best framework to attract private capital in the sector.

The starting point of this Government commitment stands in the belief that the first problem of Italy is not public debt but low growth and low productivity. It is not really the public debt if we consider:

- the relevant primary budget surpluses continuously achieved by Italy since 1994 (with the only exception of 2004)
- the low debt of Italian families and business (strongly below the European average)
- the good sustainability in the medium and long-term of Italy's explicit and implicit public debt (ranking among the five lowest in EU, much lower than the

debt of Germany, Spain, France and UK, following the last scoreboard of the Frankfurt's Marktwirtschaft Stiftung³).

- the medium term impact on fiscal consolidation of the structural reforms approved by the Italian Parliament in the last 3 to 4 years, now in the process of progressive implementation

Of course a severe fiscal discipline must be assured, the fiscal consolidation process must be continued and the public debt must be reduced. But the problems to be tackled without delay are first of all, in Italy, low growth and low productivity (and, of course, demography). By enhancing growth and productivity we will also achieve a reduction of the debt / GDP ratio, by the denominator side. Of course, for enhancing growth and productivity, we need to increase investments, and especially long-term investments, favoring those that have a more rapid and long standing effect on productivity, such as the investments in infrastructures, R&D, technologies, education and high-productivity companies. First of all, the investments in digital infrastructures, digital economy, and hi-tech promising and innovative companies.⁴

These are, in summary, the reasons why measures to boost the digital infrastructures and the digitization of economy and public administration have a central place in the government policies. As regards the network infrastructure, the Government approved in 2015 a National Ultra-Broadband Plan aiming inter alia to enable, by 2020, an high speed access network assuring to 85% of population a coverage at >100Mbps and to 100% of population a coverage at >30Mbps. To achieve its objectives the Government's Plan allocated 6.9 billion euro coming from the European Structural Funds awarded to Italy or to Italian regions. 50% of the funds available have been allocated for NGA coverage of the market failures areas (so called white areas: around 25% of the population and two third of the national territory; for these areas, investors selected via a public tender will deploy publicly owned fiber networks, available to all service providers. The investors (preferably not vertically integrated with the supply of telecommunications services) will enjoy public twenty years concessions, during which they can recover their CAPEX with the revenues generated by

³ See: Stiftung Marktwirtschaft, *EU-Nachhaltigkeitsranking 2016*, in http://www.stiftung-marktwirtschaft.com/fileadmin/user_upload/Pressemitteilungen/2016/PM_Ehrbare_Staaten_Update_2016_11_16.pdf

⁴ An Italian research (by Cisco and Tor Vergata University) shows that a 50% increase in the penetration of the fiber to the home may have a positive direct impact on growth of about 1.1%, plus indirect effects of about 2,4% including the capacity to increase innovation, the creation on new digital services "internet based" and a general increase in productivity.

providing wholesale access to the fiber network to telecommunications operators.

The remaining 50% of the available funds will be used to incentivize the deployment of next generation networks in cities and in general in the black and grey areas, giving priority to the most future proof solutions, and thus to the fiber to the home or to the building networks. The types of incentives that will be provided depend on the negotiations with the European Commission (DG Competition and DG Connect), but I think that the incentives which will be allowed, at the end of the day, will be vouchers for families, to be used to activate their subscription to new generation networks (support for demand, useful, first of all, in order to incentivize the mass migration from copper to NGN) and guarantee schemes on loans obtained from the EIB or from the banking system, in the framework of the Juncker Plan⁵.

The rationale behind this strategic choice is the conviction that the objectives set by the European Digital Agenda are now being overtaken by the speed of technological change. In fact, we are going towards a Gigabit society, as is, moreover, clearly highlighted by the decision of the US cable TV networks to adopt the standard Docsis 3.1, or even the Full Duplex DOCSIS 3.1.

After a long public debate, the Italian Government gave up the choice to impose by law the structural separation of Telecom Italia's wholesale network operation from its downstream retail services. Instead, the government decided to take a broad set of measures, acting on the demand side as well as on the supply side⁶, aimed to incentivize the investment in the digital infrastructure and, consequently, to favour the emergence of new, specialized 'wholesale only' operators willing to launch a competitive challenge to the incumbent.

⁵ The *Europe's Digital Progress Report 2016* has assessed very positively the Italy's Ultra Broadband strategic Plan, considering it "extremely important as, in the absence of any public policy initiative, a new digital divide may emerge for significant parts of the country".

The same Report stresses that Italy is the first EU Country to notify full transposition of the Cost Reduction Directive 2014/61/EU, which could further support cost-savings in network build-out and investments in synergy with smart utilities objectives (eg: smart meters). The *Digital Economy and Society Index 2017* acknowledges the Italy made important progress on connectivity, in particular through improvements in NGA access.

⁶ For a brief summary of these measures, see F. Bassanini, *Strengthening Growth and Competitiveness through Digitization: the Digital Single Market and the Italian Government Action Plan*, Key Note Speech, Mediobanca Italian CEOs Conference, Milan, 22-2 June 2016 (in http://www.bassanini.it/wp-content/uploads/2016/10/bassanini_mediobanca_rev_0907.pdf)

The Italian example: the responses of the industry players

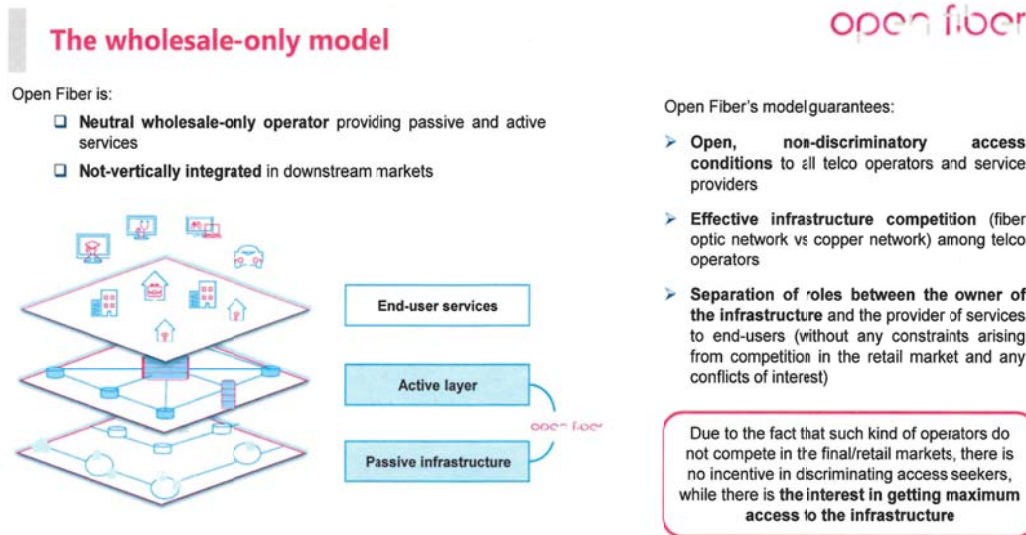
This policy has in fact contributed to produce some significant developments in the scenario of the Italian telecommunication sectors. The two most important are represented by the **entry into the market** of the telecommunications infrastructure **of two important new players**, **Enel** (the Italy's former state owned company, leader in the production and distribution of electricity) and Cassa Depositi e Prestiti (**CDP**, the Italian Promotional Bank); and by the decision of the incumbent, **TelecomItalia (TI)**, to increase the investment in new generation fixed networks, in order to face the new competitive challenge and to intercept the growing demand for connectivity produced, inter alia, by the measures adopted by the Government.

Enel decided to explore and exploit all possible synergies with the electricity distribution networks owned by the group and with the planned installation of the smart meters in houses and offices; TelecomItalia is trying to translate from copper to fiber its dominant position in the fixed telecommunications market; CDP bought a large stake in Metroweb Italia, an unlisted joint stock company, which had deployed a dark fiber network covering nearly all the Milan metropolitan area and the cities of Turin and Bologna, based on FTTH technology.

One year ago, both TI and Enel proposed a merger to Metroweb, valued also for its consolidated know-how in the design, construction and management of FTTH networks.

The competition for the acquisition of Metroweb was won by Enel which, in December 2016, formed with Cassa Depositi e Prestiti, a new company, Open Fiber SpA (OF). In the black and grey areas, OF currently connects 1,2 million units with FTTH network and will provide FTTH coverage to approximately 9.6 million homes in the 2016-2021 period, which represents an investment of around €4 billion. Meanwhile OF will try to win the tenders for the construction and the commercial exploitation of the newly designed state-owned network in the white areas. Few weeks ago, OF has in fact won the first tender, concerning six Regions, and seems well placed for the others (not yet awarded).

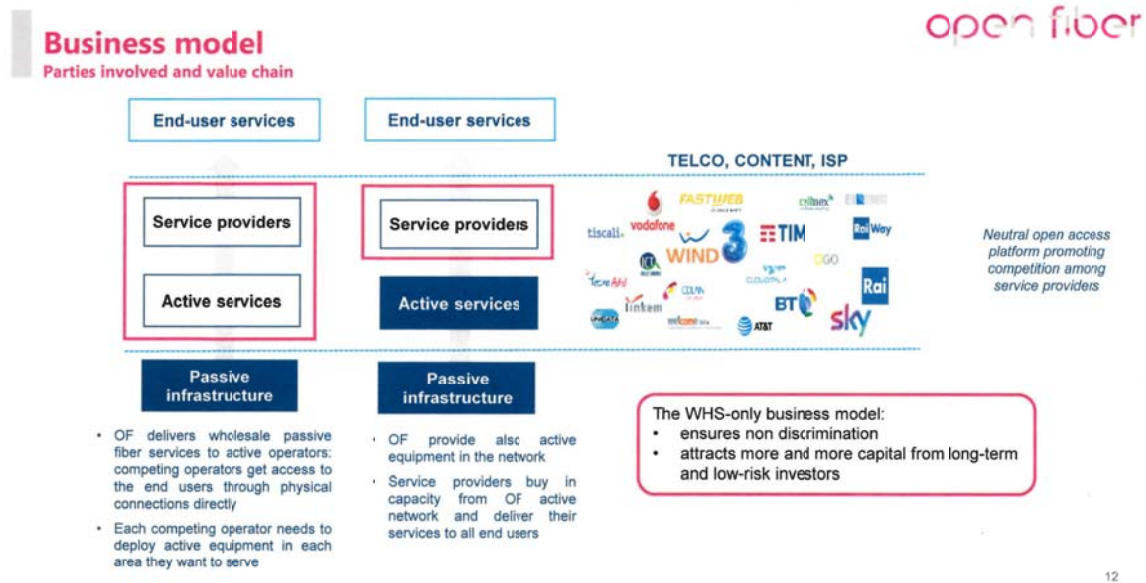
The business model of the new company is deploying and exploiting over the long term, a future-proof fiber network in Italy, providing access to telecom operators and large business.



OF has no legacy network and no interest in blocking access. On the contrary, OF is in dialogue with all operators, listening to their needs and examining how to deal with them to expand its client's portfolio. The economics of Fiber to the Home is large fixed and sunk costs of passing homes but comparatively low marginal costs when it comes to connecting additional subscribers. The operating costs are lower than those from copper networks, the reliability is higher and energy consumption lower. This means that in order to recover its initial investments, OF needs to sign in as many as possible customers. OF has for example already entered into agreements with Vodafone and Wind/Hutchinson.

OF's network is conceived as an optical platform for any kind of technology/architecture (FTTH, FTTB, P2P, backhauling for mobile and wireless fixed operators), assuring an open, transparent and non-discriminatory access conditions to all service providers. It delivers wholesale passive fiber services and if needed also active equipment in the network. Following the Metroweb's experience, one of its key assumptions is the re-use of the existing infrastructures owned first of all by local authorities and national or local public

utilities (such as energy, gas, water supply, public lighting, traffic lighting and heating networks)⁷. This allows a consistent reduction in digging costs, time of roll-out, and environmental and social costs.



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Open Fiber's business model is clear. The question is, however, what the business model of the incumbents will be. We see for example that Telecom Italia and Fastweb have also started deploying Fiber to the Home networks.

The Italian example: towards an infrastructure competition?

The crucial question, however, is: do we have, in Italy, the market space for an infrastructure competition, in which two or more operators can obtain an adequate return on investment in NGN?

Duplicating fiber networks clearly involve significant uncertainties and risks. This explains why overbuild is very limited in Europe today. According to the consensus of analysts, fiber network competition would be profitable, in Italy, only in the 10 to 12 major densely populated metropolitan areas of the country.

⁷ Starting from a green field scenario, in Bologna and in Turin, Metroweb re-used the existing infrastructures for more than 50% of the whole track.

Outside these geographic areas, overbuild would not be a sustainable business model.

Therefore, should we consider as unquestionable the assumptions of the consensus of analysts we should envisage, for the remaining part of Italy, an agreed or *de facto* partition of the territory between the two major competitors or a divestiture of the fixed network of Telecom Italia, followed by an agreement between Open Fiber and the netco of Telecom Italia, to merge both network companies. The latter scenario could boost the deployment of fiber outside the densely urban areas and prevent a digital divide of Italy. The amounts needed should be substantial.

However, I think that the analysts have not yet adequately considered two specificities of the Italian market.

First, the contribution of the public funding in equity and the incentives - worth about 7 bn euro - recently earmarked for fiber networks. This public funding will significantly reduce the amount of private capital required.

Second, the absence, in Italy, of cable TV networks, able to compete with the telecommunications infrastructures in providing connectivity to households and businesses. This absence is due to regulatory restrictions imposed by the Parliament in the eighties with the aim to protect the television duopoly between the State-owned RAI and the Mr. Berlusconi owned Mediaset. This has been for years a handicap for Italy, given that the incumbent telecom company, Telecom Italia, has not been obliged to invest to cope with the competition of the cable TV networks like incumbents of other countries were compelled to do.

Now the absence of cable TV networks could be an advantage for investors in NGN. In fact, before the end of 2020, or at least 2022, Italy will be obliged, under the European spectrum policy, to allocate to wireless mobile communications services a great number of frequencies now used by the television broadcasters: the so-called second digital dividend. Consequently, the digital terrestrial broadcasting of television programs, which in Italy occupies more spectrum than in other Member States, will be obliged to migrate to broadcasting on the fiber networks, expanding the demand for high quality connectivity on the Italian fixed telecommunications infrastructure.

Few final words on regulation

Let me conclude with a few words on regulation. OFCOM took a courageous initiative, taking into account the current regulatory framework. However, only divestiture of the wholesale operation can deliver both non-discriminatory access and long term investment incentives.

The ball is now with the EU institutions.

I tried to explain the reasons why the whole-sale only fiber company model has many advantages and produces many benefits in terms of public policies. It allows regulators to more easily build a supportive framework for open competition among telecommunications service providers, to ensure that the playing field is indeed level. It favours long-term investment in the construction of new generation infrastructure (FTTH and 5G), a key factor for the growth and competitiveness of European economies. It makes easier for governments putting in place market friendly incentives.

The European Commission seems now to share this approach. The Commission recently highlighted that network owners *“that do not have retail market activities and whose business model is therefore limited to the provision of wholesale services to others, can be beneficial to the creation of a thriving wholesale market, with positive effects on retail competition downstream. Furthermore, their business model can be attractive to potential financial investors in less volatile infrastructure assets and with longer term perspectives on deployment of very high capacity networks. (...) The competition risks arising from the behaviour of operators following wholesale-only business models might be lower than for vertically integrated operators, provided the wholesale-only model is genuine and no incentives to discriminate between downstream providers exist”*⁸.

However, in the current regulatory framework, national regulators do not have the power to impose structural remedies such as legal separation and requirement of different controlling shareholding of the legally separated entities, powers that, in the same current regulatory framework, are vested only

⁸ Proposal for a code, rec 192.

to the national competition authorities. Thus, the restrictions imposed on the margin of manoeuvre of national regulators to impose structural remedies, forces them, as illustrated in the case of the British OFCOM, to distract substantial resources from their other regulatory activities, to achieve legal separation. Obviously, these restrictions reduce substantially the deterrent effect that national regulators can have vis-à-vis operators with significant market power that do not implement satisfactorily behavioural access remedies.

However, the actual EU Commission's proposal for a European Electronic Communication Code falls short of giving national regulators the power to impose structural remedies, albeit as a last resort . In fact, the code proposed by the Commission seeks only to carry over the current rules allowing national regulatory authorities to impose functional separation. While the EU Competition enforcement practice now gives priority to structural remedies over behavioural remedies⁹, the Commission proposes the opposite for the electronic communications regulators, without providing any justification for this inconsistent approach.

So, I think that the European Parliament and the Council should take the opportunity of the current review of the Commission's Proposal to align the powers of the national regulatory authorities with those of the competition authorities, giving them the tools to impose ownership separation, when needed (that is, when prescribing behavioural remedies has proved to be ineffective).

More generally speaking, I think that the new regulation should adopt a pro-investment and flexible approach, and should first of all recognize the different nature of the new market models such as wholesale-only operators, separated at full level, investing in innovative and capital intensive technologies like FTTH, and provide appropriate rules for them.

In fact, as regards the proposed regulatory treatment of wholesale-only operators by the new code, further fine-tuning is required to take into account the specific

⁹ "...behavioural remedies, which would have been difficult to implement and monitor effectively", *Commission press release on the prohibition of the Hutchinson - Telefónica UK merger*, 11 May 2016. See also OECD, *Remedies in merger cases - European Union*, 28 June 2011, p. 3: "commitments which are structural in nature, such as the commitment to sell a business unit, are, as a rule, preferable from the point of view of the Merger Regulation's objective (...)".

characteristics of the business plans of such operators. Fiber investment – as we have explained above - provides a long-term payback period (more than 10 years), reason why typical shareholders of vertically integrated telecom operators who seek for returns with a five-year or even shorter horizon are delaying investment in fibre. Moreover, the risk of wholesale-only is significant, given that the investor has limited means to influence the take up by end-users, which depends on the marketing of operators in the retail market. In addition, margins are small in comparison with the amount of the investments.

As a consequence, the fact that the code allows national regulators to impose regulated mandatory access to the ducts of wholesale-only operator in the same way as access to the ducts of vertically integrated operator, is likely to dissuade network roll out by wholesale-only operator. Such regulated access threatens the small margins in areas where, in particular, the vertically integrated telecom operator could use the ducts of the wholesale-only operator to deploy its own fiber, paying only for the usage of the ducts and not for the usage of the fibre deployed by the wholesale-only operators, which would then remain idle and consequently would not generate revenues allowing to depreciate the investment made.

Even the definition of the wholesale-only business model should be further clarified. Under the proposed code, for instance, wholesale-only operators should not provide services to end-users. However, if we better consider their specific business model, wholesale-only operators should only be precluded from offering services to end-users when these services could compete with the services offered by their wholesale customers operating in the retail markets, such as the provision of mere connectivity to end-users, meaning connectivity without internet access service, or the provision of network elements for businesses setting up their dedicated networks. Forcing artificially the latter to pass through retail operators to buy these semi-final products would lead to double marginalization and increase the cost of fibre based dedicated networks for the concerned industries.