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Regulating access to the fiber in Turkey: Would regulatory holiday be a tool to increase the investment of operators?

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REGULATING ACCESS TO THE FIBER IN TURKEY: WOULD REGULATORY HOLIDAY BE A TOOL TO INCREASE THE INVESTMENT OF OPERATORS?¹

By Mehmet Bilal Ünver² and Erhan İlhan³

Abstract:

In this paper, regulatory policies and their effects on NGA investment are analysed through a categorisation of four-part: (i) conventional (e.g., copper-based) type regulation, (ii) no imposition of mandatory access, (iii) regulatory holiday, (iv) deregulation. While EU's regulatory policy towards NGA networks originally was denoting somewhere between the first two options, the recent developments refashion an approach near the first. While US experience clearly exhibits 'deregulation' under the fourth category, Turkey's NGA policy represents an approach near the third yet marking a difference with the regulatory steps taken recently. This study first elaborates Turkish experience, then deepens EU regulatory approach from the beginning to the its current NGA strategy under the recommended principles and Commission's decisional practice. Throughout the discussion, the interplay between copper based regulations, e.g., LLU prices and the NGA investments are delved into with factual analysis along with the market behaviours. At last, it is found that conventional regulatory approach has hazardous effects over NGA investment, and needs to be overhauled in view of some tools that could be gained from Turkish experience, e.g., protecting first-mover advantages from regulation along with ascertained rules of level playing field. Last but not the least, rather than US based deregulation, a controlled regulatory holiday would rather be an appropriate option given the need for regulatory predictability and the hazards of conventional regulatory approach in an emerging NGA environment.

¹ *The views and statements expressed in this article are those of the author, and do not reflect those of Information Communications and Technologies Authority of Republic of Turkey.*

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1. Introduction

Competition in broadband services can be facility based or service based. While each service provider acts in the market using its own physical network under facility based competition, the resources of a common network are shared so as to reach to the customers in service based competition⁴.

Appropriateness of competition models to be applied by the regulators depends on market conditions as well as the investment incentives of the operators. For instance, while the access obligations of incumbent operators may be crucial for new entrants to start their operations fast and easily in a domestic market, compatibility of such access regulations with the notion of incentivizing investments is important to promote the higher steps of service based competition, which let the alternative operators to compete with the incumbent in a more flexible manner. Besides, light access regulations may be more appropriate for the new and emerging infrastructures considering the need to maintain investment incentives of the overall industry. Thus the status quo should be analysed with a forward looking perspective in order to achieve the objective of workable competition in the relevant market without damaging the investment incentives. Even increasing such incentives would need to be prioritised by the regulatory approach from a long-term point of view.

For next generation broadband services, not only alternative operators but also incumbent operators are well aware of increasing demand, being eager to turn this opportunity into a good amount of profit. While switching from copper to fiber may affect customer decisions, this process would not be deemed separately from the competition between the former and the latter platforms, which may lessen the price increases at the end. More challenging is how to meet the increasing demand that requires the infrastructure investment so as to have the operators carry out increasing quotas and traffic through new generation access (NGA) deployments. At this point, achieving the right balance between regulating access to the networks and protecting the investment incentives of the operators gains vital importance for national broadband policies.

Regulatory framework for the NGA networks in Turkey has been constituted on a ground which flourished in time and resulted in a distinct form of balance concerning the so-called policy choices. The approach includes a partial regulatory holiday with some complementary

⁴ J. Blevins, A Fragile Foundation - The Role of Intermodal and Facilities-Based Competition in Communications Policy, 2008.

measures aiming at sustainability of access products in the upstream. While access to fiber (FTTH/B) is excluded from the market analyses processes providing that entry level wholesale (resale and bitstream access) services are to be offered, conventional regulations are kept for DSL offered in brownfield areas with an expanded and detailed duct sharing obligation subsequently introduced. On the other hand, the EU policies give a signal to regulate all fiber based wholesale services and infrastructures with the fear of re-monopolisation over emerging NGA networks. In this context, the potential investment initiatives and steps would be hidden behind the concerns related to access and price regulations. While such regulations may not seriously affect alternative operators' incentives towards NGA investment depending on the pricing conditions, both access and price regulations over NGA networks bear seriously negative results as demonstrated by literature.

The purpose of this paper is to seek the right answer to the question of “would regulatory holiday be a tool to increase the investment of operators” through analysing Turkish case. Not only Turkish case but also other regulatory approaches with a particular regard to EU have been analysed throughout the paper with a four-part categorisation: (i) conventional (copper-based) type regulation, (ii) no imposition of mandatory access, (iii) regulatory holiday, (iv) deregulation. Out of these categorical regulatory approaches, Turkey's position has been focused on, with a conclusion of far-reaching implications. The methodology consists of the review of the statistical data regarding the broadband related market developments, while theoretical analysis and EU related elaborations mainly rely on the literature review. The paper aims to contribute to finding the right drivers to investment that is required to answer the demand increase with a whole perspective of welfare increase in the realm of NGA deployments.

1. The regulatory framework for NGA broadband services in Turkey

In Turkey both wholesale physical network infrastructure access market (market 4) and wholesale broadband market (market 5) have been regulated since 2005 through determining the operators with significant market power (SMP) and imposing on them therelevant remedies within the context of market analysis.

In the second round of those market analyses in 2010, Türk Telekomünikasyon AŞ (Türk Telekom), the fixed incumbent, was determined as the SMP operator and obliged to provide ADSL/VDSL access products. On the other hand, the incumbent was not imposed any remedy

with regard to fiber access services since the fiber infrastructure was not considered as substitute with copper infrastructure and thus not included in the market definition considering its limited coverage throughout Turkey.

The limited coverage of NGA networks with the fact of increasing demand for broadband services as well as the 2023 broadband targets set by the Government⁵ triggered Information and Communication Technologies Authority of Turkey (BTK) to take required measures for an encouraging regulatory environment for the new investments in NGA networks.

The Board Decision dated 03.10.2011 and numbered 511

BTK issued the decision dated 03.10.2011 and numbered 511, which

- excludes the access to the fiber (FTTH/FTTB) from market analyses process for the five year period or till the percentage of fiber internet subscribers reaches the 25% of the whole fixed broadband subscribers, and
- requires Türk Telekom to comply with its commitment on providing resale and bitstream access at wholesale level on fiber infrastructure to ISPs on non-discriminatory basis and notifying such wholesale tariffs before entering into force.

The purpose of the Decision was to encourage new investments, technological development and production in the electronic communications sector, and within this context, promoting increase of newly emerging fiber internet access services and improving infrastructure based competition.

Pursuant to the first paragraph of the decision, fiber access is regarded as an emerging market, and thus not be included into the market analyses until one of the specified criteria (threshold) is met. Therefore, any obligations about fiber technology will not be applied to any of the SMP operators within the market analysis meanwhile.

While the first paragraph of the decision entails a degree of regulatory holiday for the operators investing in fiber access network, a number of safeguards are given to the operators in terms of wholesale fiber access by the second paragraph of the Board Decision. In this regard, a level playing field has been ensured for the enhancing the service-based competition through Türk Telekom's emerging access infrastructure and market foreclosure possibility is

⁵ It is targeted to reach 30 milion broadband subscribers by the end of 2023 according to the 2023 Objectives of the Government (<http://www.ulastirmasurasi.gov.tr/assets/up/pdf/yeni/haberle%C5%9Fme.pdf>).

aimed to be preempted in a way whereby Türk Telekom is required to comply with its commitment to provide resale and bit-stream access (BSA) at the wholesale level via the existing fiber infrastructure to alternative operators on non-discriminatory basis, and to notify BTK of the wholesale tariffs pertinent to such services before they become operational. It should also be noted that, according to previous relevant market analyses, which were in effect until the beginning of 2013, Türk Telekom was not subject to any obligation regarding fiber access. Thus the aforementioned decision of the Board has actually injected an additional obligation to the current regulatory framework by requiring incumbent to provide a set of fiber wholesale services if not regulated in the conventional form of copper.

This Board Decision may be deemed serving creation of regulatory certainty for all the market actors as the incumbent is not only the operator investing in NGA networks. By the issue date of the Board Decision, Superonline, the leading operator in terms of number of fiber subscribers and fiber homepass in Turkey, has got 99.57% of the whole fiber internet subscribers, reminding that just as the share of the fiber internet subscribers in the whole fixed internet subscribers was 3.0% as of September, 2011.

The Board Decision dated 02.07.2012 and numbered 303 and the Board Decision dated 18.07.2012 and numbered 335

After the decision of 511, it was observed that the incumbent accelerated its investments towards NGA by the way of transforming its copper access network to FTTB rather than establishing new FTTH access network in the greenfield areas. This is quite clear from the comparison of homes passed numbers for FTTH and FTTB before and after the Decision 511 under the assumption that Türk Telekom generally goes to the greenfield areas through FTTH topology and transforms its copper network to FTTB. While the number of FTTH homes passed was higher than the number of FTTB homes passed in the end of 2011-1Q, the latter was approximately 10 times higher than the former in the end of 2013-1Q.

This is actually a quick and economic way to upgrade the network to an NGN-based or a hybrid one, since it is possible for the incumbent to finance its fiber deployments through selling the replaced copper in the brownfield areas as well as to the less need for capital of expenditure in those areas. This investment approach of the incumbent, on the other hand, raised the competition concerns since it was more applicable for the incumbent to transform the most-crowded areas at the outset where the alternative operators are already providing

services through copper-based wholesale access. This consequently meant that those operators were not be able to offer retail services after the transformation via the regulated products under the conditions of 511 which provided a certain level of regulatory holiday towards NGA.

In the following period, BTK issued the decision dated 02.07.2012 and numbered 303 and the decision dated 18.07.2012 and numbered 335, taking a complementary step to the decision of 511 in order to ensure the rights of alternative operators for copper based WBA (LLU/BSA/Resale) services being kept where copper network has been transformed to fiber by the incumbent.

At the end, a number of safeguards for the service based competition have been declared to be given to alternative operators in terms of fiber access and continuity of wholesale copper access services under the second paragraph of the decision 511 and subsequent decisions of 303/335, while it is still aimed to attract investment incentives of the operators for the NGN and thus promote infrastructure based competition by the first paragraph of the decision 511.

The Board Decision dated 12.04.2013 and numbered 188

The third round of market analysis for the wholesale physical network infrastructure access market has been conducted and final document of the analysis has been approved by the Board Decision dated 12.04.2013 and numbered 188.

BTK's regulatory attitude regarding fiber regulations has gained a new dimension, when BTK published its last market analysis regarding wholesale physical network infrastructure access. This document obliges the fixed incumbent, the SMP operator, to give access to the physical network (passive) infrastructure, leaving "access to fiber" (active equipment and cabling) outside the scope, which had already been exempted from regulation by the decision of 511 in October 2011. This access obligation for civil infrastructure is believed to give more opportunities to the alternative operators to invest in fiber networks especially in the parts of the network where the incumbent replaced the copper with fiber allowing more spaces for new cables⁶.

⁶ All of authorised operators, which are able to establish and operate electronic communication infrastructure, are simetrically obliged to share their passive infrastructures including ducts, manholes by the Board Decision dated 12/04/2013 and numbered 2013/DK-ETD/187.

While such a dichotomy of regulation, a heavy-handed approach towards passive civil engineering infrastructure on the one hand and a light-touch approach towards active remedies on the other hand characterise Turkish experience, which marks a big difference when compared with the EU's regulatory framework as explained below. Historically in the EU, conventional broadband services have been echoed with service competition and regulated access to the incumbent networks at various levels.

The emerged regulatory framework for NGA broadband services in Turkey has been established on abovementioned decisions of BTK. The effects of the framework have being observed through the numbers.

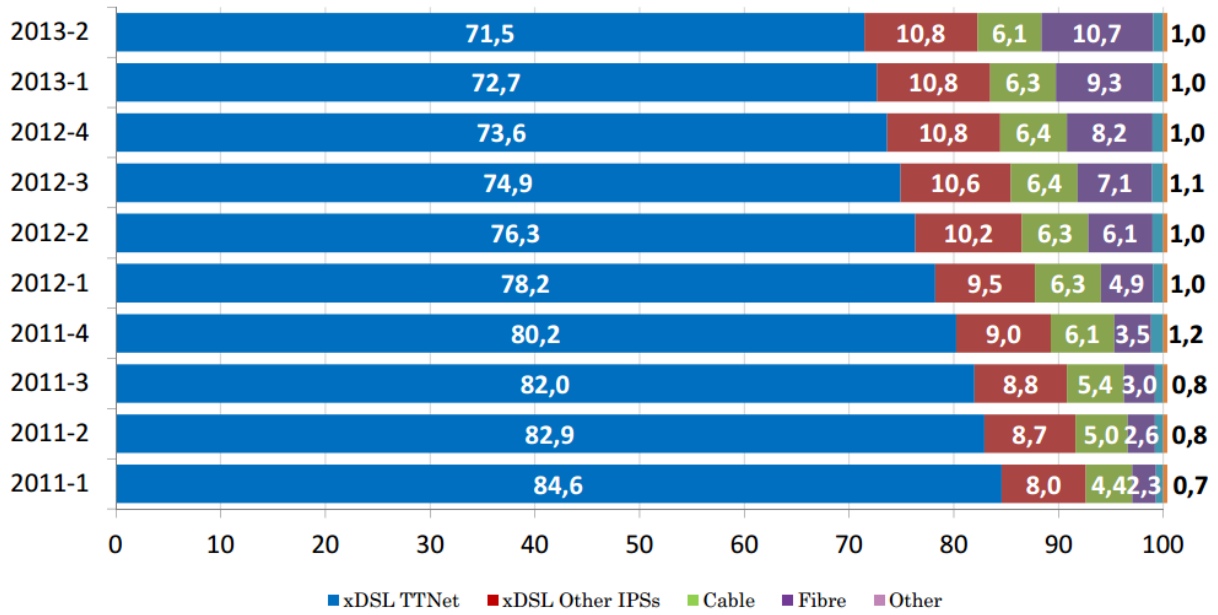
At the outset, the number of fiber subscribers is of importance as well as its comparison to all fixed broadband technologies. Below table shows the number and development of fixed broadband subscribers pertaining to each technology from the first quarter of 2011.

	xDSL	Cable	Fiber	Other	Total
2011-1	6.700.198	321.080	163.783	157.052	7.342.113
2011-2	6.726.981	368.055	189.597	164.426	7.449.059
2011-3	6.792.013	407.502	220.777	129.858	7.550.150
2011-4	6.776.036	460.451	267.144	159.383	7.663.014
2012-1	6.736.138	483.843	378.475	139.858	7.738.314
2012-2	6.632.661	485.531	469.668	140.299	7.728.159
2012-3	6.602.030	492.765	548.493	142.753	7.786.041
2012-4	6.643.299	500.658	645.092	139.665	7.928.714
2013-1	6.678.907	501.201	741.675	137.256	8.059.039
2013-2	6.644.571	491.852	860.871	126.904	8.124.198

A steady increase in the number of fiber subscribers can be seen from the Table-1 following the period of Decision 511. The number of fiber subscribers has increased by 290% after the issuance of Decision 511, namely during less than two years while the total number of broadband subscribers has only increased by 7,6% in the same period.

In order to make the numbers more comprehensible, the development of each fixed broadband technology in terms of number of subscribers is presented below in Figure-1.

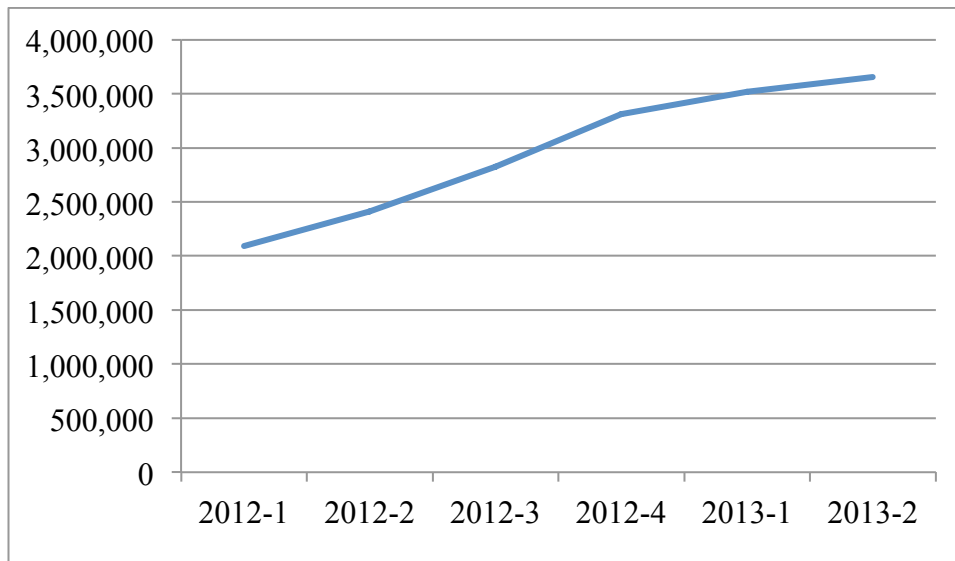
Figure-1: The distribution of fixed broadband subscribers (%)



As could be seen from the Figure-1, the share of fiber in the fixed broadband subscribers has tripled while the shares of other technologies have almost stayed stable or decreased since the third quarter of 2011. In order to understand possible effect of the Decision 511, we may compare the increases in the fiber subscribers before and after the third quarter of 2011. From the first quarter to the third quarter of 2011, fiber subscribers increased by 30% in two quarters while it increased by 257% in seven quarters. Thus the average increase per quarter is 15% before the Decision 511, just as it is about 37% after it was issued. From the Figure-1, it should also be noted that the proportion of alternative xDSL operators has also increased which shows the service-based competition is properly working.

Another indicator that should be analysed is the number of homes passed of the access network in order to understand the take up. Below Figure-2 shows the increase in the number of homes passed of fiber.

Figure-2: The number of homes passed of fiber



By looking at the Figure-2, it can be seen that the number of homes passed of fiber has also increased after the decision of 511 in parallel to the increase in the number of subscribers.

2. EU regulatory approach in the next generation broadband environment

In Europe, delving into competitors' capabilities to replicate network elements and to compete on that basis against the incumbent player(s) constitutes the main concern in general. Since such concerns are believed not to be overcome without regulatory intervention, a number of access and pricing obligations are imposed on operators, who are found having SMP after relevant market analyses based on a forward-looking approach⁷. This approach is generally

⁷ According to the Article 15 of the Framework Directive (2002/EC/21), national regulatory authorities should perform market analyses, including significant market power (SMP) assessment in the relevant markets and imposing appropriate remedies on SMP operators. The so-called market analysis basically consists of a three-step process: market definition, market power assessment, and remedies (See Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communications networks and services, Brussels, C(2007) 5406, 2007/879/EC, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:344:0065:0069:en:PDF>). A market first must be shown to include an operator having SMP before becoming eligible for the regulatory interventions, namely imposition of remedies. Before assessing market power and remedies, a cornerstone analysis called "three-criteria test" is to be done at the outset in order to decide whether or not to continue market analysis by identifying SMP operators and imposing on them relevant remedies. These instruments of market analysis depict the predominance of competition law and policy in electronic communications regulations. In accordance with this policy approach, Commission published first 2003 and subsequently 2007 Recommendations to determine the "markets susceptible to ex-ante regulation" in the EU Member States. National regulatory authorities, relying on the EU Regulatory Framework, performs market analyses with regard to those markets already defined in the Recommendation(s) and those they found requiring

complemented by the ‘ladder of investment’ theory⁸. According to this conception, the development of competition starts with services competition, allowing competitors to develop knowledge of operations and customers by granting them access to the incumbent’s network. After some time, experience, confidence and a critical mass of customers would prompt investment in networks, which would also allow the competitors to differentiate its service. They would then step up a rung on the ladder⁹.

Historically in EU, conventional broadband services have been echoed with service competition and regulated access to the incumbent networks at various levels. In this context, national regulatory authorities (NRAs) have been involved in carving into the access demands of the market players primarily by defining and analyzing the markets, and then imposing relevant remedies on SMP operators, with the ultimate goal of ensuring effective competition. The access and pricing remedies are determined by focusing on the accumulated powers of alternative operators that are presumed to be climbing on the renowned ‘ladder of investment’. Accordingly, first service-based broadband models and remedies, e.g., resale or bitstream access, then more investment-inclusive measures such as local loop unbundling (LLU) and/or duct sharing are supposed to be imposed on incumbents in view of competitors’ capabilities to invest more without (or with a less) reliance on incumbents. New entrants are assumed to ascend the ladder in time, resulting with a higher level of investment and more differentiated products offered at the retail level. Yet, this rather theoretical principle of gradually offering new entrants different levels of access to the incumbent’s network is dependent on some assumptions, e.g., investment-driving (optimum) market prices and conditions, which entail no entrenched reliance by alternative operators on a specific access model¹⁰. While a combination of access models is the way new entrants generally adopt in

ex ante regulation. At the end of relevant market analyses, SMP operators are imposed on the remedies set out in the Access Directive (2002/EC/19) and Universal Service Directive (2002/EC/77), which are detailed and explained in the Commission Recommendations.

⁸ The so-called ‘ladder of investment’ theory is conceptualised by M. Cave as follows:

“[I] have argued in this paper that the objective of one-way access regulation should be to generate sustainable infrastructure-based competition where feasible, and that the twin objectives of promoting competition and promoting investment and innovation can be achieved by providing access opportunities for competitors which are appropriately calibrated over time. These are designed to encourage competitors to ‘climb the ladder’ of infrastructure investment, by installing progressively less replicable assets.” (Martin Cave, Making the ladder of investment operational, www.ictregulationtoolkit.org/en/Document.2916.pdf, 2004, p. 28).

⁹ J. Huigen and M. Cave, Regulation and the promotion of investment in next generation networks – A European Dilemma, Telecommunications Policy, Vol. 32, p. 718.

¹⁰ For a detailed analysis regarding the assumptions attached to ladder of investment approach and criticising this approach see M. Bourreau, P. Doğan and M. Manant, A critical review of the “ladder of investment” approach, Telecommunications Policy, Vol. 34, 2010, p. 683–696.

EU, a remarkable reliance on LLU¹¹ by 72.5% by alternative ISPs verifies the possibility of the flawed assumption(s)¹². While LLU is the highest rung of ladder of investment based on copper, there is very slow migration towards NGA lines¹³, which represents another ladder that is constructed mainly by alternative operators rather than by ex-ante regulation, e.g., wholesale access to incumbent's network¹⁴.

Abovementioned presumptions attached to ladder of investment theory with a focus on copper side differ in case of NGA. The process here is far more complicated by the architecture of NGAs¹⁵, which often fail to retain the 'top of the ladder' position observed with current generation (DSL-based) broadband, namely the local exchange, where local loops are unbundled.¹⁶ Either combined with copper lines or provided through dedicated fibers to the homes or nodes, NGA networks promise utterly more than conventional (copper-based) broadband networks. Out of NGA networks, FTTH/B (fiber to the home/building) platforms, reaching to the end of the network hierarchy, maximise the consumer benefit and meet the long-term bandwidth needs. They bring out innovative and higher speed platforms on the one hand, incur significant amount of long-term investments on the other. In fact, FTTH/B deployments require a long rate-of-return period based on the employed cost of capital that

¹¹ New entrants use LLU (fully unbundled lines and shared access) as the main option to access the incumbent network. There is a continuous migration towards full LLU, all other types of access to the incumbent network is going down (European Commission, Commission Staff Working Document, Digital Agenda Scoreboard 2013, Brussels, 12.06.2013, SWD (2013) 217 final, p. 59-60).

¹² ISPs' tendency to stay on a specific rung of ladder investment could also be seen in Turkey, yet with a difference of relying on BSA rather than LLU. IP-level BSA that has been the ISPs' primary access model for a long time in Turkey, has not been abandoned despite the regulatory measures that encouraged LLU. This may be related to the lack of neutralizing the replacement effect (opportunity cost) created by BSA against building up new fiber infrastructure. As shown above, Turkey's fiber homepass and subscriber development is on its road of progress. This fact being elaborated with the reliance on BSA across the industry demonstrates an ambivalent situation, which could be construed as the unsatisfactory development of investment ladder.

¹³ FTTH and FTTB technologies went up by 31% in the last 12 months across EU, which still represents only 5.1% of all fixed broadband lines (European Commission, Commission Staff Working Document, Digital Agenda Scoreboard 2013, Brussels, 12.06.2013, SWD (2013) 217 final, p. 50).

¹⁴ A study demonstrates that European entrants that use local loop unbundling do not ascend the ladder of investment and build their own infrastructure (M. Bacache, M. Bourreau and G. Gaudin, Dynamic entry and investment in new infrastructures: Empirical evidence from the fixed broadband industry, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1750217).

¹⁵ Next Generation Access (NGA) networks are new or upgraded infrastructure that will allow substantial improvements in broadband speeds and quality of service compared with current services. The term is used to describe the infrastructure and set of technologies which provide super-fast broadband including Fibre to the Cabinet (FTTC), Fibre to the Home (FTTH), Fibre to the Building (FTTB), and wireless technologies (OECD, Next Generation Access Networks and Market Structure, <http://www.oecd.org/dataoecd/57/36/48223202.pdf>, 2011, p. 14-15). In this study, the term of NGA is used to refer to FTTX models and platforms in which fiber optic is deployed fully or partially during the distance between end-users and the central exchanges.

¹⁶ Huigen and Cave, 2008, p. 718.

are attributed to network construction and upgrading within a time frame not easily predictable for a self-sustaining business model¹⁷. When considered with the demand uncertainty as well as cannibalising risk of NGA, ladder of investment theory would not answer the questions surrounding the migration from copper to fiber. All these facts are claimed to require a regulatory certainty as well as financial sustainability, which the investors would need before and during the pay-back period of the investments made.

Notwithstanding, there is no common strategy either globally or across Europe representing policy makers' approach regarding whether or how to regulate NGA platforms. Not only the need to meet the increasing bandwidth demand but also digital gap reasons as well as global competitiveness in the Internet era makes NGA investments a high-profile target for many countries. In order to reach such goals, either regulatory policies or macro policy tools are developed, with a common perspective of triggering FTTX deployments in a faster and mostly unstringent manner that would allow investors a reasonable rate of return on the required capital employed for NGA purposes.

By the same token, many European incumbents and alternative operators have made plans and commenced their strategies to deploy large scale fiber investments. The technologies used and the pace of development vary from country to country according to existing networks and domestic factors. Almost commonly, the incumbents' preferred choice is FTTCab (fiber to the street cabinet) while the alternative operators' choice is FTTB/H, generally bypassing completely the incumbent's network. While FTTX deployments are ongoing across Europe, the European operators are also making a large use of copper-based LLU with a proportion of 72.5% of all the broadband subscribers¹⁸. And, this fact affects both development of NGA networks particularly because of lowered LLU prices as well as limited level of inter-platform competition, characterising regulatory attitude of EU policy makers. This is particularly so because, EU policy makers, including European Commission consider that achievements of

¹⁷ In a study based on market data pertinent to Turkey, it is found that NGA pay-back period (99 months) doubles that of the copper LLU (49 months). According to the findings of the study, an operator will have to be able to offer its services on fiber platform without any profitability during a period of 8 years, incurring monthly losses of a four-year period (break-even point) in the FTTB model, while the same period reduces to approximately 4 year lacking profitability with a duration of approximately 2 year monthly loss. Under the same study, the evaluation of costs and revenues of the IP-level BSA model reveals that the break-even period is equal to 23 months, whereby their operations turn profitable after 43 month (M. Bilal Ünver and Mehmet Altınsoy, NGA Transition in Turkey: A Comparative Analysis of LLU and FTTX in An Immature Broadband Market, International Telecommunications Policy Review, Vol.19 No.2 June 2012, p. 13-17).

¹⁸ European Commission, Commission Staff Working Document, Digital Agenda Scoreboard 2013, Brussels, 12.06.2013, SWD (2013) 217 final, p. 60, <http://ec.europa.eu/digital-agenda/sites/digital-agenda/files/DAE%20SCOREBOARD%202013%20-%20SWD%202013%20217%20FINAL.pdf>.

former EU regulations, namely the competitive results of third party access obligations should be maintained, and the path followed so far under the copper access/unbundling regulations would be able to promise similar results. This mindset is embedded in the “last mile” consideration. That is, in the European regulatory approach, the last mile, although being changed from copper to fiber, keeps its importance and role in provision of broadband services. Existence of bottleneck in the terminating segment and the foreclosure possibilities in an NGA environment make European Commission fearful about competitive provision of next generation broadband services.

Commission’s position towards NGA platforms reflects the view that by-products of such platforms if deregulated would bear anti-competitive risks including a re-monopolisation. According to the Commission, high-speed broadband networks and services would bring out new bottlenecks and foreclosure of competitors in the hands of vertically-integrated dominant players. Such market failures are often weighed against the possible first-mover advantages which are seen *prima facie* hazardous to the consumer welfare. Accordingly, competitive forces are always believed to generate more consumer welfare when compared with a monopoly under regulatory control and/or oligopolistic market structure.

Under this point of view, physical (fiber) unbundling including access to the terminating segment is proposed by the European Commission regardless of incumbent’s network architecture and technology implemented by the SMP operator¹⁹. Commission is of the view that fiber unbundling should in principle be applied even where duct sharing is available or equivalent obligations such as dark fibre²⁰. In this context of regulatory attitude, it is no too far to say that obligations formerly imposed on SMP operators in broadband markets²¹ are to be pursued within the NGA development process in parallel with unbundling obligation over the legacy networks²². Although Commission does not have veto power over the market

¹⁹ BEREC Report on the Implementation of the NGA Recommendation, BoR (11) 43, October 2011, p. 42-43.

²⁰ Ibid. For example in the Lithuanian notification (Case LT/2011/1197), the Commission is of the view that both access to civil engineering and fully unbundled access to fibre loops shall be obliged in parallel, and the latter should not be conditional depending on the lack of access to civil engineering. By the same token, ARCEP’s regulation regarding access to civil engineering infrastructure that is complemented by symmetric measures was not considered sufficient by the Commission, who asked to impose additional SMP remedies as necessary (BEREC Report on the Implementation of the NGA Recommendation, BoR (11) 43, October 2011, p. 42-43).

²¹ Broadband markets are referred to mean the “market for wholesale (physical) network infrastructure access” (market 4) and the “market for wholesale broadband access” (market 5). (See Commission Recommendation of 17 December 2007 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation, Annex).

²² It is argued that in all likelihood, an NGA will meet the well-established three criteria and hence be subject to ex ante regulation, and therefore the fundamental questions raised by the deployment of NGAs are not so much

remedies unlike the process of market definitions, Article 7 and 7a of the Framework Directive provide the Commission with enlarged powers, which allow him to force NRAs towards specified acts. Given these powers in conjunction with the Article 19 of the Framework Directive²³, which has not been implemented yet, the Commission would have a driving force for uniform remedies in the emerging NGA environment similarly with the copper-based obligations²⁴.

In fact, a deviation from the formerly-being applied regulatory tools does not appear during the course of transition from the copper to NGA, even though the latter could be regarded as an emerging market within the meaning of 2003 Recommendation from a broader perspective²⁵. After the well-known Germany (Deutsche Telekom) case in 2006 has watered down such possible reactive acts, subsequent regulatory steps taken by the Commission such as NGA Recommendation and the Recommendations on Non-Discrimination and Costing Methodology²⁶ narrowed the regulatory flexibility of NRAs across EU. Even though the regulatory tools embedded in the EU Regulatory Framework represent dynamic levers to ensure competition according to the features of each domestic market, the following

related to whether their underlying economic markets should be subject to ex ante regulation, but essentially to whether there is significant market power in those markets (Ricardo Gonçalves and Álvaro Nascimento, The momentum for network separation: A guide for regulators, *Telecommunications Policy*, Vol. 34, 2010, p. 357). Generally saying, if FTTH is included in the relevant market and fiber unbundling is found feasible, FTTH unbundled access is imposed by NRAs. In 10 countries, where unbundled access to the fibre loop (ODF access) is imposed, except for one, cost-orientation is applied, sometimes being accompanied by a margin squeeze test. (BEREC Report on the Implementation of the NGA Recommendation, BoR (11) 43, October 2011, p. 46-47). This situation is almost the same for access to the terminating segment (Ibid. p. 37).

²³ According to the Article 19 of Framework Directive amended by the Directive 2009/140, Commission may issue a recommendation (non-binding) or a decision (binding). Under the Article 19/3(a), Commission can issue a binding harmonisation decision only after:

- (a) At least two years following a Commission recommendation dealing with the same matter; and
- (b) Taking utmost account of an opinion from BEREC on the case for adoption of such a decision, which shall be provided by BEREC within three months of the Commission's request.

While such binding Commission decisions are envisaged to address "the inconsistent implementation of general regulatory approaches by national regulatory authorities on the regulation of electronic communication markets in the application of Article 15 and 16, where it creates a barrier to the internal market", it is not so clear whether the remedies are included within the referred general regulatory approaches of NRAs.

²⁴ After the Commission's initiative regarding the Single Market Regulation Proposal, the uniform remedies with an empowered and centralised scrutiny of the Commission is not a speculation (See http://europa.eu/rapid/press-release_MEMO-13-779_en.htm).

²⁵ New and emerging markets are not in principle subjected to ex-ante regulation according to the EU system (See Framework Directive, Recital 27; Commission Recommendation of February 11, 2003 on relevant product and service markets within the electronic communications sector susceptible to ex ante regulation in accordance with Directive 2002/21/EC of the European Parliament and of the Council on a common regulatory framework for electronic communication networks and services, Recital 15, C(2003) 497, 2003/311/EC, http://ec.europa.eu/information_society/topics/telecoms/regulatory/publicconsult/documents/relevant_markets/1_1420030508en00450049.pdf, para. 15).

²⁶ Commission Recommendation on Consistent Non-Discrimination Obligations and Costing Methodologies to Promote Competition and Enhance the Broadband Investment Environment, Brussels, C(2013) 5761 final, 11.9.2013.

legislative developments and Commission's decisional practice gave a concrete signal to the NRAs and policy makers, allowing no discretion towards deregulation or a partial regulatory holiday.

In the well-known Germany case, the Commission took a very determined and aggressive stance against the Germany's initiative to exempt VDSL connections from access obligation by the virtue of a legal provision pertinent to 'emerging market'²⁷. German Government relying on the "emerging market" concept laid down in the Framework Directive and Commission's Recommendation on market definitions, ensured an amendment in the Telecommunications Act (TKG) resulting with an exemption of the services embodied by the statutory definition of "new market" from the mandatory access obligations. However, Commission, having regarded this action as a form of bypassing the rules of ECRF, and been concerned about the Deutsche Telekom's competitors being deprived of access to the new FTTC network, has launched a "fast track" infringement proceeding against Germany over the country's just-passed legislation²⁸. While the ECJ found that the said German Act infringed the ECRF (the consultation and consolidation procedures of the Article 6 and 7 of the Framework Directive), it did not refer to Commission's competition concerns²⁹.

According to the Commission, the competitive successes gained within the context of using the available network facilities would be under threat if network owners are entirely unfettered from regulation. Maintaining the former obligatory measures with a view to have a competitive landscape in the NGA nevironment, EU Commission took further (high-level) steps that would trigger faster and competitive spread of NGA networks, e.g. i2010 initiatives including Digital Agenda, launched 9.1 billion Euro for local, national or European projects, and recently figured some more intrusive interventions, e.g., via Single Market Regulation Proposal³⁰. Commission's approach becoming more interventionist is related to seemingly divergent approaches across NGA-based regulatory policies in the EU Member States despite the Commission's efforts to integrate them via more uniform and harmonized rules.

²⁷ In the referred example, Deutsche Telekom, facing increased cable competition and local infrastructure investments, planned to upgrade its access network by deploying new street cabinets (outdoor DSLAMs serving VDSL2 type high-speed broadband services), and called for a governmental assurance enabling itself exemption from mandated third party access.

²⁸ Eruope Press Release, Brussels, 26 February 2007, <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/237&format=HTML&aged=0&language=EN&guiLanguage=en>

²⁹ Judgment of the Court (Fourth Chamber) of 3 December 2009, *Federal Republic of Germany v Commission*, (Case 424/07). The Court's ruling emphasized that before exempting a 'new market' from regulation, relevant NRA should follow the referred procedures which give the discretionary power to define and analyse a market to the NRA but not the Act itself (Ibid).

³⁰ See the supra note 24.

The most important and maybe the single aspect that makes different the Commission's regulatory attitude over the NGA networks from its approach to legacy networks is an emerging relaxation with regard to pricing obligations, which was not present in the context of copper based remedies. Where the latter (copper networks) was subject to cost-oriented prices from the beginning³¹ under a detailed regulatory scrutiny, the former (NGA networks) marks a difference in terms of price control regime, which is detailed under the new Recommendation on Non-Discrimination and Costing Methodologies. While Commission determines that fiber loops built by SMP operators are to be granted third party access via cost-oriented prices in principle³², the recently adopted Recommendation seems to leave a number of harbours to relax this obligation in the emerging NGA environment, specifically with regard to the remedies related to passive access (and non-physical or virtual access with equivalent functionalities)³³.

According to the referred Recommendation, in order to diversify the risk of investment incurred by the SMP operator, access prices pertaining to the so-called wholesale NGA products are allowed to be flexibly regulated, rather than a straightforward cost-orientation price methodology. While a bottom-up LRIC+ method is envisaged as the standard costing methodology to be followed by NRAs³⁴, they are asked to replace this obligation with a set of remedies mainly based on margin squeeze test dependent on an ascertained rules (e.g., 'Equally Efficient Operator' principle) in the event that maturity of infrastructure-based competition is gained resulting with lowered retail prices³⁵. Hereby, competitors' playing field, namely their capability of offering the same products with those of incumbent is protected against the price flexibility under the possibility of non-imposition of access price regulation. Not only safeguard of "economic replicability" but also the "technical replicability" test and "equivalence of inputs (EoI)" rule are labelled as the pre-requisites in

³¹ See the Regulation (EC) No 2887/2000 of the European Parliament and of the Council of 18 December 2000 on unbundled access to the local loop, Art. 3/3.

³² See NGA Recommendation, Art. 25.

³³ Recommendation on Non-Discrimination and Costing Methodologies, Art. 30-37.

³⁴ Recommendation on Non-Discrimination and Costing Methodologies, Art. 48-58.

³⁵ Recommendation on Non-Discrimination and Costing Methodologies, Art. 48-58. According to the Commission, "[f]or active NGA wholesale inputs, sufficient competitive safeguards exist if access seekers can rely on upstream products in the market for network infrastructure access (for example unbundled access or virtually unbundled access), which are provided on an EoI [Equivalence of Inputs] basis, provided that the actual take-up of such upstream products or the presence of alternative infrastructures create a demonstrable retail price constraint, so that no additional safeguards are necessary at the wholesale level" (Ibid, para. 53).

this context of relaxing cost-orientation obligation³⁶. While it is too early to speculate how the recommended access and price regulation relating to NGA platforms works out, it is clear that a regulatory micro management and a strict scrutiny over certain rules is advised by the Commission.

3. Mainstreams of NGA regulatory approaches

The above depicted EU regulatory approach tells us some boundaries of regulatory flexibility regarding next generation broadband policies. While EU policies embody scrutinised public subsidies as well as demand-increasing tools, the main path for NGA investment and competition strategies is regulation-based as enshrined under the EU Regulatory Framework. Market analysis is the core place for all possible regulatory interventions and SMP remedies except for ‘rights of way’ and ‘duct sharing’ to some extent³⁷. Whereas the said exceptional measures could be broadly formulated in the context of domestic laws³⁸, all other access and pricing obligations should be addressed under market analyses, which stretch out from imposition of all of the relevant obligations (defined under Access Directive) to not to impose any mandatory obligation as to a specific market and/or product³⁹.

³⁶ The so-called formulation is enshrined in a very detailed form of regulation in the Recommendation on Non-discrimination and Costing Methodologies, which reads as follows:

“The NRA should decide not to impose or maintain regulated wholesale access prices on passive NGA wholesale inputs or non-physical or virtual wholesale inputs offering equivalent functionalities, pursuant to Article 13 of Directive 2002/19/EC, where -in the same measure- the NRA imposes on the SMP operator nondiscrimination obligations concerning passive NGA wholesale inputs or non-physical or virtual wholesale inputs offering equivalent functionalities, pursuant to Article 10 of Directive 2002/19/EC, that are consistent with:

- (a) EoI, following the procedure in point 51;
- (b) obligations relating to technical replicability under the conditions set out in points 11 to 18 when EoI is not yet fully implemented; and
- (c) obligations relating to the economic replicability test as recommended in point; under the condition that:
 - (d) the NRA can show that a legacy access network product offered by the SMP operator subject to a cost-oriented price control obligation in accordance with the costing methodology specified in points 30 to 37 or 40 constitutes a copper anchor and thus exercises a demonstrable retail price constraint; or
 - (e) the NRA can show that operators providing retail services over one or more alternative infrastructures that are not controlled by the SMP operator can exercise a demonstrable retail price constraint. For the purposes of this condition, ‘control’ should be interpreted in accordance with competition law principles” (Recommendation on Non-Discrimination and Costing Methodologies, Art. 49)

³⁷ Article 12 of the Framework Directive entails a ‘market power free’ perspective for facility sharing obligation. Wide-ranging powers as to facility sharing, including sharing of wiring inside buildings or access to the first concentration or distribution point (where this is located outside the building) are envisaged on part of NRAs in the said provision.

³⁸ Symmetric type inner building remedies, which require any operator arriving first at a multi-dwelling unit near or inside the building to grant third party access to building wiring, exemplify that category of obligation. This obligation is first introduced in France without looking at market powers of fiber operators.

³⁹ No imposition of mandatory obligation is possible in the event that three-criteria test is not fulfilled in a specific market, which means no need to ex-ante regulation in that market (See supra note 7). In case an SMP

Under the light of above explanations, one of the boundaries of EU rules is the “no imposition of mandatory access”, which could be possible in a case where the relevant market has been found effectively competitive, meaning non-existence of SMP operator(s). This could be realised under the threat of cable companies against FTTX operators including fixed incumbent. Such an exemplified scenario should not be deemed an infinite and/or unlimited possibility as the NRA should review the relevant market conditions at least every three years. In a subsequent market review, inter-platform competitor(s) may be found or could be identified weak, resulting in an insufficient competition, i.e. in a case of increased reliance on the dominant FTTX platform. In that case, one or several of the Directive (access&pricing) obligations are needed to be imposed by the regulator. Yet, declaration of a regulatory holiday with or without making a market analysis is not possible according to the EU framework, which is partially enshrined under the European Court of Justice’s Deutsche Telekom judgment.

The other far edge, namely boundary of the EU rules is imposition of the full set of obligations defined under the Access Directive. As far as next generation broadband policies are concerned, this option could be rephrased as “conventional (copper-based) type regulation”, which is the general baseline of the EU policy makers even in the NGA environment. While a “one-size-fits-all” approach is refrained from, the Recommendations and Commission’s reviews over the market analyses submitted by the NRAs depict a policy approach via which newly adapted versions of the conventional open access rules are proposed. According to that approach, competitive and innovative access measures are centralised on SMP remedies, with some necessary modifications for FTTX topology, depending on the copper obligations⁴⁰. Whereas the NRAs have discretion with regard to imposition of the remedies under the Access Directive, the NGA Recommendation prescribes a conventional type regulatory approach along with copper line measures.

While the “regulatory holiday” and “deregulation” options are not embodied by the EU rules and precedents, these regulatory approaches are those followed partially or fully by some

operator is found to be acting in the relevant market as opposed to the former situation (non-fulfillment of three-criteria test), Access Directive stipulates imposition of at least one of the obligations defined between Article 8-13 of the same Directive.

⁴⁰ Non-imposition of access remedies may be warranted by the EU rules in limited scenarios, e.g. where strongly established inter-platform competition exists resulting with competitive retail prices, which is a rare case across Europe. Exceptionally, different geographical areas could reveal existence of competition between competing infrastructures, and in those sub-markets NRAs could have a discretion not to impose mandatory access remedies (See NGA Recommendation, Art. 22 and 28).

countries. The former is represented with the former Deutsche Telekom decision with a fully fledged case. Besides, Turkish experience also depicts a similar yet distinctly-formulated approach, which could also be categorised as a partial regulatory holiday. On the other hand, “deregulation” is perfectly characterised with the US example, where FTTX networks are freed from mandatory access since 2005. In USA, even fundamental type common carriage rules brought before have been lifted after the Supreme Court’s *Brand-X* decision⁴¹, which gave way to deregulation decisions being issued by FCC. As FCC has no duty of regular market analysis, it has no longer obliged to re-regulate the industry, but to monitor the developments in the markets, including investment dynamics related to FTTX platforms.

At this juncture, possible regulatory reactions including those of EU and US approaches, namely ‘conventional type regulation’ and ‘deregulation’, and other intermediate options between them (‘no imposition of mandatory access’ and ‘regulatory holiday’) could be categorised in a four-part table. The below figure offers this by showing such basic mainstreams for NGA regulation.

Figure-3: Policy approaches for NGA regulation



The above figure incorporates four different options related to how to deal with FTTX platforms, spreading over between deregulation and maximized regulation, which is

⁴¹ *National Cable & Telecommunications Association v Brand X Internet Service*, 545 US 967 (2005).

represented in the copper-based EU regulatory approach being modified to NGA policies with a lesser stringent approach. Turkey as explained above, reveals a distinct approach staying between ‘regulatory holiday’ and ‘no imposition of mandatory access’. Below a comparative assessment is made among these different categories by touching upon interaction between each category and their impact over NGA investments.

4. Comparative Assessment

In the EU approach, shaped following liberalisation of 1998, is lying on the core idea of opening the legacy platforms to access seekers for allocative (cost) efficiency with a view to enhance both service and facility based competition. While the so-called aims have been reached to an extent with a significant difference in favour of service-based competition, the same conclusion could not be arrived for the facility-based competition based on dynamic efficiency. When the discussion turns into correlation between FTTH roll-out and copper access (unbundling) regulation, a clearly negative result is confronted⁴². Notwithstanding this fact, if pricing remedies are elaborated in this discussion, different outcomes are possible to be arrived.

Primarily saying, low access pricing and amount of investment have a negative relationship between each other⁴³. Yet, NGA-based decisions are speculated to be positively affected under this interplay as fixed incumbents would more invest in NGA when faced with a reduced copper access price, assuming that they gain less than they expect under regulatory pressure⁴⁴. It would also be speculative to derive the same conclusion as for the alternative operators. Rather different dynamics may stay behind the investment decisions of competing infrastructure operators. Given the fact that FTTH/B providers come out of the alternative operators rather than incumbents across Europe⁴⁵, the above correlation (between lower

⁴² In a study concerning the relationship between copper unbundling and FTTH deployment in the EU-27 countries it is found that copper regulation has negatively affected NGA deployment (W. Briglauer, G. Ecker and K. Gugler, Regulation and Investment in Next Generation Access Networks: Recent Evidence from the European Member States, 2011, http://www.wu.ac.at/regulation/research/wp/next_generation_access_eu).

⁴³ See T. M. Valletti, The theory of access pricing and its linkage with investment incentives, Telecommunications Policy, November/December 2003, Vol. 27, No.10-11, 2003, p. 666; M. Cave and Ingo Vogelsang, How access pricing and entry interact, Telecommunications Policy, Vol. 27, 2003, p. 70-72.

⁴⁴ Notwithstanding this premise is also dependent on the consumer tendencies and their demand and migration capacity to higher speed platforms including NGA networks. Thus, it may be an excessive statement to establish a directly positive relation between the two, namely NGA investment of incumbents and copper price regulations.

⁴⁵ New entrants provide 77.5% of NGA lines, although their market share in the total fixed broadband market is only 57.7% (European Commission, Commission Staff Working Document, Digital Agenda Scoreboard 2013, Brussels, 12.06.2013, SWD (2013) 217 final, p. 43).

copper prices and increased FTTX investment) would fall down as a general statement, especially for competing operators. This is may also be a driving reason for the European Commission to initiate stabilising the copper price level instead of reducing them⁴⁶. In terms of NGA roll-out, one can not correlate the prices being lowered across the rungs of the investment ladder with the climbing over them resulting in a jump to the NGA ladder (that is built up in parallel). In other words, we can conclude that stepping through the investment-inclusive access models (e.g. from service based competition to a facility based one) is not dependent on copper based regulations, particularly lowered prices⁴⁷. Alternative operators climbing over the investment ladder, but being stuck on the rung of LLU but not going up verifies this premise⁴⁸. Under the light of above considerations, a partially positive relationship between copper regulation (either access or pricing based) and FTTX roll-out could theoretically be established, yet this picture could not be extended to total investment initiatives especially those of alternative operators.

On the other hand, when fiber investments are correlated with the NGA regulations, even a partially positive relationship could not be reached as this correlation is more horizontal and straightforward⁴⁹. This is the fear which the European regulators have in their mind, and the baseline on which the Commission built up its view of flexibility over NGA products under some conditions, e.g., economic replicability, EoI test⁵⁰. As matter of fact, such concerns versus the need for faster and innovative investments clash each other to the extent that the EU rules allow for a large-scale optimisation. However, as explained above the EU Framework has some boundaries set out by the former precedents and established rules. The manoeuvrability of regulators are demarcated with the extent of market analyses, which would rarely allow no mandatory access because of strictly recommended principles.

On the other hand, a regulatory option of ‘no mandatory access’ does not mean a certain and long-term view, but a technical solution applicable during a specific time-frame. That is to say, the legal predictability and regulatory certainty, which the investors seek for the rate-of-

⁴⁶ See Recommendation on Non-Discrimination and Costing Methodologies, para. 44-45.

⁴⁷ See also M. Bourreau and P. Doğan, Service-based vs. Facility-based Competition in Local Access Networks, June 2002, reading “[s]ervice-based competition at worst, deters (or delays) facility-based competition . Hence, to the extent that service-based and facility-based entry are substitute strategies for the entrants, policies that are designed to support each one of them may exhibit conflicts”.

⁴⁸ See the supra note 9.

⁴⁹ See also R. W. Crandall, Jeffrey A. Eisenach and A. T. Ingraham, The long-run effects of copper-loop unbundling and the implications for fiber, Telecommunications Policy, Vol. 37, 2013, p. 274-277.

⁵⁰ See the supra note 34.

return purposes would not be possible in this option. In other words, unless a competing infrastructure is built up resulting with a strong level of competition between the incumbent and other FTTX provider(s), the incumbent would be faced a certain level of obligations under market analyses since emerging market conception is not acknowledged by the EU approach. That is to say, as ‘regulatory holiday’ is impossible partially or fully, imposition of access and pricing obligations would follow a certain level of investment by the incumbent as he is deemed to have an irresistible power arising out of a nation-wide infrastructure upgradable to NGA with anti-competitive risks. This notion of potential re-monopolisation, if not mitigated with possible macro-level interventions and subsidies in favour of forthcoming NGA deployments, would bear some shaky outcomes.

First and foremost, the incumbent most probably, as demonstrated by the literature, be reluctant to invest in NGA under the threat of third party access at the regulated rates. The level of this reluctance would differ among the marketplaces where possible competitive infrastructure(s) already started to be built. If there is one or two such networks, which are intensifying on high-density areas, the incumbent would limit its investments those areas, which, while answering the increasing demand, would not prevent a possible digital gap between the distinct geographical regions in terms of broadband coverage, quality and speed. Yet, such a gap would trigger governmental act towards public initiatives and funds for attracting investment to broadband-poor areas. On the whole, these consecutive developments are fully hypothetical, being far from idealising for an emerging NGA environment. Besides, how to drive investors to deploy fiber to even urban areas is still being confronted by the regulators, staying as the major problem surrounding NGA investments particularly in the absence of inter-platform competition.

Secondly, investing in NGA may be a problem from the viewpoint of alternative operators for some reasons. In countries where service based models are well functioning and matured enough, alternative operators would be expected to enter the NGA market, given their accumulated financial and market powers may help them in terms of breaking off their reliance on incumbent. On the other hand, incumbent’s regulated products would delay this process, particularly in case, where a very attractive LLU model (e.g., with lower prices) and highly risky NGA environment is in place. In those situations, some risk sharing mechanisms such as co-investment initiatives are supposed to take place to an extent. Yet, co-investment initiatives require optimised level of co-operation between stakeholders who normally expect

a reasonable rate-of-return for maximum regions or locations⁵¹. In addition, such plans are subject to competition law scrutiny, which may have some delaying and limiting effects. Unsurprisingly, there is no wave of co-investment for NGA across Europe under such uncertainties⁵². Rather, small-scale partial-private-partnerships, e.g. with municipalities and/or utilities are preferred by the undertakings, towards particular customer masses.

All the problems referred above also relate to cases in which the regulators prefer mandatory access and associated remedies, e.g. pricing obligations, etc. That is, the abovementioned first and second options, which denote the boundaries of EU approach, do not include a difference between each other in terms of (non-)availability of a long-term, investment inclusive strategy. Both denote short-term, wound-dressing steps falling short of coping with the inherent problems surrounding deficit of supply. Although NGA investments could be realised by alternative operators either via public-private-partnerships (PPPs) or other risk sharing mechanisms, generally such initiatives have a picture of locally-limited deployments and projects. On the other hand, not only alternative operators' but also incumbents' NGA investments are quite related to the extent to which incumbent products are regulated. In fact, the mandatory access regime is proven to inhibit investment decisions with possibly different reactions of competitors who may have gained sufficient power and prospective vision for the fiber deployments in domestic markets where this is warranted by all other parameters (e.g. optimum pricing structure, economic viability, consumer demand and migration possibilities). While alternative undertakings may have an investment inclination after a long period of reliance over regulated products that is supposed to help them in climbing the investment

⁵¹ Generally, co-investment strategies are found inclusive of skeptical effects. In this regard, Cave points to possibilities with regard to co-investment strategies turning into barriers to subsequent market entries. According to him, “[t]he co-owners of the networks would assume risks which would not be borne by later comers seeking to buy access; price differentiation would be justified, but calculating a legitimate limit would be problematic. The opportunity for collusive exclusionary or exploitative conduct would be increased”. (See M. Cave, Policy and regulation for next generation Networks in G. R. Faulhaber, G. Madden and J. Petchey (eds.) Regulation and the Performance of Communication and Information Networks, 2012, p. 124).

⁵² However, there is good example of French stakeholders for co-investing NGA platform across. In France, very little fiber had been deployed by any of the telecom carriers until they reached agreement with their regulator, ARCEP, on a Very High Broadband National Plan, which provides for substantial co-investment by the three major entrants and the incumbent, France Telekom/Orange. This plan requires all of the carriers, incumbent and entrants alike, to provide competitors with access to their connections to multifamily dwellings at a mutualisation point, thus providing for symmetric access regulation. The plan anticipates that 17 million households (approximately 60 percent of the country) will be passed by fiber by 2020. ARCEP has announced that public subsidies, provided by local, national or EU authorities, will be required to induce rollout to much of the rest of the country (R., W. Crandall, J. A. Eisenach and A. T. Ingraham, p. 274).

ladder⁵³, this conclusion is again hard to be derived under the assumptions referred above especially in case of excessive price reductions in the copper side⁵⁴.

The impact of such reductions made to copper prices over competing FTTX investments is ambivalent being dependent on various parameters, e.g., the spill-over effect of reducing access prices over investment of incumbent/alternative operators, availability of migration opportunities on part of customers, cannibalising effect of switching from copper to fiber. The seeming negative impact is also claimed to be in the opposite direction as argued by the European Commission and ECTA. According to the Commission, incumbents take initiative to invest to NGA if and when copper prices are lowered enough as they otherwise see not prospect to build up new networks. In view of ECTA, a high access charge on the copper network reduces the incumbent's incentives for fiber investments, because moving access seekers' customers to fiber cannibalizes the incumbent's existing access profits. Taking many factors into account, it is difficult to argue that incumbents have great a first-mover advantage over potential competitors with respect to fiber as they did, 15 years ago, with respect to their embedded (i.e. sunk cost) copper networks⁵⁵. Well capitalized entrants can deploy fiber to the home just as easily as incumbents, and in Europe, as noted above, entrants have far more fiber customers than do the customers⁵⁶.

The latter fact of incumbents lagging behind the new entrants under realm of NGA investments has several dimensions. First and foremost, such a fact is mostly relevant in cases, where either a PPP or funding mechanism has already been introduced and implemented. Alternatively, making reusable elements of existing infrastructures, i.e. ducts, manholes, conduits (including those of utilities) available to operators is also effective in driving competitive forces of new entrants towards fiber investments⁵⁷. These factors entail

⁵³ See J. Bauer, Regulation, public policy and investment in communications infrastructure, *Telcommunications Policy*, Vol. 34, 2010, p. 68; M. Cave, 2012, p. 135.

⁵⁴ Alternative operators could not easily give up their entrenched way of offering service based on stringently regulated LLU type products. While their decision to invest in NGA relates to first-mover values being deducted out of such investments and rate-of-return capabilities, the so-called "replacement effect" is also remarkably important in that respect. According to M. Bourreau et al, when the access charge for the existing infrastructure is set at a high level, the entrant's opportunity cost of investment is low, which promotes infrastructure investment by the alternative operator (which corresponds to the said "replacement effect").

⁵⁵ R. W. Crandall, J. A. Eisenach, A. T. Ingraham, p. 275.

⁵⁶ R. W. Crandall, J. A. Eisenach, A. T. Ingraham, p. 275.

⁵⁷ See Cave, M. (2010). Snakes and ladders: Unbundling in a next generation world, *Telecommunications Policy*, Vol. 34, No. 1-2, p. 85, reading "[W]hereas the costs of the copper network were sunk a long time ago, NGAs in most countries are still in the course of construction; unless large scale duct-sharing is attainable, the regulator is thus confronted by an apparently intractable conflict between promoting competition on the network and creating incentives to build it in the first place".

public (macro) policy elements rather than regulatory (micro) management tools. Yet public policy tools other than duct sharing and rights of way may not be available as widely spread, rather they are used via specific collaborative actions, mutually commercial transactions or pilot projects. Merging these with the accumulated powers of new entrants may conclude impressive results, if not at country-level large scales. These kinds of solutions could offer new and alternative routes for NGA investment. This fact, especially new entrants' superior position, collapses the "essential facilities" ("stepping stone") theory that is embedded in the last mile (local loop) notion from the beginning. Whereas new entrants using some financial resources (released by states/EU, etc.) and/or facilities owned by incumbent have a role, market dynamics behind fiber deployments have a distinctive nature when compared with copper times. In this emerging realm of investment, first-mover advantage of capturing potential users is of an important effect to speed up the NGA deployments. Since there is no FTTX network already built by the State, and natural monopoly characteristics remove largely because of diverse opportunities, "level playing field" concerns are not necessarily bound to affect the regulatory landscape. This remarkable point and the correspondingly changing mindset becomes more evident when cable and mobile next generation broadband developments are taken into consideration.

Always superior conceived position of incumbent operator is becoming blurred in time, and the abovementioned developments warrant relaxation of the conventional regulatory approaches. In fact, such factual developments denote the possibility of a kind of regulatory forbearance, the third and fourth options referred in this study, respectively as 'regulatory holiday' and 'deregulation' would enlighten such a forbearance. While the "deregulation" means not regulating fiber platforms in no manner, "regulatory holiday" entails a temporary or conditional situation of non-regulation, e.g. until a sunset is realised. Below, some comparative explanations are given to make such options more understandable against the first and second options.

The third option referred above, namely "regulatory holiday" depicts a deliberate action following a policy decision, not a passive action pursuing of not regulating yet. The German example of exemption of fiber from regulation is pertinent to this kind of a policy decision, which was devised on the scheme of 'emerging market'⁵⁸. "Regulatory holiday" option deviates from the second option (no imposition of mandatory access) as it envisages non-

⁵⁸ See the supra note 27.

regulation *a priori* but not after a market analysis (under the three-criteria test). The conclusion of this test being positive demonstrates a lack of workable competition in the market, resulting in a need of ex ante regulation to specified product(s) that constitute the subject-matter of a market. While the result shows a need to regulate a defined market, regulators could choose target-based remedies upon their needs, which means a discretion in view of the tool-set enshrined under the European Regulatory Framework. EU countries choosing such remedies, are bound with the EU rules, in particular Access Directive and the relevant Recommendations. While the Deutsche Telekom decision blocks the way to prefer ‘regulatory holiday’ option, the current Recommendation(s) do not exhibit a different regulatory setting, and narrow the manoeuvrability of the NRAs in general⁵⁹. Now, in Europe just the applicability of ‘risk premium’ under costing methodologies and/or margin squeeze test is discussed, dismissing the possibility of a full or partial regulatory holiday. That is, European regulators have no discretion but to regulate the FTTX with a margin of appreciation, which seems to be narrower in time. While the Recommendation on Non-discrimination and Costing Methodologies brings out a possibility of EoI based margin squeeze test for assessing the economic replicability of fiber products, it does not allow a totally new regulatory approach, e.g. a partial or full regulatory holiday.

On the other hand it is established that under some conditions access or regulatory holidays can increase investment incentives for emerging infrastructure⁶⁰. According to Vogelsang, a combination of intermediate regulation with the expiration of regulatory holiday could spur investment⁶¹. In his view, a major problem of regulatory holiday is that verifiable standards are needed to determine under which regulatory holiday would be warranted. Turkey’s approach would be taken into consideration in this regard, at least could be seen as a reference point or a benchmark to view a self-sustaining model of regulatory holiday.

⁵⁹ Since 2003, just market definitions were being challenged via a veto power by the Commission. However, by the Single Market Regulation Proposal, it is proposed to equip the Commission with a veto power over the remedies proposed by NRAs (See <https://ec.europa.eu/digital-agenda/en/news/regulation-european-parliament-and-council-laying-down-measures-concerning-european-single>).

⁶⁰ See J. Gans and S. King, Access Holidays for Network Infrastructure Investment, *Agenda*, Vol. 10, Number 2, 2003, p. 168, http://ftp.monash.edu.au/pub/econ/RePEc/mos/moswps/Access_Investment.pdf; P. Baake, U. Kamecke and C. Wey, A Regulatory Framework for New and Emerging Markets, *Communications & Strategies*, Vol. 60, December 2005, p. 132, http://mpra.ub.uni-muenchen.de/2518/1/MPRA_paper_2518.pdf. Baake et al describes a scheme for establishing a rather long regulatory holiday. In their view, a commitment to such a holiday for, say, 10-15 years may not be really credible at the same time. However, breaking this kind of commitment and installing regulation may itself take time so that the long period in his case is likely to be longer than ordinary long periods (See also I. Vogelsang, Incentive regulation, investments and technological change in G. R. Faulhaber, G. Madden and J. Petchey (eds.) *Regulation and the Performance of Communication and Information Networks*, 2012, p. 106).

⁶¹ Vogelsang, p. 106.

Turkish regulator (BTK), simultaneously with the related Board decision issued (numbered 511), provided a set of conditions upon regulatory holiday. Under this framework, BTK stipulated that bitstream access and resale services were to be provided to new entrants in a non-discriminatory manner for the purpose of achieving entry-level competition in FTTX areas. Afterwards, the brownfield areas are covered under the realm of former (DSL-based) regulations, in order to ensure that the former (said) Board Decision does not affect the regulatory landscape at the expense of investment incentives. A final step, which could be regarded as the complementary step in fostering fiber products, has been “duct sharing” over the access network owned by Türk Telekom⁶². At the end, a semi-regulatory holiday is confronted by the market players, firstly commenced with a conditional access holiday, being followed by complementary decisions ensuring level playing field with an effort to optimise investment incentives and service competition in this emerging platform. In this framework, exclusion of brownfield FTTX areas from the regulatory holiday in conjunction with introduction of an enlarged duct sharing obligation characterise Turkish case, which may be deemed staying just above ‘regulatory holiday’ but not within the context of ‘no imposition of mandatory access’ under the Figure-3.

Deregulation, which is a stronger attitude than regulatory holiday in terms of regulatory forbearance, is the last option staying at the bottom of the Figure-3. Deregulation does not necessarily include a wait-and-see or a check-balance approach, which is sometimes included in regulatory holiday approaches. A decision or declaration as to no longer regulating the innovative and risky (NGA) infrastructures matches the notion of deregulation. This approach is represented in the US experience, where open access obligations are removed with a deliberate answer to market behaviours. This deliberate type of regulatory forbearance is of course unlike a non-regulation situation such in New Zealand, and is generally based on a justified reason. For instance, US deregulation decision is justified with the argument that cable television and telecommunications firms, incumbents and entrants, are in equal footing to deploy their own next generation networks⁶³. As a matter of fact, US terminated open

⁶² Türk Telekom was already obliged to make its ducts, manholes and conduits available to other operators who were seeking access at the exchange level, namely for the backhaul purposes. In April 2013, market analysis has been concluded with a facility sharing remedy imposed on Türk Telekom pertaining to access network, which means an enlargement in this field of obligation. In another decision issued BTK in April 2013, all the infrastructures owned by telecom operators are opened to access. However, this latter obligation has been imposed without a pricing control regime, namely by fleeing the obliged operators from cost-orientation (or another pricing remedy), marking a difference from Türk Telekom’s obligation.

⁶³ D. Brito, P. Pereira and J. Varela, An assesment of the equality of access and no-regulation approaches to next generation networks, Telecommunications policy, Vol. 35, 2011, p. 821. See also P. Siciliani, Access regulation

access rules, which were only directed to incumbent fixed line operators (ILECs) under the realm of 1996 Telecommunications Act that envisaged a literally very large mandatory access obligations that included all the technically feasible network elements according to the Article 251(c)(3)⁶⁴. The excessively envisaged mandatory access obligation as well as the lobbying of incumbent operators to such structure which cable firms found disimnatory to themselves affected the regulatory process with a result of deregulation⁶⁵.

One of the thrusts peculiar to deregulation is that regulator no longer feels a commitment to regularly revisit the deregulation decision (e.g., such in market analyses) unlike the second and even third options referred above. In a case where no mandatory access is imposed after non-fulfilment of three criteria test regular market review is inevitable and inseparable from the regulatory approach itself. While such a regular review is not indispensable under the regulatory holiday, a review over the validity of the conditions pre-defined and attached to the holiday is necessary. Yet, neither of these review activities is essential in case of deregulation, which does not incorporate any pre-requisite or condition to be affiliated to the deregulation. That is not to say, regulator could impossibly be at a position to abandon its decision of deregulation partially or fully. However, an unpredictable regulatory landscape is generally viewed in the context of deregulation, which renders the regulatory processes open to political pressure and lobbying activities. It could then be pointed out that certain aims and well-structured legal provisions, which characterise US Telecommunications Law 1996, are not enough to lay down the regulatory certainty and predictability⁶⁶. In the light of these facts, no

on NGA-A financial, market-led solution to bridge the gap between US and European diverging regulatory approaches, Telecommunications Policy, Vol. 34, 2010, p. 290.

⁶⁴ The FCC issued the Local Competition First Report and Order, which established, among other rules, the minimum list of network elements that an incumbent local exchange carrier must grant access on an unbundled basis to other telecommunications carriers pursuant to the Articles §§ 251(c)(3) and 251(d)(2). Afterwards, the said list has been reduced, enabling a less number of network elements were to be opened non-discriminatory access towards competitors, with a regulatory forbearance at the end.

⁶⁵ In the United States, the Federal Communications Commission elected in 2005 to forbear from fiber undundling, a decision which was followed immediately by Verizon's announcement of its FTTP deployment. Verizon has since deployed fiber throughout its region of the country, leading cable television competitors to respond by deploying high-capacity services based on DOCSIS 3.0. A few smaller telephone companies – many of them beneficiaries of universal service funding or broadband deployment subsidies – have also deployed fiber, as have a few municipal overbuilders (R. W. Crandall, Jeffrey A. Eisenach and A. T. Ingraham, The long-run effects of copper-loop unbundling and the implications for fiber, Telecommunications Policy, Vol. 37, 2013, p. 273). See also Sheila S. Sager, Michael W. P. Fortuanto, Theodore R. Alter and William C. Shuffstall, A Comparative Analysis of the Role of State in Broadband Policy for Rural Areas: An Investigation of Telecommunications Policy in the United States and Canada in M. Falch and J. Markendahl (eds.) Promoting New Telecom Infrastructures: Markets, Policies and Pricing, 2010, p. 87.

⁶⁶ This presumption is mostly applicable in the US context, which is becoming fluctuated by the market and policy actors, including courts. The articulated objective of the Telecommunications Act of 1996, which is to *"promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunication*

condition being envisaged under deregulation, which may though be justified with certain reasons, could thus be considered as a risky point in terms of the given signals to the industry. In other words, deregulation would mean no mitigation of the incentives given to investors against a need to sound, reliable and predictable regulatory regime, which all the stakeholders are in need.

5. Conclusion

The relationship between NGA investments and wholesale access obligations over NGA and legacy networks has so far been a controversial issue, fraught with a great many determinants which may affect regulatory solutions. In this paper, without refashioning regulatory settings, the major determinants are analysed by relying on the literature and going through the theoretical and empirical research results. Not only academic but also factual analysis has been made with a focus on Turkish and European regulatory approaches. Whilst analysing the so-called relationship with a focus on mainstreams of NGA regulation, four-part categorisation has been ended up: (i) conventional (e.g., copper-based) type regulation, (ii) no imposition of mandatory access, (iii) regulatory holiday, (iv) deregulation.

While fitting none of these categories, Turkey's situation stays between the second and third categories, namely regulatory options. Seemingly fitting more into the third option, BTK (Turkish regulator)'s attitude deviated from this by laying down a number of conditions as well as obligations upon Türk Telekom. First of these conditions attached to regulatory holiday (phrased as "exclusion of *access to the fiber (FTTH/B)* from the market analyses") is envisaging provision of bitstream access and resale by Türk Telekom over FTTX networks. This regulatory framework, which represents a kind of compromise, is built upon a two-fold threshold: Access to the fiber, not inclusive of non-fiber passive elements, is excluded from *ex ante* regulation *for the five year period or till the percentage of fiber internet subscribers reaches the 25% of the whole fixed broadband subscribers*, and Türk Telekom is faced an obligation, namely its commitment to provide bitstream and resale over NGA networks (without establishing a pricing remedy). After a period less than one year, BTK attached another condition relating to the brownfield areas (e.g., areas upgraded from FTTC to FTTH/B) to this regulatory framework, which could be expressed as exclusion of such brownfield areas from the so-called first measure (Board Decision numbered 511). This

technologies." (Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56, 56) then becomes a platform on which such actors take a role in decision making processes and in building up regulatory landscape.

partial holiday was narrowed with not also this second measure but also with the market analyses that resulted with a detailed facility sharing remedy imposed on Türk Telekom pertaining to access network owned by itself. Whereas such additional tools are used to increase level playing field, the firstly given room to infrastructure operators including Türk Telekom has resulted in a remarkable increase in numbers of fiber homepass and subscribers. The number of fiber subscribers has increased by 290% after the issuance of Decision 511, namely during less than two years (since October 2011) while the total number of broadband subscribers has only increased by 7,6% in the same period.

Historically in the EU, conventional broadband services have been echoed with service competition and regulated access to the incumbent networks at various levels. This approach based on EU rules and decisional practice of the Commission is mostly represented under the 'ladder of investment' theory, and is generally extended to NGA-level measures. At the end, there arises a narrowing margin of appreciation for regulators between the two, namely copper and fiber. That is to say, on the ground of re-monopolisation fear and anti-competitive risks, EU policy makers prefer to regulate newly started NGA deployments and fiber networks. Under the Commission's recommended rules and principles, national regulatory approaches over FTTX networks are being scrutinised if they act as a barrier to the new entries. This means that EU fluctuates between the first and second options described above, while staying near the top band of conventional approach based on copper measures.

EU policy, having a very negative attitude towards regulatory holiday as well as deregulation, which represent the third and fourth options, may reconsider this position, given that FTTX deployments are not complete yet, and are needed to be supported against copper reliance. Against the additional negative factors such as financially unstable conditions, demand structure (particularly against the lowered LLU prices), and lack of continuous funding opportunities and risk sharing mechanisms, first-mover advantages may need to be favoured in the emerging NGA environment⁶⁷. Investment initiatives of new entrants come out of this idea, which marks the real difference between copper and fiber based progresses. This would mean that fleeing NGA investors from the conventional regulatory atmosphere and rules would trigger potential investment which is hidden now⁶⁸. In mitigating possible negative

⁶⁷ This fact, though almost being removed after the complementary regulatory steps, yielded positive results in Turkey.

⁶⁸ Yet, the Single Telecom Market Proposal envisions harsher rules and more straightforward way as to regulating NGA, e.g., by imposing EU-wide VULA obligation, and empowering the Commission more than before (See supra note 24).

effects that could arise out of a partial or full regulatory holiday, Turkey's experience would enlighten the regulatory policies, which may need verifiable standards. In other words, for similarly growing markets where inter-platform competition is not already strong, leaving the growth of fiber to the market players needs to be seriously reconsidered as an alternative approach, for which Turkey could be viewed with a two-year working experience.