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DEPLOYMENT OF HIGH-SPEED BROADBAND INFRASTRUCTURES DURING THE ECONOMIC CRISIS. THE CASE OF REGIONAL GOVERNMENTS IN SPAIN*

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ABSTRACT

This paper reviews the Spanish situation regarding Next Generation Networks (NGNs) and analyzes some public initiatives undertaken by regional governments. The paper focuses on “Xarxa Oberta”, a public-private project to deploy NGNs in Catalonia that may be especially attractive for countries and regions with severe budget constraints. Its main features are the following: i) the project focuses on the availability of advanced public services to the population rather than in bringing fibre to the homes; ii) “Xarxa Oberta” is designed as an open and neutral network which according to the Commission is compatible with the “Broadband Guidelines”, and may even foster private investment in last mile infrastructure; iii) the finance strategy relies on a PPP structure based on periodical payments that can be partially compensated by the payments for telecommunication services that will be self-provided.

KEYWORDS: Broadband, Next Generation Networks, Public-Private collaboration, Spain, Catalonia.

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1 INTRODUCTION

The economic crisis has highlighted the Spain's competitive weaknesses. In the recent Global Competitiveness Report 2010–2011, Spain has dropped nine ranks this year to a 42nd place.¹ Many factors, as a highly inflexible labor market or lack of competition in some key sectors, can be behind these bad figures. This paper focuses on one of the drivers of competitiveness which is the good access to communications networks. To this respect, Spain has a tradition of low broadband penetration and prices among the most expensive in Europe. The last comparative report on broadband prices in the European Union prepared by the Spanish National Regulatory Authority (CMT, 2010a) shows that broadband and voice services with medium speed (from 2 Mb to 10 Mb) are 10.8% more expensive in Spain than the average of the best offers in Europe. Furthermore, when the study is restricted to comparing only the offers of the incumbents, the report shows that the best offer by the Spanish incumbent (Telefónica) is a 71.7% higher than the average of the best offers from other incumbents in Europe. In addition, the fixed broadband penetration rate reaches 20.7%, lower than 23.9% in EU27 (EC, 2009a). The deployment of Next Generation Networks (NGNs) may be an opportunity to reverse this situation. However, and unfortunately, some facts suggest that Spain could stage a new failure. It is not well positioned in the rankings on access to NGNs. In particular, it does not appear in the top 20 countries with the highest penetration of fibre to the home elaborated by the FTTH Council Europe.²

All of this is compounded by the presence of a strong incumbent with high market shares. The Telefónica's market shares are 55% in broadband lines and 76.9% in fixed telephony (CMT, 2010b). The poor and behindhand private deployment of NGNs in Spain is in part explained by the lack of incentives of Telefónica to invest. Traditional telecoms companies, as Telefónica, are in general very cautious regarding NGNs, since NGNs are likely to change the traditional business model of telecoms in favor of other player in the production chain, as content providers.³ Moreover, the deployment of NGNs would reduce drastically the values of its current assets (ADSL, fixed

¹The "Global Competitiveness Report 2010–2011" conducted by the World Economic Forum provides a ranking of countries based on both publicly available data and the Executive Opinion Survey. The complete document is available in <http://www.weforum.org/en/initiatives/gcp/Global%20Competitiveness%20Report/index.htm>.

²<http://www.ftthcouncil.eu>

³Ganuza and Viécens (2010) study the interplay between all the agents of the industry production chain. Their analysis suggests that content providers are the only clear winners of the NGNs revolution.

telephony, etc.), something that can be an important factor for Telefónica given its very high market shares. Finally, Telefónica is not subject to strong competitive pressure. It is a very large company, with deep pockets and good technological capabilities, and then it would be able to react very fast to any threat of investment by a competitor in its domestic market. Therefore, Telefónica seems to follow a rational “wait and see” strategy regarding NGNs. Currently, the biggest effort in the deployment of NGNs has been undertaken by the cable company ONO whose market shares are of 14.8% in broadband lines and of 9% in fixed telephony (CMT, 2010b). The ONO network upgrade to DOCSIS 3.0 is cheap. However, the financial constraints of ONO limit its capability to invest. Now, ONO is more focusing in upgrading its existing network than in extending it. Therefore, private investment is not likely to play an essential role in the deployment of NGNs in Spain in the next future. Thus, the worldwide debate about how the public sector should elicit the investment in NGNs is fundamental in Spain.

Contrary to other developed countries, Spain has not launched yet a national broadband plan. However, some regional governments are developing plans (or expressing intentions) to accelerate the spread of next generation broadband in their cities and towns. The interest of the regional governments can be explained because they control most of the public expenditure over education and health, two areas in which NGNs can have a valuable impact.

This paper briefly reviews these public initiatives, but it mainly focuses on the model proposed by Catalonia, the “Xarxa Oberta” project (“Open Network” in Catalan). The “Xarxa Oberta” has been designed to give the Catalan Administration an autonomous network of optical fibre to connect all its sites around the territory (hospitals, universities, public libraries, etc...). In addition, excess capacity of the network will be available to operators of retail services of telecommunications (provided some conditional access). Besides, the project is an example of collaboration between public and private sector and it has been very recently (August 2010) approved by the European Commission (EC, 2010). Particularly, the Commission concluded that the “Xarxa Oberta” project meets the compatibility criteria set out in the Broadband Guidelines.

The “Xarxa Oberta” is as model of public intervention to promote the access to NGNs that can be extended to other regions in Spain, as well as to other countries. The design of “Xarxa Oberta” helps to reduce the digital divide very effectively by providing access to the advantages of high speed Internet in essential services to most of the population. Moreover and crucial, given the

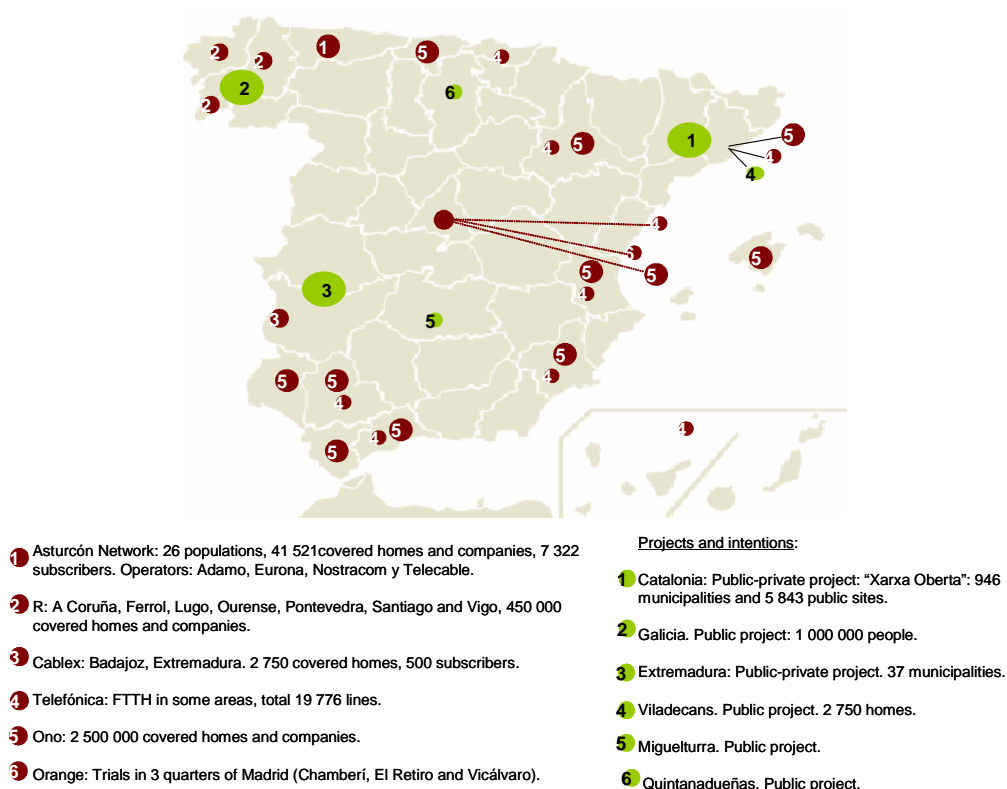
financial crisis and the government budgetary constraints in many countries, the project proposes an affordable way to implement the deployment of NGNs.

The paper is organized as follows. Section 2 provides an overview of the private deployment and public initiatives of NGNs in Spain. In Section 3 the “Xarxa Oberta” model is presented. Section 4 discusses the significant characteristics of the model and tries to identify the insights that can be used for designing future public projects in Spain and other countries. The concluding remarks are presented in Section 5.

2 SPAIN: AN OVERVIEW

This Section shows that the Spanish map is characterized by few public initiatives of NGN deployment, a limited and difficult to determine investment by the incumbent, and some cable companies with a modern technology.

Private deployments and public initiatives in Spain



Source: FEDEA Observatory of NGNs in Spain. August 2010

2.1 *Private deployments*

The deployment of Telefónica is scarce and difficult to determine. According to data provided by CMT (2010) Telefónica has 19 776 FTTH lines. They are distributed in some areas of the points (4) indicated on the map.

On the other hand, the cable offers some potential for the country. Cable companies in Spain have a modern technology that may be cheaply upgraded to NGN. In particular, the technology DOCSIS 3.0 is offered by ONO with 2 500 000 covered homes and companies spread in some areas of many provinces (points (5) in the map). In this sense, ONO currently represents the company with the highest coverage to high-speed services. This technology is also provided by R in some cities in Galicia, with 450 000 covered homes and companies.

It should be clarified that the points on the map refer to the existence of certain deployments in the area and those can be very limited. In relation to this, in Madrid, although ONO, Orange and Telefónica are present, there are large areas in the city center that are not covered by any NGA network. For instance, the deployment of Orange corresponds to a commercial pilot of FTTH in just three quarters (three of the richest in the city). Similarly, the deployment in Badajoz, done by a local firm, has taken place in just a residential development.

2.2 *Public initiatives*

The Asturcom network, in Asturias, has been pioneer in the offer of high speed access to subscribers (FTTH). This public owned network started to be deployed in 2005 with a clear intention of bringing economic activity to the region. The network is open, neutral, scalable and structurally separated from the retail market. The clients of the network are the service operators (currently there are 4 companies) which connect to one point of the network to provide final services to their customers. The service operators compete for subscribers and pay an access fee to the network per each of them. The network reaches cities with more than 1 000 population but is not present in big cities. All the investment comes from public funds (“minery funds”).

Some municipalities, as Viladecans, Quintanadueñas and Miguelturra, have taken advantage of the National Plan to boost economy (Plan E) to propose projects for access to the fibre. All

of them are very small towns whose governments argue that private investment will take too long to arrive.

There are two other projects that if come true may acquire a great relevance in the country: the “Broadband Plan 2010-2013” in Galicia and the “Telecable-SOFIEX” project in Extremadura. Galicia’s plan seeks that a million users have Internet connections with speeds exceeding 100 Mb by deploying fibre in those areas that are not profitable for the private sector. The goal is to provide broadband service in 2013 in all villages of more than one hundred inhabitants. Private operators will be responsible for the retail service. In Extremadura it has been announced the intention to carry out a project led by Telecable (a private company) to bring the fibre to 37 cities in the next 10 years and offer services with connection speeds of 100 Mb and 1 Gb. This is a project of public and private participation, including Telecable to 51% and SOFIEX (96.99% owned by the Government of Extremadura) to 49%.

Finally, the Catalan project, the “Xarxa Oberta” will be discussed in detail below.

3 CATALONIA: THE “XARXA OBERTA” PROJECT

Catalonia is an autonomous region of Spain located in the North East of the country. According with the Spanish constitution, Catalonia enjoys an important political autonomy. *Generalitat de Catalunya* is responsible among other things for schools, universities, health, social services, culture, urban and rural development and policing. The region has a population of around 7 400 000 inhabitants, its territory is about 32 000 km² and 63 of the 946 municipalities account for 70% of the population.

3.1 *Motivation and objectives*

The project consists of two sub-projects: the connection to the network of all the sites of the Generalitat (self-provision) and the supply of wholesale services to operators serving the retail market (wholesale access).

1. Self-provision: the Catalan government wants to reach all municipalities (946) with fibre (one connection point per municipality) and then provide the service to 5 843 public bodies. The

sites to be connected include all governmental departments and agencies, sites of the health care administration, primary and higher education institutions, research institutes, museums, libraries and cultural institutes, fire and police service, heritage conservation, environmental protection, etc.

2. Wholesale access: the network operator will provide spare capacity of the network in an independent, non-discriminatory, transparent and neutral way. Under the supervision of the National Regulatory Authority (CMT), access to the backhaul part of the public infrastructure will be open, fair and non discriminatory for all existing and future operators who wish to connect their NGA last mile infrastructures (EC, 2010). The price for wholesale access will be based on average prices for comparable services in more competitive areas and in the absence of a reference offer, these prices will be approved by the national regulator.

3.2 Funding

One issue that worries policy makers when confronting public investment is the public cost of funds. To this respect, leaders of the “Xarxa Oberta” plan argue that Catalonia will invest deploying this network which anyway would have spent on communications services from current operator. Hence, the Generalitat has conducted an estimate of the future needs of connectivity of the public administration and has found that the computed amount would be sufficiently high to justify the building of the own NGN for internal use. The way by which this calculation has been made can be subject of criticism, but in any case, the philosophy of the finance scheme is refreshing. The Catalan Administration avoids to make large initial payments to the firm with the concession (the network operator). In contrast, disbursements will be made on a regular basis, as remuneration for the service it will be receiving with the new fibre network. The network operator will make the investment and will afford operation and maintenance costs. Also, it will yield additional revenues by selling the spare capacity of the network.

Besides, the project involves the utilization of all public infrastructures that may be useful for the purposes of network deployment in order to minimize costs and to ensure an efficient investment. Consistently, there is a compromise to make maximum use of optical fibre networks that already exist in the territory and of available passive infrastructures as ducts throughout the road

and the railway networks managed by the Generalitat. The infrastructure of the municipalities of Catalonia is made available to the project and it is also considered the use (by renting dark fibre capacity) of the infrastructure of alternative connectivity service providers. To know the available infrastructure in Catalonia that can be used to carry out the project, the Generalitat convened in December 2009 a public consultation. Its results allowed to know the availability of infrastructure in Catalonia today and in the next three years, and assess the need for investment so that no to overlap with private initiatives. In particular, no operator declared having any infrastructure or investment plans outside of Barcelona and the provincial capitals.

At the end of the period of the concession, a fully amortized network, scalable and able to withstand all of the corporate services of the Catalan government will be available at a cost of connectivity equal to the cost of operation.⁴

3.3 Tender process

In February 2010 the Generalitat authorized the bidding process to select through an open tender an independent private company to deploy, manage and operate the network, and to provide the final services to the Catalan public administration. In view of the complexity of the project, adjudication has been organized through a “Competitive Dialogue” procedure in compliance with the Spanish Law 30/2007 and Directive 2004/18/EC about public sector contracts.⁵ The procurement process will be implemented through a contract of collaboration between the public and the private sector.

The “Competitive Dialogue” developed in three phases. During the first phase candidates presented applications. In particular, three companies expressed interest in participating: Abertis, Telefónica and a consortium conformed by Axia (Mediapro) and Imagina. Then, the dialogue phase took place. Finally, the third phase involved the following steps: bidders submitted the final offers based on the solution or solutions presented and specified during the dialogue phase. The tenders had to include all elements needed to carry out the project. In this stage the contracting

⁴Responding to a condition that the Commission provides for this type of projects, the Generalitat has included some mechanisms in the conditions of the tender to avoid overcompensation of the tenderer in the event that due to the transfer of public assets, the tenderer gets extra profits higher than expected.

⁵The Competitive Dialogue procedure is very linked with the implementation of Public Private Partnerships (PPPs), for a description and evaluation of it see Burnett (2009).

authority may ask for clarifications, explanations, adjustments or additional information on the bids submitted. Offers are evaluated in accordance with the award criteria announced in the descriptive document. The contracting authority may require the tenderer which has submitted the tender that is considered most advantageous clarification on it, or ratify the commitments contained therein, provided that this would not modify substantial elements of the offer, this would not distort competition nor produce any discriminatory effect.

On September 22, 2010 the “Centro de Telecomunicaciones y Tecnologías de la Información”, the constituted body to integrate all computer and telecommunications services of the Generalitat in a single structure, approved the adjudication of the project to the consortium conformed by Imagine and Axia. This first part of the project has been adjudicated for 95 municipalities, by 253 millions of Euros and for a period of 20 years. Once it expires, the network will be transferred back to the Generalitat.

3.4 The EC Case (DG for Competition)

The “self-provision sub-project” does not intend for commercial purposes and then it falls outside State aid rules. Consistently, that part of the aid in the project was not covered by the EC decision. In contrast, the wholesale “sub-project” has been considered State aid as state funds are used to construct a network for wholesale provision of services on the private market. Moreover, the transfer of the existing infrastructure (currently owned by the Generalitat) to the winning bidder also constitutes State aid.

The Commission’s decision On August 11, 2010 the Commission has approved under EU State aid rules the rollout of the network. The decision is summarized as follows:

- It was established that the project does not comply with the Market Economy Investments Principle because the investment is justified by public interest objectives and then is not guided by profit maximizing behavior.
- The Commission concludes that the project “Xarxa Oberta” constitutes State aid.
- The wholesale “sub-project” is allowed under specific conditions which depend on current

market situation. Four different groups of areas are conformed:

- “NGA white” and traditional “white areas”: this group of municipalities is characterized by no existing infrastructure nor plans for the near future. Basic broadband retail services are also absent here. In this category, no restrictions are imposed on the type of last mile infrastructures allowed to use the excess capacity of the “Xarxa Oberta”.
 - “NGA white” and traditional “grey areas”: this group of municipalities is characterized by the existence of Telefónica’s infrastructure. Basic broadband retail services are also provided by Telefónica. In those municipalities where retail services are offered by Telefónica as a monopoly no restrictions are imposed on the type of last mile infrastructures allowed to use the excess capacity of the “Xarxa Oberta”. In those municipalities where there are active alternative operators (by ULL), the use of the excess capacity of the “Xarxa Oberta” is only allowed to those operators investing in NGA last mile infrastructure.
 - “NGA white” and traditional “black areas”: in this group there is an alternative infrastructure to the one of Telefónica. The use of the excess capacity of the “Xarxa Oberta” is only allowed to those operators investing in NGA last mile infrastructure.
 - “Grey or black NGA” and traditional “black areas”: in the cities of this category (the four provincial capitals: Barcelona, Girona, Lleida and Tarragona) the “Xarxa Oberta” can not be used for commercial wholesale services.
- The Commission considered that the procedure to select the operator that will build and manage the network minimizes the amount of aid involved.
 - The Commission decided that “Xarxa Oberta” meets the compatibility criteria set out in the Broadband Guidelines and hence the aid involved in the project is compatible with Article 107(3)(c) TFEU.

The position of Telefónica Telefónica has shown clear dissatisfaction in relation to the project. The company argued that it could provide the necessary services to the Catalan administration for a cheaper price, but without transferring back the network to the Generalitat at the end of

the project. The firm also alleged there would be distortionary effects on competition and that the new network is unnecessary since a Telefónica's network already exists under conditions of no market failure.

Regarding these concerns the Commission has considered that the conditional access established by the four regions takes into account the existence of basic broadband deployments but also the evidence of certain market failures. Moreover, the Commission evaluated that it is in the discretion of the Catalan public authorities to assess the best way to offer services to the citizens.

4 DISCUSSION

In the following paragraphs the three main features of the “Xarxa Oberta” project are discussed. The analysis may offer some guidelines for future public projects that pretend to extend the NGN in Spain and other countries.

Fighting the Digital Divide. Large coverage of high speed Internet in essential services One of the main issues in telecommunications public policy is to avoid the digital divide. Private initiatives of NGN targets households in populated and rich areas. Then, fibre network will not reach every area even in the medium term. Consequently, many regions will be left behind unless some measures are taken to provide them the services that fibre will allow. Covering all households in a country can be prohibitively expensive for the public sector.⁶ In this sense, a network that reaches all the hospitals, schools, police stations, court offices, public libraries, and every public body, will help to overcome the access divide by giving the population the ability to access to the more relevant services. The main argument is to use the public funds for “giving services to all” instead of “giving fibre to a few”.

Promoting competition. Structural separated, open and neutral network The project is perfectly compatible with EU Broadband Guidelines. From a competition policy point of view a key factor is that “Xarxa Oberta” is designed as an open and neutral network. The operator of the “Xarxa Oberta” will sell the excess capacity to any third operator willing to connect its

⁶Cave and Martin (2010) set the question about whether universal access to NGAs is feasible. They support the idea that such a policy is likely to be disproportionately expensive.

last mile infrastructure in non-discriminatory, transparent and open access terms. The access obligations (which vary geographically depending on the pre-existing level of competition) will be supervised by the CMT, and this selected operator will be vertically separated from the retail business which reduces the regulatory burden. Notice that due to the prohibition of entering the downstream market, the operator will have no strategic incentive to refuse to any other companies the access to its wholesale capacity.

A central question in the debate over the public investment in NGNs is the risk that the public investment may crowd out the private one. However, “Xarxa Oberta” may be a complement more than a substitute for private investment. The wholesale access provided by the “Xarxa Oberta” network may encourage private operators to deploy the last mile infrastructures in areas where investment would have been unprofitable for private operators otherwise. Due to the technological neutrality involved, any retail operator can benefit from the project (provided the category areas set by the Commission).

Investing under severe budget constraints. Public-Private Partnerships and utilization of existing infrastructure “Xarxa Oberta” shows to public administrations an affordable way to make the deployment of NGNs. There are three main elements that facilitate the financing of the project:

i) The project is a public-private partnership (PPP) with the technical operator that obtains the concession.⁷ The Catalan Administration does not make an initial large outlay of money instead it will make monthly payments per each public site connected for 20 years. In some way, the idea is to translate to the telecommunications world, the way in which typically highways are financed. It involves a commitment by the public partner to a stable demand for a long period in exchange of a low rate of return for the private partner. Moreover, the construction firms which are familiar with these finance schemes may hold a competitive advantage in NGNs given that around 70% of the investment is done in civil infrastructure.

ii) The project involves a self-provision of the telecommunication services. Then, it has to be discounted from the investment the payment of such services which would otherwise have

⁷Consequently, this project is other evidence that the public-private collaboration scheme has come to the sector to stay for the next years, as already indicated by Gómez-Barroso and Feijóo (2010). For a revision of the literature on PPPs, see Nucciarelli et.al. (2010). See also the document published by the Commission to promote the formation of PPPs (EC, 2009b) .

been paid to a private operator. Regarding telecommunication services, it is worth to notice that currently there is not a private supply of NGN services in the area covered by the project, and that the basic internet services are provided in a no very competitive environment. However, the PPP project is awarded competitively which ensures an economically advantageous supply. This competition process may attract many telecoms and construction firms since there are no clear entry barriers for this competition process. In short, the model of “Xarxa Oberta” takes the advantage that the competition *for* the market can be more intense than the current competition *in* the market.

iii) The project requires that wherever possible, the new network will use existing infrastructure, whether owned or leased. It efficiently avoids unnecessary and wasteful duplication of existing networks and minimizes the public funding needs. To this respect, the infrastructure owned by the Generalitat will be given in use to the selected operator. The possibility of using all the public assets provides to PPPs a comparative advantage over alternative private initiatives.

5 CONCLUDING REMARKS

A great concern is that countries with strong fiscal deficit, such as Spain, will not be able to invest in NGNs at the level that other countries are investing, something that could generate strong digital divides and affect the country competitiveness. The situation of Spain is aggravated by the fact that the current broadband market is not very competitive which reduces the private sector incentives to invest. On the top of that, NGN investment involves mainly civil infrastructure and then it is a very labor intensive. Therefore, NGN investment may be especially interesting for Spain given its high unemployment rate and its strong construction sector.

In this framework, some public initiatives by Spanish regional governments are arising. This paper analyzes one of them, the “Xarxa Oberta”, which is a model of public- private interplay that can be extended to other regions of Spain and also to other countries. The three main features of “Xarxa Oberta” are highlighted and discussed: i) the project focuses in providing essential advanced Internet services (health, education, etc..) to the population in public sites; ii) the model (approved by the Commission) is based on structural separated, open and neutral network that even may foster investment in last mile infrastructure; iii) the finance strategy relies

on a PPP structure that allows for an affordable financing scheme for administrations with severe budget constraints.

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