

Wholesale Broadband Access to IPTV in an NGA environment: How to deal with it from a regulatory perspective?

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Abstract

Network operators are increasingly competing with triple play offers from cable providers for both broadcast customers and telecommunications customers. In recent years they have invested in IPTV platforms and launched their own IPTV services. This has brought a new question on the regulatory agenda: Shall network operators be obliged to offer wholesale access to their IPTV platform? And if yes, should the new wholesale IPTV product be regulated in the same way as traditional wholesale access? Or should traditional regulation be modified? While the majority of countries have so far no regulatory rules in place, some national regulators have started to become active in this market segment.

In order for alternative network operators to realize multiple play offers including IPTV they must be able to match the offers of the incumbent operators. Such replicability with respect to telecoms infrastructure is in principle no problem as long as regulatory rules on local loop unbundling and related facilities are in place. But what if incumbent operators are neither required to offer unbundled access to their FTTH local loops nor do alternative network operators have access to sub-loop unbundling? It is for this reason that many argue some form of direct access to the incumbent multicast equipment needs to be provided. Otherwise the provision of IPTV services will be restricted to large network operators.

The paper demonstrates that the regulation of wholesale access to IPTV depends above all on country specific conditions. Ex-ante regulation of access to wholesale broadband services over any DSL technology and any transport technology (ATM and Ethernet) in the sense that the SMP operator is obliged to offer a multicast functionality that allows competitors to offer TV services should be bound to a number of requirements: 1) The demand characteristics such as demand for bundled products. A precondition for determining regulatory obligations with respect to the provision of wholesale access to IPTV platforms should be that multiple play offers are the dominant form of providing telecom services. 2) The lack of cable TV operators exerting competitive pressure at the retail level for triple play products. 3) A lack of LLU in the country, so that alternative operators need a multicast WBA access to offer multiple play services.

The paper is organised as follows. The first section of the paper briefly describes the technical and market characteristics of wholesale IPTV access. The second section provides a conceptual framework for the regulation of IPTV wholesale access. The third section will examine regulatory issues concerning access to wholesale IPTV in more detail. The final section will give key recommendations for a regulatory strategy on wholesale broadband access to IPTV.

1 Introduction

Network operators are increasingly competing with triple play offers from cable providers for both broadcast customers and telecommunications customers. In recent years they have invested in IPTV platforms and launched their own IPTV services. This has brought a new question on the regulatory agenda: Shall network operators be obliged to offer wholesale

access to their IPTV platform? And if yes, should the new wholesale IPTV product be regulated in the same way as traditional wholesale access? Or should traditional regulation be modified? While the majority of countries have so far no regulatory rules in place, some national regulators have started to become active in this market segment.

In order for alternative network operators to realize multiple play offers including IPTV they must be able to match the offers of the incumbent operators. Such replicability with respect to telecoms infrastructure is in principle no problem as long as regulatory rules on local loop unbundling and related facilities are in place. But what if incumbent operators are neither required to offer unbundled access to their FTTH local loops nor do alternative network operators have access to sub-loop unbundling? It is for this reason that many argue some form of direct access to the incumbent multicast equipment needs to be provided. Otherwise the provision of IPTV services will be restricted to large network operators.

This paper examines whether there is a need for the regulation of wholesale broadband access to IPTV and if yes, how possible regulatory tools need to be shaped. The paper is organised as follows. The first section briefly describes the technical and market characteristics of wholesale IPTV access. The second section provides a conceptual framework for the regulation of IPTV wholesale access. The third section will examine regulatory issues concerning access to wholesale IPTV in more detail. This will be done by comparing the regulatory approaches of Germany and UAE and the results in terms of IPTV penetration. Thereby it will also be considered to what extent available wholesale broadband access products enable alternative operators to duplicate economically the incumbent bundles including IPTV. The final section will give key recommendations for a regulatory strategy on wholesale broadband access to IPTV.

2 The market for IPTV

2.1 What is IPTV?

Internet Protocol Television (IPTV) is digital broadcast-quality television and/or video signals that are delivered to customers using a broadband connection over Internet Protocol (IP). The ITU (2008, p. 698) defines IPTV as multimedia services such as television/video/audio/text/graphics/data delivered over IP-based networks managed to support the required level of QoS/QoE, security, interactivity and reliability. IPTV has to be distinguished from video streaming over the public Internet viewed on a PC.¹ Different from Internet video streaming which can be used by anyone, users of IPTV (as well as IP addresses and locations) are known by the network operator. In order for customers to use IPTV they need to have a set-top box with a television display (Tadayoni, 2006).² IPTV operates on a different premise than traditional satellite or cable television in that channels are being pushed to the consumer's home on a per-selection basis. Moreover, IPTV provides two-way communication (customer requests a program from the TV guide and the program

¹ The paper does not cover video streaming over the public Internet viewed on a PC.

² The set-top box enables the implementation of additional services such as 'time-shifted' viewing of TV broadcasts, or 'catch-up' viewing if the viewer interrupts a live broadcast programme.

delivers). In this respect IPTV goes beyond traditional linear one-way TV distribution, enabling on-demand services and interactivity. Any type of content (movies, video gaming, etc.) can be distributed on demand, allowing service providers to exactly match customer preferences. Also, IPTV can interact with other Internet services such as Voice over IP (VoIP), enabling consumers services such as having caller ID displayed on their television.

IPTV can be realized via two types of technologies: Multicasting and unicasting (Stetter and Martin, 2009, pp. 8). While with multicasting the broadcasting server only has to output one video stream per broadcast channel, with unicasting the server has to output one stream per viewer. Accordingly the required bandwidth is many times higher in the case of unicasting.³

2.2 Market characteristics

As of today, telecom operators in nearly all countries have started providing commercial IPTV services, usually offered as multiple play bundles of services.⁴ A standard IPTV offer includes a basic package of 50-100 TV channels, extra channels on subscription, plus VoD (i.e. for premium sports) on pay-per-view basis (PPV). Such multiple play bundles are also offered by cable-TV operators. With the upgrade of cable TV infrastructures in recent years, both digital broadcasting and two-way broadband services can be offered via such networks.

For the provision of multiple play bundles a bandwidth of approximately 20 Mb/s is required per household. To make such bandwidth available operators either need to upgrade their copper-based access networks with Digital Subscriber Line (DSL) technology or they roll out Fibre-to-the-Home (FTTH) networks. While fibre has virtually unlimited bandwidth capacity, this is not the case for copper. DSL operators are therefore in the process of upgrading their copper access networks by investing in the roll-out of fibre networks closer to end users (i.e. to the street cabinet: fibre-to-the-curb, FTTC).⁵

While incumbents use their own copper and/or FTTx access networks, alternative network operators (ANOs) have several options to offer IPTV services:

- usage of own FTTx infrastructure if available,
- fully (or shared) unbundled local loops (ULL) access, and
- access to wholesale DSL services (bitstream access), suited to the provision of IPTV (thus requiring multicast functionality in the wholesale broadband access offer).

The latter two options require regulatory rules to be in place enabling access to ULL and/or bitstream.

³ For instance, if MPEG-4 is used as a compression standard for movies, the provision of 50 channels to 200.000 users would require a bandwidth of only 50 Mb/s in the case of multicasting, but 200 Gb/s in the case of unicasting.

⁴ Typically IPTV services are sold together with broadband Internet access and IP telephony using a DSL "router" modem connected between the telephone socket and the set-top box (STB).

⁵ For a household to have a bandwidth of 20 Mb/s the copper distance from the household to the nearest aggregation point should not be more than 1.5 km.

3 A conceptual framework for wholesale access IPTV regulation

A comprehensive regulatory framework of IPTV covers several regulatory areas: traditional TV regulation, network access regulation (including both legacy networks and next generation access networks), content access regulation and regulation of resource organisation in the IP platform.⁶ In this paper the focus will be on network access regulation. As IPTV allows TV and VoD to be transmitted over IP networks new regulatory issues arise in this area: Replicability of incumbent operators' IPTV offers, predatory pricing, bundling, cross-subsidy by alternative operators of their retail prices from fixed PSTN call termination revenues, must-carry obligations, and net neutrality. This paper will focus on replicability.⁷ Thereby, at the wholesale level, two questions arise which will be discussed subsequently:

- Should incumbent operators be required to offer not only unbundled access to copper local loops but also to their FTTH local loops?
- Should ANOs have access to a bitstream access product enabling multicast functionality and thus the provision of IPTV services?

These two questions will be analysed by considering the cases of Germany and UAE. Thereby any regulatory approach to wholesale access IPTV products must meet two regulatory requirements in view of predefined policy objectives to be aimed at: 1) The promotion of competitive telecom markets at both service and network level, and 2) the encouragement of efficient investment in new and alternative infrastructure

3.1 Encouraging competition and investment

The ultimate objective of any form of IPTV regulation is to encourage competition at both the infrastructure and service level. Encouraging the development of infrastructure competition is essential for two reasons⁸:

1. Competition in the supply of network facilities is a prerequisite for the emergence of long-term competition that can be sustained without the need for future regulation. Once there is an alternative infrastructure, there are no barriers to entry for service providers by giving them a choice of network operators. A dominant network operator then cannot control essential facilities and therefore abuse its market power, for instance by charging prohibitive network access rates from its competitors. Conversely, in the absence of infrastructure competition the incumbent retains a monopoly on large parts of the market and ongoing regulatory intervention would be required.

⁶ See Tadayoni et al. (2006) for more information on the different regulatory areas.

⁷ For an overview of the other access-related regulatory issues of IPTV see Thomson, 2006.

⁸ It should be noted that infrastructure competition may not evolve in some geographical areas due to technological or economic infeasibility. Also, from an economic perspective the duplication of infrastructure should be avoided where it is impractical or undesirable. Also the existing European regulatory framework stresses the importance of network infrastructure competition (European Commission, 2008, p. 4).

2. If the focus is purely on service competition, neither the incumbent nor new entrants have an incentive to invest in new infrastructure. This is because the terms and conditions of network access do affect the investment decisions of network access providers. Assuming that prices for network access are set below costs, entrants would not be able to compete in infrastructure markets. While such a regulatory practice might ensure the economic success of new service providers, for example through guaranteed profit margins on retail tariffs, it would not stimulate investment in infrastructure. If competitors know that the incumbent has to provide its network elements at rates where costs are no longer covered, they are not willing to invest in building their own telecommunications networks.

The objective of encouraging investment is particularly important in an environment where new network infrastructure is required at the access level. A precondition for any competition on the market for triple play products is the availability of broadband access enabling IPTV. Any form of IPTV regulation must therefore ensure that incentives for more investment into NGA networks are set. In this context, NGA investment challenges are

- making possible penetration pricing strategies without running into margin squeeze problems,
- achieving a symmetric distribution of loss during the penetration phase, and
- allowing (retail) pricing flexibility for a faster recovering of the investment costs.

To sum up, when introducing regulatory provisions on network access related to the provision of IPTV such rules need to be assessed in view of the two goals referring to competition and investment. In other words, any future regulation should be shaped in a way that it supports sustainable infrastructure competition.

3.2 Retail and wholesale markets

With the coming up of IPTV a new market may arise at the retail level: The triple play market for fixed telecom services, Internet access and TV services. Thus, when considering the regulation of wholesale access to IPTV platforms, it must be analysed to what extent the triple play market has already emerged as a separate retail market. If this is the case and significant or joint significant market power (SMP) can be identified, wholesale broadband access for the provision of IPTV services may need to be regulated. Yet, should cable TV operators and telco network operators both offer high speed broadband access to customers retail price competition for all three services can be expected to sharply increase due to more intermodal competition.

This is particularly true for broadcasting services. The expansion (diffusion) of IPTV services fosters competition on TV markets (Tadayoni et al., 2007). Originally broadcast services were delivered via terrestrial, satellite and cable TV networks. With the development of an IPTV market as a new platform for TV services, competition on the broadcast market increases. This is especially the case in regions where in the past only one TV platform has been available to consumers. Moreover, an IPTV platform increases the quality of broadcast

because different from traditional broadcast TV IPTV platforms allow for the delivery of HDTV. Last but not least, also the value of broadcast services becomes higher in the case of IPTV (Tadayoni et al., 2006). Due to its interactive component the value for users is higher, i.e. by enabling them to use content when they want or by making additional content available.

As to telephony services and broadband internet access the effect on competition is twofold. On the one hand the emergence of IPTV services increases the pressure on cable TV operators to upgrade their networks. To keep their TV customers they must be able to provide triple play services. This in turn increases competition on the markets for telephony services and broadband internet access. On the other hand, alternative network operators may not be able to duplicate the IPTV offer of incumbents. As a result they may lose customers wishing to have triple play bundles.

It is for this reason why, at the wholesale level, the market for broadband access needs to be considered because the provision of IPTV services requires some form of broadband access. As has been mentioned above this covers both ULL access and access to wholesale DSL services (bitstream access). A minimum regulatory intervention would require incumbents to offer multicast functionality in its wholesale broadband access offer to allow competitors to offer multiple play services. This would require that the router near the customer premises could replicate TV channels. This minimizes wholesale partner's costs for transporting content through the wholesale providers transport network. Regulatory obligations to provide such multicast are not unusual but also not standard. Germany and recently Belgium are examples of Jurisdictions that impose multicast obligations on Incumbents.

However, a regulatory remedy to provide multicast functionality does not necessarily enable competitors to provide profitable triple play offerings: Proprietary middleware providers like Microsoft charge relatively high fees – independently from the number of subscribers of a particular platform. Moreover, smaller competitors usually can not realize economies of scale when purchasing settop boxes. Content providers might also not be prepared to spend the time negotiating with small providers from which they stand to gain little revenue. This problem can be overcome with a fully fledged wholesale offering of IPTV services⁹. The following figure shows the typical division of labor resulting from a wholesale IPTV offering:

⁹ Wholesale-IPTV picture is gloomy in Eastern Europe 03 February 2011, Stephen Wilson

Task	Wholesale Provider	ISP
TV content negotiation	✓	✗
Content encryption	✓	✗
Acquiring broadband subscribers	✗	✓
TV provisioning, e. g. service activation	✓	✗
Purchasing settop boxes	✓	✗
End billing to customers	✗	✓
First-level support help desk (network maintenance)	✗	✓
Second-level support help desk (TV service maintenance)	✓	✗

Note: The table is based on the division of roles in Vestitel's wholesale Tivia IPTV platform. Source: Informa Telecoms & Media

An obligation to provide fully fledged wholesale IPTV is however inappropriate as above mentioned obstacles for profitable triple play products relate to Economies of Scale and to the size of the operator. With such an obligation a regulator would therefore protect an unviable business model instead of removing anti-competitive market failures. Fully fledged wholesale IPTV offerings will emerge if commercially viable – for example in Hungary. Instead regulators should limit intervention to access related bottlenecks which leaves content and settop boxes provisioning out of the obligation. Such a regulatory obligation to provide wholesale IPTV is currently imposed in the U.A.E.

4 Country experience in regulating wholesale IPTV access

4.1 The German IPTV market

As of today the majority of households in Germany have a broadband connection. By mid-2011 the number of broadband connections reached 26.6 m (increasing from 25 m at the end of 2009) and thus 66.3% of all households. The share of alternative operators has been 54%. Most of the broadband connections provide between 2 Mbit/s and 10 Mbit/s of downstream bandwidth (41.7%) and are therefore not suited for the provision of IPTV services. So far, only approximately one third of broadband connections offers (downstream) rates exceeding 10 Mbit/s. (6.3% more than 30 Mbit/s) BNetz AG (2011a, p. 36).

Accounting for almost 88 percent of broadband connections, DSL continues to be the dominant access technology, followed by broadband connections using the cable TV infrastructure (the number of operational DSL lines totalled 23.2m). The latter recorded significant growth rates in recent years (from 2.3m in end 2009 to 3.2m in mid 2011). Cable TV networks with back channel capability have developed into a real alternative to the traditional fixed-line network in recent years; this applies in terms of both price and technology. The rapid upgrading of this infrastructure enabled 24m households to access the Internet with bandwidths of up to 120 Mbit/s at the end of 2010 (BnetzA, 2011b, p. 80). The number of 3.2m households realising broadband connections via cable TV infrastructure

suggests that cable TV operators are successful in competing with telco operators for broadband customers. Given annual growth rates of 30% and more this access technology is becoming ever more important and thus increases the intermodal competition on the broadband market.

Out of 23.2m DSL lines 12.1m broadband connections were provided by the incumbent DTAG and 11.1m by competitors. When looking at different types of wholesale access one can observe that local loop unbundling (LLU) continues to be by far the dominant access form. In mid 2011 this wholesale product was used for some 9.2m DSL lines supplied by competitive providers. In contrast DT AG's bitstream product which is offered since July 2008 has stagnated at a level of 0.8m customers since end of 2009. This is a striking feature of the German telecommunications market where LLU is offered since 1998: Competitive DSL providers' demand for wholesale services has always been dominated by LLU. Also, competitive DSL providers' demand for wholesale services has increasingly shifted away from DT AG's resale offer. By mid 2011 the product was used for some 1.1m DSL lines supplied by competitive providers, down from 1.4m at the end of 2009.

As to the retail market for IPTV, in mid-2011 only 2.7% (about 1.4m) of all TV-households were IPTV customers (BnetzA, 2011a, p. 82). The low number of subscribers is despite the fact that between October 2006 and July 2009 Deutsche Telekom reduced the price for its triple play bundle by more than 43% from 80.84 € to 44.95 € (Stettner and Martins, 2009, p. 32). The large majority of households (1.3m) were IPTV customers of Deutsche Telekom. The two other network operators with significant numbers of IPT customers were Telefonica (80.000) and Vodafone (25.000) (IPTVtoday, 2011). One important reason why IPTV plays a rather minor role on the German broadcast market is that although nearly all German households have at least potentially broadband access, there is only a small share of households where the bandwidth is sufficient for the provision of IPTV. Thus significant more investment in the upgrade of network infrastructure is required in order to make the access network fit for the provision of IPTV services. Yet, there are also other reasons for the low penetration of IPTV services. For instance, most households traditionally have the choice to consume broadcast services from different platforms: cable TV, satellite TV or terrestrial networks. Moreover, the German TV market is rather saturated and the willingness to pay is rather low due to a large number of high quality free-to-air-programs and rather low prices for the transmission of these programs (Stettner and Martins, 2009). Unless households truly recognise the additional value of IPTV it will remain difficult to stimulate demand at a large scale.

4.2 The IPTV market in UAE

The broadband telecom market in the UAE has shown significant growth in recent years. Broadband household penetration has grown from 42.2% in 2007 to 112% in September 2011. The growth of the United Arab Emirates' mature broadband market was driven the expats community and their demand for IPTV and other high-bandwidth services. Total Broadband subscriptions reached 842,258 at the end of 2011 from 241,000 at end 2006 (Informa 2009, p.149; Telegeografie 2011, p.1).

While ADSL is currently the most popular broadband access method in Germany, UAE, where take up is driven by one of the highest incomes per capita in the world, has embarked on ambitious fibre or hybrid fibre network rollouts. It is expected that soon the majority of households will be connected via FTTH. Different from the situation in Germany there is no cable TV network in UAE¹⁰

Triple-play packages consisting of voice telephony, broadband and IPTV over fibre-to-the-home (FTTH) infrastructure were offered by Etisalat in May 2010. This rather high priced bundle is available to all homes connected to the FTTH network. As an answer Du invested heavily in upgrading its IP-based core network to 40Gbps in the first half of 2009. This made higher internet speeds as well as high-definition IPTV and video on demand offering feasible. Du's in turn offered double- and triple-play packages in August 2010 and started to heavily undercut Etisalat's prices. However coverage is limited and hence competition is still very low.

Local loop unbundling as well as bitstream access is still to be implemented in the UAE. Both players do until today not agree on implementation of unbundling and bitstream Access. While Du claimed not being able to address over 90% of the market, Etisalat saw itself unable to address the free economic zones. Negotiations on bitstream access and local loop unbundling started in 2009 and in March 2010 an agreement has been announced which foresaw that Du was allowed using Etisalats fixed line infrastructure starting from the second half of 2010.

However, in 2010 the regulator announced that technical issues will delay the implementation to 2011. A trial bitstream service with selected customers finally started in July 2011, focussing on the provision of high speed internet, business VPNs and fixed line voice services. Both operators intend to extend their bitstream agreement to include IPTV services at a later stage, when a number of commercial and technical requirements are aligned. A nationwide launch of the service is still to come.

4.3 IPTV regulation in Germany

In Germany comprehensive regulatory provisions (including cost-based prices) on LLU are in place since day one of the liberalisation of the German telecom market, 1st January 1998. As a result competition on local telecom markets has been far more rapid in Germany than in any other European country. By the end of 2000 Deutsche Telekom had already concluded 97 agreements on ULL access (Fredebeul-Krein, 2002). Ten years later, by mid-2011, more than 9m LLU lines were rented by competitors of Deutsche Telekom, more than in any other European country.

In view of future NGA networks BNetzA adopted on March 21, 2011 its final decision on regulatory obligations imposed on Telekom Deutschland with respect to the physical network infrastructure access market (market 4/2007), including LLU. While BNetzA originally intended to extend the existing regulatory obligations of cost orientated ex ante price control

¹⁰ There is only one small cable TV company in UAE, called E-Vision. It's owned by Etisalat, the incumbent operator.

for unbundled access to fibre loops, it finally decided that fibre unbundling can be subject to a more relaxed price control than unbundling of copper loops. BNetzA would only intervene ex post in cases of abusive pricing. The rationale for this decision was that competition from cable networks will prevent Deutsche Telekom from charging excessive rates for access to its newly built fibre loops. German cable network operators cover already 30% of German households with DOCSIS 3.0 and will cover about 60% this year. Telekom plans to cover about 10% of German households with FTTH or FTTB. The European Commission criticised the draft as not being fully aligned with the NGA recommendation (EU-Com, 2011). In particular, the European Commission did not agree with BNetzA's proposal to relax price control for fibre unbundling. Whereas BNetzA found it sufficient to intervene only ex post in cases of abusive pricing, the Commission insisted on applying ex ante price control based on cost orientation.

Another regulatory decision has been taken on wholesale access via bitstream, a product which is offered by Deutsche Telekom since 2008. While originally only ADSL products were to be offered via bitstream access, BNetzA is now of the opinion that broadband access products based on VDSL are substitutes to ADSL at the retail level and correspondingly also at the wholesale level. Therefore, in late 2009 BNetzA published a draft of its market analysis and regulatory order on broadband access, including VDSL in the scope of market 5/2007 as determined by the European Commission. While the market covers all DSL infrastructures, including VDSL (based on FTTC or FTTB), it does not include bitstream products based on pure optical fibre infrastructures (FTTH).¹¹ Thus bitstream access enables competitors to market all types of DSL lines established by DT in their own name.

In its first round analysis BNetzA distinguished between two separate sub-markets for bitstream access: at layer 2 with handover at ATM level and bitstream at layer 3 with handover at IP level (Cullen International, 2011). This was in line with the corresponding two retail markets: A mass market for broadband connections (based on wholesale products with handover at IP level) and a premium market with higher quality retail products (based on ATM wholesale products). Having designated DT to have significant market power (SMP) in both sub-markets,¹² BNetzA proposed to impose on DT similar regulatory obligations as those already in force. Under the draft regulatory order, DT is obliged to offer bitstream access under non-discriminatory conditions. As far as prices are concerned, BNetzA considers ex post price control, together with an obligation to notify bitstream prices two months in advance, as sufficient.¹³ An intervention is foreseen only in case of abusive pricing (margin squeeze tests). This ex post price regulation is a first step towards easing control. According to German law this means that prices do not need to be cost oriented and that BNetzA only intervenes in case of abusive pricing.

¹¹ BNetzA considered that FTTH networks are no substitutes because FTTH networks are more difficult to deploy due to higher investments and needed approvals by building owners.

¹² The designation of SMP was based on a variety of indicators: DT's high market shares (between 70% and 80% in both sub-markets), control of infrastructure not easily replicable, low potential competition, vertical integration and low countervailing buyer power.

¹³ This is in contrast to a BNetzA decision in June 2009 where ex ante price control based on cost orientation was reintroduced for IP level bitstream access following a court ruling.

In May 2011 the NGA forum, a high-level group hosted by BNetzA to discuss NGA issues, identified key characteristics of the new layer 2 wholesale broadband access (WBA) product. The product would be more flexible than the current WBA product, which is based on IP (layer 3). Five months later, in October 2011 the NGA forum agreed on the technical specification for the layer 2 (Ethernet) WBA product (NGA Forum, 2011). The specification covers among others the technical and operational interfaces, along with the key business processes necessary for interoperation:¹⁴

- The technical specifications are neutral in terms of access architectures and technologies (i.e. technical interfaces are based on FTTH, FTTB or FTTC networks). They set out the basic structures, models, protocols, parameters etc for interoperation. At the customer side, handover can be based on VDSL (over copper loops) or ethernet (over fibre, cable, or copper loops). The product will support four classes of quality of service in the downstream and two classes in the upstream.¹⁵
- A comprehensive document with several annexes defines the operative processes: ordering, provision of the access line, fault recovery, change of service parameters and cancellation of the contract. They aim to offer NGA operators and providers of end customer NGA products with descriptions of the processes needed for cooperation in wholesale products that are uniform and as simple as possible. Additional requirements will enable multicast services which can be used by IPTV applications.

To sum up, on both access products, fibre unbundling and the new layer 2 WBA product BnetzA imposed a more relaxed price control than on established wholesale access products. The decision to intervene only ex post in cases of abusive pricing takes into account the need to encourage investment in the roll out of NGA networks.

4.4 IPTV regulation in the UAE

In the UAE, competition within the fixed line market is weak given the relatively late launch of market liberalisation. Neither has the fixed telecom market been fully liberalised, nor is comprehensive wholesale regulation in place. There are two broadband service providers in UAE – Etisalat and Emirates Integrated Telecommunications, known as Du. These two operators are the only ones having been granted a Telecoms license which is required to supply broadband internet access. While Etisalat provides nationwide broadband access, Du currently provides fixed broadband services only in the free economic zones. In theory an interconnection agreement between both competitors enables Du to offer DSL services via unbundling of Etisalat's exchanges. Yet, in practice alternative operators do not have the option to rent unbundled local loops. Moreover there are currently negotiations over bistream Access products. Until now however in reality cooperation is limited and the operators concentrate largely on their own traditional geographic areas.

¹⁴ It is not within the mandate of the forum to discuss pricing issues.

¹⁵ Detailed parameters (for frame delay, jitter and frame loss ratio) are not defined in the specification, but will be agreed in service level agreements.

Even though IPTV is a comparatively new product in the UAE it is an important component of any telecom service package offered by service providers. According to information from operators about half of residential broadband customers have acquired IPTV as part of a 'bundled' broadband package. If alternative operators were forced to offer a bitstream-only broadband service without IPTV they would most likely not attract customers. In other words, alternative operators cannot compete effectively in the broadband market without an IPTV offering. Such foreclosure of competition would be detrimental to the future development of the broadband market in the UAE.

Since IPTV is a key component of multi-play service offerings, typically together with bitstream-based broadband services, it is vital to effective competition that the interconnection pricing for IPTV is set at an appropriate rate. In view of promoting service based competition in the UAE telecommunications sector the Telecommunications Regulatory Authority (TRA) in 2010 has mandated upon the incumbent Etisalat the introduction of a Bitstream Access Service. Following this decision, in late 2010 the TRA determined interconnection charges for Bitstream Access Services. Given that cost-oriented charges were not available in the UAE, prices to be applied from 1 July 2011 were based on international benchmarks (TRA, 2011). The decision also included prices for the delivery of IPTV over bitstream access. The TRA hence imposed the obligation of offering wholesale IPTV services corresponding to a white label wholesale offering excluding IPTV content. This obligation exceeds the pure multicast offering. This decision can be understood as an answer to the still very limited infrastructure competition in the UAE: In order to enable a competitive service offering - i.e. triple play bundles - Du must be enabled to use the entire Infrastructure of Etisalat's network. As to the pricing of Bitstream Access being used for the provision of IPTV, the TRA applied an additional mark-up on the monthly rental charges to allow a contribution towards the incremental cost associated with the extra capacity used on the core network. As to the cost based methodology for the calculation of IPTV channel costs the TRA decided that the relevant IPTV mark-up should be calculated using a retail minus 15% approach. In doing so the TRA fixed an IPTV mark-up of AED 0.31 per channel per Subscriber per month to be levied by an Access Provider to an Access Seeker who is providing IPTV services to its Subscriber through the use of the Bitstream Access.

5 Lessons for IPTV regulation

As of today, IPTV has become a substitute for other forms of broadcast transmission and cable TV networks have become substitutes for IPTV networks. This has an important effect on the retail markets of both TV services and telecom broadband services. By adding an additional IPTV platform to the established broadcast platforms IPTV increases competition on the TV market. The fact that cable TV operators increasingly compete with telco operators for the provision of telecom broadband services also increases competition on this market. Yet, if triple play bundles are to be considered as a separate retail market, competition may also be negatively affected with the upcoming of IPTV. This is because alternative operators may no longer be able to offer competitive bundles in the retail market. In such case there is a need for wholesale access regulation to IPTV platforms.

The economic rationale for the regulation of wholesale access to IPTV is to ensure that operators with a dominant market position cannot abuse their market power. In doing so, regulators pursue two objectives. On the one hand they need to actively encourage investment to replicate socially desirable investment levels. On the other hand regulators need to foster competition at both network and service level. Both objectives might be achieved by a regulatory framework based on clear and transparent regulatory requirements supported by technical interfaces that achieve the regulator's statutory duties and objectives.

The two country studies of Germany and the UAE have demonstrated that the regulation of wholesale access to IPTV depends above all on country specific conditions.

- What are the demand characteristics such as demand for bundled products?
- Is there already competition on the market for TV services?
- Are alternative network operators able to build their own IPTV platform?
- To what extent is an NGA infrastructure already available?
- Which other forms of wholesale access are available?

Ex-ante regulation of access to wholesale broadband services over any DSL technology and any transport technology (ATM and Ethernet) in the sense that the SMP operator is obliged to offer a multicast functionality that allows competitors to offer TV services should be bound to a number of requirements:

- The demand characteristics such as demand for bundled products. A precondition for determining regulatory obligations with respect to the provision of wholesale access to IPTV platforms should be that multiple play offers are the dominant form of providing telecom services. Once multiple play offers including IPTV become the established product service providers not being able to offer IPTV will be at a competitive disadvantage. As a result retail markets for traditional telco products (fixed telephony, Internet access) become less competitive.
- The lack of cable TV operators exerting competitive pressure at the retail level for triple play products. It may be the case that cable TV operators compete only in some regions whereas in other regions they are not present. In such case a differentiated regulatory approach based on the definition of regional submarkets may be appropriate.
- A lack of LLU in the country, so that alternative operators need a multicast WBA access to offer multiple play services. In case the offer of LLU-based telecom services is not an established business model a further LLU deployment is not likely because incumbents are about to close local exchanges.

As part of our analysis we have demonstrated that in countries such as Germany with comprehensive regulatory rules for access to LLU, alternative operators are able to freely enter the market and compete with the incumbent on equal terms. If, in such a case, new regulatory rules are introduced in view of encouraging service competition the negative

consequences are at least twofold: Not only will network operators be discouraged to invest in the roll out of new NGA infrastructure but also existing ANOs must fear to be driven out of the market. Moreover, operators are able to agree upon specifications for wholesale access without regulatory intervention. This is because given that many alternative operators offer traditional telecom services (voice telephony, internet access) to their customers, they are subject to competitive pressure by cable operators which are able to offer more attractive triple play products. If the incumbent is not willing to enable ANOs to replicate the triple play product he is about to lose not only the retail revenue but also the wholesale revenues.

Regulatory requirements are different in countries where neither fixed telecom markets have been fully liberalised, nor comprehensive wholesale regulation is in place. The case of UAE has shown that there might be country specific characteristics which require regulatory rules on wholesale access to IPTV platforms. If not there will be negative consequences for competition on retail markets. Moreover, it is hardly possible to quickly adopt comprehensive regulatory rules for the wholesale market LLU. Both the establishment of such rules and its implementation are time consuming processes requiring substantial resources. It might be the case that such implementation takes several years in a country. Against this background it is unlikely that highly competitive retail markets on a broad scale will develop in the short run. Some other form of wholesale access to IPTV is then necessary. This is particularly important, when IPTV is an important component of any telecom service package offered by service providers.

The **type of wholesale access regulation to IPTV platforms** depends on the extent of competition in the triple play market. As the market becomes increasingly competitive (also due to cable TV operators) the level or scope of regulation in the market for wholesale broadband access should be reduced proportionately. Therefore, the level of price (or any) regulation should be inversely related to the degree of competition. Based on the findings of the market analysis of relevant markets, a regulator may switch from an ex-ante price regime based on cost-orientation to an ex-post price regime. It is a transparent step which has been applied by many regulators in the world. Also, the regulator may adapt a softer approach and define remedies whereas compliance with these remedies would be controlled ex-post.

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