



Document de travail

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Why and how should innovative industries with high consumer switching costs be re-regulated?

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Abstract

The existence of costs to consumers to switch between products is central to the process by which firms set prices. Their effect on the introduction and diffusion of innovative technologies is not by now well understood, however. This paper aims to study this effect based on evidence in the broadband Internet industry. We discuss the movement of deregulation implemented since the early 2000s in France and the potential impact consumer switching costs may have had on it. We argue the existence of a cost to consumers to switch between connexion technologies may impede the expected beneficial outcomes of self-regulation through competition in liberalised innovative industries as it has been implemented so far in several countries. This is illustrated by providing a discussion of the low penetration rate of cable in France possibly due to the high cost to retail consumers to switch their DSL modems which, in returns supports the domination of this latter. These results suggest that retail broadband Internet markets may need some sort of re-regulation, including new principles for competition policy, to avoid the unwanted effects of consumer switching costs.

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1 Introduction

This paper deals with recent debates on the impact of deregulation in the information communications industry, including new arguments promoting re-regulation based on institutional and other approaches (Richards, Foster and Kiedrowski, 2006; Alleman, 2005). While most of the contributions on the subject focus on wholesale markets, retail price control and access prices, we explore the question of deregulation and re-regulation by addressing the role played by consumer switching costs (see Farrell and Klemperer, 2007, for the most recent and comprehensive survey on consumer switching costs) between Internet service providers (hereafter ISP) and their Internet connexion technologies. Unlike the common wisdom these costs are likely to be high in broadband Internet thus raising the question of self-regulation as the most profitable means of market functioning. In this paper, switching costs include transaction costs, contractual (artificial) costs, and technological costs. The approach will thus be different from an institutional approach *à la* Williamson (1975, 1985, 2005), yet complementary in the attempt to emphasise the costs created by relationship-specific assets for a buyer who changes suppliers (Spulber, 1999, Ch. 3; Farrell and Shapiro, 1988), and to measure them such as in Wang (2003), Wallis and North (1986).

Empirical and econometric evidence in retail markets of several network industries opened up to competition where buyers and sellers bind themselves by contract suggest the existence of significant consumer switching costs. Their effect on the decision by firms to sell differentiated products is well understood (see e.g. Gerlach, 2004 and the references therein). Only a few economic studies have shown the potential impact of those costs on the introduction and choice by consumers between ISPs and innovative Internet connexion technologies, however.

Our objective in this paper is to study this impact, more particularly with regard to the roles of regulation and competition policies based on evidence in the innovative broadband Internet retail markets. As regard empirical evidences in France and in other European countries there is a strong adoption of Internet but technological inertia favours the dominance of a single technology, Digital Subscriber line (hereafter DSL) that is the technology offered by the incumbents that also occupied a dominant position in related markets (fixed and mobile telephony). We decided to focus on broadband Internet in France as a case in point where one firm, France Telecom, still dominates the market both in terms of the shares of serviced customers and technology supplied, namely DSL.

In the following section, we group a description of retail broadband Internet and how it has been regulated so far. We emphasise the limit to today's competition and regulation policies in this and innovative industries in general when consumers have switching costs. In section 3, we show why the existence of high levels of switching costs is very likely to impede the expected beneficial outcomes of self-regulation, more particularly the costs associated with switching between technologies to access the Internet (modems). Consequently, we argue in section 4 that retail broadband Internet markets may need some sort of re-regulation to avoid the effects of consumer switching costs on the diffusion of cable or new technologies. Obviously, any action to reduce switching costs should be taken by the relevant institutions, provided the benefit to society can be expected to outweigh its costs (including the cost of taking such action). Not only an accurate measure of switching costs but also of market intervention are necessary, which will be discussed in that section. We show why and how broadband Internet retail markets should be re-regulated. For instance, competition policies should not only focus on prices *ex-post* of some lock-in and on product compatibility but also on how well informed consumers are about the different available technologies. Gans and

King (2001) already examined a similar issue in the case of local number portability by showing that the costs customers face in changing phone numbers can be reduced by market regulation. From a policy perspective, the present paper also emphasises that the existence of consumer switching costs in innovative industries reinforce the importance of competition and regulation policies co-existing while having separated roles. We conclude in section 5.

2 Limit to today's regulation and competition policy in innovative industries when consumers have switching costs

In the info-communications industry, and especially in broadband, there is currently a debate on whether competition policy has to replace regulation, or whether a co-existence is required. The replacement thesis is largely dominant, however. For instance, important contributions such as Shelanski (2005) and Waverman (2006) provide a list of critics on the conventional monopoly regulation in the United States, and suggest that the time is right to shift from a regime of *a priori* rules governing incumbent-form conduct to a regime of *ex post* competition law enforcement. Alleman and Rappoport (2005) and Cave (2006) emphasise the fact that policy makers misread (recent) economic theory including dynamic models or game theoretic ones and use thus an inappropriate background regulatory model. Finally, in these contributions, the prohibitive cost of regulation is advocated as a major reason for deregulation, although no definition or evaluation of this cost is provided.

The co-existence thesis appears in this context as an exception with however strong arguments in the specific field of broadband in Papacharissi and Zaks (2006) for maintaining regulation on open access, pricing plans and innovative content. We can also find in Stelzer (2006), appearing in a collection of essays prepared for the UK Office of communications

(Ofcom), a list of regulation and competition rules to stimulate R&D innovation in the information communications industry. Finally, focusing on the consumer agenda in the Ofcom collection of essays as well, Mayo and Cullum (2006), stress that pro-active regulatory action is to be reinforced to sweep away consumers' barriers to switching between companies and promote an informed choice. This includes enabling consumers to share their experiences of different companies, so that those who deliver good products and high service standards benefit, while those who don't lose out. More largely, what is promoted is publishing information on companies' performance on a kind of co-regulation mode involving consumers' associations. In this view, largely in opposition with the former view, the potential gains of re-regulation are supposed to be substantial compared to costs. However, elaborating a strict benefit-cost test is always difficult in a situation where uncertainties in the estimates can be significant and hard to quantify (Hahn, 1998; Harrington, Morgenstern and Nelson, 2000). Even in the simpler case of *ex post* calculation, the definition of baselines is somewhat arbitrary, depending on the analysts' beliefs about what would have happened without regulation. In other words, regulatory costs estimates can hardly escape being to some degree hypothetical.

While these contributions emphasise the issue of innovation, on the one hand, and the existence of consumers' switching costs, on the other, they do not address the coexistence thesis in a context where the industries are both innovative and characterised by high consumers' switching costs between competing firms. The reason why we support this coexistence thesis is that since high consumers' switching costs do exist and can be measured in innovative industries like broadband, purely self regulated situations – even based on strong competition policy principles – may lead to inefficient outcomes.

The former regulatory framework (the “1998 package”, see Cave, 2004) focused predominantly on *ex ante* price control. Three specific measures were designed:

- control of retail prices. This control is considered as necessary only when the historical operator exercises market power at the retail level and when, in the absence of retail price controls, customers will be significantly disadvantaged. Member states have historically fulfilled this consumer protection function;
- universal service obligation (hereafter, USO). Governments have typically imposed a universal service obligation requiring the historical telecommunications operator to provide service to all parts of the country at a uniform price, despite the presence of significant cost differences;
- control of access prices. In order to keep all subscribers connected with each other in the presence of competing networks, operators require access to one another’s networks to complete their customers’ calls. This requires a system of inter-operator wholesale or network access prices. Especially in the early stages of competition, entrants require significant access to the dominant incumbent’s network, and this relationship almost inevitably necessitate regulatory intervention. As infrastructure is duplicated (at different rates in different parts of the network), the need for direct price regulation of certain network facilities diminishes. The interconnection directive (97/33) requires that charges for interconnection follow the principles of transparency and cost orientation.

The implementation of these three sets of measures was not exempt from critics. The controls of retail prices often lead in practice to the situation where, under monopoly conditions, tariffs were seriously unbalanced with respect to cost. On the USO, results were also much debated. Firms entering the market without such an obligation had a strong incentive to focus on low

cost, profitable customers, putting the USO obligation at a disadvantage. In the meantime, the incumbents could use this USO obligation as an argument against entry. On the control of access prices, transparency implied the publication of a reference interconnection offer. As a corollary, operators with significant market power (hereafter SMP) – defined as 25% share of a prespecified national market – were required to keep separate accounts for their wholesale or network activity and for other activities, including retailing. Finally, cost orientation turned out to be an excessively vague phrase, permitting excessive interconnection charges.

These critics and difficulties of implementation, together with the fact that the information communications has begun over time an increasingly competitive market with a high degree of technological and market convergence, have generated in 2002 the new EC Directive for a common regulatory framework on electronic communications and services.

The new framework, implemented in most of the European Community (hereafter EC) countries in 2004, suggests the predominance of competition law over regulation rules. The issues of the market definition and the analysis of dominance are thus central. Market definition involves the application of the Hypothetical Monopolist Test that identifies the smallest set of goods and services with the characteristic that, if a firm gained control over them, it would be able to raise prices by 5 to 10% over a sustained period, normally taken to be about a year. The firm's ability to force through a price increase obviously depends on the extent to which customers can substitute the good or service in question (demand substitution) and the extent to which its firms can quickly adapt their existing productive capacity to enhance supply (supply substitution). Dominance is characterised both at the level of an individual firm and colluding firms. Single firm dominance is based on the calculation of a

Lerner index as a proxy for market power, with additional reference to market shares, relative position of competitors, existence of entry, power of suppliers and buyers.

The implementation of such self-regulation policies raises major concerns for innovative industries and especially for broadband Internet. Let us consider facts, first. Looking back on what occurred in the industry over the last few years, we note that anti-competitive decisions have never had by themselves the efficient outcomes they were intended to produce. At the end of November 2001, FT had 90% of the French market for ADSL Internet access. The EC sent FT a Statement of Objections on 21 December 2001 on the ground that the preliminary DSL Internet access services were currently being charged below cost. The EC finally adopted a decision against FT (July 16 2003) for abuse of a dominant position in form of predatory pricing in ADSL based Internet access services for the general public. The anti-competitive decision on FT in 2003 is a specific example of the implementation of the new regulatory framework, with a market share well above the SMP, and using this position to charge predatory prices. In terms of market shares, in 2004 the incumbent France Telecom was leader (47.2%), ahead of same-technology providers AOL (7.5%), Neuf telecom (7.0%), Alice (6.0%), Tele 2 (4.7%), Cegetel (3.9%) and Club Internet (3.3%). Iliad/Free, the sole Wifi provider, was at 16.9% (for a detailed presentation of broadband in France and Europe, see Krafft and Salies, 2008). In 2006, and despite the new regulatory framework dedicated to stimulate competition, market position of major actors have not evolved significantly, although some estimation tend to show that the domination of France Telecom has increased over time. Some sources (Xitimonitor.com) evaluate in December 2006 the position of France Telecom at 48.6%, followed by Iliad/Free (20.3%), Neuf (10.1%), Alice (5.4%), Club Internet (4.6%), Noos (4.1%), Aol (4.0%) and Tele 2 (1.2%).

Broadband access and services appear to be a specific field where incumbents attempt to dominate new markets. The political goal of increasing the penetration of broadband Internet has allowed incumbents to provide their own DSL services at low, or even predatory, retail prices, which has kept new entrants out of the broadband Internet market (Buigues, 2004). Joint firm dominance is also at the core of the new framework with the detection of both structural factors favouring collusion (including concentration, entry, cross participation between competitors, regularity and frequency in interactions, power of suppliers and buyers, demand growth and elasticity, product differentiation, symmetry between competitors, multi-market contacts), as well as behavioural factors (strategic use of transparency in prices and exchange of other information through public and private announcement). The 2005 anti-collusion decision on Orange, SFR and Bouygues in the mobile industry reflects this joint firm dominance procedure. However the fact that these companies have been condemned for collusion in November 2005, has not refrained them to charge common and excessive prices in roaming (operators charge consumers a price for international calls €1.30/minute while the cost is €0.12/minute), involving an emergent debate on the necessity to reintroduce *ex ante* regulation in this industry.

Let us now consider the assumptions behind self-regulation. In innovative industries, they do not necessarily hold, particularly where high consumers' switching costs are present. Therefore, self-regulation may generate pervasive effects for several reasons:

- firms are indeed heterogeneous: they are differentiated by switching costs between functionally different products (for example, cable and DSL modems are different connexion technologies, for DSL comes with a free self-installation kit whilst cable is installed by a professional installer) and not only by switching costs for functionally

identical products (even in the market of DSL consumers only, each ISP provides its own modem that may not be redeployable in the sense of Williamson; see our Section 3);

- if regulation and competition policies neglect switching costs, then reluctance by consumers to switch suppliers can lead to sub-competitive outcomes (see Waterson, 2003 for evidences in several retail markets including non-innovative ones). Further measures to stimulate competition may not bring more innovation, altering both productive efficiency in the short run (exit of potentially efficient competitors), as well as dynamic efficiency in the longer run (elimination of higher quality / cheaper price emergent offers).
- *ex post* (competition policy) sanctions often occur too late and the long run evolution of the industry may be altered since inefficient outcomes may persist after the anti-competitive decision (see above decisions on collusion and predatory prices in mobile and broadband);

Finally, the new framework advocates the implementation of self-regulation, but the observed cost of regulation is increasing: the budget for Arcep in 2003 was 16.75 million euros, and gradually raised to 17.75 for 2004, 18.71 for 2005 and 21.47 for 2006. The implementation of the new framework where competition law is deemed to replace (supposedly inefficient) regulation rules reveals the fact that important deficiencies still exist. To solve these deficiencies, we should explore how competition laws could co-exist with regulation rules, regulation rules that are not exclusively centred on *ex ante* price control. To us, regulation rules dedicated to inform *ex ante* consumers on what they really obtain when they subscribe a broadband service, and more crucially what are the costs and barriers they have to face when they desire to switch, are necessary elements to restore efficiency in the current framework. Competition policy should also be more oriented towards the issue of decreasing consumers' switching costs, which is not necessarily the basic priority today.

3 Consumer switching costs for differentiated products

In network industries such as Internet, mobile phone and energy, the opening of retail markets to competition are not always accompanied with high switching rates. A possible explanation emphasised in the economic literature is that consumers have to pay different costs to initiate a new relationship with an alternative retailer, of which some are due to firm strategies to servicing captive consumers. Before we list these potential costs for the market of broadband Internet, we notice the reader the effects of the existence of those costs on the behaviour of firms selling homogenous or differentiated products are now well understood, at least theoretically (see, e.g. Farrell and Klemperer, 2007 for a recent survey). More empirical works are still needed. High levels of switching costs act as barriers to entry (McAfee et al., 2004) in general. In models of horizontal and vertical differentiation, the existence of consumer switching costs allows firms to elevate their prices further to their level with differentiation only and the level of differentiation may not be independent from that of switching costs. As far as we know Gerlach (2004) is sole to consider a vertically differentiated entrant when the incumbent's consumers have switching costs. Announcement can facilitate entry of a vertically differentiated firm when a fraction of consumers are locked-in on an old product. This incentive to announce innovation shows that truthful information about products is pro-competitive and should be encouraged by regulators. This result will be exploited in our Section 4.

Switching costs can be separated into several elements regardless these costs are perceived (before switching become effective) or have already been paid.³ Transaction cost is a real type

³ We note the reader that the distinction between 'perceived' and 'paid' switching will be clear from the context.

of cost which a new user or a switcher faces in residential broadband markets. Transaction costs in closing an account with one's current provider and opening another with a competitor are systematic and include changing e-mail addresses unless e-mail portability is allowed. This could be measured in terms of the value of lost time involved. In some cases, consumers also have to pay cancellation fees that may be relatively high (up to €6 with some providers in broadband Internet in France in 2005). Consumers must also find out which ISPs operate in their local area, and which offers the best package for their needs, which involves shopping costs, transportation costs and search costs.⁴ This specific transaction cost based on comparison and selection of providers may be small since free ranking services are available on the web. Transaction costs also include the cost to return rented modem to one internet service provider (hereafter ISP) and rent identical (or another) equipment from an alternative ISP. Switching requires those customers to replace completely their current technology Internet connexion device. For example, when one wants to switch from FT (Wanadoo) to Club-Internet, it is necessary to replace one's modem. even in the market of DSL consumers only, each ISP provides its own modem that may not be redeployable to another provider unless the consumer is an expert⁵; this non-redeployment implies a cost to consumers to switch between ISPs.

When consumers have real switching costs, firms may find profitable to lock them in further by using *lock-in devices* (endogenous switching costs) aimed to create contractual or artificial costs to customers. For example, the most obvious action used by IPSs to lock their customers is to make them (or almost all of them) believe they can't use another modem than the one they provide. We expect that the negative effect of artificial lock-in on effective switching is

⁴ Unlike Chen and Hitt (2005), we do not distinguish search costs from transaction costs as the former is included in the later that involves costs to consumers of using the market in the Coase's sense.

⁵ We thank Michel Ghertman who suggested a comparison between switching and redeployment costs.

even stronger when consumers are misinformed about what technologies are available and how they work. Mayo and Cullum (2006) coin the expression ‘barriers to switching’ occurring in a competitive and innovative (non mature) market structure and having several complications. Artificial lock-in can take the form of binding terms in the contractual relationship that links a customer to her firm, e.g., lengthy subscription periods and several months’ notice, which customers must comply with to terminate a contract. Artificial lock-in to increase duration of the customer’s relationship may not increase satisfaction but au contraire emphasises the need to serve consumers over a long time given a constant usage of the service (Bolton, 1998). Though firms have good reasons to develop long-term relationships with their customers such as reimbursing acquisition costs (broadcast advertising, door-to-door selling...), artificial lock in may make consumers reluctant to switch to an alternative IPS, more particularly if it supplies a different connexion technology.

Among those so-called switching costs, one should also play a particular role in innovative industries, which is the specific cost to switch between two different technologies. Indeed, by switching to an alternative technology (e.g. from DSL to Cable) consumers may have to learn how to use it. This is termed as *learning cost* (see e.g. Chen and Hitt, 2005, p. 11).⁶ Though availability of some Internet services offered to broadband consumers may vary between types of modems, their primary function is to allow access to the Internet, which makes ISPs very substitutable in this respect. These technologies may however involve different connection speeds and very different connexion devices (note e.g. the difference between Cable and DSL technologies). Therefore a consumer already using a type of modem may consider an alternative one as both functionally and qualitatively different thus perceive a cost

⁶ This cost is not necessarily that ‘...of learning to use new brands’ of Klemperer (1995, p. 517) as in our case, products are not necessarily functionally identical.

to switch to an alternative technology. A possible consequence is that once a large base of customers invests in one provider's technology, that provider has no incentive to design one of the alternative technologies already supplied by competitors (see Krafft and Salies, 2006). Therefore, a competitor that enters with an alternative technology knows that it may not attract the incumbent's customers easily as these would have to learn how to use this alternative technology.

Krafft and Salies (2006, pp. 13–14) focus on household consumer costs of switching between ISPs in the French broadband Internet industry and calculate them. They found high values for these costs – more particularly for the cost to switch the incumbent, and therefore suggest a potential high cost to switch between technologies as an explanation of these high values. Note also that the availability of these technologies also depends on consumer living location. Location is a key determinant of availability (Papacharissi and Zaks, 2006) as for some technologies, e.g. DSL, the quality degrades the farther the user is from the central switching office.

These evidences in the retail market for broadband Internet show the effects of consumer switching costs may be noticeably substantial. Consumers do not select cheaper offers for products with a similar quality than that provided by their current provider. Furthermore, one observes a self-reinforcing dominance of ex-monopolies or of firms already owning a large market share (stabilisation of market shares) which favours the dominance of their technology (technological inertia). Consequently, the market may drive promising firms to exit or to consolidate with other and dominant firms and select older / less innovative technologies (Krafft and Salies, 2008).

The effects of technological switching costs on firm's pricing, market shares and the diffusion of alternative technologies to DSL in broadband retail can be illustrated by noting the decision of FT that sold its business in cable to an American investor, Cinven in March 2005. The higher price of subscription to Cable (while the corresponding share of consumer was lower) than that for DSL in the first semester of the year 2004 provides support of an attempt by FT to attract consumers on its dominant technology at that time, DSL. But this may also reflect different costs to switch between those technologies. Given the performance of Cable relative to DSL in many respects, our opinion is that that decision by FT shows its attempt to attract and lock all its new consumers in DSL while discouraging its cable consumers to remain on that technology.⁷ The number of consumers of FT at that period was about 2 000,000 on DSL whilst this number was 80,000 on cable.⁸ The price for DSL charged annually by FT was €440 while €540 for cable (all options inclusive in both cases).⁹ We measured the switching costs by using the same methodology as in Krafft and Salies (2008). Given those prices and market shares, the values of switching costs are respectively $€440 - 80,000 \times €540 / 2080,000 = €19$ from DSL to cable and $€540 - 2\,000,000 \times €440 / 2\,080,000 = €17$ from cable to DSL.¹⁰

⁷ As the number of services associated with cable is more important we consider the products as differentiated.

⁸ See document from the French regulator web site: <http://www.art-telecom.fr/fileadmin/reprise/publications/c-publique/anmarch-detail051004.pdf>, Accessed May 2007.

⁹ These prices are exclusive of cancellation fees.

¹⁰ Unlike Krafft and Salies (2008) who use Shy (2002)'s model, we do not consider switching between two brands but between two technologies within one brand. If the firm has as objective to maintain its base of customers on each technology then, in a sense, it is playing a strategic game against itself. We assume the firm has already recovered some fixed cost to acquire its customers so as to focus on sales maximisation. In that case, the price offered in one market/technology to a consumer covers the marginal cost to serve her.

These costs have to be interpreted as net values, following Green (2000). Green's theoretical model considers the concept of an 'added value' of buying an alternative product so that the cost of switching is a net rather than a gross cost. Given the existence of technological switching costs, we ask whether regulators and competition commissions should have operated differently? For example, by subsidising FT to enhance the cable technology. There is clearly a role for regulatory commissions in preventing the potential effect of technological switching costs on the adoption of cable. This suggestion is in line with Waterson (2003, p. 146) who suggests that in some sectors regulatory commissions should set quality standards as an essential means to encourage consumers to switch. Regulators face a dilemma, for consumers' switching costs should not only be interpreted as a preference for one's current retailer. Assuming it would have made sense to subsidise DSL consumers to switch to cable, this raises the question of how could regulator identify those consumers who actually wanted to and subsidise their switching preferably in a costless way to taxpayers.

4 What sort of re-regulation and competition in innovative industries with switching costs?

Regulation policy, by definition, applies to special sectors, whose structure is such that one would not expect competitive forces to operate efficiently. Regulation policy is generally considered as distinct from competition policy that traditionally applies to mature industries, or in industries where structural conditions are compatible with a normal functioning of competition (Motta, 2004, p. xviii). Regulation involves an over time assessment of the competitors' behaviours, while competition policy operates *ex post*, and it normally proceeds from overwhelming institutions, the regulator and the regulatory rules, that operate in specific

industries (emergent, in transition, innovative) and sustain the development of these industries over time. The propositions that follow restore the coexistence of regulation and competition policies since broadband is not a mature industry yet, and needs an overtime assessment of both technological and market developments by regulation authority. In the meantime, more attention to barriers to switching should be devoted by competition authority and adequately sanctioned.

In the former regulation framework, the role of the regulator was to select and regulate monopoly/oligopoly providers, especially in the fields of infrastructure provision, investment, access and pricing, operation (QoS), horizontal and vertical interconnection, universal access/service provision. In the perspective of re-regulation, the role of the regulator is to (1) deliver, based on its inherent industry expertise that competition authorities do not share¹¹, all *ex ante* information including quantitative and qualitative elements that may enter in the choice of consumers, and (2) select over time oligopoly providers on the basis of the adequateness of their offers with the needs of consumers, and especially their capability to switch if they wish. We argue that re-regulation involves that regulators have to sustain by *ex ante* and over time assessment the introduction of innovative products from new entrants and their adoption by consumers, a delicate issue especially when consumers are reluctant to switch whereas they would gain extra utility in doing so. A specific issue is of what sort of re-regulation would be more appropriate to facilitate switching to firms providing alternative and potentially most efficient technologies, where efficiency relates for example to connection speed and depends on geographical constraints. Restoring a strong role for regulation authorities would involve, as far as consumers' switching costs are concerned, to consider *ex ante* and over time that if new competitors do not attract new consumers, this is not because

¹¹ Note that the regulator is industry specific while competition laws are by nature general in their competence.

of their cost inefficiency, or because their product is less preferred, but because consumers may be stuck to their current suppliers. This claim is obvious if consumers are not well informed about the alternative technologies.

Re-regulation is needed to generate/collect expertise on the comparison of competitors, and to provide customers with clear and readable information on the different competing offers. Today, this task is done most of the time by private businesses, and the information they give is dispersed, not necessarily usable by consumers who have to spend some time and effort to collect and synthesise the information before switching, and not necessarily reliable since independence between these businesses and broadband providers still has to be asserted¹². Even if regulation authorities may not have sufficient resources in house to carry out the job of expertise, it could at least select the best sources of comparative information, and redirect consumers to them. To avoid barriers to switching expertise guideline should include:

- comparative overview of technical feasibilities to limit search costs on the consumer's side: The regulator should inform *ex ante* and over time on what the consumer really has for the price of the subscription, in terms of speeds and services; what are the average delays to get access to the service; what are the average delays faced by consumers when they move from one supplier to the other; what are the technical and geographical requirements for access to be provided. The most critical issue here is that, for technical and/or geographical problems, broadband speeds may fall from 20MB (what the consumer subscribes) to 512KB (what the consumer effectively has), leading to the unavailability of a number of applications;

¹² Some inquiries on the independence of price comparators are currently undertaken at the level of the French Ministry of Economy, Finance, and Industry. See www.dgccrf.minefi.gouv.fr

- comparative overview of quality of services to limit cognitive costs on the consumer's side: using quantitative criteria (availability, measuring the proportions of population that has access to a broadband connection if they want it; penetration, measuring the proportion of population already having a broadband connection; capacity and speed; prices; but also bugs, average length of breakdowns, number of complains) and qualitative criteria (quality of access and goodness of fit with the needs of users), the regulator should be able to diffuse the experience of consumers with the different technologies available, and to inform about their reliability. Specific attention should be devoted here to after sales services, that may affect firms' reputation. Here also using quantitative (price, delay of reply) and qualitative criteria (quality of reply and goodness of fit with the needs of users), the expertise should provide consumers a clear assessment of the effectiveness of the after sales services of broadband suppliers, and especially of the hotlines they offer;¹³
- Comparative overview of details in subscription to limit transaction costs from the consumer's side: the consumer has to be informed on the delays in closing an account and opening a new one, whether e-mail portability can be guaranteed, whether competitive providers have better conditions when resiliation occurs.

Any aim to promote competition through innovation in broadband Internet should implement laws that facilitate switching between technologies. As Waterson (2003) points out, the common thinking of competition policy in terms of tackling collusion and abuse of a dominant position is insufficient to render the industry competitive in presence of consumers' switching costs. Competition policies should not only focus on prices *ex-post* of some lock-in

¹³ Today, average price is 0.34 euros/minute, and the quality of support is highly variable.

and on product compatibility (Farrell and Klemperer, 2006) but also on how well informed consumers are about the different available technologies. Making technology more transparent to consumers may have some advantage over retail market regulations that mainly focus on price transparency because making prices transparent may favour collusive behaviour (Waterson, 2003) when consumers are reluctant to switch.

As to competition policies, we think unlike Motta (2004, p. 81) that they should prevent artificial lock in by firms. As suggested in Farrell and Klemperer (2006, pp. 41–43), policy intervention to reduce switching costs may be appropriate in the case of artificial lock-in. Special mention should also be devoted to the issue of deadline notice which was reduced to 10 days in France, and has thus to be enforced by law. Another mention concerns “fair advertising”. Announcement requires advertising, the cost of which may be easier to bear by incumbents than by new entrants in the industry. When advertising is costly, incumbents have a first mover advantage vis-à-vis small consumers when only the segment for large consumers have been opened to competition. Advertising aimed at large consumers indeed may indeed grab the attention of small consumers.

On the basis of the switching expertise that regulation authorities provide and diffuse over time, competition authorities may be able, when the measure of switching costs is prohibitively high and persistent over time, to infer that artificial switching costs exist, and to adopt as a consequence decisions forbidding broadband operators’ anti-competitive behaviours. This measure of switching cost would act as an indicator of important deficiencies at the level of consumers to adopt the technology they want or to change suppliers easily. Presumably, the more regulation authorities provide clear information about the evolution of switching costs, and thus of the potential existence of barriers to switching,

the less frequent will be the intervention of competition policy. It's worth noting that making technology more transparent may be important. But this objective should not hide that adopting a new technology involves sunk costs to consumers that firms may have to subsidise to attract those consumers. Therefore, too low switching costs may discourage firms to cover those costs since they are not certain to keep their consumers thus favouring technologies that require less learning, for example.

5 Conclusion

This paper has focused on the question of technological switching costs in the innovative broadband industry, that are the costs to switch between ADSL and cable. This question is too largely neglected in the debate deregulation *versus* re-regulation. From our investigation into the French case we have seen that these costs are high, and that this high level has an impact on the movements of deregulation implemented so far. In our view, re-regulation is needed to assess and diffuse all information that enter in the components of these switching costs. Competition policies should act if these switching costs remain prohibitively high over time, implying that artificial switching costs may exist, despite the switching expertise generated by the regulator.

Future perspectives for research can be designed. In the recent literature, competition is increasingly considered as a process, which implies that the so-called market imperfections such as switching costs may appear as useful devices for ensuring coordination that makes viable the innovation process. According to this view, regulation policy has to determine why and when switching costs are to be condemned or not. Regulation policy has to be considered as a means for conducting the restructuring of the industry, and thus allowing the emergence

of a new market structure. The viability of the change may require some market imperfections, among which, technological switching costs are a means to prevent too fast a change in the organisation of the industry.

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