



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, as well as the apparent emerging potential of re-regulation. We argue the presence 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. We provide a measure of the cost to switch from DSL to cable for retail consumers in France which supports the domination of the former technology. 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.

Keywords:

Regulation and competition policies, Consumer switching costs, Product innovation, Broadband Internet

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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, we explore the question of deregulation and re-regulation in retail markets by addressing the role played by consumer switching costs between differentiated products (see Klemperer, 1995, for an early survey on the literature on switching costs). 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 measure costs specific to the relationship between buyers and suppliers, such as in Wang (2003), Wallis and North (1986), Ménard and Shirley (2005).

Empirical and econometric evidence in retail markets of several network industries suggest the existence of significant consumer switching costs. Their effect on the decision by firms to sell incompatible products is well understood. Only a few economic studies have shown the potential impact of those costs on the introduction and choice by consumers between alternative innovative technologies, however (Gerlach, 2004; Beggs, 1989 and see the references therein). 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 focus on broadband Internet in France where the incumbent still dominates the market both in terms of the shares of serviced customers and technology supplied, namely DSL.

In the following section, we show why the existence of high levels of switching costs is very likely to impede the expected beneficial outcomes of self-regulation. This is quite a polemical subject given the relation between innovation and competition may not be monotone. We focus our discussion more particularly on the costs associated with switching between access technologies in retail broadband Internet. We measure those costs for French consumers. In section 3, we emphasise the limit to today's competition and regulation policies in innovative industries when consumers have switching costs. 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 new technologies. We show why and how broadband Internet retail markets should be re-regulated when consumers have high switching costs. 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. From a policy perspective, this 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 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 firms strategies to create captive consumers. The effects of the existence of those costs on the behaviour of firms selling homogenous products are addressed in tens of papers and are now well understood (see, e.g. Farrell and Klemperer, 2006 for a recent survey). In general, high levels of switching costs act as barriers to entry (McAfee et al., 2004).

Transaction cost is a real type 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 may imply changing e-mail addresses. 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.³ 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.

When consumers have real switching costs, firms may find profitable to lock them in further by using devices (endogenous switching costs) aimed to create contractual or artificial costs to customers. Artificial lock-in can take the form of binding terms in the contractual relationship

³ 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.

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. Artificial lock-in by firms 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 although better technology. If the perceived cost of switching due to artificial lock-in is too high then potential switching will never become effective.

Among those so-called switching costs, one should also play a particular role in innovative industries, which is the cost to switch between two different technologies (hereafter 'technological switching cost'). By switching to an alternative technology, consumers may have to invest in learning how to use it (hereafter 'learning cost'; see e.g. Chen and Hitt, 2005, p.11). This learning cost should be part of the technological switching cost.⁴ 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. 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).

The effect of consumers' switching costs on the choice of alternative suppliers in markets for differentiated products has not received much attention, however. This is quite surprising

⁴ This cost is more general than 'the cost of learning to use new brands' of Klemperer (1995, p. 517) as we do not assume products are functionally identical.

given that, apart from the energy industry, services provided to retail consumers are quite differentiated, in general. Broadband Internet is thus a case in point since different Internet service providers (ISPs) supply different technologies to consumers. Most works focus on horizontally differentiated products (Shy, 2002; Green, 2000; Sharpe, 1997; Klemperer, 1987; Von Weizsäcker, 1984) with as main conclusions that the existence of switching costs allows firms to elevate their prices further to their level with differentiation only and that the level of differentiation may not be independent from that of switching costs. To our knowledge only Gerlach (2004) considers 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.

The source of differentiation between ISPs is not trivial. Although 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. These technologies may however involve different connection speeds. Therefore a consumer already using a type of modem may consider an alternative one as both functionally and qualitatively different thus perceive a cost to switch to an 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. Furthermore, there is no e-mail portability between ISPs, in general.

We expect that the negative effect of artificial lock-in on effective switching is 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. 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, 2006).

The effects of technological switching costs on firm's pricing and market shares in broadband retail can be illustrated by applying Shy (2002)'s model. Unlike this author, we do not consider switching between two firms (or brands) but between two technologies within one firm selling one service through two access technologies. Let us consider a large ISP that retails two types of modem to its retail consumers who have a technological cost to switch between technologies. 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 (note that Shy, 2002, considers zero production costs too). In that case, the price

offered in one market / technology to a consumer covers the marginal cost to serve her. This price is set subject to the constraint that the price offered in the other market does not attract consumers of the former. Shy (2002, p. 75) developed a model that we can interpret in the present context. Equilibrium prices satisfy a solution concept named as undercut proof property (hereafter UPP). At equilibrium, UPP prices are function of firms' market shares and unobservable (to the modeller) switching costs. The model in the two-firm case is revisited in Salies and Glachant (2005) that gives more precise conditions of the parameter space (market shares and prices) under which switching costs can be measured.

In the present situation, the model is interpreted differently. One firm sells a service through two different technologies, DSL and cable, to N consumers inherited from the past. There are $N_\alpha > 0$ DSL-oriented consumers (type α) and $N_\beta > 0$ cable-oriented consumers (type β), with $N \equiv N_\alpha + N_\beta$. Type α consumers perceive a cost $s_{\alpha\beta}$ of switching to technology cable while type β consumers perceive a cost $s_{\beta\alpha}$ of switching to DSL. The utility functions of each type of consumer are:

$$u_\alpha = \begin{cases} U_\alpha - T_\alpha & \text{if staying with DSL} \\ U_\alpha - T_\beta - s_{\alpha\beta} & \text{if switching to cable} \end{cases} \quad (1a)$$

$$u_\beta = \begin{cases} U_\beta - T_\beta & \text{if staying with cable} \\ U_\beta - T_\alpha - s_{\beta\alpha} & \text{if switching to DSL} \end{cases} \quad (1b)$$

where U_i denotes the gross utility of consumer type $i = \alpha, \beta$. T_α is the price the firm charges to consumers who adopt DSL and T_β is the price it charges to consumers who adopt cable. Let

n_α and n_β denote the endogenous / equilibrium number of customers supplied with DSL and cable technologies, respectively. These numbers depend on prices and switching behaviours of both types of customers:

$$n_\alpha = \begin{cases} 0 & \text{if } T_\alpha > T_\beta + s_{\alpha\beta} \\ N_\alpha & \text{if } T_\beta - s_{\beta\alpha} \leq T_\alpha \leq T_\beta + s_{\alpha\beta} \\ N & \text{if } T_\alpha < T_\beta - s_{\beta\alpha} \end{cases} \quad (2a)$$

$$n_\beta = \begin{cases} 0 & \text{if } T_\beta > T_\alpha + s_{\beta\alpha} \\ N_\beta & \text{if } T_\alpha - s_{\alpha\beta} \leq T_\beta \leq T_\alpha + s_{\beta\alpha} \\ N & \text{if } T_\beta < T_\alpha - s_{\alpha\beta} \end{cases} \quad (2b)$$

It can be shown that $T_\alpha = \frac{N(Ns_{\alpha\beta} + N_\beta s_{\beta\alpha})}{N^2 - N_\alpha N_\beta}$ and $T_\beta = \frac{N(Ns_{\beta\alpha} + N_\alpha s_{\alpha\beta})}{N^2 - N_\alpha N_\beta}$ are UPP prices,

given $s_{\alpha\beta} \geq \max\{-1 - \frac{1}{1+\delta} s_{\beta\alpha}, -\frac{1}{2+\delta} s_{\beta\alpha}\}$, where δ denotes $(N_\alpha - N_\beta)/N_\beta$.⁵ Note that a unit

increase in the switching cost of type α consumers ($s_{\alpha\beta}$) has a larger effect on the price charged to those consumers than to consumers of type β .

In the first semester of the year 2004, the prices for cable-oriented consumers were higher than that for DSL while the corresponding share of consumer was lower. This may reflect an attempt by FT to attract consumers on its dominant technology, DSL but this may also reflect different costs to switch between those technologies. The number of consumers of FT at that

⁵ The Proof is given in the annex of Salies and Glachant (2005).

period was about 2 000,000 on DSL whilst this number was 80,000 on cable.⁶ Data on prices must be considered with caution as the number of services associated with cable is more important, in general (the products are differentiated). The price for DSL charged annually by FT was €440 while €540 for cable (all options inclusive).⁷ In this situation prices satisfy the UPP if switching costs are as follows (see (b) of Proposition 2 in Salies and Glachant, 2005): $s_{\beta\alpha} > 0$ and $-s_{\beta\alpha}/(2+\delta) < s_{\alpha\beta} < (1+\delta)s_{\beta\alpha}$. Note that in all cases where prices satisfy the UPP, switching costs are $s_{\alpha\beta} = T_{\alpha} - N_{\beta}T_{\beta} / N$ and $s_{\beta\alpha} = T_{\beta} - N_{\alpha}T_{\alpha} / N$. Given those prices and market shares, the values of switching costs are respectively $\text{€}440 - 80,000 \times \text{€}540 / 2080,000 = \text{€}119$ and $\text{€}540 - 2\,000,000 \times \text{€}440 / 2080,000 = \text{€}117$. Besides, $(1+\delta)s_{\beta\alpha} \approx \text{€}3000$ and both costs are positive, which supports the previous inequalities. Note that FT had sold its business in cable to an American investor, Cinven in March 2005 thus showing FT's attempt to attract and lock all its consumers in DSL while discouraging cable consumers to remain on that technology given its high price. Data on costs or other variables related to them would help us to prove this assertion further.

Given the existence of technological switching costs, we ask whether regulators and competition commissions should have operated differently? 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.

⁶ See document from the French regulator web site: <http://www.art-telecom.fr/fileadmin/reprise/publications/c-publique/anmarch-detail051004.pdf>, Accessed May 2007.

⁷ These prices are exclusive of cancellation fees.

Switching costs may eventually be negative (Knittel, 1997, p. 526), in which case switching could be encouraged. Green (2000)'s theoretical model considers the concept of an 'added value' of buying from entrants so that the cost of switching is a net rather than a gross cost. Accordingly, consumers may attach positive values to target firms whilst their net cost of switching remains positive. Krafft and Salies (2006) rely on that concept to support the empirical evidence of negative values for some switching costs in the broadband Internet retail market in France. Assuming it would make sense to subsidise consumers with negative switching costs to leave their current retailer, this raises the question of how could regulator identify those consumers and subsidise their switching preferably in a costless way to taxpayers. There is also a consequence for theoretical models dealing with consumer switching costs, in general. A distinction of whether consumers do not switch because they have a preference for a particular branded product or consumers do not switch because they are locked-in artificially or can't afford it should seriously be considered.

3 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) emphasize the prohibitive cost of regulation, and the fact that policy makers misread (recent) economic theory including

dynamic models or game theoretic ones and use thus an inappropriate background regulatory model.

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 Callum (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. While these contributions emphasize 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 innovative industries are characterised by high consumers' switching costs.

The reason why we support this co-existence 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 (SMP) – defined as 25% shared 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 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 usual critical threshold, and using this position to charge predatory prices. 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 euros/minute while the cost is 0.12 euros / 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 and not only by switching costs for functionally similar products;
- 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);

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.

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 share⁸, 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 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.

⁸ Note that the regulator is industry specific while competition laws are by nature general in their competence.

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 asserted⁹. 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;
- 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;

⁹ 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

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;¹⁰

- 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 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

¹⁰ Today, average price is 0.34 euros/minute, and the quality of support is highly variable.

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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