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Comparative study on the effectiveness of Telecommunications regulators: summary

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Matthias Finger

Annelies Voets

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Introduction

The purpose of this study is to assess the effectiveness of the telecom regulator, i.e., the National Regulatory Authority (NRA) in the telecom sector between January 1998 and March 2003. Indeed, during the years 1996-1998, major changes took place in the field of telecom regulation in all the member countries of the Organization for Economic Co-operation and development (OECD), especially in the countries covered by our studies, i.e., Austria, Denmark, France, Germany, South Korea, Switzerland, the United Kingdom and the United States. These changes were triggered by two major international telecom-related initiatives, namely the World Trade Organization (WTO) Basic Telecommunications Agreement and the European Regulatory Framework for Telecommunications, which became effective in 1998. In Switzerland, the Telecommunications Act (LTC) was enacted on January 1, 1998 and laid the basis for the telecommunication liberalization. In the European Union (EU), the Regulatory Framework for Telecommunications was designed in order to foster competition in the market and to harmonize policies in the different member states.[1] In the United States, the Telecommunications Act of 1996 confirmed the principles already existing in the Communications Act of 1934 and introduced competition in the local market. In South Korea, the Telecommunications Acts of 1983 was amended in order to be compliant with the WTO Agreement. In Korea, the severe economic crisis of 1997, along with significant technological progress, furthermore pushed for liberalization and privatization.

Such new legislations led to two main results, namely the set-up of new institutions in charge of telecom regulation – with the National regulatory Authority (NRA) at their center – and/or the definition of new public policy objectives, often translated into specific targets for the regulator.

Today, most countries are again partially, or sometimes even totally, revising their regulatory frameworks, and this as the combined result of technological changes and market evolution. Indeed, in a process of mutual stimulation, market evolution requires political intervention and in return, political intervention contributes to shaping the market. The EU's New Regulatory Framework, which will become effective in July 2003, is a typical example of how political intervention both responds to and guides the evolution of the telecom sector. In Switzerland too, the ongoing revision of the Telecommunications Law (LTC) demonstrates the necessity to adapt legislation in the light of new technological and economic challenges. After five to ten years of intensive liberalization and re-regulation of the telecom sector, there is now an overall tendency to assess the results obtained through the actual institutional framework, and to adapt this framework to the rapidly evolving telecom sector. Consequently, most countries now undertake some sort of auto-evaluation of their telecom regulatory regime, hoping to come up with inspirations for designing the appropriate institutions for the years to come.

The purpose of this report is precisely to respond to these needs for performance assessment by means of a comparative analysis. There currently exist very few studies, trying to systematically assess regulatory intervention when it comes to the telecommunications sector. There are, however, some very valuable reports, offering overviews of the sector and its regulation.[2] Other publications

[1] This does not apply to the United Kingdom, which was considerably ahead of all other member states with regards telecom deregulation.

[2] World Bank (WB), *Telecoms Regulation Handbook*, 2000.
International Telecommunications Union (ITU), *Trends in telecommunication reform 2002: Effective regulation*, 2002.

assess telecom regulation, yet with very specific approaches, such as assessing the implementation of European legislation in the member countries,[3] comparing regulation across sectors,[4] or quite narrowly focusing on the NRAs and their resources.[5] As mentioned above, this study seeks to link the outcomes of telecom regulation in selected countries to the corresponding institutional regulatory regimes.

This is a synthesis of a larger research project done for the Swiss telecommunications regulator (OFCOM) including case studies carried out in the selected countries. This document is structured as follows: In the first chapter, we will present the conceptual framework underlying our study by including a short introduction on network industry regulation, a presentation of the objectives and the institutional design of telecom regulation and our approach to measure regulatory effectiveness. In the second chapter, we will analyze the results of our study, based on the information collected in our case studies. This should allow us to determine the outcomes achieved in each country and the impact of the regulators on these outcomes. Finally, we will provide the conclusions of our study; in particular explain the reasons why the impact of a regulator differs from one country to another.

OECD, *Telecommunications regulations: Institutional structures and responsibilities*, 2000.

[3] So-called Implementation reports, available from the DG Information Society website. The last report (8th) was elaborated in December 2002.

[4] OECD, Reviews of Regulatory Reform per country.

[5] Jones Day Reavis & Pogue, *Regulatory scorecard*, 2002.

1 Conceptual model underlying our study

Our analysis of telecom regulation is grounded in a solid theoretical model based on public policy considerations as applied to the network industries, of which telecommunications is typically one. Historically, network industries were what one may call sectorally 'integrated industries'. This was particularly the case of telecommunications, postal services, public transport, air transport, electricity, gas, water distribution, and audiovisual. These industries were generally organized on a national level and if they were not totally integrated within the same enterprise, the professional nature of these industries would ensure that all concerned actors collaborated, nationally as well as internationally. Economically, these industries operated under what is called a "Cost+ regime", thus paying primarily attention to the technical aspects and only secondarily to financial and/or customer considerations. These industries generally had more or less important public service objectives. These public service objectives were however not ensured by means of regulation, but mostly by means of public ownership and political control. With the process of liberalization of these industries, starting in the 1980s and continuing in the 21st century, all these founding features of the network industries are questioned. More precisely, liberalization in these industries must be understood as a combination of unbundling – a primarily technical endeavor – and competition, whereby unbundling is a pre-requisite for competition. As a consequence, the formerly integrated industries are becoming fragmented and the different actors within the industry, which were previously cooperating, are now increasingly competing or otherwise behaving strategically. In light of all these challenges, sector regulation has been designed as a solution to accompany the liberalization of the network industries. Such sectoral regulation is most appropriately considered to be a public policy, given that in the end, regulation is always a form of governmental intervention. As such, state intervention must be rooted in public policy objectives, for which regulation, ultimately, is only the means but never an end in itself.

In this section, we will first present the public policy objectives in the telecom sector, then outline the institutional arrangement set up in order to achieve these public policy objectives, and finally outline our research design aimed at evaluating the effectiveness of the telecom regulator.

1.1 Telecom regulation as public policy

In the telecommunications sector, one can generally distinguish between three types of public policy objectives, namely competition, public service, and systems integrity and innovation. Indeed, all liberal countries have one or several public policies pertaining to fair competition, anti-trust and more generally to the regulation of the market. Such competition regulation aims at promoting the public policy goals of national competitiveness and economic efficiency. Theoretically, market or competition regulation could simply be extended to the newly liberalized sectors. This is, however, rarely the case, as the liberalization of the network industries requires still additional and sector specific intervention. Indeed, in the formerly monopolistic network industries, markets and competition often first need to be created, thus promoting 'a-symmetric' regulation by treating the incumbent less advantageously while favoring the competitors.

Another important public policy objective pertains to public services, such as in the case of regional and economic development, but also employment and security of supply. Historically, these public service objectives were implemented by means of ownership, but in the age of liberalization ownership turns out to no longer be an appropriate means to do so, considering in particular the fact that public service obligations can seriously handicap the historical operator and/or distort the market. Public services objectives thus also need to be regulated. Furthermore, and as a result of liberalization, a new form of public service has yet emerged, i.e. the protection of consumers. This form of public service includes what the broadly accepted terminology of the European Union calls 'Universal Service', meaning the same treatment of all consumers across a given territory in terms of quality, access, and price. It can also comprise other forms of consumer protection, such as the provision of information to the consumers.

A third area of regulation pertains to technical questions and as such is very sector specific, even though each sector does have technical questions to be regulated. In the telecommunications sector technical regulation pertains to spectrum allocation, sector integrity, and sector innovation. Indeed, in the age of liberalization, the use of the scarce resources (e.g., spectrum in the case of mobile telephony) can no longer be left to the decision of the historical operator and the scarce resources must be fairly – and technically satisfactorily – distributed among the various competitors in the market. Similarly, the integrity of the sector is at stake once the different operators start to behave strategically, as is the case in a liberalized environment. Sector regulators therefore need to set and/or enforce rules on interoperability or other industry standards. Similarly, it is sometimes said that sector regulators need to play a role when it comes to stimulating sector evolution and learning, as the strategic behavior of the different actors in the sector does not automatically lead to innovation. However, in our study we have not examined the effectiveness of the regulator when it comes to technical aspects, given the fact that they seem much less problematic, but also given the fact that we are not competent in this matter.

1.2 Institutional arrangements

The transition from public policy implementation by means of ownership to public policy implementation by means of regulation is also a process of profound institutional change, and as such difficult and politically controversial. As a matter of fact, the creation of regulatory (sectoral) authorities is one of the most spectacular outcomes of the new institutional configuration resulting from liberalization. Labeled as 'National Regulatory Authorities' NRAs or 'regulators', these new institutions are now in charge of regulating the recently liberalized sectors. The advent of independent regulators brings along a whole series of institutional and organizational issues, namely the issue of the independence of the regulator and its power relative to other actors.

By definition, sector regulators are independent from the operators they are supposed to regulate. However, the term 'independence' is also used for the institutional separation between the regulator and the political authorities. Indeed, the general philosophy of the institutions promoting independent regulators (i.e., in particular the European Commission and the World Bank), is that regulators should also be an 'arms-length' away from government. This argument is particularly linked with the issue of

public ownership. But, although the 'independent regulator' model is the more frequently chosen option, many countries choose to set up political or administrative bodies, rather than more autonomous regulatory authorities. This issue of independence is in particular interesting for the questions of the nomination of the members of the regulatory bodies (Who nominates? For which period of time are regulators nominated?), reporting structures (To whom does the regulator report, i.e. to the government, the parliament or a special commission?), oversight mechanisms (Who oversees the regulator, i.e. parliament, the judiciary or yet another body?), and power.

But, independence of the regulator is only one of two key elements to be considered, the other one being the regulator's power. As a matter of fact, a regulator can be very independent, yet have little power. It is therefore important to consider the power attributes of the regulator, such as the legal attributes (Can the regulator decide on its own or simply recommend? Can the regulator investigate on its own or only act upon complaints? Can the regulator intervene ex-ante or ex-post? Does the regulator have to consult with other bodies, such as for example price surveillance before acting? etc.), the financial resources (What is its budget?), the human resources (What are its competencies?), as well as the financial autonomy (By whom is the regulator paid, i.e., the government, the consumers, the operators, or a combination thereof?). These attributes, together with the institutional tensions between the regulator and all other actors which are part of the larger institutional regulatory framework (e.g., competition regulator, the ministry, judicial authorities, regional regulatory authorities, price surveillance, etc.), ultimately determine whether the NRA theoretically can and practically does have an impact upon the outcomes.

These two factors – i.e., independence and power – allow for a significant amount of variety between regulatory institutions in different countries. And indeed, it appears that regulatory institutions are closely related to the history and political tradition of a country (i.e., Anglo-Saxon tradition, German tradition, Scandinavian tradition and Latin tradition), as well as to the state system (centralism versus federalism). In the present study, the main focus is on the regulator and its characteristics as mentioned above. It must not be forgotten, however, that regulation is a multi-dimensional process and that regulators are only one (key) element of a much larger system where multiple actors interact. The role of judicial and/or dispute settlement institutions, for instance, must also be carefully considered. In addition, the importance of consultative bodies (administrative or ministerial) and organized lobbies (consumer groups, unions) should be included into the wider analysis of the regulatory process. This process raises a series of institutional issues, which, from a theoretical point of view, all pertain to questions of inter-organizational relationships, control, and power. As we will see in chapter 2, the nature, the shape, the power, and the mission of the regulatory bodies and authorities vary significantly, thus considerably affecting the effectiveness of a sector regulator.

1.3 Measuring the effectiveness of regulation and of the regulator

As we have seen in the preceding chapters, the main role of regulation is to ensure public policies objectives, once these objectives can no longer be implemented by means of public ownership. In our study, we will focus only on the objectives of competition promotion and public service provision,

leaving aside the technical objectives of spectrum allocation, system's integrity, and innovation promotion. Five years after the full liberalization of the telecommunications sector, we now want to examine – in the case of eight countries – whether sector regulation has indeed promoted competition and ensured public services, and whether and to what extent this can be attributed to the work of the NRA in each country. Conclusions from such an evaluation shall help the legislators design new policies and regulatory frameworks and/or adapt existing ones.

More precisely, our study wants to answer the following three questions:

- To what extent have the original public policy objectives in the telecommunications sector been achieved?
- To what extent can these outcomes be attributed to the regulatory institutional framework as opposed to external factors, beyond the control of the NRA and other institutional regulatory actors (e.g., economic growth or technological innovation)?
- Wherever the role of the external factors is small, to what extent, then, can the outcomes of the regulatory framework be attributed to the specific actions of the sector regulator, i.e., the NRA?

Assessing such regulatory effectiveness is a necessary and important task, yet not an easy one. It presupposes that targets are/were set beforehand and that it is possible to compare the outcomes against these targets. Evaluators thus need a set of pre-defined performance indicators that give clear indications about the actual results yielded by a regulatory institutional regime, and, in the case of the present study, that make it possible to isolate the particular role played by the independent regulator. Also, it must be recalled that outcomes are always related to public policy objectives, meaning that it might precisely be an objective not to regulate some of the outcomes, as we will see below.

As mentioned earlier, the main objectives of telecom regulation are, in our view, related to competition and public service. We have subdivided these two objectives in a series of measurable indicators that should make it possible to determine whether objectives have been reached or not.

Competition

There are many ways to measure the degree of competition in a specific market. For our study, we have selected the following four generally accepted indicators:

- **Number of operators in the market:** The number of competitors in the market and the evolution of this number are a manifest sign of the existence of competition. A market in which market conditions are equally favorable to all competitors (which is not true in the first years of telecom liberalization) attracts more companies who invest, lease lines, and produce.

- **Market shares of the incumbent:** From the beginning of liberalization the market shares of the incumbent have been considered as a major indicator for competition in the telecom market.

Given the asymmetric nature of regulation, it is indeed important that the incumbent's market shares decrease in favor of the newcomers.

- **Choice for the consumers in terms of technologies/operators:** One of the goals of liberalization is to increase choices for the consumers. It is important to monitor this and to make sure that consumers can effectively choose between different operators and between different technologies for each service.

- **End-user prices:** Price-drops are viewed as the most successful outcome of market liberalization and are a result of competition between operators, sometimes sustained by regulatory intervention. The extent to which prices have dropped and their evolution over time are therefore considered as important indicators of competition and successful liberalization.

Public service

There are several conceptions of public service. In this study, we decided to take a broad definition of public service, including not only Universal Service,[6] but also a good availability and quality of services, as well as the provision of relevant information to the consumers. As far as universal service is concerned, we have looked into its provision for each country, but we will not discuss this issue in the present summary, as differences between countries are minimal.

We have thus selected the following three indicators helping us to determine to what degree public service objectives are met:

- **Availability of services:** The availability of services refers not only to the provision of so-called universal services, but it also includes the variety and geographical coverage of all telecommunications services. When questioning the availability of services, we want to answers the questions: How advanced and widespread is the rollout of varied and modern technologies in the country?

- **Quality of services throughout the country:** Quality of service remains a priority in most OECD countries, and this despite the increased reliance on market forces in the telecommunications sector (ITU, 2002). Quality monitoring means that there is a political will to make sure that consumers, although offered various products, can still count on a minimum quality level. Throughout our case studies, we will see to which extent regulators are concerned with this aspect of liberalization and what they do to ensure quality of services.

- **Information to the public:** Information to the public is an important part of public service, as it protects the consumer from abuses and at the same time, enhances the advantages that a consumer can derive from market liberalization. Indeed, liberalization leads to the mushrooming of new products, offers and features, which makes it often difficult for the

[6] Universal service is a widely accepted concept that defines a certain number of telecommunications-related services considered as essential for the physical, economical, and social wellbeing of all inhabitants of a given territory and that should be made available irrespective of the profit or loss that they may occur.

consumers to know about the opportunities that are offered to them, to understand the differences between offers, and to know their rights vis-à-vis the multitude of telecommunication operators in the market. The scope, quality, and delivery of information, therefore, have to be considered as an outcome of regulation, on which, as we will see, the regulator has an important impact.

To recall, regulatory regimes should indeed have been set up in a way that regulation produces the desired outputs, which in turn should lead to the planned outcomes. For instance, if the creation of competition is a policy objective, the regulation of interconnection prices, especially for incumbent operators, is one of the means for achieving the objective (or outcome), and this by means of impacting upon the incumbent. In other words, the output (e.g., decision) of the regulator impacts upon the incumbent, which in turn should lead to the desired outcome (e.g., more competition). However, it seems a little naive to believe in the perfect causality of sector regulation. First of all, it is not always clear which institutional arrangement is optimal in order to achieve the desired objectives. Secondly, it may be that some actors within the institutional regulatory framework are more effective than others, that the action of one of the actors is blocked by another one, that actors have overlapping competencies, or that some regulatory functions have not been assigned to anyone within the framework. No matter how good, strong, coherent, or sensible the regulatory framework, there are still a number of uncontrollable factors (such as consumer behavior or stock markets in the telecom sector), on which regulatory intervention has little or no impact.

For the purpose of this study, we will assume that the regulator has a crucial role to play in the achievement of telecom policy objectives in the areas of competition promotion and public service provision. As the most competent body in the sector and the main institution in charge of telecom regulation, we will assume that the intervention of the regulator is necessary, determinant, and unlimited in time. Regulatory performance refers to the effectiveness of the regulator, that is, the ability of the regulator to achieve its goals. Performance also refers to the impact of the regulator, i.e. the degree to which the regulator's action contributes to achieving the public policies objectives. Both are studied in this report. However, we will not study regulatory efficiency, i.e. the regulator's usage of resources for achieving objectives. By seeking to determine the performance of the regulator, we will have to take into consideration the means, powers, and competencies of the regulator within the larger institutional framework in which it operates.

2 Analysis

In this chapter, we will use the key findings of our different case studies in order to answer our four main research questions. In other words, we will

- evaluate the outcomes achieved by means of the existing regulatory framework, i.e., compare outcomes with initial public policy objectives;
- evaluate the relative importance of sector regulation over other, contextual factors
- evaluate the impact of the regulator in achieving the outcomes; and
- assess the relevance of the institutional framework, when it comes to achieving the outcomes, as well as when it comes to the work of the regulator.

The chapter is divided into two parts. In the first part we carry out an analysis according to the indicators of competition and public service that have been predefined. For each indicator, we will discuss the three first points mentioned above, that is: look at the outcome in each country, evaluate the relative importance of regulation and external factors for each indicator and evaluate the impact of the regulator on the outcome. The external factors determining the impact of the regulator taken into consideration are by definition beyond its control. Such factors are, for example, the overall economic climate, technological developments (at least to a large extent, even though they may be affected by national research and development, as well as technology policy), consumer behavior, and topography. These factors do not constitute an object of our study and are thus not discussed in detail. In the second part, we will discuss the institutional arrangements for each country, and weigh up their implications on the effectiveness of regulation.

2.1 Outcomes and relative impact of regulatory intervention and external factors on competition indicators

In each country, there is a legislation that sets the objectives of telecom regulation and defines, to a certain extent, the outcomes to achieve. Even though the different countries have the same general objectives of competition and public service, it may be, and is indeed so, that the outcomes are slightly different from one country to another. In the paragraphs below, we will present the outcomes of telecom regulation in the different countries, by keeping in mind that objectives might have been different from one country to another to begin with.

In spite of broad and continuous efforts over the past years, all specialists agree that measuring and comparing outcomes in the telecommunications sector has proven to be a very difficult task. Indeed, there is not a single source of information that provides sufficiently reliable data in order to get an accurate picture of the advancement of telecommunications liberalization across time and across countries. Because of obvious practical reasons, one can only grasp specific aspects of the whole picture, by relying on a few specific indicators. The efforts made by the OECD in its Communications Outlook and the European Union with the Implementation Reports should certainly not be underestimated. Both documents aim at providing a relatively comprehensive picture of the state of

advancement of liberalization in Europe and the OECD countries. However, statistics are rapidly outdated in the telecom sector, and not always comparable from one country to another.

While attempting to collect statistical data in the countries covered by our studies, we encountered the same difficulties. Some countries have precise and regularly updated information about their telecom sector, whereas others do not, for a whole series of reasons. Indicators are not always measured the same way, and very often, countries tend to put forward essentially those statistics that advantage them most.

As in the context of our cases studies we conducted interviews with actors of the sector, we have also gathered quite a bit of subjective information translating the perception the different actors have of the situation in their own country. We believe that this kind of information, even if disputable from a methodological point of view, should nevertheless be valued in the context of this study, as perceptions also translate, shape, and change policy objectives and priorities within the country.

Keeping in mind the above remarks, the outcomes in the different countries for each indicator are as follows:

2.1.1 Number of operators

In all countries observed, there has been an increase in the number of operators offering communication services over the past 5 years. Although it not impossible to know how many licensees there are in each country (except in Denmark maybe, where there is no obligation to announce), this still says little about the different types of licensees and the evolution of their number over time. Most countries have witnessed a tendency towards concentration after the burst of the ICT bubble, but not enough to speak of a real danger for competition. If we rely on the data displayed in the OECD's Communications Outlook 2003 regarding the number of operators in service for each one of our countries,[7] we see that the number of operators per million of inhabitants[8] is especially high in Switzerland (more than 30 operators per million inhabitants), Austria (13.5/mio), the USA (9.8/mio) and Denmark (7.9/mio). Germany comes next with 7.3 operators per million inhabitants, followed by the UK (4.1/mio) and France (1.9/mio). Korea ranks last on the list with only 0.5 operators per million of inhabitants, i.e., 60 times less operators per inhabitant as in Switzerland.

[7] OECD, *Communications Outlook 2003*, p. 35

[8] As reference, we took the population statistics given in our case studies.

Let us now weigh the respective importance of the regulator's intervention and the external factors. As far as the regulator is concerned, we can make a list of actions that the regulator can perform and that may have a certain impact upon the outcomes:

Intervention of the regulator on the number of operators
▪ Facilitate licensing procedures
▪ Control unfair practices by the Incumbent that penalize new entrants
▪ Promote the introduction of features favoring competition (CbC[9], CPS[10], ULL[11], NP[12])
▪ Promote low interconnection tariffs
▪ Make rapid decisions to improve legal and planning certainty

The regulator has intervention power in creating a fair, stable, and simplified market environment. For instance, low licensing requirements encourage small companies to launch their activities in the market when at the same time; comparatively low interconnection charges further encourage the deployment of activities. On the other hand, licensing procedures that are tiresome and expensive tend to discourage companies from setting up activities in the country. Another essential activity of the regulator is to take timely decisions and intervene rapidly against unfair practices (e.g. price dumping, unfair marketing practices, non-compliance with obligations falling on operators with Significant Market Power - SMP), something which *de facto* evicts competitors from the market. The early introduction of features such as ULL, CPS, CbC, and NP also has a positive impact on the attractiveness of a market, and thus the number of operators. It is the task of the regulator to promote the introduction of such features and if the legislation does not allow it, to make sure that the legislation gets adapted consequently.

We could conclude from the above that the Swiss, the Austrian, the American, and the Danish regulators fulfill their tasks best, whereas the Korean regulator performs rather badly for this specific indicator.

Then again, we must not forget that it is the general legislative framework that sets the conditions of work for the regulator, and this explains why, for instance, the Korean regulator performs badly on the licensing procedures. Korean law simply does not favor easy licensing procedures, mainly for reasons of protecting domestic companies. Reciprocally, the Swiss legislation has very light licensing requirements, as does the Danish and the American legislation. In Switzerland however, it is not proven that the regulator exerts very tight control on the Incumbent, or that it promotes low

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9 Call-by-call carrier selection is a service enabling a telephone subscriber to select a carrier for individual calls, irrespective of whether the carrier is the provider of the local loop by dialing specific digits.

10 Carrier pre-selection is a service enabling a telephone subscriber to select a carrier for all calls or for certain categories of calls (e.g., international and/or long-distance), irrespective of whether the carrier is the provider of the local loop, without having to dial specific digits.

11 Unbundling of the local loop is a service whereby a telecom organization grants access to its local loop to another telecom organization.

12 Number Portability is the ability for a customer to transfer its service account from one operator to another without requiring a change of the customer's number.

interconnection tariffs. Only the Danish regulator could be considered as fulfilling the majority of the actions listed above, but then Denmark comes only fourth in terms of number of operators.

Therefore, we believe that the impact of the regulator's work is not negligible on the final outcome, but that there are also other factors that have a major importance for the final result. If we look at the countries observed, the following external factors seem to have some influence:

External factors affecting the number of operators
▪ General business conditions in the country
▪ National economic climate
▪ Date of liberalization
▪ Size of the country
▪ Purchasing power
▪ Openness to foreign investments

The good outcomes in countries such as Switzerland, Denmark and Austria seem to result from a combination of factors such as the small size of the country (offering an adequate critical mass for telecommunication operators), as well as high purchasing power and generally favorable business conditions, all factors which also apply to the United States. Openness of the market to foreign investments is also a factor with a positive effect on the number of operators, and early liberalization in the United States could be yet another explanatory factor for its good position.

All in all, it seems that the external factors mentioned above have a preponderant importance on the number of operators, and that there is no strong link between regulatory intervention and the number of operators.

2.1.2 Market shares of the Incumbent

After the liberalization of the market, a decrease in the market shares of the Incumbent is considered as an indicator of competition, and is often used to show evolution over time and to carry out international comparison.

For several reasons, it is a difficult enterprise to make statements about the market shares of the Incumbent, and the supposed progress of competition that is linked to it. First of all, in some countries, operators are not requested to make their market shares public (Austria and Switzerland) with the result that the regulator and other bodies involved in telecom regulation have difficulties to know the respective positions of the different actors on the market. Secondly, market shares are sometimes expressed in number of subscribers, sometimes in the amount of call minutes and sometimes in revenue. Another difficulty is linked to the fact that a 'small' market share of the Incumbent could 'hide' a duopoly situation, which is not how effective competition is generally understood. Market shares also evolve quite rapidly, either in favor or at the detriment of the

Incumbent, which is why the available data (market shares of the year 2001 – Communications Outlook 2003) could well be misleading. We must therefore be prudent with the interpretation of the incumbent's market shares as a sign of competition. We also attempted to collect more recent information, but realized that information was not always available and also that different sources sometimes gave different results. In the end, we will use a combination of the information provided by the OECD and the data that we have, as it is more recent (mid-2002). Unless mentioned otherwise, market shares are expressed in call minutes. Once all these difficulties are acknowledged, the question remains as to whether it is possible to compare the market shares of the Incumbent in each of our countries and draw conclusion from it. We will attempt to do so, by keeping in mind the remarks above.

As far as market shares are concerned, the record is mixed in all of our countries, at least with regards to certain market segments. When we look at fixed telephony, a distinction has to be made between international telephony and domestic long-distance (DLD) telephony on the one hand, and local telephony and subscriber lines on the other hand. In the first two categories, a certain degree of competition has been reached, both in countries with early liberalization (e.g., United Kingdom, United States in the early '80s) and in countries where competition in the fixed telephony market was introduced only in the late '90s (e.g., EU countries, Switzerland and South Korea). Competition in these two markets is mainly due to the introduction of CPS and CbC, as well as due to the mushrooming of international calling cards. The market shares of the competitors in the **international** telephony market average from 26% to 55% for 'late' liberalizers and are as high as 67.5% in the case of the United States. In the **long-distance** fixed telephony market, the market shares of the competitors are mostly comprised between 15% (Korea - in revenue) and 40% but there are 2 exceptions: the United States with 65.2 % in 2000, as well as Austria with 54.7 % in 2001.[13]

Competition in the **local telephony** market is a completely different issue. The local market comprises subscriber lines and the one hand and the traffic considered as local on the other hand. Evidence shows that it is much harder for competitors to conquer market shares in that segment. Generally speaking, the incumbent still has a very high market share of local subscriber lines (because unbundling has only recently started) and a smaller share if we consider traffic (which in turn is essentially the result of carrier-selection). If we look at the market shares of competitors for **subscriber lines**, we note that the United Kingdom leads by far with 19.8% of subscriber lines in 2001, essentially due to the success of cable telephony. Denmark follows with 12%, and the United States and Austria with 10% and 7% respectively in 2001.[14] In all four other countries, competitors own less than 5% of the subscriber lines in 2002 (Korea 4%; Germany 3%; France 0.5% in 2001 and Switzerland with less than 0.1%). As for **local traffic**, results are quite heterogeneous from on country to another. Unfortunately, we do not have any information for Austria for this market segment. In the other countries, competition in the local calls market has made headway in Denmark, Switzerland and the UK with respective market shares of 35%,[15] 28%, and 27.4% for mid-2002. France and the United

[13] References from OECD, *Communications Outlook 2003*.

[14] All references of 2001 from OECD, *Communications Outlook 2003*.

[15] It is important to note that there is no distinction made in Denmark between local and long-distance calls.

States are still lagging behind with respective market shares of 14.6%[16] and 9.8%.[17] In Germany and Korea, the competitor's market shares are still below 5%, as local call carrier selection was not introduced yet.

As far as competition in the **mobile market** is concerned, market shares are much more equally distributed among operators than in the fixed market. Incumbents have market shares ranging from 65% (e.g., Switzerland) to 40% (e.g. Denmark and Germany). Regulatory intervention in these markets is much less intensive in most of the countries observed, as the initial situation of the different market players is very different from the situation in the fixed market, where the incumbent had or still has a major infrastructure advantage.

As for the **Internet market**, a distinction has to be made between dial-up Internet and broadband connections. In the dial-up market segment, competitors have succeeded in gaining important market shares, here again, mainly because of carrier-selection. For dial-up Internet we have market shares for only 3 countries namely Denmark, France and Switzerland. In all three countries the market shares of the competitors approach 2/3 of the market. In the ADSL market on the other hand, the market shares of the competitors are much smaller at least for a majority of the countries observed. As ADSL services require a new connection, market power on the subscriber line market are often leveraged into the ADSL market. This is true for Germany, with a meager 3% market share for the competitors, France with a 10 % market share, Austria with 13% and Denmark with a 21% market share for competitors, down from over 60% in January 2001. In Switzerland and Korea however, competitors have market shares in the ADSL market corresponding to 44% and 54.2% respectively in mid-2002.

The following rankings summarize the comments above and classifies the countries according to the loss of market shares of the incumbent, in decreasing order:

DLD and internat.	**Subscriber lines**	**Local traffic**	**Internet ADSL**
1. United States	1. UK	1. Denmark	1. Korea
2. UK	2. Denmark	2. Switzerland	2. Switzerland
3. Denmark	3. USA	3. UK	3. Denmark
4. Austria	4. Austria	4. USA	4. Austria
5.Switzerland	5. Korea	5. France	5. France
6. France	6. Germany	6. Germany	6. Germany
7. Germany	7. France	7. Korea	7. n.d.
8. Korea	8. Switzerland	8. n.d.	8. n.d.

All in all, if we attempt to classify the countries according to the incumbent's loss of market shares in the four market segments mentioned above, we find the UK, Denmark, the USA, Austria, Switzerland, Korea, France and finally Germany.

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[16] August 2002 in *8th Implementation Report – Annex 1*, European Commission, December 3, 2002

[17] FCC, *Telephone Trends 2002*, page 9-9.

Let us now weigh the respective importance of the regulator's intervention and of the external factors. As far as the regulator is concerned, the actions that the regulator can perform and that may have a certain impact upon the outcomes are:

Intervention of the regulator on the market shares
▪ Promote the introduction of features favoring competition (CbC, CPS, ULL, NP)
▪ Control unfair practices by the incumbent (to avoid competitors from losing market shares)
▪ Exert strong asymmetric regulation (fines for non-compliance, investigation if tendency towards monopoly)
▪ Exert surveillance of incumbent's compliance with the provision of pre-products (prices, timeframes, quality, time of response)
▪ Provide information about prices to customers

The regulator has intervention power in creating good conditions for the new entrants on the market; in particular regulate third party access on the incumbent's fixed network. Carrier selection and unbundling are two important requirements in this respect. Competition at the service level, by the introduction of CPS and CbC, produces the most convincing results so far, especially for long-distance and international telephony, as well as dial-up internet. Unbundling on the other hand aims at creating long-term effective competition by giving new entrants direct access to the customer. The introduction of these features is planned by law, of course, but the regulator still has a role to play. After all, the regulator may dictate the agenda of implementation and exert surveillance on the compliance of deadlines and conditions. Besides, surveillance in a more general sense is a major task of the regulator when it comes to creating viable conditions for new operators on the telecommunications market. Another regulatory intervention that might have an (indirect) impact on the market shares of the competitors is the provision of relevant information to the consumers, either related to new services or to prices.

The question as to whether the impact of the regulator is determining for the market shares of the competitors must be analyzed in light of the empirical evidence of our case studies and the results mentioned above. The UK, Denmark and the United States are, according to our calculations, the countries where competitors' market shares are the highest. Thus the question: is it so that the corresponding regulators intervene more in these countries than in the others? We could say so for Denmark, and to a lesser extent for the UK and the USA. For these two cases, early liberalization seems to be a better explanatory factor. However, if we compare Denmark to other countries where liberalization occurred in the late '90, it shows that regulatory intervention has an impact on the market shares of the competitors. A clear and audacious policy of third party access and information about new offers and prices to the consumers seem to bring about positive results for the newcomers on the market. Reversely, in countries where market shares of the incumbent are still comparably high, as in Korea, France and Germany, regulatory intervention is very different. In South Korea, the regulator (ministry) is not so much concerned with the actual state of competition, as it is with the rapid and broad deployment of technologies. Clearly, in South Korea the promotion of competition is not the regulator's first priority. In France and Germany on the other hand, competition is a priority but

it seems that the regulator has a rather passive attitude, and is reportedly light-handed on the incumbent.

This raises the question about the ownership of the incumbent: indeed one could put forward total privatization[18] of the incumbent as an explanatory factor for the incumbents' lower market shares. In countries where the incumbent is totally privatized, its market shares are indeed lower (in the case of Korea, this rule does not yet apply, because the incumbent was privatized only in 2002). In France and Germany on the other hand, state-ownership would be an explanatory factor for higher market shares of the incumbent.

Austria and Switzerland are two cases that do not fit into any of the explanations above. Indeed both are 'late' liberalizers, with partly state-owned incumbents, and not particularly active regulators, at least with respect to this indicator. However, both countries rank in the upper middle of our list, indicating that the incumbents' market shares have significantly decreased over the past years. In comparison to France and Germany, this could lead to think that the regulator is less complaisant vis-à-vis the incumbent or that the attachment of the Swiss and Austrian consumer to their incumbent is less important. Moreover, Swiss and Austrian consumers also seem to be better informed about and make more extensive use of carrier-selection, as our case studies have shown.

All in all, decreasing market shares of the incumbent seem to be attributable to a combination of regulatory intervention, especially the rapid introduction and implementation of carrier-selection and to external factors such as early liberalization and possibly also total privatization of the incumbent as well as consumers' attachment to the historical operator.

External factors affecting market shares
▪ Early liberalization
▪ Total privatization
▪ Customer loyalty to the incumbent

2.1.3 Choice for the consumers

Choice is one of the main goals of liberalization, as competition should bring about more varied products and services for the consumers. In particular, for a given service, the consumer is expected to have the choice between several operators but also, and more and more, between different competing technologies. Initially, we wanted to look into both aspects, but we had to renounce because there exist very little information about the choice in terms of technologies. As a result, we only considered choice between operators for which a limited amount of data is available.

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[18] Incumbents are totally privatized in Denmark, in the United States (nation-wide operators), in the United Kingdom and in Korea.

Even though the objective is clearly an important one for all our countries, the systematic monitoring of choice is deficient in most cases. In order to measure choice between operators, we have chosen to take into account the number of mobile operators[19] as well as the percentage of population that can choose between 5 or more operators for local as well as long-distance and international fixed telephony.[20] This figure however does not indicate precisely how many more than 5 operators are available, nor if these operators offer different technologies.

Choice for the consumer								
	A	**DK**	**F**	**D**	**SK**	**CH**	**UK**	**USA**
Mobile	4	6	3	4	4	4	4	5(80%)[21]
Local	>5(95%)	>5(95%)	>5	>2(33%)	n.d.	>5	>5	n.d.
DLD and international	>5(95%)	>5(95%)	>5	>5(95%)	n.d.	>5	>5	n.d.

As we can see, there are no significant differences from one country to another, except in Germany, where choice for local telephony is reduced because carrier selection has not been introduced yet. In all other countries, consumers have a fair choice of operators for each service. Unfortunately, we have no information about the choice for consumer for Internet services, but this market segment is known as the one where the choice is broadest.

If we list the different actions a regulator can undertake in order to advance **the choices for consumers**, we find:

Intervention of the regulator on the choice for the consumers
▪ Promote the introduction of features favoring competition (CbC, CPS, ULL, NP)
▪ Stimulate competition between operators
▪ Stimulate the deployment of different technologies for a given service
▪ Inform the public about available features and services

As far as choice between operators is concerned, the impact of the regulator on this indicator is closely linked to its responsibility and capability to introduce and to maintain competition in the telecommunications market. By stimulating competition within a given market segment (market surveillance, detection of unfair practices, investigation, rapid intervention, use of sanctions), the regulator contributes to ensuring a certain amount of choices for the consumer. Choice between different technologies can be stimulated by monitoring the variety of technologies available, ensuring

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[19] As recorded in the OECD Communications Outlook 2003, pp. 35 and 40

[20] As recorded in WIK, *Auszug aus dem 8. Implementation Report der EU – erweitert um die Schweiz*, 2003. Figures not available for Korea and for the United States.

[21] In brackets, the percentage of the population that has the choice between the given number of operators

the safety of investments (by providing planning and legal certainty), and promoting the deployment of alternative technologies for a given service. Finally, the regulator can inform the consumers more or less about different technologies available. This is the case in Denmark, for instance, whereas in most other European countries the responsibility for promoting new technological features is left to the operators themselves. Of course, the regulator's action is limited by government policies and by the extent to which the regulator can make propositions, suggest legal changes and can intervene as an expertise body on future telecom policies in a given country. External factors, such as difficult topographies or variable population density (such as in Austria and Switzerland, for instance), also impact upon choice the consumers can benefit from, as does the general economic climate in the country.

External factors affecting choice for the consumers
▪ Topography and population density
▪ Economic climate

All in all, we can say that regulatory intervention is essential to the increase of choice for the consumers, but this intervention is highly dependent upon the legal framework underpinning the regulator's action. Indeed, creating long-lasting conditions for effective competition is the most important action a regulator can perform to ensure choice for the consumers, but it is the legal framework that delimits the power of the regulator in this respect. This is also true for the introduction of carrier-selection, as well as the encouragement of intermodal competition as a guarantee for long-lasting competition.

2.1.4 End-user prices

For all of the countries observed, it is undeniable that prices have decreased since the introduction of competition in the sector, especially for international fixed telephony, where competition is fierce. The extent to which prices have dropped is quite particular to each country. In order to discuss price differences, we have chosen to compare our 8 countries according to the ranking made by the OECD for some market segments[22] and to class them according to a global price index elaborated as the combination of the different market segments.

[22] All references in OECD, Communications Outlook, pp. 158, 159, 162, 163-165 and 187

For the purpose of comparison, we took into consideration the prices for fixed telephony, Internet, Mobile telephony and leased lines. According to these data, our 8 countries are ranked as follows, from the cheapest to the most expensive country:

Fixed telephony[23]	**Internet**[24]	**Mobile telephony**[25]	**Leased lines**[26]
1. Switzerland	1. Korea	1. Denmark	1. Denmark
2. UK	2. France	2. USA	2. Switzerland
3. Denmark	3. UK and USA	3. France	3. Germany
4. Korea	4. Germany	4. UK	4. USA
5.Germany	5. Austria	5. Switzerland	5. Austria
6. United States	6. Denmark	6. Korea	6. France and UK
7. France and Austria	7. Switzerland	7. Austria	7. Korea
		8. Germany	

If we make a global price index based on the above ranking, we find the following sequence, from the cheapest country to the most expensive. Parity of purchasing power has been taken into account in the original data from the OECD.

1. Denmark
2. UK, USA and Switzerland
3. Korea and France
4. Germany
5. Austria

If we now list the different actions a regulator can undertake in order to influence **end-user prices**, we find:

Impact of the regulator upon end-user prices
▪ Closely monitor wholesale prices
▪ Impose price reductions or caps on all telecommunications operators
▪ Impose price reductions or caps on the incumbent's services
▪ Set up permanent price control mechanism

Intervention on prices can cover several options: price-caps for services comprised in the Universal Service Obligation (USO), fixed prices for interconnection and fixed price reductions for all telecommunications services. Of course, imposing a price-cap mechanism is generally a decision to

[23] We take into account the OECD residential tariff basket and the OECD composite basket of residential telephony charges, both for August 2002.

[24] We take into account the OECD Internet access basket for 40 hours at daytime respectively evening using discounted PSTN rates, both indicators for September 2002.

[25] We take into account the OECD baskets of low/average and high user mobile telephony charges, all indicators for August 2002.

[26] We take into account the OECD basket of national leased line charges for August 2002

take by the government and not by the regulator, yet it is the task of the regulator to implement such policies and in certain cases, to advice the government on possible adaptations of the legislation in this regard. Also, the implementation of price regulation policies is partly dependent upon the degree to which the regulator exerts surveillance and uses its power of initiation and intervention when need arises.

In the outcomes described earlier, we found that Denmark is the cheapest country according to our price index. There seems to be a clear link between this result and the Danish government's motto of 'best and cheapest telecommunications services'. Indeed, as a result of this motto, the regulator has been very active to promote cheaper prices, in particular via the intervention on wholesale prices. For instance, the regulator systematically imposes price reductions on wholesale products when best practice comparisons puts Denmark behind any other country. The regulator also has the task to carry out studies based on international comparisons, in order to make sure that the end-user price policies are coherent with the results in other liberalized countries. The second cheapest countries in our comparison are the United Kingdom, the United States and Switzerland. The positions of the United Kingdom and the United States could be explained by the fact that they have a long(er) liberalization and regulation history and have thus applied price regulation for a longer time. In the United Kingdom, the regulator still maintains fixed price-reductions for all telecommunications services. The fact that the incumbents in Denmark, the UK and the USA are totally privatized could also have an influence, in the sense that fully privatized operators have less bargaining power and political support than (partly) state-owned companies.

Switzerland on the other hand comes as a surprise as far as prices are concerned. Indeed, the Swiss liberalization history is concomitant to the EU, the incumbent is still more than 60% state-owned and the regulator has done very little to sustain price reductions. In many respects, the Swiss example thus contradicts the arguments presented before. However, it must not be forgotten that Switzerland has the highest purchasing power in the world, and that as a result, the data used for calculations may contain a serious bias. If prices were taken without adjustment by means of purchasing power, we would find that prices in Switzerland are high compared to other countries. The Swiss regulator usually takes this into account by publishing both absolute prices and prices converted with purchasing power parity[27]. According to the regulator's own saying, comparatively low prices for Switzerland are thus mainly the result of high purchasing power.

In the remaining countries including Korea, France, Germany and Austria, price-regulation is essentially carried out through price-caps for incumbent's services and the obligation for the incumbent to respect cost-orientation for the delivery of wholesale products. In none of the countries there is a specific policy to bring prices down, other than through competition.

All in all, we can conclude that regulatory intervention, underpinned by a clear price regulation policy has a high impact on the actual level of prices. However, we cannot exclude that early liberalization, full privatization and other external factors also have some effect.

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[27] OFCOM, in the future, will publish price comparisons on the basis of exchange rates.

External factors affecting end-user prices	
▪ Date of liberalization	▪ Purchasing power
▪ Full Privatization	▪ Cartel agreement between operators
▪ Consumer response	

2.2 Outcomes and relative impact of regulatory intervention and external factors upon public service indicators

As we have seen before, the other very important objective of regulation is the provision of public service, which includes universal service as well as more broadly choices and more appropriate information for the consumers. We have not included universal service into our list of indicators but decided to observe the availability of services, the quality of services and the quality and amount of information given to the consumers.

2.2.1 Availability of services

By availability of services, we mean the innovation and rollout of technologies as well as their availability on the territory. Unfortunately, data for this indicator are very incomplete; indeed sometimes technologies are known to be available but not to which extent, some technologies are still in a pilot phase, and sometimes it is impossible to find any information at all. We have used the data collected in our case studies and additional data from the OECD Communications Outlook to assess the situation in the different countries, but the reader should be warned about the lack of comparability of the data.

	A	DK	F	D	SK	CH	UK	USA
Mobile coverage[1]	99%	100%	99%	99%	99%	99%	98%	97%
ADSL availability[2]	80%	100%	72%	n.d.	100%	95%[6]	n.d.	50%
Network digitalization[3]	100%	100%	100%	100%	88%	100%	100%	97%
Cable modem[4]	yes	yes	yes	yes	yes	yes	yes	yes
Voice over cable[4]	yes	yes	yes	yes	yes	yes	yes	yes
Voice over powerline[5]	Pilot project	yes	no	yes	n.d.	Pilot project	n.d.	n.d.

[1] For the year 2001, in OECD *Communications Outlook 2003*, p. 107; [2] For mid-2002, figures provided by the NRAs; [3] For the year 2001, in OECD *Communications Outlook 2003*, p. 108; [4] Statistics about the availability of cable modem and voice over cable could not be found; [5] Power line telephony is a new technology that it still in its testing phase in most countries or at the very beginning of commercial launch (Germany). [6] In % of local switches

We can conclude from the table above that availability of services is good in all countries observed. Digitalization is almost completed in all countries, except in Korea where the high demand for DSL connections makes ISDN a priority of second importance. Mobile coverage is good, as is ADSL availability. As for cable telephony and cable Internet access, availability is very good in the UK (more than 200'000 connections for cable modem and 5.5 million for cable telephony[28]) and in the United States. In Korea, cable modem Internet access is also widespread with more than 3 million customers. The Korean case is interesting as the broadband Internet market is much more advanced as in all the other countries observed. Indeed, while all the other countries are still focusing their attention on ADSL, Korea is turned towards VDSL (20'000 kbps) with an expected 85% of the population covered by 2005. As for power line access, it is quite impossible to make statements about the respective situations in each country, as this technology is still in a very early development stage.

If we also take into consideration the comments gathered during our interviews, we can conclude that technological developments and deployment are especially quick in Korea, in Denmark and to a lesser extent in the United States and the United Kingdom. This comes as no surprise, given that Korea and Denmark are two countries where technological innovation and R&D are considered to be key priorities by the government. The United Kingdom and the United States on the other hand, have particularly high availability (and demand) for cable telephony and Internet.

There are some interventions that a regulator can undertake in order to foster the **availability of services**, such as:

Intervention of the regulator on the availability of services
▪ Provide legal certainty, which is essential for investments
▪ Set targets for the rollout of specific technologies when granting licenses
▪ Inform the public more or less about the new technologies available
▪ Develop content related initiatives to sustain the demand-side

The intervention of the regulator as far as the availability of services is concerned is quite dependent upon governmental policies encouraging technological innovation and deployment. As a matter of fact, the regulator has a rather indirect impact on this indicator, i.e. mainly through its capacity to provide maximum legal certainty through quick and consistent decision-making, which remains the major condition for investment in the sector. Informing the public about available technologies and sustaining new technologies through initiatives based on security of use and of content are also tasks that the regulator can be responsible for, thus again contributing to the availability of services.

From what we can observe in our cases, the impact of the regulator is generally weak when it comes to the availability of services, except in South Korea and Denmark, where explicit strategies on broadband development or on the deployment of several channels to the home (e.g. Denmark) guide

[28] OECD, Communications Outlook 2003, pp. 37 and 139

the regulator's intervention. The presence or not of a government strategy in the area of technological development and the consequent powers conferred to the regulator are thus major elements behind the impact of the regulator.

As an external factor, the financial health of the operators constitutes a very important condition for the rollout of technologies, and although the regulator can have an indirect impact thereon, the financial health of telecommunications operators is much more determined by the situation of the stock market and the international strategies of global operators. Other external factors are the geographic characteristics of the country and consumer responsiveness to technological innovation.

External factors affecting the availability of services
▪ International economic situation
▪ Topography of the country and population density
▪ Dynamism of telecommunications operators
▪ International strategies

All in all, it seems that the role of the regulator with respect to the availability of services is weak, except for countries in which there is a very pro-active policy on innovation and R & D. However, even those countries are conditioned by the financial situation of the operators which may delay the planned rollout of certain technologies.

2.2.2 Quality of services

In OECD countries, the quality of communication services is good and differences between countries are very slight. From our interviews, we got the impression that quality is indeed good in all of our 8 countries, although some governments seem to take quality monitoring more serious than others (notably South Korea, Denmark, the United States and the United Kingdom). However, this subjective impression was not confirmed with actual data in our case studies.

Some data on quality of services can be found in the OECD's Communications Outlook. The OECD has attempted to measure the quality of services by means of a series of indicators, including the waiting time to get a connection, the number of payphones per 1000 inhabitants and the number of payphones in working order, network defaults and repair time, the price for directory assistance and the answer seize ratios (ratio of international calls that are successfully terminated in the public switched networks of operators of other countries).[29]

[29] The methodology behind these indicators can be found in OECD, Communications Outlook 2003.

If we rank the countries according to the indicators mentioned above we find:

# payphones per 1000 inhabitants[1]	% of payphones in working order[2]	Faults per 100 lines per year[4]	% of faults repaired in 24 hours[5]	Directory assistance in USD PPP[6]	Answer seizure ratio in %[7]
Korea (11.4)	Austria (98.2)	Denmark (0)	Korea (96.8)	USA (0)	DK (68.4)
USA (6.7)	CH (98)	Korea (1.4)	CH (94)	Korea (0.06)	France (67.8)
CH (5.6)	UK (94.6)	Austria (5.2)	Austria (90.4)	UK (0.58)	USA (67.4)
France (3.6)	Korea (91)	UK (11)	UK (78)	Austria (0.71)	Austria (65.9)
Austria (3.3)	DK (90)	USA (12)	n.d.	France (0.91)	Korea (65.5)
UK (2.6)	n.d.	CH (16)	n.d.	CH (1.09)	UK (64.3)
D (1.4)	n.d.	n.d.	n.d.	n.d.	CH (62.7)
DK(1.1)	n.d	n.d.	n.d.	n.d.	D (61.8)

[1] OECD Communications Outlook, 2003, p. 199; [2] OECD Communications Outlook, 2003, p. 200, no data available for France, Germany and the United States; [3] OECD Communications Outlook, 2003, p. 198; [4] OECD Communications Outlook, 2003, p. 201, no data available for France and Germany; [5] OECD Communications Outlook, 2003, p. 202-203, no data available for France, Germany, the United States, and Denmark; [6] OECD Communications Outlook, 2003, p. 204-205, no data available for Denmark and Germany; [7] OECD Communications Outlook, 2003, p. 206

All in all, if we combine all these factors without weighing their importance and without taking into consideration the fact that data are not available for all countries for each indicator, we find that in terms of quality of services, Korea comes first, followed by the USA, Austria, France, Denmark, the United Kingdom, Switzerland, and finally Germany.

If we list the different actions a regulator can undertake in order to guarantee the **quality of services**, we find:

Intervention of the regulator on the quality of services
▪ Define quality standards for USO/other services
▪ Test services, such as directory inquiries or value-added services
▪ Test the quality of customer relation within the companies
▪ In case of deficiency, the regulator can or cannot impose sanctions
▪ Publish performances of the operators by means of a favorable status list, for instance
▪ Develop quality measurement tools for consumers
▪ Make public inquiries about the available quality

The regulator can play a very active role in this field, through a whole series of measures. First of all, the regulator can set quality standards for the telecommunications services but also for the

relationship between operators and their clients. The monitoring of these standards and the appropriate sanctioning in case of non-compliance are in this respect, at least as important as the standard definition itself. The degree to which the regulator informs the consumer about the quality of services or provides them with quality measurement tools is yet another field where the regulator can promote good quality services.

There seems to be a relation between the intervention of regulators and the actual quality of services in a country, as shown in the cases of Korea and the United States. However, establishing an undisputable link between regulatory intervention and improved quality of services is hazardous with the data that we have in our possession. For instance, according to our ranking, the UK is not among the most performing country in terms of quality, at least when looking at our indicators, although the British regulator was found to be rather active in this field. France on the other hand has a good score, although we did not get the impression, through our interviews that much attention was given to this aspect of regulation. It would be worthwhile to have more detailed information on quality of services, and chronological series for all countries. Indeed, some countries do not provide data for all the indicators taken into account. Starting from there, one could also argue that when there are no data available for an indicator in a country, the regulator does not sufficiently monitor quality. In France for instance, data can only be found for 4 indicators out of seven presented above. Only Korea, Switzerland, Austria and the United Kingdom have information for all indicators.

External factors affecting the quality of services could be the costumer orientation of the enterprises themselves, the quality of the initial network inherited from the monopolistic era, and the topography in the country.

External factors affecting the quality of services
▪ Level of maintenance
▪ Customer orientation of telecommunications operators
▪ Topography

However, all things considered, the regulator seems to have a great role to play to ensure quality of services and consumer satisfaction, and this role is taken very seriously in countries such as the United States, Korea and Denmark.

2.2.3 Information to the consumer

The provision of information to the consumers does not seem to be a priority in all of the countries observed in this study. In continental Europe, for instance, responsibility is left to the consumers to find out about new offers and possibilities. Regulators rely on the operators to advertise their offers and new services made possible through regulatory intervention (such as number portability or carrier selection for instance). In the United States, the United Kingdom, and Denmark, on the other hand, we found that informing the consumer was considered as an important objective of regulation. In the context of this study however, we did not have the means to verify the extent to which consumers are

actually informed with or without regulatory intervention, but it would certainly be an interesting exercise.

The different actions a regulator can undertake in order to promote the **information offered to the public** are listed below:

Intervention of the regulator on the quality of services
▪ Make information permanently available
▪ Update information regularly
▪ Put more or less information online
▪ Decide on the amount and the quality of the information
▪ Answer questions from the public more or less rapidly
▪ Provide information about prices of telecom services
▪ Provide information about the quality of telecom services
▪ Have a more or less friendly and efficient customer relation service

As far as informing the public is concerned, we saw that it has become an important function of the regulator, once the liberalized market witnessed the mushrooming of new features, offers, and services. The impact of the regulator on this indicator could theoretically be strong, as there are not many external factors impeding its actions. However, here again the impact of the regulator strongly depends on the powers and means that are conferred to it by the legislator. Among the countries we observed, the Danish regulator seems to take on this role the most actively. Indeed, the Danish regulator informs the Danes about available technologies, about the offers of the operators, and has also developed an interactive price guide for consumers who wish to know how much they actually could pay for specific services. Furthermore, the Danish regulator is obligated to answer any consumer demand within a period of 5 days, and has extensive personnel in its customer division. In other countries, we have found that there is still significant room for improvement with regards to information for the consumer, something which is especially true for Switzerland, France, and Germany. In these countries, the regulators are not properly empowered with the function of informing the consumers, a task which is often left to private organizations.

As mentioned before, in the context of this study, we could not compare the actual outcomes of this indicator, i.e., verify whether the information provided by the regulator is useful, used and yields actual benefits fro the consumer. As a consequence, we can only affirm that the information of the regulator can be crucial, but not that without regulatory intervention there is an information deficiency for the consumer. Factors on which the only regulator has little impact are the consumer awareness in the country, reputed to be strong is Scandinavian countries for instance, and the extent to which private operators or private organizations inform the consumer.

External factors affecting the information to the consumer
▪ Consumer awareness
▪ Information given by private organizations / consumer associations
▪ Advertising of the companies

All in all, we can say that the regulator has an important role to play as far as information to the consumer is concerned, as in the end, the regulator is also supposed to be the guardian of the consumer's interests within the process of telecom liberalization. This view is not shared by all countries though, where responsibilities for informing are left to the companies and to private organizations.

2.3 Summary

If we summarize the paragraphs above in a table reflecting the respective impacts of regulatory intervention and external factors on all seven indicators, we find the following:

Indicators	Prevailing impact
# of operators on the markets	External factors
Market shares of incumbent	External factors and regulatory intervention
Choices for the consumers	External factors and regulatory intervention
Availability of services	External factors and regulatory intervention
End-user prices	Regulatory intervention
Quality of services	Regulatory intervention
Information to the consumer	Regulatory intervention

Overall, it appears that the impact of the regulator is potentially higher in public service objectives, than in the case of competition creation objectives. This is of course quite logical, considering the fact that competition significantly depends upon macro-economic factors (such as the overall economic climate, global cartelization), as well as on other actors within the overall telecommunications regulatory framework (e.g., competition authority).

Although the above conclusions apply to all regulators, there are still differences to be made between the countries taken into account. For those indicators on which the regulator can make a real difference, we have summarized the findings of our case studies below. More precisely, for the 3 indicators upon which the regulator can have a strong impact (end-user prices, quality of services and information to the consumer) and the other 3 upon which the regulator can have some impact (market shares of the incumbent, choice for the consumers and availability of services) we have refined the analysis per country.

For each category of indicator, we have observed that the national regulator can either have a "weak", an "average", or a "strong" impact. When a regulator is said to have a weak impact on a given outcome or indicator, we mean that the intervention of the regulator is not determinant for the final result or outcome. An average impact means that the regulator has a certain influence on the indicator, but that it is limited by a whole series of institutional and external factors. When a regulator is said to have a strong impact on a given indicator, his actions are determining and can significantly change the characteristics of the telecom market (and public services). However, the reader must understand that when a regulator is said to have a weak impact on a given indicator, this does not necessarily mean that the regulator himself is weak, but that its freedom of action is either limited by other institutions, by law, or by external, and other uncontrollable factors.[30]

Thus, looking at the six indicators upon which the regulator can have some impact, we see that the respective impacts of the national regulators in our countries are:

Impact of the regulator on ...	**Austria**	**Denmark**	**France**	**Germany**	**South Korea**	**Switzer-land**	**United Kingdom**	**United States**
Market shares of incumbent								
Choices for the consumers								
Availability of services								
End-user prices								
Quality of services								
Information to the consumer								

Weak Average Strong

As we can see, there can be significant differences from one country to another with regards to the impact of the regulator on the different indicators. This table also reflects the results of the previous

[30] The reader must keep in mind that the information underlying the statements expressed in the table is drawn from the case studies, and that the impact of the regulator on any given indicator is always relative to the other countries observed. In other words, there is no ranking against any best practice or any best country. We simply compare regulatory intervention against the lists of interventions by the regulator used in the preceding analysis. These lists have been furthermore established by us, i.e., as a result of our empirical observations, and does not reflect international standards. It could, however, constitute a check-list for possible regulatory intervention, and we use it as such.

section, which concluded that, potentially, the regulator could have a more significant impact upon the public services outcomes than on the competition outcomes.

Overall, and across all countries, it appears that the impact of the regulator on some indicators is more substantial than on others, as shown in the list below, ranking from the most to the least substantial impact.

1. Impact upon the quality of services
2. Impact upon end-user prices
3. Impact upon the information to consumers
4. Impact upon the choices for the consumers
5. Impact upon the market shares of the incumbent
6. Impact upon the availability of services

If one compares, across all the indicators, the impact of the regulator on the outcomes in the eight different countries, the following ranking can be established:

1. Denmark
2. United Kingdom
3. South Korea
4. United States
5. Austria and France
6. Germany and Switzerland

Quite obviously, the degree to which a regulator impacts the outcomes is dependent upon certain factors, which are of course again different from one country to another. One can distinguish between four such factors, namely the substantial legal framework, external factors, the efficiency of the regulator and the institutional legal framework and subsequent institutional regulatory arrangements. Let us briefly look at each of them.

The substantial legal framework determines the public policies objectives. For obvious reasons, the regulator can have an impact only when such public policies objectives exist. From our analysis, we concluded that the broad public policy objectives are similar across all eight countries studied, yet with two caveats: first, early liberalizers seem to be more effective in fostering competition than late liberalizers, which tends to indicate that (1) the timing of public (telecommunications) policy matters, and that (2) the regulator does learn, at least in the area of competition promotion. Secondly, some countries do have technology innovation and R&D policies, which positively affect consumer protection objectives.

There is also the question of external factors, which are per definition out of the regulator's control. From our analysis, we deduce that external factors are more significant when it comes to competition regulatory objectives than when it comes to public services objectives.

There is also the issue of the efficiency of the regulator. Indeed, even if the public policy objectives are clearly stated and the regulator finds itself in the center of the institutional regulatory framework and is given competence, power, and resources, it can fail to impact upon the outcomes because it works poorly and inefficiently. The issue of efficiency is not relevant in the framework of the present study, which is why we will not address the matter any further here.

The institutional legal framework and corresponding institutional regulatory arrangements are yet another, in our view very significant factor, determining the impact of the regulator on the outcomes. Where the objectives of liberalization and regulation are clearly defined and the regulator is located in the center of the system and given power and resources, the chances that the regulator effectively contributes to the achievement of the defined outcomes are naturally higher (as it is the case in Denmark and the United Kingdom). But when the institutional regulatory arrangement is less coherent, the impact of the regulator will naturally be less significant. This is the analysis we will provide in the section below. It will specifically seek to assess the status of the regulator within the overall institutional regulatory framework.

2.4 Role of the institutional regulatory framework in determining the impact of the sectoral regulator on outcomes

We have seen above that the regulator can have a strong, average of weak impact upon the outcomes of telecom regulation. In this section, we exclusively focus on one of the above four factors having an influence on such an impact, namely the question of the institutional regulatory framework. As noted earlier, the design of this institutional framework does have a very significant influence upon the overall performance of the regulator (i.e. upon the impact it can have or not have in achieving the regulatory outcomes), as it defines the status and the power of the regulator, as well as its relationships with the other actors of the framework. In other words, in this section, we try to understand why in some countries the regulator seems to have a more significant impact upon the outcomes than in others.

If one assumes that the external factors are more or less identical in all eight countries, that all regulators work with a similar degree of efficiency, and that the public policies objectives are also more or less identical, the main explanatory factor for this difference in impact has to origin in the institutional regulatory framework. Ideally of course, the objectives of telecom regulation should be clear and the competencies of the different involved actors, in particular of the sector regulator, precisely defined, in order to guarantee maximum coherence and stability of the institutional regulatory framework. However, when we look at the different case studies, we can note that there are sometimes serious institutional flaws in the regulatory framework, which prevent the overall system from yielding optimal results. Among such flaws one may note the struggle for power among the involved actors, competition for 'clients', overlapping or poorly defined tasks, contradictory political objectives and attributions, as well as a lack of cooperation between the different actors involved in telecom regulation. As the most obvious indicator of such institutional flaws – i.e., the way these institutional flaws are expressed – one may take the degree of conflict (or tension) among the involved actors. As we are interested in the performance of the regulator, we will in particular examine the degree of conflictuality between the regulator and the main other actors involved in the

institutional framework (i.e., judicial powers, sponsoring ministry, competition authority, incumbent, and competitors).[31] In other words, we are using here the "degree of conflictuality" between the regulator and the other main actors as the key indicator defining the performance of the regulator within this framework.

To determine the degree of conflictuality in our different countries, we relied on the interviews that we conducted with each one of the actors involved in the regulatory system in each country. The drawback of such as method is that the information provided is highly subjective, and that the interviewed representatives may precisely not be representative of the most shared opinion. The advantages of this approach on the other hand, are that we could capture the sometimes contradicting opinions of the different stakeholders and that the rather informal nature of our visits encouraged our interviewees to speak openly.

From what we learned through our interviews, we classified institutional tensions in a comparative manner, distinguishing between low, medium, and high tensions between the regulator on the one hand and all other main involved actors in the institutional regulatory framework for telecommunications on the other.

	Austria	**Denmark**	**France**	**Germany**	**South Korea**	**Switzerland**	**United Kingdom**	**United States**
Institutional tensions between								
Regulator and judicial powers								
Regulator and ministry								
Regulator and comp. authority								
Regulator and incumbent								
Regulator and competitors								

Low Medium High

An analysis of this table indicates that there are significant differences among the eight countries when it comes to the degree of conflictuality between the regulator and the other main actors involved

[31] In the case of Switzerland, where we have two bodies making up for the "regulator", we will not distinguish between the ComCom on the one hand and the part of the OFCOM which is executing telecommunications regulation, thus implicitly assuming that there are no conflicts among these two bodies (which, to our knowledge, is the case).

in telecommunications regulation. One may rank the countries from the least conflictual to the most conflictual:

Conflictuality in increasing order	Reminder: Impact of the regulator in decreasing order
1. Denmark and Austria	1. Denmark
2. United Kingdom	2. United Kingdom
3. France	3. South Korea
4. South Korea and Switzerland	4. United States
5. United States	5. Austria and France
6. Germany	6. Germany and Switzerland

There appears to be a certain correlation between the degree of conflictuality on the one hand and the impact of the regulator on the outcomes on the other, especially in the case of the extremes: the country where the degree of conflictuality is minimal is also the country where the regulator seems to have the most significant impact on the outcomes of telecommunications regulation (e.g., Denmark and the United Kingdom). On the other hand, where the degree of conflictuality is maximum, the regulator also appears to have the least impact upon the outcomes (e.g., mainly Germany, but to a lesser degree also Switzerland). There are, however, exceptions, namely the United States and South Korea – where the regulator has a certain impact despite a relatively high degree of conflictuality – on the one hand, and Austria on the other, where there is little impact of the regulator despite a low degree of conflictuality. The low degree of conflictuality in Austria is essentially attributable to two factors: first of all, until July 2002 there was no competition authority, the function of regulating competition was left to the ministry. Secondly, the low degree of conflictuality between the regulator and the judicial powers is essentially due to the judicial power's slowness. Indeed, out of 120 cases pending before court since 1998, only 3 were ruled on. In actual fact, conflictuality is still low, but this situation could change if the courts were to rule on a whole series of pending cases. The US and South Korean exceptions, must, in our view, be attributed to the substantial policies (on consumer protection and technology innovation), which give the regulator additional roles to play.

We can conclude from the above that the way the institutional regulatory framework is set up significantly affects the outcomes of regulation, and in particular the performance of the regulator. Inter-organizational tensions often reflect weaknesses in the legislation itself, which is often not clear enough, especially when it comes to the division of competencies among the different actors. Also, legislation does sometimes not grant enough power to those institutions that should be primarily involved in the telecom regulation, i.e. the NRA. This can be the result of a deliberate decision aimed at limiting the powers of certain institutions, in particular the regulator, but it can also result from the fact that legislation could not predict the evolution of the market and the regulatory needs.

Overall, one observes that there is significant tension, in order of importance, between the regulator and the incumbent, between the regulator and the judicial powers, between the regulator and the competition authority, between the regulator and the sponsoring ministry, and finally between the regulator and the competitors. The assumption is made here that such tensions diminish the

regulator's overall performance – i.e., the impact of the regulator on the outcomes. This assumption may not be true, especially in the case of the tension between the regulator and the incumbent (and to a lesser extent between the regulator and the competitors). Nevertheless, the inverse correlation between regulatory performance and the degree of conflictuality within the overall institutional framework remains, even if one removes the regulator's relationships with the incumbent and the competitors. If a certain conflictuality between the regulator and the operators seems to be normal – or even necessary for a regulator to succeed – conflictuality with the judicial powers, the competition authority, and even the sponsoring ministry appears to be rather counter-productive. We are facing here the fact that (1) there is indeed no optimal institutional regulatory framework, and that (2) this regulatory institutional framework still strongly reflects the political and institutional history of a given country. In other words, a certain conflictuality – negatively impacting upon the performance of the regulator – will always exist between the regulator and the judicial authorities, as well as between the sector regulator and the competition regulator. Therefore the performance of the sector regulator will always be sub-optimal, no matter how good the institutional regulatory design. However, the tension between the sector regulator and the sponsoring ministry is generally due to the fact that one of the operators in the marker – i.e., the incumbent – remains publicly owned, and this tension will ultimately only disappear with total privatization.

Finally, and as we have seen, the degree of conflictuality – influencing significantly the performance of the sector regulator – strongly varies from one country to another. It is interesting to observe that it is highest in federalist countries (Germany, United States, Switzerland), again with Austria being an exception. This is not surprising, as federalist countries are known to have a strong culture of separation of powers and check-and-balances. Powers and competencies are therefore more often split between several institutions, which involves potentially higher conflictuality[32]. In other words, the performance of the regulator seems to be somewhat diminished because of the type of the political system, as well as because of public ownership of the incumbent.

[32] See Genoud C., Arentsen M., Finger M., Section on Regulation in Midttun, A. (eds) *Reshaping EU electricity and gas industries : regulation, markets and business strategies*, forthcoming autumn 2003, Elsevier, Amsterdam.

3 Conclusion

To recall, the purpose of this study was to assess the relative impact of the sector regulator as compared to the outcomes. More precisely, we wanted to respond to three main questions, namely:

- To what extent have the original public policy objectives in the telecommunications sector been achieved?
- To what extent can these outcomes be attributed to the regulatory institutional framework as opposed to external factors, beyond the control of the NRA and other institutional regulatory actors (e.g., economic growth or technological innovation)?
- Wherever the role of the external factors is small, to what extent, then, can the outcomes of the regulatory framework be attributed to the specific actions of the sector regulator, i.e., the NRA?

Overall, we can affirm that the objectives of telecom regulation have been partly achieved in all of our countries, and that the current frameworks for regulation have proved to be effective. Of course, there are some differences from one country to another; in particular regarding the objective of competition. Indeed, countries such as the USA, the UK and Denmark have reached higher levels of competition whereas the rest of continental Europe and Korea still have very dominant incumbent operators. Still, there is no country among the ones observed in the context of this study, which has failed to achieve at least a major part of its telecommunications objectives.

However, one can see that the impact of the regulator upon the outcomes varies to some extent from country to country. It appears to be most significant, in decreasing order of importance, in (1) Denmark, (2) the United Kingdom, (3) South Korea, (4) the United States, (5) Austria and France, and finally Germany and Switzerland. This varying impact can be explained, according to our study, by four factors, namely (a) the degree of conflictuality within the existing institutional framework, (b) the timing of liberalization, (c) the specific aspects to be regulated, and (d) the original telecommunications legislation. Let us look at each of these factors in more detail.

One can say that the institutional framework for telecommunications regulation does matter. Indeed, we can affirm that, in general, the more the institutional framework bears conflict, the less impact the regulator has on the outcomes. We have identified such conflict, across the different countries, in order of decreasing importance, between the regulator and the incumbent, between the regulator and the judicial powers, between the regulator and the competition authority, between the regulator and the sponsoring ministry, and finally between the regulator and the competitors. But this degree of conflictuality strongly varies from one country to another: it is strongest in the federalist countries of Germany, the United States, and Switzerland, which are also these countries where impacts of the regulator on regulatory outcomes are weakest. On the other hand, the least conflictual country, Denmark, is also the country in which the regulator has the highest impact. From there, we can conclude that the impact of the regulator on telecommunications objectives is potentially highest when:

1. Competencies have been clearly defined and shared out among the different institutions
2. Within the institutional framework, the legitimacy of one institution is not questioned by other institutions, in particular the regulator's action by the competition authority, the juridical power or even the sponsoring ministry.
3. The regulator is given sufficient means and powers to face conflicts with the Incumbent operator, especially in those countries where the Incumbent is still partly state-owned, and where there (can) exist conflicting interests at political level

We can also affirm that the timing of liberalization does matter: the earlier liberalization has occurred, the bigger the impact of the regulator on the outcomes. This is particularly the case of the United States, the United Kingdom, and to a lesser extent Denmark. Of course, this can be explained by the fact that the regulator will have had time to learn. At the same time, the market also 'learns' or at least evolves towards more solid competition. In particular, alternative operators have started to make profits and in some cases, resolved their debts problems.

Thirdly, it appears clearly that the impact of the regulator upon the outcomes varies considerably according to the type of aspect to be regulated. Overall, one can distinguish between competition and public service objectives. As a matter of fact, it appears that regulation is less effective in achieving competition outcomes than it is in achieving public service outcomes. Indeed, in the area of public service, the regulator can have a strong impact, provided there is according legislation on its role as a promoter of public service objectives. On the other hand, as far as competition is concerned, factors beyond the control of the regulator do play a quite significant role in the achievement of the final outcomes. From our observation, we conclude that downstream, the regulator's action is primordial to create the appropriate conditions for competition to emerge. In an asymmetric market such as the telecommunications market, regulatory intervention is indeed a *sine qua non* condition to even make competition possible. Upstream however, macro-economic factors weigh heavily on the final degree of competition within the market. Therefore, the intervention of the regulator is essential, but the final results that can be expected can only partly be attributed to regulatory intervention. From there, we can assume that:

1. The regulator can have a strong impact on public service objectives, in particular on consumer protection and information
2. The action of the regulator is a prerequisite for competition to be made possible, but the final degree of competition that is to be observed does not only depend upon regulatory intervention

Finally, it must be recalled, that legislation does indeed matter: telecommunications regulators, as all other regulators, can only be as effective, as the legislator wants them to be. In particular, if the legislator does not want one aspect to be regulated, the regulator cannot become active and its impact upon the outcomes can actually not be judged. In particular, countries, which do have pro-active policies for consumer protection and/or technology innovation and R&D policies, positively affect public service objectives. Thus the following conclusions:

1. Regulatory intervention is best where policy objectives and according legislation have been clearly defined and responsibilities clearly attributed
2. Legislative fuzziness only leads to conflictuality within the institutional framework and in particular, to the undermining of the regulator's legitimacy and credibility

If we look back at the Swiss case in light of the remarks made above, the main challenges of future telecommunications regulation are:

1. A more precise legislative framework in which the regulator's competencies cannot be systematically questioned, either by the incumbent, or worse, by the judicial powers. Indeed, dissolving regulatory power among several actors when attributing powers, besides to the regulator (both the ComCom and the OFCOM), also to the judicial power, to the competition authority, as well as to price surveillance, ultimately leads to challenging the credibility of the regulator. More precisely, it leads to reducing its bargaining power vis-à-vis the operators that it is supposed to regulate, and especially vis-à-vis the Incumbent. We may compare the Swiss case to the situation of Denmark or the United Kingdom, for example, where the regulator (and not the sponsoring Ministry as is sometimes the case in Switzerland) is considered to be the most important actor of the telecom regulation institutional framework, and where regulatory objectives have been clearly laid down. There, the regulator knows its limits and uses them to implement the public policy objectives without being constantly put under pressure and accused of overstepping its competencies (as is the case with the Swiss regulator). As a result, the operators have a different attitude vis-à-vis the regulator, and the Incumbents do not systematically appeal the regulator's decisions.

2. The empowerment of the regulator in the field of public service objectives. Indeed, if in Switzerland, the regulator's main role pertains to creating and sustaining competition (without however, giving it all the necessary means to do so, as seen above), in many of the countries observed however, the regulator also provides significant and useful support to the consumers. In doing so, the regulator does play a key role, if not the key role, in providing the benefits of liberalization for the consumers, which is in the end, the major and ultimate objective of liberalization and regulation. Especially in Denmark, the United Kingdom, the United States, and South Korea, consumer focus is strong and explicit and the work of the regulator in terms of information and support to the consumer is considered as a national priority. Furthermore, and as we have seen in our study consumer protection is also the area where a regulator is ultimately most effective, i.e., where it can most significantly influence the outcomes. Of course, in Switzerland, the law is, to a certain extent, concerned with consumer interests, but it does not see this a priority, nor does the currently existing institutional regulatory framework attribute the regulator the means to play a particularly significant role in protecting the consumers' interests.

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