

Regulatory Reform in Denmark

Regulatory Reform in the Telecommunications
Industry



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FOREWORD

Regulatory reform has emerged as an important policy area in OECD and non-OECD countries. For regulatory reforms to be beneficial, the regulatory regimes need to be transparent, coherent, and comprehensive, spanning from establishing the appropriate institutional framework to liberalising network industries, advocating and enforcing competition policy and law and opening external and internal markets to trade and investment.

This report on *Regulatory Reform in the Telecommunications Industry* analyses the institutional set-up and use of policy instruments in Denmark. It also includes the country-specific policy recommendations developed by the OECD during the review process.

The report was prepared for *The OECD Review of Regulatory Reform in Denmark* published in 2000. The Review is one of a series of country reports carried out under the OECD's Regulatory Reform Programme, in response to the 1997 mandate by OECD Ministers.

Since then, the OECD has assessed regulatory policies in 16 member countries as part of its Regulatory Reform programme. The Programme aims at assisting governments to improve regulatory quality — that is, to reform regulations to foster competition, innovation, economic growth and important social objectives. It assesses country's progresses relative to the principles endorsed by member countries in the 1997 *OECD Report on Regulatory Reform*.

The country reviews follow a multi-disciplinary approach and focus on the government's capacity to manage regulatory reform, on competition policy and enforcement, on market openness, specific sectors such as electricity and telecommunications, and on the domestic macroeconomic context.

This report was principally prepared by Kyoko Sato and Dimitri Ypsilanti of the Directorate on Science, Technology, and Industry. It benefited from extensive comments provided by colleagues throughout the OECD Secretariat, as well as close consultations with a wide range of government officials, parliamentarians, business and trade union representatives, consumer groups, and academic experts in Denmark. The report was peer-reviewed by the 30 member countries of the OECD. It is published under the authority of the OECD Secretary-General.

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Executive Summary

Background Report on Regulatory Reform in the Telecommunications Industry

The telecommunications industry has undergone significant regulatory reform over the last decade. By 1998, 23 of the OECD countries had liberalised their telecommunications market, including voice telephony, infrastructure investment and investment by foreign enterprises. The success of this liberalisation process will depend on the presence of a transparent and effective regulatory regime that enables the development of full competition, while efficiently protecting the public interest. This report addresses whether the regulatory regime in Denmark can ensure the success of the liberalisation process by assessing telecommunications regulations in Denmark, recent regulatory reforms and their impacts on market performance.

Denmark opened its telecommunications market to full competition in July 1996, 18 months in advance of the 1 January 1998 deadline set by the EU Full Competition Directive and, thus earlier than many other major European Union countries. In liberalising the market, an ambitious political objective was adopted to have the “best and cheapest telecommunications services before the year 2000”. Since then, the Danish government has been striving continuously to achieve this political objective through promoting effective competition.

Denmark has one of the most open telecommunications market among OECD countries with no barriers to entry and no discriminatory restrictions on foreign companies, including ownership restrictions. With the combination of early and complete market liberalisation, there has been success in promoting competition, and many new operators, including many foreign companies, have entered the telecommunications market. The Danish government has also made significant efforts to enhance effective competition in the market by implementing essential safeguards in areas including interconnection and carrier pre-selection. All these efforts have resulted in the development of competition, especially in the mobile market and the international market, although the former monopoly Tele Danmark continues to be dominant in a number of key market areas. Prices for telecommunications services in Denmark have generally been among the lowest in OECD countries, and have declined further as a result of competition. New service options, including innovative services, have also been introduced, further benefiting consumers.

However, the process of developing competition has also resulted in the emergence of many new regulatory issues. Although most of the essential safeguards for ensuring an efficient market have been introduced, there remain issues which still need to be resolved to establish a firm basis for sustained competition and ensure that users continue to benefit from reform. One of the major issues which needs to be addressed is the role of the independent regulator, the National Telecom Agency (NTA). Up to now, the regulatory authority of the NTA, in terms of its relations with Tele Danmark, has been relatively weak and it has been unable to enforce effective and adequate regulation to promote further competition. NTA’s lack of regulatory authority has caused considerable delays in the implementation of regulation on critical issues such as interconnection, that have often resulted in a serious disadvantage for new entrants. It is vital that the NTA is given sufficient authority to take swift action in regulatory decisions, so as to keep pace with the rapid changes in the telecommunications market. Furthermore, Tele Danmark has not been subject to asymmetric regulation so that these delays, and the fact that the company has been allowed to merge a number of separate service areas into the company, has served to strengthen its dominance.

Denmark is currently at an important juncture in terms of telecommunications regulatory reform. The overall review of telecommunications legislation and regulation, currently being undertaken by the government, could provide the opportunity to create a firm basis for the future of telecommunications competition in Denmark, and perhaps move closer to the political goal set for the sector.

1. THE TELECOMMUNICATIONS SECTOR IN DENMARK

1.1. *The national context for telecommunications policies*

Denmark is a small economy located at the northern end of continental Europe with a total population of 5.2 million.¹ Telecommunications market revenue in Denmark reached US \$4.6 billion in 1997, an increase of 12.2% over five years earlier.² Growth has accelerated compared to the previous five-year period during the monopoly era where the five-year revenue increase was only 2.1%. Expenditure on telecommunications per capita in Denmark was US\$881 in 1997, which was higher than the OECD average (US\$569) and also the highest among the Scandinavian countries.³ Investment in the telecommunications market was US\$670.8 million in 1997, equivalent to 14.5% of total market revenue.⁴

At the end of 1997 there were 63.6 telecommunications access lines per 100 inhabitants in Denmark.⁵ This was the fifth highest rate among OECD countries.⁶ In terms of the network, digitalisation of fixed networks was completed by the end of 1998, and 84.0% of mobile networks have also been digitalised.⁷ The penetration rate of cable television is relatively high (49.5%) in Denmark above the OECD average of 34.1%.⁸

Tele Danmark, the former monopoly, ranked as the 27th largest public telecommunications operator in the OECD area in 1997 with revenue of US\$4.5 billion and a total staff of 17 268.⁹

1.2. *General features of the regulatory regime, telecommunications market and market participants*

1.2.1. *The influence of the EU*

The European Union has had a strong influence in establishing the regulatory structure of the telecommunications sector in Denmark. Since the "Green paper on the development of the common market for telecommunications and services" published in 1987, the European Commission has led the liberalisation process in European countries, including Denmark, through its liberalisation directives.¹⁰ The Full Competition Directive of March 1996 which set the deadline for full competition at 1 January 1998 provided a turning point to the Danish telecommunications market, when the government decided to open the market in July 1996 to meet the requirements of the directive.

The European Commission has also provided various harmonisation directives¹¹ with the aim of establishing a consistent regulatory framework among member countries and forcing the implementation of specific safeguards to ensure effective competition in the telecommunications market. Denmark has been among the earlier countries to implement and reflect these directives in national legislation.

1.2.2. *Brief history*

Process of liberalisation

All telecommunication networks and services were completely liberalised in Denmark as of 1 July 1996, subject to a basic political agreement of December 1995 on the full liberalisation of the telecommunications sector. This was 18 months in advance of the requirement of the EU Directive on full liberalisation.

Prior to the full liberalisation of July 1996, the Danish legislation had allowed the government to grant an exclusive right to an operator to establish and operate specific telecommunication infrastructure and associated services. The Act on Certain Conditions in the Telecommunications Field, which created the legal basis for establishing Tele Danmark, had also granted Tele Danmark the right to exclusively provide: telephony service; text and data communications service; leased lines; mobile communications and satellite services; and the transmission of television and radio programs via telecommunications networks i.e. cable television.

Together with this exclusive concession, the Act had also vested in the government the mandate to decide on liberalisation in those areas where Tele Danmark had been granted a monopoly. Based on this mandate, various areas of the telecommunication sector were liberalised to allow competition gradually from 1990. This included areas such as the GSM system in mobile communications; data communications; and provision of satellite networks and services. However, other areas including the provision of public switched telephone networks and services remained as Tele Danmark's exclusive right.

Box 1. History of telecommunications liberalisation in Denmark

1990	Liberalisation of supply and service of telecommunications equipment.
1992	Liberalisation of the cellular communications market for GSM system.
1993	Liberalisation of the use of leased lines for resale of data communications services.
1994	Liberalisation of the used of leased lines for resale of voice services.
1995	Liberalisation of operating broadband infrastructure within municipalities. ¹²
1996	Full liberalisation of all telecommunications infrastructure and the services.

The political agreement made in April 1995,¹³ on the restructuring of the Danish telecommunications sector was the starting point of the liberalisation process in Denmark. This agreement laid down the policy objective of the telecommunications sector to have the worlds "best and cheapest telecommunications services before the year 2000". It was agreed at this point to restructure the Danish telecommunications sector towards full liberalisation through a two-stage strategy - Stage 1 and 2.

As the initial step towards full liberalisation, Stage 1 eliminated Tele Danmark's exclusive rights in several areas. The rights of Tele Danmark to exclusively transmit television and radio programs through its nation-wide telecommunications networks¹⁴ and to establish broadband networks within the boundaries of the municipalities were abolished. Interconnection procedures for mobile operators were also improved to ensure mobile operators the right to have direct access to other domestic and international mobile operators through interconnection agreements.

The real turning point of the Danish telecommunications sector, however, came in December 1995, when it was agreed at the political level to introduce full liberalisation from July 1996, 18 months in advance of the deadline set up by the European Commission.¹⁵ This was the start of the so-called Stage 2, which created an entirely new regulatory regime for the Danish telecommunications sector. Stage 2 introduced the core legislation framework for full liberalisation in Denmark in two phases - generally known as Stage 2a and Stage 2b.

Stage 2a was implemented by introducing a package of legislation that focused on the main requirements for full liberalisation from 1 June 1996. The legislation package for Stage 2a included five acts that came into effect from July 1996.¹⁶ This package contained the main safeguards required for liberalisation: open access to all telecommunication infrastructure and services; the basic interconnection framework; the framework for price regulation; universal service obligations; allocation of numbering resources including the 4-digit number for carrier selection; and the outline of the public tender process for the new DCS1800 system. Tele Danmark's exclusive right to establish and operate transmitting networks for Denmark's Radio and TV2 was abolished also at this stage, and the previous restriction on Tele Danmark to provide television and radio content services via satellite and cable networks was lifted simultaneously. This elimination allowed Tele Danmark to enter the cable television content business. The two appeals boards - the Telecommunications Complaints Board and the Telecommunications Consumer Board - were also established in the Stage 2a process.¹⁷

The legislation package of Stage 2b came after full liberalisation. The package contained various supplementary initiatives to safeguard effective competition in the sector including: the legal basis for NTA's independence; an extended interconnection framework; the framework for spectrum allocation; the rules for number portability and carrier pre-selection; and access to rights of way. The legislation package of Stage 2b came into effect from July 1997.¹⁸

Box 2. Liberalisation development of Stage 1 and Stage 2

Stage 1

- Liberalisation of transmission of television and radio programs through Tele Danmark's telecommunications networks
- Liberalisation of broadband networks within municipalities
- Significant cut in prices of broadband services
- Improved interconnection conditions for mobile cellular operators

Stage 2a

- Full liberalisation of all telecommunications infrastructure and services
- Basic framework for interconnection
- Universal Service Obligation
- Access to numbering resources including carrier pre-selection
- Promotion of further competition in the mobile sector
- Establishment of two appeal boards

Stage 2b

- The Act on the National Telecom Agency
- Extended framework for interconnection
- Framework for frequency allocation
- Carrier pre-selection and number portability
- Access to rights of way

Development of Tele Danmark

Before the establishment of Tele Danmark in 1991, the operation of the Danish telecommunications sector was divided among four regional telecommunications companies - KTAS (Copenhagen Telephone Company), Jutland Telephone Company, Funen Telephone Company and South Jutland Telecom - and one inter-regional/international telecommunications company - Telecom Denmark. The four regional companies were responsible for providing telecommunications networks and services in their own geographical area, while Telecom Denmark was in charge of certain national services including the interconnection of networks between the regional companies and international telecommunications services. This structure had some interesting implications. First, there was implicit price and quality competition between the regional monopolies which partly explains Denmark's favourable price and quality performance. Second, it resulted in regional price differentials, which still exist today unlike in most other countries that have nation-wide geographically averaged prices.

According to the political agreement of June 1990 and the introduction of the Telecommunications Act 1990, in 1991, the four regional companies and Telecom Denmark were brought together under a single holding company, Tele Danmark. Tele Danmark was established as a corporate organisation from the initial stage. The rationale of this restructuring was to create an efficient nation-wide telecommunications market that could also compete in the global market. All the regional companies and Telecom Denmark have been integrated into Tele Danmark since then and now Tele Danmark directly operates all domestic and international activities.

Because the previous regional companies had built up their own separate networks in each region, there had been no unified nation-wide network in Denmark even after the establishment of Tele Danmark in 1991. Recognising this disadvantage, in 1995 when all the regional companies were integrated to Tele Danmark, the company decided to construct a digitalised nation-wide network structure for its PSTN operation.

Uniquely among many other member countries, the Danish government holds no shares in the former monopoly Tele Danmark. Neither does the State maintain a 'golden share' in Tele Danmark. The shares of the State were sold in several phases and, unlike most other European countries, the last block of shares was sold to a strategic investor, Ameritech, in June 1998.¹⁹

1.2.3. Telecommunications market and participants

There are more than 50 participants in the Danish telecommunications market, most having entered the market after full liberalisation on 1 July 1996. However, the top five companies - Tele Danmark, Sonofon, Telia, Mobilix and Tele2 - represent most of the revenue of the Danish telecommunications market at present.

Table 1. **The major telecommunications operators in Denmark**

Operator	1997 revenue (US\$ million)	Number of customers (1 July 1998)
Tele Danmark	4 627	Fixed network: 3 400 000 Mobile network: 884 000
Sonofon	296	Mobile network: 610 000
Telia	77	Carrier selection: 150 000 Mobile network: 10 000
Mobilix	--	Mobile network: 10 000
Tele2	25	Carrier selection: 190 000

Source: NTA (Status '98), Tele Danmark (Annual Report 1997).

Tele Danmark, the former monopoly is clearly the strongest player in the Danish telecommunications market even after full liberalisation with more than 95% of the total revenue of the market.²⁰ Tele Danmark's revenue has been growing continuously since full liberalisation, and in 1997, its revenue increased by 24% from the previous year to reach US\$ 4 627 million.²¹ The company is providing service in every segment of the telecommunications market, and either has a complete 100% share or the largest share among competitors in each of these segments. Tele Danmark is completely privately owned and foreign investors such as Ameritech, which owns 41.6% of the company, own the majority of its shares. Danish investors own only a small part of the company and the State no longer holds any shares.

In the domestic fixed network market, Telia and Tele 2 are the major competitors to Tele Danmark, and are providing services in both the local and long distance market. In the international market, Telia, Tele 2 and GlobalOne are the major competitors.

In the local fixed network market, Tele Danmark had a 100% share as measured by the percentage of access lines²² and a 98% share measured in terms of revenue²³ in 1997. Tele Danmark's dominance in the local loop forces new entrants to obtain access to Tele Danmark's network to reach the end-users to complete their services. Telia and Tele2, the two major competitors to Tele Danmark have also been providing service through carrier selection codes and interconnection agreements with Tele Danmark.

At present, there is no sign of infrastructure competition in the local loop in Denmark. The two technologies, often viewed as most promising as alternatives in local loop competition i.e. the wireless access network and the cable television network have not yet developed in Denmark. The regulator has carried out a study on wireless access networks, and Telia and Mobilix have expressed their interest to develop the technology, but the development is still at its initial stage. The cable television penetration rate was 49.5% at the end of 1997, which is higher than OECD average (34.8%). However, cable television networks have not been utilised fully for telecommunications services such as voice telephony in Denmark except for a few trials carried out by small operators, partly because Tele Danmark is also the largest cable television operator in Denmark. The company had a share of 51.9% in the cable television market with approximately 765 000 subscribers at the end of 1997.²⁴

Competition in the long distance market only started in 1997 when Telia and Tele 2 entered the market. The share of the new entrants was 5% at the end of 1997²⁵ and is estimated to have extended to 10% by the end of 1998.²⁶

Compared to the domestic market, competition is clearly developing in the international market. Tele Danmark's market share declined to 65% at the end of mid-1998 measured in terms of traffic volume.²⁷ Telia, Tele 2 and GlobalOne are the three major operators that have been providing service in the international market since 1996. Tele 2, the service-based operator, was the first to enter the market. After concluding an interconnection agreement with Tele Danmark, Tele 2 started its business in October 1996 by providing international voice telephony using the carrier selection code 1001 and gained 30 000 customers within just ten weeks. By May 1998, Tele 2 had captured 14% of the international telephony market.²⁸ Telia has also been providing international voice telephony since 1996 with a carrier selection code 1010.

Tele Danmark continues to maintain a strong position in the fixed network market due to its widely deployed infrastructure, but changes are occurring. For example, the number of supplementary subscriptions, that is customers using a 4-digit carrier selection code, is increasing rapidly. At the end of 1996, there were only 32 000 end-users that had supplementary subscriptions to the new entrants via a carrier selection code. But this number increased to 197 000 at the end of 1997, and to more than 383 000 in mid-1998 (equivalent to approximately 11.3% of access lines).²⁹

Another trend is the increasing investment made by the new entrants in the fixed backbone infrastructure. New entrants such as Telia and Mobilix have been rolling out fixed backbone networks. While Telia is utilising the ducts, right of ways and infrastructure capacity obtained from *Vejdirektoratet* (the Road Directorate), *Storebaeltsforbindelsen* (the bridge consortium) and the electricity companies, Mobilix is utilising the National Railway Agency's existing fibre-optic cables and routes. Both companies have also concluded agreements with the Municipality of Copenhagen to obtain access to its metropolitan area network. Powercom, which was jointly established by two major electricity companies in April 1998, is also constructing a fixed backbone network. Unlike Telia and Mobilix, however, Powercom's intention is to resell its transmission capacity to third parties. Tele 2 has recently announced that it would obtain part of its transmission capacity from Powercom instead of Tele Danmark.

With 1.26 million cable television subscribers by the end of 1997, Denmark's penetration rate was 49.5%, which is higher than the OECD average (34.8%). The two major operators, Tele Danmark and Telia Stofa, dominate the market. It is estimated that the two operators represent approximately 85% of the total Danish cable television market.³⁰ Tele Danmark has the largest share in the market with an integrated optical fibre trunk system across the country, and is taking full advantage of this situation. For example, it is introducing a new dial-up technology to allow a ten times increase in Internet speed for subscribers utilising a cable-TV modem. Besides the networks of the two major operators, there are also municipal and community cable systems in Denmark. But in most cases the switching capability of these systems are still unsatisfactory and many of the networks require to be upgraded for two-way communication.

The numbers of subscribers in the mobile market reached 1.57 million at the end of mid-1998 with a penetration rate of 29.7%.³¹ Denmark's mobile penetration rate is among the highest of member countries although it is behind most other Scandinavian countries.³² The Danish mobile market generated US\$581.0 million revenue in 1997, showing a growth of 53.7% since 1995 and accounting for 12.6% of total telecommunications market revenue.³³

There are currently four digital mobile cellular network operators in Denmark as well as an analogue NMT system³⁴ where Tele Danmark is the only provider. In 1992, the Danish government granted two GSM900 licences to Tele Danmark and Sonofon. Denmark was the first country to introduce competition in the GSM field. Subsequently, in June 1997, the government granted four DCS1800 licenses. The DCS1800 system resembles a GSM900 system in many ways but uses a different frequency band (1800 MHz). Telia and Mobilix acquired DCS1800 licenses to enter the mobile market, together with Tele Danmark and Sonofon, and started commercial service in 1998. At the end of mid-1998, Tele Danmark and Sonofon continued to share dominance in the digital mobile market, with Tele Danmark having a share of 49.6% and Sonofon following with 44.5%.³⁵ But Telia and Mobilix had captured approximately 10 000 customers thus stimulating competition in the mobile market.³⁶ In addition, apart from the four network operators, service-based operators are also entering the mobile market. Debitel, which sells mobile subscriptions based on the networks of Tele Danmark and Sonofon, has captured more than 60 000 customers as of mid-1998.³⁷ Tele2 has also announced its intention to enter the mobile market as a service-based operator.

The number of subscribers to ISDN lines nearly doubled in 1997 to reach approximately 172 000 subscribers,³⁸ mainly due to the rapid growth of the Internet. However, the penetration level still remains at a relatively low level compared to some other countries (the number of ISDN lines per 1 000 fixed network lines was 2 in 1996, and 8 in 1997). Tele Danmark has been offering ISDN lines since 1992 and continues to be the only operator providing ISDN subscriptions.

The number of Internet users has grown rapidly, especially residential customers, exceeding 800 000 users in 1998.³⁹ The number of Internet hosts per 1 000 inhabitants increased from 30.4 to 36.3 during January 1998 to July 1998.⁴⁰ This is just about above the OECD average. There were 44 nationwide ISPs in Denmark by the end of 1997. Tele Danmark and Tele 2 are the largest providers of Internet access followed by several independent ISPs such as CyberCity. So far, Telia has been the most successful among the ISPs in providing Internet telephony. ISDN and leased lines are increasingly being used for Internet access and xDSL technology is anticipated to accelerate this trend.

Table 2. Major participants in Denmark's telecommunications market with percentage share

	Domestic	International	Mobile	CATV	Internet	Notes
Tele Danmark	A Local: 98% Long distance: 95%	A 65%	A 56.2% (49.6%)	A 51.9%	A	
Sonofon			A 38.7% (44.5%)			
Telia	A Local, Long distance	A 12%	A 0.6% (0.7%)	A 33.2%	A	Telia provides mobile service with the DCS1800 system.
Mobilix			A 0.7% (0.8%)			Mobilix provides mobile service with the DCS1800 system.
Tele 2	A Local, Long distance	A 15%	P		A	
Debitel			A 3.8% (4.4%)			
GlobalOne		A				

A= Currently Active, P= Planned to enter

1. Data for domestic PSTN, CATV and the Internet are as of 31 December 1997. Data for international PSTN and mobile are as of the end of mid-1998.
2. For PSTN, data on local market is based on revenue. Data on long distance and international market is based on traffic volume.
3. Data on market share of the mobile market is based on the number of subscribers. Figures without brackets include both analogue and digital markets (NMT, GSM900 and DCS1800). Figures in brackets include only the digital market (GSM900 and DCS1800).
4. Data on market share of the cable television market is based on the number of subscribers.

Source: OECD, NTA (Status '98, Tele Yearbook '97, Telecom statistics – first half of 1998).

2. REGULATORY STRUCTURES AND THEIR REFORM

2.1. Regulatory institutions and processes

The Ministry of Research and Information Technology (IT) is responsible for policy formulation in the telecommunications sector. The Ministry was set up in January 1993. In terms of telecommunications regulation, the Ministry's main mandate is to lay down the legislation for regulation and to hold general responsibility for the activities of the National Telecom Agency (NTA), the independent regulator, towards the Parliament. Within the Ministry, the IT Department's Division for IT

and Telecommunications Regulation is in charge of carrying out the Ministry's task. The Ministry also has a Telecommunications Council as an advisory body to the Minister on major policy issues. The Council has approximately 20 members including individual operators.

Danish legislation in the telecommunications sector has been established by the Ministry as a package of more than ten detailed acts⁴¹ with many executive orders rather than one general telecommunications law as is the case in many other countries. Industry and consumers have found difficulty in understanding the overall legislative framework, which consists of a number of dispersed detailed laws, many of which are amended almost every year. Such a form of legislation also results in a high potential for inconsistency between the various acts. To ensure consistency and greater transparency of legislation, it is important that the Ministry publishes consolidated legislation of the different laws, the amendments, and comments to the laws. This will enable a better understanding of the regulatory framework.

The National Telecom Agency (NTA) is the independent regulator responsible for implementing regulation in the telecommunications sector in Denmark although it is a government agency under the Ministry of Research and IT in terms of its relations with the Parliament. The NTA was established in January 1991 and is one of the few independent agencies in the Danish governmental structure. It has a staff of 165 as of 1 January 1998.

The Act on the National Telecom Agency introduced in June 1997 stipulates NTA's goals and scope of its responsibility. The NTA has two major goals of "promoting competition in the telecommunications sector" and "ensuring the necessary consumer protection". It is required to: administrate the observance of existing regulations; stipulate administrative regulations in areas where it has a mandate; advise the Ministry of Research and IT on the need for changing existing regulations and on queries on the telecommunications sector by the Ministry; provide consulting service to users and telecommunication companies concerning regulatory issues and other questions on the telecommunication sector; and represent the nation's interest in the telecommunications sector in international negotiations.

The NTA is a sector-financed independent regulatory body with approximately 95% of its activities being financed directly by the Danish telecommunications sector. Prior to full liberalisation, Tele Denmark had paid the government an annual fee of 4% of its revenues in the areas of exclusive rights (a turnover based fee), and also the costs associated with the government's administration in these areas. A new finance scheme was implemented along with full liberalisation, which now allows the NTA to collect a fixed fee from telecommunications companies for frequency usage and numbering resources.⁴² The cost of NTA's activities in 1998 was estimated to be approximately US\$ 14.9 million.⁴³

The general division of responsibilities between the Ministry and the NTA is shown in Table 3. In general, there is a clear division of responsibility between the Ministry, which establishes the regulatory framework, and the NTA, which implements regulations. However, the role of the Ministry in Denmark is relatively wider and more active compared to many other member countries with an independent regulatory body. This is because the Ministry has established a package of detailed laws, as well as many executive orders, which enter into detailed issues such as the methodology of calculating interconnection charges and of determining price-caps for price regulation. Thus, rather than having a single comprehensive law outlining the general framework for regulation and vesting a broad mandate to the NTA to determine the details of regulation, the Ministry articulates many of the details of regulation.

Table 3. **Division of responsibilities between the ministry and NTA**

Area	Ministry	NTA
Interconnection	Sets up a detailed framework for NTA's supervision including the calculation methodology for interconnection charges.	General supervision including the approval of standard interconnection offer.
Price regulation	Sets up a detailed framework for price regulation on USO services including the calculation methodology for price-caps.	Implementing price regulation on USO services.
Market entry for mobile communications	Sets up a detailed framework of the public tender for mobile communications.	Carries out the public tender for mobile communications and grants individual Licenses to the operators it has appointed.
Frequency	<ul style="list-style-type: none"> - Determines the frequency plan. - Decides on frequency management measures. 	<ul style="list-style-type: none"> - Proposes the frequency plan. - Proposes frequency management measure and implements the measures decided by the Ministry. - Grants individual licenses for the use of frequencies.
Numbering	Sets up the general framework for the NTA to draft the numbering plan.	<ul style="list-style-type: none"> - Drafts the numbering plan based on the general framework set up by the Ministry. - Assigns numbers to the operators.

Source: OECD.

The Act on the National Telecom Agency ensures NTA's independence from the Ministry of Research and IT by stipulating that the Ministry cannot give official orders to the NTA on its handling of authority functions in *concrete* cases; on its handling and decision on *individual* cases; on its issue of administrative regulations in areas where it is authorised to do so; or on other supervisory activities of the NTA for the purpose of ensuring compliance with legislation.

However, as a government agency under the Ministry, the NTA must fulfil several legal obligations. One of the unique obligations is the requirement for NTA to conclude a performance contract between the Ministry in order to ensure NTA's efficiency in carrying out its regulatory tasks. This performance contract sets up the framework for NTA's activities by indicating concrete targets and requirements for its activities, productivity and quality in specific areas, and requesting co-operation between the Ministry in solving various issues. For example, the performance contract for 1999 focuses on specific issues such as interconnection, universal services, radio communications including spectrum allocation, and the advisory role to the Minister on legislation issues. The NTA must also submit an analysis plan to the Ministry each year defining the areas or issues in the telecommunications sector where there is a need for sector-financed examination in the coming year. This analysis plan needs to be approved by the Ministry. In addition, the NTA is required to submit an annual report to the Ministry.

It is important that the regulator is ensured sufficient independence from the Ministry's policy-making functions and is allowed to act consistently in carrying out its daily regulatory task for fostering competition in the market. The fact that performance contracts have been concluded on an annual basis up to now, together with an annual analysis plan, has resulted in diminishing NTA's ability to determine priorities in its regulatory tasks and act more autonomously. As an administrative body under the Ministry, in terms of its relations with the Parliament, the requirement of a performance contract itself represents good public management practice. But contracts concluded on an annual basis appear excessive as a means

to ensure NTA's efficiency, and could divert NTA from some of its main tasks as set down in legislation. The annual analysis plan also diminishes NTA's autonomy in regulating. From the perspective of enabling the NTA to act more autonomously, the annual analysis plan should be abolished, and the performance contract should be concluded for a longer period. The requirement for submitting an annual report should be maintained in order to keep the Ministry informed about market conditions and enable the Ministry to take necessary policy action if justified by changing market conditions.

Apart from these explicit legal obligations, some other factors also weaken the NTA's independence in terms of its relation to the Ministry. The Director-General of the NTA is virtually appointed by the Minister of Research and IT and can be removed by the Minister at any time. In his position he functions as a civil servant and is therefore subject to indirect political pressure. On the other hand, the period of appointment is indeterminate and there has been no change in the post since 1991 when the NTA was first established. This is very different from the case in most countries where heads of regulatory bodies are appointed for fixed terms, cannot be removed from office (except under specific conditions), and are free from potential political interference. The fact that the Ministry needs to approve every year NTA's budget, including its staff, also limits the ability of the NTA to act as an independent regulator. In the context of improving the regulator's performance in enhancing competition in the market, it is important to ensure that the NTA is legally, politically and financially more independent from the Ministry than at present.

In Denmark, two appeals boards were established in February 1997 - the Telecommunications Complaints Board and the Telecommunications Consumer Board. As well as resorting to the courts, complaints concerning NTA's decisions and administration on individual cases can be appealed to these two boards. While the Telecommunications Consumer Board is responsible for issues on consumer protection, the Telecommunications Complaints Board is responsible for dealing with complaints from operators on NTA's decisions on regulatory issues. The scope of issues treated by the two boards is defined in legislation. The boards are ensured legal independence in their decision-making on individual cases. Each board consists of seven members appointed by the Minister of Research and IT comprising experts in legal, financial, telecommunications technology and consumer fields. The members are appointed for a four years period although legislation does not exclude the possibility of members being re-appointed. A single secretariat assists the two boards. The secretariat currently has 11 staff.

Although some member countries also have an independent body to correspond to consumer complaints, the existence of the Telecommunications Complaints Board where operators can file complaints on the regulator's decisions in individual cases is a unique feature of Denmark's telecommunications sector. A broad range of issues can be appealed to the board (see Table 4), and as mentioned, the board is ensured legal independence in its decision-making.

Table 4. **Major NTA decisions within the scope of the Telecommunications Complaints Board**

Interconnection	General supervision including approval of interconnection charges
Universal service	Appointment of USO provider, laying down terms for handling the USO obligation, fixing of maximum prices, decision on deficit covering in USO provision
Mobile communications	Supervision on compliance with terms as a license holder, transfer of licenses, roaming Agreements
Frequency	Licensing for frequency use, rejections of applications for licenses, supervision on compliance with regulation
Numbering	Supervision on compliance with regulations including access to carrier selection, establishment of facilities for number portability, delivery of directory number

Source: NTA.

The initial intention of establishing the Telecommunications Complaints Board was to secure NTA's independence from the Ministry because previously all complaints from the operators were sent to the Ministry. Such a mechanism of having a specialist tribunal for disputes in the telecommunications market, if it functioned as initially expected, would have ensured the right of appeal on regulatory decisions in a more efficient way compared to the normal mechanism of resorting directly to the court system which has prolonged the resolution of disputes in some countries. However, as described below, in practice, the existence of the Telecommunications Complaints Board in Denmark has served to weaken the regulatory authority and independence of the NTA, and has led to significant delays in the implementation of regulatory decisions. This has had negative consequences for the development of competition in the Danish telecommunications market.

Within one and a half years since the establishment of the Board, 16 cases were filed and in 4 cases the Board rejected NTA's regulatory decision in favour of Tele Danmark. These included cases such as the scope of the interconnection regime (the "raw copper" case),⁴⁴ the scope and calculation methodology of price regulation (the "Christmas discount" case⁴⁵ and the "best practice" case⁴⁶ (see Section 2.3.3.)), and competitor's access to information on Tele Danmark's service provision.⁴⁷ The existence of the Board has provided a relatively easy and cheap way to delay implementation of key decisions aimed at fostering competition. A common complaint about the Board's decision-making process is that it tends to strictly interpret the terms of legislation without considering the policy intention of legislation aimed at promoting and safeguarding competition. As an independent regulator, the NTA should be responsible for interpreting and executing legislation and relevant Executive Orders. The Board is, in effect, reinterpreting NTA's interpretations of regulation and thus undermining NTA's authority as a regulator by turning out to become a "regulator of the regulator". In addition, by providing the possibility of constantly being appealed to the Board, the NTA can lose its aggressiveness, which is essential for a regulator promoting competition in a market that is still in its initial stage of competition.

Furthermore, the appeal of NTA's decisions to the Telecommunications Complaints Board has caused delays in all the regulatory issues that were filed to the Board including those that had finally supported NTA's decision. This included critical issues including cases on interconnection prices (see Section 2.2.2.). In this context, the law only stipulates that the Board should make its decision within three months "as far as possible" for cases relating to interconnection issues, and there is no time limitation for other cases. Consequently, almost all the cases filed with the Board have taken more than three months to be decided. Furthermore, cases can be filed to the court again even after being argued at the Board, which can extend the delay. Such a delay is a large burden for a rapidly evolving market such as the telecommunications sector, and has resulted in imposing a market disadvantage to new entrants in many cases.

It is true that in the early stage of changing the regulatory framework, some supervision of the regulator may be required as part of the learning-by-doing process. However, in a rapidly changing industry as the telecommunications sector, it is significantly important that the regulator eventually becomes the sole body preoccupied with regulatory matters in order to ensure a dynamic regulation of the rapidly changing industry. Given the ability to take decisions to the courts, it is questionable whether the Telecommunications Complaints Board should be maintained. However, if the Board is to be maintained for constitutional reasons, it should be given more explicit and limited objectives and specific criteria to follow in accepting appeals and in making decisions on individual cases, so that the Board would focus mainly on procedural questions and not be re-examining regulatory decisions of the NTA. It is also important that the Board has the same objective as the NTA, that is promoting competition in the telecommunications sector and ensuring necessary consumer protection. In addition, a strict time limit should be required for decisions and steps should be taken to ensure that plaintiffs do not abuse the appeals procedure to benefit from delays in implementation of regulation.

Together with the NTA, the Competition Authority also has jurisdiction in the Danish telecommunications sector based on the Competition Act. The new Competition Act came into force as from 1 January 1998. The telecommunications legislation also requires co-operation between the NTA and the Competition Authority in specific cases (see Section 2.2.8).

Table 5. **Outline of telecommunications regulation in Denmark**

Category	Regulatory restrictions	Notes
Entry regulations		
Voice Telephony	No license or registration	
Leased lines	No license or registration	
Mobile communications	Entry on the basis of individual licensing	A mobile operator needs two individual licenses: one for operating the mobile network and another for frequency use.
CATV	No license or registration	
Broadcasting	Entry on the basis of individual licensing	
Line-of-business restrictions	No line of business restrictions. Tele Danmark is also allowed to provide all telecommunications networks and services including CATV.	Tele Danmark must prepare accounting separation between different businesses.
Foreign restrictions	No foreign restrictions.	
Interconnection controls		
Prices	Prices based on fully distributed historical costs with a "best practice" concept. Tele Danmark needs NTA's approval for terms and conditions of its standard offer for interconnection agreements.	Tele Danmark must prepare accounting separation.
Dispute resolution	Parties can ask the NTA for arbitration. In case of failure of arbitration, parties can ask the NTA to set the terms and conditions for interconnection.	
Scope	Interconnection for call termination (switched interconnection), lease of infrastructure capacity, and service provision agreement is guaranteed.	
Price controls		
On USO provider (Tele Danmark)	Price regulation in the form of pre-setting maximum prices combined with an overall price-cap that requires a real term annual decrease for specific USO services (fixed voice telephony, ISDN and directory enquiry services).	
On mobile operators	Conditions on prices are stipulated under individual licenses.	
Spectrum allocation	Mix of "first come first served" and public tender.	
Numbering policy	Carrier selection codes introduced since July 1996. Carrier pre-selection introduced since January 1999. Local number portability planned from July 1999. Nation-wide number portability including mobile planned from 1 January 2001.	

Universal service USO provider	Tele Danmark is designated as USO provider until 31 December 2007.	
Scope	Fixed voice telephony (local, national and international), ISDN, leased lines apart from broadband lines, special services for handicapped persons, public radio based maritime distress and safety services, and directory enquiry service.	
Financing	USO providers may be compensated for a deficit for fixed voice telephony, special service for handicapped persons, public radio based maritime distress and safety services, and directory enquiry service with contributions from other operators providing fixed voice telephony.	

Source: OECD.

2.2. *Regulations and related policy instruments in the telecommunications sector*

2.2.1. *Regulation of entry and service provision*

Full liberalisation in July 1996 completely changed the regulatory regime for market access in Denmark. Market access is now completely open in Denmark. All telecommunications operators, except for those providing public mobile communications, can enter the market freely without the need to obtain individual approval from the NTA or even to register with it. Under this regime, operators simply need to fulfil the general conditions stipulated in an Executive Order⁴⁸ (which follows the essential conditions set down in the EU Licensing Directive) on issues such as confidentiality, data protection, interoperability, emergency services and supplying relevant data to the regulator. As a result of such an open regime, more than 50 operators have entered the Danish telecommunications market since full liberalisation.

This approach to market entry is commendable and provides a model for other OECD countries. This situation is very different to many other countries where licensing or authorisation frameworks exist, and where regulators use licences to impose certain conditions on telecommunications operators, if necessary, in particular, to impose asymmetric regulation on carriers with significant market power. In this context, the EU Licensing Directive sets down the conditions that may be attached to licenses.⁴⁹ These include, for example, conditions linked to the provision of information reasonably required for the verification of compliance with applicable conditions and for statistical purposes, and conditions intended to prevent anti-competitive behaviour in the telecommunications market including measures to ensure that tariffs are non-discriminatory and do not distort competition. The liberal market entry regime in Denmark, on the other hand, requires the NTA to find different means to regulate operators, especially the dominant operator Tele Danmark. Currently, many of the different laws in Denmark comprise provisions referring to operators with significant market power, but there is no single provision, such as an Executive Order, which sets down all the requirements and obligations of such operators.⁵⁰ Such a single provision would help to facilitate implementing regulation on operators with significant market power including the request for necessary data (see paragraph 119) and ensure more transparency in regulation.

To provide mobile communications networks, operators must obtain individual licenses from the NTA. This requirement is due to frequency scarcity. Two licenses need to be obtained in Denmark, one license for operating mobile networks under the Act on Public Mobile Communications and another license for using frequency resources under the Act on Radiocommunications. These licences impose the technical, financial and price obligations of the licensees.

For the transmission of various programming services, there is no need to obtain an individual license from the NTA or register with it to establish and operate cable television networks, although operators may need to conclude a contract with private households in specific areas. Cable television operators can also freely provide telecommunications services over their networks. The same framework can be found in the terrestrial broadcasting industry. Prior to full liberalisation, Tele Danmark had the exclusive right to provide transmission networks to the two major terrestrial broadcasting companies - Danish Broadcasting Company and TV2 - and was allocated the related frequencies. This exclusive right was eliminated in the liberalisation process and now the related frequencies are initially allocated to the two broadcasting companies who have the option to choose their own transmitting network service provider.

No foreign ownership restrictions exist in the Danish telecommunications market. Together with the full liberalisation process, this openness has formulated a unique market structure in Denmark. Tele Danmark's major competitors are foreign-owned companies (Telia and Tele 2 are completely owned by Swedish companies and the majority of Mobilix is owned by France Telecom). Danish investors have only a small share in Tele Danmark, the majority of which is currently owned by a US company - Ameritech. This contrasts with many OECD countries which continue to have partial government ownership of the former monopolies and have ensured that share ownership is widespread in the privatisation process.

There are also no line-of-business restrictions in the Danish telecommunications market and a telecommunications operator can provide all types of telecommunications networks and services without restrictions. This has encouraged operators to become full service providers and to promote convergence in the Danish telecommunications market by bundling various services. One typical example of such bundling can be seen in Tele Danmark's *Duet* concept that is an integrated product of fixed and mobile networks/services.

Table 6. **Ownership of the major operators in Denmark**

Company	Ownership
Tele Danmark	41.6% Ameritech 7.0% Brandes Investment Bank, USA >5.0% Bank of New York 0.6% Employee stock Others (Danish and foreign shareholders)
Sonofon	53.5% GN Store Nord 46.5% BellSouth, USA
Telia	100% Telia, Sweden
Mobilix	86.0% France Telecom, France 14.0% Danish National Railway Agency
Tele2	100% Tele2, Sweden

Source: NTA (Status '98).

In this context, no line-of-business restriction has been imposed upon Tele Danmark as well. It has been allowed to provide, without restrictions, all types of telecommunications networks and services in the market. The only safeguard to prevent anti-competitive behaviour by the dominant operator, such as cross-subsidisation, is through the requirement for accounting separation between different businesses.⁵¹ As a result of this relatively light-handed regulation, Tele Danmark has recently been merging into the main operating company subsidiaries that have been structurally separated. In 1998, Tele Danmark Mobile A/S and Tele Danmark Internet A/S, 100 per owned subsidiaries, were merged into Tele Danmark. The NTA has no authority to stop such mergers and there was no objection from the competition authority.⁵² If such light-handed regulation is to be maintained, regulatory authorities should ensure the implementation of strict and clear accounting separation between Tele Danmark's different activities as required by regulation.

Up to July 1996 Tele Danmark had been prohibited from providing television and radio programming services via their cable networks. This prohibition was abolished at the same time as full liberalisation when all exclusive rights of Tele Danmark were eliminated. This allowed Tele Danmark to enter into the cable television content business, as well, in which today they hold the largest share of 51.9% at the end of 1997 with a nation-wide integrated optical fibre trunk system. The cable television business is run as a unit from within Tele Danmark and no legal separation between the PSTN activities and cable television activities has been required. Recognising the high potential of cable television networks as an alternative infrastructure to the local loop to offer voice services, the dominant position of Tele Danmark in this area should be of concern. In addition, Tele Danmark will have little incentive to upgrade its local networks to an integrated broadband network in the present circumstance. To encourage infrastructure competition in the local loop, Tele Danmark's ownership in the cable television market should be divested as has been done in several other member countries.⁵³ In this context, the European Commission has proposed a Draft Commission Directive on this issue,⁵⁴ requiring that telecommunications networks and cable television networks jointly owned by the former monopoly should be operated by separate legal entities at the minimum, concluding that accounting separation would not be sufficient in this case.

The promotion of infrastructure competition in the local loop is one of the most challenging tasks for regulators in OECD countries. In addition to CATV infrastructures, wireless technologies are viewed as offering the best alternative to generating such competition. In this context it is surprising that the Danish government allowed Tele Danmark to opt for a RLL system (Radio access in the local loop) and allocated the necessary frequencies to it in the process of granting the DCS1800 licenses when spectrum was made available only to a limited number of selected operators. Given Tele Danmark's existing dominance in the local loop, this decision has the effect in strengthening their overall dominant position in alternative technologies that can be used to generate competition in the local loop. This was an area where asymmetric regulation should have been used as a means of fostering greater competitive opportunities in the market place. The fact that Tele Danmark was granted a DCS1800 license should also be noted. This is in contrast to some other countries that have excluded the existing mobile operators from applying for DCS1800 licenses to enhance competition in the market.⁵⁵ These decisions provides examples of cases where the regulatory authorities have not taken the opportunity to apply asymmetric regulation to the carrier with significant market power.

Rights of way

For access to private land, special procedures for public telecommunication purposes including expropriation were established by the new act in 1997. For access to properties owned by public authorities and utility companies, obtaining rights of way for railways and highways are more strict and are subject to approval from the Ministry of Transportation, compared to rights of way for ordinary roads which are subject to approval from individual municipalities. However, increased competition, resulting in more demands for access, is making it more difficult to obtain approval from the municipalities. Currently, the Ministry is expected to take measures to enable easier access to public properties on an open and non-discriminatory basis.

Collocation requests by new entrants have led to problems. Although Tele Danmark is generally required to provide collocation to essential facilities, especially for its ducts, there have been complaints from new entrants on access to sea cable housing facilities where facility sharing collocation is not ensured since Tele Danmark asserts that this not a standard network. In addition to undersea cable access, antennae systems for wireless communications, such as mobile telephony and radio links, also can benefit from common usage. To promote competition and at the same time protect the environment, the Ministry of Research and IT has introduced a draft bill requiring operators to ensure joint utilisation of masts for setting up antennae systems.

2.2.2. *Regulation of interconnection*

New entrants highly rely on Tele Danmark's network to provide services to end-users. This is, and will remain for some time especially for the local loop. For this reason, the Danish government has made various efforts to provide an opportunity to new entrants to acquire access to Tele Danmark's network resources at cost-based prices in order to ensure that new entrants are not unreasonably hampered in their competitive opportunities.

Interconnection agreements are in principal a commercial matter in Denmark. However, the NTA may arbitrate if the operators are not able to reach an agreement.⁵⁶ In accordance to the EU Interconnection Directive, all operators in the Danish telecommunications market have the right and obligation to negotiate interconnection agreements with each other for call termination. Operators with significant market power in specific markets⁵⁷ must respond to all reasonable requests from other operators for all terms of interconnection at non-discriminatory prices. Furthermore, such operators with significant market power apart from those in the mobile market must also provide interconnection charges at cost-based prices. Tele Danmark is the only operator required to provide cost-based and non-discriminatory interconnection charges at the current stage.

The interconnection regime in Denmark has a broad scope compared to many other member countries. Interconnection is defined in the Danish legislation in three terms: switched interconnection (call termination, access etc.); lease of infrastructure capacity including leased lines and raw copper etc.; and agreements on special network access (service provision agreements). Tele Danmark is obliged to provide cost-based interconnection charges for call termination and lease of capacity with an addition of a 12% profit margin of the aggregated costs.⁵⁸ In this context 'cost-based' means historical costs and does not necessarily reflect economically efficient cost levels. Thus, the addition of a profit margin is questionable.

The service provision agreements are viewed basically as a commercial agreement between the operators. In certain cases, where commercial agreements cannot be reached, the NTA may apply a cost-based charge estimated as minus 21% of the wholesale price in case no agreement can be reached between operators and the NTA finds that the proposed tariffs would create distortion in competition. The purpose of the discount is to allow resellers a sufficient margin. The extent of the discount is important since, if it is too low it will be a disincentive for entry by resellers and may also be an incentive for the incumbent not to reach commercial agreements. If the margin is too high it may provide too much of an incentive for entry by resellers to the detriment of facility-based competition.

The requirement on Tele Danmark to provide unbundled network elements including access to raw copper and ensure service provision agreements is important in stimulating new market entry. However, the NTA needs to ensure that there is the right balance between facility-based competition and 'reseller' competition. The Danish interconnection legislation also has a wide scope in comprising all forms of cable-based and wireless telecommunications infrastructure, including mobile networks, cable television networks and broadcasting networks.

The number of interconnection agreements in the Danish telecommunications market has increased since full liberalisation, and 24 interconnection agreements have come into effect as of 31 December 1998. This includes interconnection agreements within and between fixed and mobile networks. The NTA arbitrated in six cases where Tele Danmark and the new entrants were not able to reach an agreement.

Table 7. Increase in the number of interconnection agreements

1995	1996	1997	1998
2	7	15	38

Source: NTA (Status '98).

Being an operator with significant market power, Tele Danmark is required to publish all of their interconnection agreements and a standard offer for interconnection services. For its standard offer, it also needs to obtain an individual approval from the NTA. In granting an approval, the NTA examines whether Tele Danmark's standard offer gives access to other operators on a cost-based and non-discriminatory basis. Legislation requires the NTA to consult the Competition Council for its opinion on whether the standard offer infringes the competition law to any extent. The Council's opinion on this point is binding on NTA's final decision. Tele Danmark must also maintain accounting separation for establishing interconnection charges.

Following the Executive Order on Interconnection,⁵⁹ Tele Danmark immediately reduced its charges in the standard offer with some large reductions in September 1997.⁶⁰ It was assessed by the NTA, however, that the interconnection prices were still higher by more than 10% than the actual cost. It had taken nearly a year for the NTA to make this determination, partly due to the difficulty it had faced in gathering precise data from Tele Danmark, even though NTA has legal authority to obtain data.⁶¹ Tele Danmark's appeal to the Telecommunications Complaints Board against NTA's cost determination resulted in further delays in the case. Although the appeals board, in its decision of February 1999, supported NTA's decision in this case by concluding that the evaluation by the NTA was "mostly correct", it has taken a year and a half to attain a conclusion on this issue.

The time taken in reaching this conclusion has been critical since new entrants have been paying Tele Danmark the interconnection prices that the regulator views to be higher than actual costs during the last one and a half years. This has resulted in the margin between end-user prices and interconnection prices being squeezed during this period, as a result of the reduction in Tele Danmark's end-user prices before the reduced new interconnect charges were implemented. This has imposed severe costs on new entrants that have, in most cases, been making losses as they build-up their infrastructures and expand their customer base. The extremely long period taken by the NTA in evaluating the costs of interconnection, and the subsequent re-course by Tele Danmark to the Telecommunications Complaints Board, has severely undermined the ability of new entrants to compete. To avoid any further distortion of competition, the NTA needs to take action more promptly and aggressively against the dominant carrier and recognise the negative consequences of delays in its administrative decisions. If the current legal authority of the NTA to obtain specific data from Tele Danmark is deemed to be insufficient, measures should be taken by the Ministry to strengthen NTA's mandate in this area.

It is widely acknowledged that pricing of interconnection is a critical requirement in establishing a sustainable competitive telecommunications market. Despite a number of regulatory efforts, interconnection charges in Denmark do not seem to have declined sufficiently and are not at best practice levels. The interconnection charges of Tele Danmark for a 3-minute call at peak rate is DKK 0.22, 0.41, and 0.50 for local, regional and national transit respectively. The figures for local and national transit just about satisfy the best practice prices recommended by the European Commission and the figures for regional transit is in excess of the recommended price by 14%. In respect to other European Union countries, although Denmark's interconnection prices are lower than many countries, it is still higher than the UK, France and Netherlands in general which shows the inefficiency of the Danish market compared to these countries. Furthermore, the fact that interconnection charges of Tele Danmark are not among the

lowest, in light of the relatively good performance of its end-user prices (see Section 3.2), is indicative of flaws in the current interconnection price setting mechanism, because the smaller difference between end-user prices and interconnection charges result in imposing a heavier burden on the new entrants.

Tele Danmark's interconnection charges have not decreased since September 1997. This was partly due to the dispute between the NTA and Tele Danmark as mentioned above. However, even when Tele Danmark carried out a re-balancing of its end-user prices in April 1998, when subscription charges were raised and usage charges decreased by a significant extent, no changes in interconnection charges were implemented. As a result of changes in retail prices, new entrants were forced to reduce their end-user prices to remain competitive, reducing their margins significantly since there were no compensating changes in the interconnection charges they had to pay to Tele Danmark. This had a severe impact on the revenue of new entrants in 1998. Interconnection continues to be dominated by Tele Danmark in all market segments thus requiring regulatory intervention and a much greater awareness by the regulator of the impact of allowing changes in end-user prices without a concurrent reduction in interconnection charges.

Table 8. **Standard interconnection charges of Tele Danmark (DKK)**

	Local	Regional	National
Peak rate period	0.06 per minute 0.04 per call set up	0.11 per minute 0.08 per call set up	0.14 per minute 0.08 per call set up
Low rate period	0.03 per minute 0.04 per call set up	0.055 per minute 0.08 per call set up	0.07 per minute 0.08 per call set up

1. Charges for switched interconnection on fixed networks at peak rates, excluding VAT. Includes call set up charges.
 2. The peak rate period covers Monday to Saturday 8:00 am to 7:30 pm. The period outside these times is designated as low rate period.
 3. As of 1 Dec. 1998. Same charges apply since Sep. 1997.
- Source: NTA.

Table 9. **Comparison of interconnection charges
(ECU/100 per minute)**

	Local	Single transit (regional)	Double transit (national)
Denmark	0.98	1.82	2.22
UK	0.61	0.87	1.69
France	0.70	1.71	2.52
Netherlands	1.17	1.60	2.06
Germany	0.99	1.62-2.14	2.58
Sweden	1.14	1.77	2.41
Finland	1.42-1.58	1.42-1.58	2.81-3.91
EU "Best current practice"	0.5-1.0	0.8-1.6	1.5-2.3

1. Interconnection charges per minute based on a 3-minute call duration.
2. Country data as of 1 Dec. 1998. EU's "Best current practice" applies from 1 Jan. 1999.

Source: EU.

The adoption of an efficient methodology for calculating interconnection costs is vital in creating a competitive telecommunication market. Hitherto, interconnection costs have been calculated on the basis of fully distributed historic costs in Denmark as in many other countries. Fully distributed historic costs were developed in many OECD countries in a monopoly environment. However, this method is not suitable in developing a competitive market and will tend to result in an over-estimation of interconnection costs. There is now general acceptance in using the LRAIC methodology (Long Run Average Incremental Costs) based on forward-looking costs and including a reasonable margin. LRAIC has been recommended by the European Commission,⁶² and by other countries such as the US. In accordance with this recommendation, Tele Danmark's interconnection charges were scheduled, according to legislation, to be calculated using the LRAIC method from 1 January 1999. However this was postponed due to the delay in developing an appropriate model. The revised schedule aimed to implement LRAIC on 1 July 2000, but this was subsequently postponed to 31 December 2002, and a task force has been set up between the Ministry and the NTA to carry out the necessary analysis. It is of critical importance that no further delays occur in introducing LRAIC and implementing efficient interconnection charges that will allow new entrants to develop their markets and ensure a stable and transparent methodology for the determination of interconnection charges. In this context, however, it is also important to ensure a certain margin, to avoid a situation where any common costs cannot be recovered and therefore risk setting regulated prices too low, since prices calculated by the LRAIC method generally provide the lower bound of an acceptable price.

Until the LRAIC method comes into effect, a "best practice" concept has been introduced in Denmark as an interim measure to supplement interconnection charges calculated on the basis of fully distributed historic costs. With this "best practice" concept, the NTA has the mandate to reduce the price of a specific interconnection services if it is proved by the requesting party that similar interconnection services in Denmark or other foreign countries are provided at a lower price level.

Although the reason for using the best-practice concept to bring lower interconnection prices to the market is clear, the regulator needs to spell out much more clearly why such benchmarking is being used when the law requires interconnection charges to be cost-based. The main reason is that Tele Danmark is inefficient and that current interconnection prices do not reflect best practice management, technology and operating efficiency. In this context, price regulation through price caps in non-competitive markets, which impose a productivity factor, could play an important role in improving efficiency. The fact that the concept was not well defined has also led to some confusion in the market. For example, Telia's request to utilise the interconnection charges in the UK as "best practice" was rejected by the Telecommunications Complaints Board in February 1999 when the board ruled that referring to only one country would not be sufficient enough to satisfy the term "best practice" and the requesting party would need to refer to a plurality of countries. This lack of clarity has resulted in an 18 months delay on the issue.

The current "best practice" concept applied in the Danish interconnection regime should, at most, be viewed only as a temporary measure and will be withdrawn when the LRAIC methodology is introduced. However, the government should acknowledge the need to take effective measures to ensure that interconnection charges are reduced to keep pace with changes in end-user prices until the LRAIC method comes into effect. In this context, until the LRAIC method is established, a "best practice" concept based on the LRAIC method could be adopted in the interim as an alternative. Such a measure could use both LRAIC methodologies and pricing structures from other countries to achieve further cost-efficiency and to ensure reduction of interconnection charges at the same time as end-user prices.

The interconnection regime in Denmark also applies to the mobile communications sector. Both Tele Danmark and Sonofon are designated as having significant market power according to current legislation.⁶³ However, neither of the operators are required to provide interconnection at cost-based prices, but simply on a non-discriminatory basis.

In order to tackle the various difficulties interconnection issues raise, the NTA is making continuous efforts through co-operation with the industry. In 1998, NTA established the Interconnection Forum in order to develop further understanding on interconnection issues between operators. The forum meets every quarter to discuss issues of mutual interest especially on regulatory issues and concerns raised from operators.

2.2.3. Pricing ("tariff") policy

Price regulation in Denmark applies to the universal services offered by Tele Danmark's fixed voice telephony (local, long distance and international); ISDN; leased lines;⁶⁴ directory enquiry services; and special services for handicapped persons. Although in most OECD countries price regulation is often required to reduce inefficiency in markets which lack effective competition, a unique feature of Danish price regulatory framework is that it is directly linked to the concept of universal service which is based on equity and social objectives.⁶⁵

The current price regulation framework came into effect on 1 January 1998.⁶⁶ Under the new regime, prices for fixed voice telephony (local, long distance and international), ISDN and directory enquiry services must be cost-based and show a real-term annual decrease. This new framework requires the NTA to set a maximum price for individual tariff elements (installation, subscription, individual call charges etc.) of those services each year under a predetermined overall price-cap.

The overall price-cap in Denmark is defined by the NTA as a combined figure of a rate-of-return and the "best practice" concept.⁶⁷ The cap is set up as an overall cap for Tele Danmark's fixed voice telephony, ISDN and directory enquiry services which allows the operator the flexibility of determining its tariffs to a certain extent. Based on this predetermined cap, Tele Danmark proposes the maximum price for individual tariff elements of each service every year. The proposed prices should be cost-based and non-discriminatory, and need to be determined by the NTA. The "best practice" concept is introduced here again to determine the yearly decrease in the real price level. In the process of examining Tele Danmark's proposal, the NTA is required by legislation to consult with the Competition Council on whether the proposed prices conform to general Competition Law. As in the case of interconnection prices, the Council's opinion is binding on NTA. In 1998, the Competition Council blocked Tele Danmark's request to adjust subscription charges to the same level across geographical regions⁶⁸ on the grounds that this was an abuse of dominant power.⁶⁹ In September 1998, the NTA determined new maximum prices for 1999.

Up to now, however, the NTA has had difficulties in determining the overall price-cap and the new price regulation regime has not been functioning. The NTA has experienced significant difficulties in obtaining essential data from Tele Danmark in the course of carrying out cost-surveys, although it has the legal authority to obtain necessary information from Tele Danmark.⁷⁰ In April 1998, NTA determined the price-caps for the years 2000 and 2001 at 6.8% and 4.0% respectively below the inflation rate, by combining the result of its survey on Tele Danmark's rate-of-return and also referring to prices in Sweden as "best practice". But the Telecommunications Complaints Board overruled this decision in August 1998.⁷¹ Taking six months after the Board's decision, finally in February 1999, the NTA made its renewed decision on the price-caps for 2000 and 2001, fixing them at 7.0% and 4.0% respectively below the inflation rate.

The current price regulation scheme in Denmark is too complex by combining too many elements, such as price-cap, rate-of-return, "best practice" and cost-based maximum prices. Price regulation in Denmark has not been functioning partly due to this complexity, since the NTA has been experiencing difficulty in verifying the costs of Tele Danmark, as required in the current methodology. Such complex regulation imposes additional burdens on both the regulator and the operator. Denmark

should re-establish a less complex price regulation regime through a simpler price-cap regime to avoid any excess burden on the market and delays in implementing regulation. In particular, they should not include competitive and non-competitive services under the same price cap since this can lead to anti-competitive behaviour.

The current price regulation in Denmark also has a wide coverage including all types of fixed voice telephony (local, long distance and international), as well as ISDN services of Tele Danmark. It is widely understood, however, that the most effective way to achieve cost-based prices is through effective competition and not through price regulation.

Mobile tariffs are not subject to price regulation although certain conditions can be imposed in individual licenses. Viewing the development of mobile tariffs in Denmark, no significant decrease was seen during the duopoly era although mobile tariffs were subject to price-cap regulation at that time. The call charges for a regular customer remained at DKK2.80 per minute on calls both to and from the mobile networks, and the NTA had to take the initiative in 1995 to reduce the maximum price from DKK2.80 to DKK2.35 per minute. What changed the situation dramatically was the entry of new competitors to the market with the introduction of the DCS1800 system in 1997. Increased competition forced prices for mobile phone calls to drop significantly in 1998. Telia and Mobilix are offering rates of between DKK0.50 and DKK1.00 per minute assuming normal subscription charges, and Tele Danmark and Sonofon have also lowered their prices to keep up with competition.⁷² The price for calling a mobile network has also dropped significantly to the current rate of DKK1.75 per minute.

The case of the mobile market clearly shows effective competition is the most efficient measure to promote cost-based prices. In this context, the current scope of price regulation in Denmark should be reviewed according to the degree of competition in the market. By mid-1998, Tele Danmark had lost 35% of its share in the international market. It had also lost 5% in the domestic long distance market at the end of 1997, and is estimated to have lost 10% at the end of 1998. These developments would support lifting price regulation on international and long distance fixed voice telephony markets. There appears to be scope to significantly streamline price regulation to cover only those markets that are non-competitive.

As noted above, one of the unique features of Danish price regulation is its direct link with the concept of universal service, and universal services are automatically subject to price regulation. The rationale of having such a linkage was to ensure that all consumers could benefit from the effects of competition. However, the goal of each concept is fundamentally different. While universal service has equity and social objectives, price regulation is required basically from the perspective of reducing inefficiency in markets with ineffective competition, and there is no basis for having direct linkage between the two concepts.

Moreover, the scope of universal service needs to be narrowed. In other countries universal service is more narrow covering access to basic voice telephony. However, a number of countries impose "essential requirements" on operators with significant market power which requires them to maintain and provide a nation-wide service coverage of specific services. Such essential requirements are considered as falling outside the scope of universal service.⁷³ In Denmark, on the other hand, such a provision seems to have been integrated with the concept of universal service, resulting in a wider scope for universal services, which, as a result, are automatically subject to price regulation. This has allowed price regulation to be imposed more broadly in Denmark. In any case, the need to ensure service availability of certain services is possible without requiring price regulation or designating a service as coming within the scope of universal service. In this context, the direct linkage of universal service and price regulation should be removed.

It is important that price regulation encourages full tariff re-balancing in order to promote competition on the basis of efficient price structures. The Executive Order on USO services enables re-balancing of Tele Danmark's tariffs. Consequently, Tele Danmark's proposal on maximum prices for 1998 and 1999 entailed tariff re-balancing to a certain extent. While the fixed charge was raised by 23.9% on average, usage charges were simplified in structure and decreased significantly by between 9.4 to 22.7% for local calls, 34.3% for long distance and 9.2% in international calls.

Table 10. **Development of Tele Danmark's PSTN tariffs (DKK)**

	1995	1996	1997	1.4.1998	Change (%)
Subscription fee	1,039	1,039	1,039	1,287	23.9
Local call	0.32-0.375	0.32-0.375	0.32-0.375	0.290	-9.4- -22.7
regional call	0.47	0.47	0.47	0.46	-2.1
long distance call	0.70	0.70	0.70	0.46	-34.3
International call	--	--	4.22	3.83	-9.2

1. All figures include VAT.
2. Figures for subscription fees are for per annum and based on weighted average.
3. Figures for calls are for per minute.
4. Figures for international calls are based on simple average.

Source: NTA (Teleprofile 98).

2.2.4. *Quality of service*

The Executive Order on USO Services requires the NTA to set minimum requirements for service quality of Tele Danmark's USO services, subject to negotiations with Tele Danmark. Minimum quality requirements are to be determined for various quality indicators, including supply time for initial network connection, fault rate in the networks used, waiting time for fault repair, percentage of unsuccessful calls and billing accuracy. The NTA and Tele Danmark are still in the negotiation process of establishing a concrete target for each indicator, and an early conclusion is expected. Once the requirements are determined, Tele Danmark will be required to report to the NTA on its service quality performance.

However, even though Tele Danmark has no regulated quality targets at present, it has been performing well in this area. For example, the waiting time for a new connection in Denmark has been less than ten days since 1993 and 91% of fault incidents were repaired within 12 hours in 1996.⁷⁴ This is consistent with the historical performance of Denmark, which was normally among the leading OECD countries in terms of performance quality indicators.

Billing and delivery time for services have been the major areas of concern in Denmark during the last few years. However, the situation is improving. Tele Danmark had received 8 500 billing complaints in 1996, but the figure declined to 4 300 in 1998. More improvement is expected as networks become fully digitalised. Itemised billing has also been offered since May 1998. Tele Danmark's delivery time for leased lines are also showing signs of improvement. Delivery time for 2 Mbit/s lines were 175

days in January/February 1997, and 140 days in June 1997.⁷⁵ Competitors had strongly criticised this performance, but the situation improved through the latter part of 1998 where more than 80% of the requests were met within 40 days.

A customer board has been established in Tele Danmark to deal with customer complaints. Consumers can also forward a complaint to the NTA, and furthermore, complaints can be filed to the Telecommunications Consumer Board on NTA's decisions by paying a flat fee of DKK150 to the Board. 177 cases were decided at the Consumer Board from February 1997 until June 1998.⁷⁶ Most of the complaints had been on billing problems.

Acknowledging the increasingly complex structure of prices offered by operators especially in the mobile sector, in August 1998, the NTA published a pamphlet in co-operation with the Consumer Council entitled "Hello, hello - do you know what it costs?" to ensure that consumers had sufficient and transparent information on prices. The pamphlet describes the prices for various telecommunications services offered by the operators and also undertakes a comparative analysis. The pamphlet was distributed to all Danish households and was also made available on NTA's homepage. The information is being updated every quarter through the press, in NTA's website, and through pamphlets that are distributed to the public libraries.

2.2.5. *Resource issues*

Spectrum allocation

The development of competition has increased the demand for frequency spectrum in many OECD countries and Denmark has not been an exception. This pressure for spectrum resources led the Danish government to establish an objective and transparent regulatory regime for spectrum allocation, which allows greater efficiency in the use of spectrum. The Act on Radiocommunications and Assignment of Radio Frequencies, which came into force in July 1997, forms the legislative basis for spectrum allocation in Denmark.

Prior to the introduction of the new act, spectrum allocation in Denmark was basically carried out under the "first come first served" principle. This principle still applies in the new act in areas where spectrum scarcity is not a problem. In these cases NTA must allocate spectrum to operators irrespective of the services they intend to provide. However, under the new act, in areas where frequency scarcity exists or is likely to exist, frequency is allocated to operators through a public tendering process i.e. a beauty contest.

The public tender for the DCS1800 system was carried out during the summer of 1996 by the NTA in accordance to the new framework. The public tender was implemented in two steps under the framework set up by the Ministry.⁷⁷ The intention of taking a two step approach was to allow all interested companies to make comments on the initial tender documents. The number of operators to be allocated frequency was also decided by the NTA at this point. Finally, in June 1997, the NTA granted licenses to four operators including two new entrants, Telia and Mobilix. The selection criteria for choosing the operators was clearly stipulated in legislation where top priority is placed on the range and quality of services, prices for end-users, degree of geographical coverage and efficient frequency utilisation. Marketing experience and financial conditions, which tend to be a disadvantage to new entrants, had less priority. The spectrum allocation process, although being a beauty contest, was more fair and transparent for the DCS1800 system compared to the previous process carried out for the GSM900 system when Tele Danmark had been allocated frequency automatically while the new entrants had to obtain it through public tendering.

Tele Danmark, Telia and Mobilix obtained a DCS1800 license for a nation-wide service with the option for RLL (Radio in the Local Loop), while Sonofon obtained a RLL license. As previously mentioned, the granting to Tele Danmark of a license allowing RLL is subject to criticism, since RLL is anticipated as one of the alternative technologies to promote competition in the local loop, and the necessary spectrum was granted only to selected operators due to its scarcity.

The Danish government is not considering the possibility of having auctions at this point. It is argued that the adoption of an auction system may cause financial difficulties for mobile companies, especially new entrants, will lower consumer benefits and not necessarily fulfil the concept of “best and cheapest”, and result in dominance by larger companies. There has been no specific pressure from potential market entrants for auctions up to now. However, in order to increase transparency and allocate scarce spectrum more efficiently under a competitively neutral market based mechanism, it may become necessary for Denmark to consider the option of introducing the auction mechanism, as has been done in some other countries.

The Ministry is responsible for approving the frequency plan and to decide on the use of specific management measures, while the NTA drafts proposals for the Ministry’s decision and is responsible for implementing the measures decided upon. But this procedure has turned out to be too rigid and time consuming in some cases. In addition, more flexibility and simplification in the administrative routine procedures may be required to achieve more efficiency in spectrum management. For example, in order to implement redistribution and administrative withdrawal of frequencies, two Executive Orders have to be issued by the Ministry including a consultation of the Telecommunications Council and one Executive Order by the NTA.

The amount of the license fee for spectrum usage is determined by the NTA using a calculation model approved by the Ministry. Based on NTA’s calculation, the license fees are fixed annually in the Finance Act and published by the NTA. The annual license fee for 1999 was fixed at US \$40 278 for a GSM900 system and at US \$64 445 for a DCS1800 system (see Table 11 for the actual spectrum allocated in connection to license).⁷⁸

The question of how the NMT900 frequencies are to be utilised in the future is becoming an important issue in Denmark. Tele Danmark holds the frequency bands in this area due to its monopoly provision in the analogue NMT system. However, Telia and Mobilix have expressed interest in these frequency bands to supplement their DCS1800 license on the basis that they want to provide nation-wide mobile services without entering into roaming agreements with other dominant operators – Tele Danmark or Sonofon. The Ministry has made no decision on this issue. Since the number of subscribers to the analogue system is declining rapidly with the shift to digital,⁷⁹ the Ministry will need to make a decision on this issue at some point in the near future by assessing the balance between the need for ensuring consumer protection in the NMT market and the benefits of further competition in the digital mobile market. It is important that the decision is carried out in a transparent manner consulting all related parties.

Licenses for the UMTS system are expected to be issued in 2001. Because spectrum will not be available for all operators, and thus only selected operators will be able to provide the service, the Ministry will have to decide on whether UMTS licenses will be granted to existing operators and/or to new entrants automatically or through either a public tender or an auction. Taking into consideration that the UMTS system will develop as an alternate to the fixed network currently dominated by Tele Danmark, the Ministry should accelerate the procedure of UMTS licensing, and also consider the possibility of deferring the provision of an license to Tele Danmark at least at the initial stage if only a limited number of licences are to be granted, since this will have a strong potential of strengthening further its dominance in the local loop and may have severe negative implications in developing local loop competition.

Table 11. **Spectrum allocation for public mobile networks in Denmark**

Operator	Service	Assigned frequencies	Requirement for geographical coverage
Tele Danmark	NMT-450	2 x 4.5 MHz	More than 95%
	NMT-900	2 x 5.6 MHz	More than 95%
	GSM 900	2 x 8.8 MHz	More than 95%
	DCS 1800	2 x 14.4 MHz	Must exceed 50%
	ERMES	1 x 25 kHz	Under construction
Sonofon	GSM 900	2 x 8.8 MHz	More than 95%
	DCS 1800	2 x 7.2 MHz	(See note)
Telia	DCS 1800	2 x 14.4 MHz	Must exceed 50%
Mobilix	DCS 1800	2 x 14.4 MHz	Must exceed 50%

1. There is no requirement on Sonofon's DCS1800 network for 50% national coverage. Instead, the coverage requirement is based on indications in the company's application.
2. DCS1800 networks for Tele Danmark, Telia and Mobilix have the option for combination with RLL.

Source: Status '98, October 1998, NTA.

Numbering issues

The Danish numbering plan is a closed non-geographical plan using 8-digit subscriber numbers. Subject to the amendment of the Act on Certain Conditions in the Telecommunications Field in July 1996, all providers of both telecommunications networks and services are ensured open and equal access to the 8-digit subscriber numbers and the allocation of the 4-digit carrier selection codes. Up to now, 53 carrier selection codes have been allocated by the NTA to providers of telephony and Internet services,⁸⁰ and the number of end-users using carrier selection codes has increased rapidly. More than 400 000 end-users were using carrier selection codes as of mid-1998 compared to only approximately 32 000 users at the end of 1996.

Table 12. **Number of customers in Denmark using carrier selection codes**

	1996	1997	Mid-1998
Number of subscribers	31 505	196 928	383 087
Percentage infixed network subscribers	1.0%	5.9%	11.3%

Source: NTA (Tele Yearbook '97, Telecom statistics – first half of 1998).

The numbering plan is drafted by the NTA under a general framework set up by the Ministry. The NTA is also responsible for supervising the numbering plan, including the deployment, assignment, modification and withdrawal of numbers, number series and addresses to and from network and service providers.

A specific Danish characteristic of numbering policy is that it allows the NTA to collect fees from telecommunication network and service providers who have been assigned numbers, number series and addresses. This scheme was introduced from 1 January 1998 to cover NTA's costs in supervising the telecommunications sector. The annual numbering fee for 1998 was fixed at 0.23 ECU per 8-digit number with additional code fees.⁸¹ The authorisation procedure is similar to that of the license fee for spectrum allocation.

Carrier selection has been possible since July 1996 where end-users can choose a provider other than Tele Danmark for each individual call via a 4-digit carrier select code. Furthermore, carrier pre-selection also came into effect from 1 January 1999. Carrier pre-selection is regarded as an essential safeguard for ensuring a fair basis for competition in the market. Now end-users can choose a pre-selected routing for outgoing calls through a specific provider other than Tele Danmark under a permanent agreement. The end-user is also ensured the feasibility of using carrier select and carrier pre-select in combination.

Table 13. **Status of carrier pre-selection in Denmark**

Types of traffic included	All types of traffic including both fixed and mobile.
Pre-selection	- Automatic default to Tele Danmark for customers who do not pre-select. - Alternative operators will obtain a "proxy" from the end-user and send it to Tele Danmark.
Set-up costs	Operators are responsible for their own costs.
Transfer costs	- No charge to end-user. - Tele Danmark may charge operators for "quick service".
Management	Handled by Tele Danmark.

Source: Tele2.

Number portability is another important safeguard for efficient competition. Number portability is planned to be introduced in two steps in Denmark. The first stage is scheduled for 1 July 1999, when it will be possible for end-users to keep their current telephone numbers when changing a provider for fixed-network telephony including ISDN if they continue to reside in the same local area. The second stage is scheduled for 1 January 2001, when the possibility of number portability will extend to mobile services and geographic number portability will be introduced.

2.2.6. *Social Regulation, including universal service obligations*

The objective of universal service, as defined in the act,⁸² is to ensure all users have access to a basic range of telecommunications services at predetermined, cost-based and non-discriminatory maximum prices. The major telecommunication services subject to the universal service obligation (USO) are shown in Box 3.

Box 3. Universal service coverage in Denmark

- Access to a fixed voice telephony network, associated services (local, national and international), and a standard subscription.
- Access to an ISDN network, associated ISDN services, and a standard subscription.
- Access to leased lines except for broadband lines.
- Availability of special USO service for certain groups of handicapped persons or special USO terms and prices for these groups.
- Availability of public radio-based maritime distress and safety services.
- Availability of a nation-wide directory enquiry service and an extensive enquiry service for foreign numbers.

The NTA may appoint providers of public telecommunication networks or services who have a nation-wide market share of 50% or more in one or more of the universal services, as a USO provider for a period of ten years. Accordingly, at present, Tele Danmark is designated as the USO provider for the period of 1 January 1998 to 31 December 2007 for all universal services.

The NTA is responsible to fix maximum prices for specific universal services for a two-year period. The concept of maximum prices is aimed at prescribing how much individual tariff elements included in the universal services may cost (see Section 2.2.3).

Although a public tender aimed at selecting one or more alternative USO providers has to be carried out in advance, it is possible for Tele Danmark to be compensated for a deficit incurred in providing certain universal services: fixed voice telephony, special service for handicapped persons, public radio-based maritime distress and safety services, and directory enquiry service. If it is proved that a deficit exists in the provision of universal services, the NTA will collect a contribution from the providers of fixed voice telephony providers on the basis of each provider's total revenue. This mechanism has not yet been used since Tele Danmark has not reported any deficit in meeting their obligations.

In Denmark, the scope of universal service is much wider compared to many other OECD countries in that it includes ISDN and leased lines. For example, the EU Directives⁸³ define universal service as "a minimum set of services of specified quality which is available to all users independent of their geographical location and, in the light of specific conditions, at an affordable price". Thus, according to EU Directives, universal service has a more narrow scope of public telephony, emergency and directory enquiry services, public pay phones, and special facilities for customers with disabilities or special needs.

Although the intention of trying to ensure best practice technologies to users is understandable, the designation of a specific technology such as ISDN as an USO service in Denmark can be viewed as equivalent to technological determinism by the regulator. It would have been more appropriate to simply designate the quality equivalent of ISDN services without specifying any technology.

As mentioned, the concept of universal service and price regulation is directly linked in the regulatory framework of Denmark despite the fact that objectives of the two concepts can differ. This linkage has resulted in universal services being automatically subject to price regulation, and has also resulted in some complexity and inconsistency in the use of terminology (*e.g.* requiring cost-based prices and making provisions for deficit compensation), and in terms of the financing system for deficits for universal services (see Table 14).

Table 14. Linkage of universal service and price regulation in Denmark

USO service	Type of price regulation	Possible compensation for deficit
fixed voice telephony	maximum price (cost-based and “best practice”)	yes
ISDN	maximum price (cost-based and “best practice”)	no
Leased lines	Interconnection regime (cost-based)	no
Services for handicapped persons	maximum price (possible not to be cost-based)	yes
Maritime distress and safety services	--	yes
Directory enquiry service	maximum price (cost-based and “best practice”)	yes

Source: OECD.

2.2.7. International aspects

Denmark can be considered as having one of the most liberalised markets among OECD countries in terms of market entry and in that it imposes no restrictions on foreign operators. Denmark allowed market entry well before the EU’s deadline of 1 January 1998 agreed to in the EU Directive on full liberalisation. Denmark has no exemptions in the European Union’s commitment for the WTO agreement on basic telecommunications that was concluded in February 1997.

Table 15. Denmark’s commitment to the WTO agreement on basic telecommunications services

Range of services Opened	Timing of liberalisation	Commitment to common set of regulatory principles	Foreign ownership restrictions	MFN exemptions
Full	By 1 January 1998	Full	No	No

Source: WTO.

2.2.8. Streamlining regulation and application of competition principles

The Danish Competition Act applies to the telecommunications sector with no exemptions. The new Competition Act⁸⁴ came into force on 1 January 1998 prohibiting anti-competitive agreements and abuse of dominant power in all industries. In addition, the various telecommunications and sector-specific regulations aim to safeguard competition in a market that is in transition from a monopoly to a competitive market. Denmark has taken steps to ensure co-operation between the NTA and the Competition Authority,

in order to secure effective and consistent supervision of the competitive situation and safeguard the idea that plaintiffs in the market can have "one-stop-shopping". In early 1997, the Danish government carried out a study to determine the appropriate interface between the two organisations.⁸⁵ Subsequently, a framework on the co-operation between the two organisations was established in September 1998.⁸⁶ This co-operation framework covers three areas: specific co-operation as required in telecommunications legislation; quarterly contact meetings between the two organisations; and continuous co-operation on individual cases. It also attaches a guideline on how the NTA should deal with issues having competition aspects.

Telecommunications legislation requires co-operation between the NTA and Competition Authority specifically in three areas - interconnection agreements, prices for universal services and cross-subsidisation in the telecommunications market.⁸⁷ For example, when approving interconnection agreements or maximum prices of Tele Danmark's universal service, the NTA needs to obtain a binding opinion from the Competition Council on whether the agreement or price is in breach of the Competition Act. The Competition Council is required by legislation to respond within 14 days. For accounting supervision, although the NTA continues to hold the principal responsibility, the Competition Council will give a binding opinion to the NTA on its assessment on cross-subsidisation issues.

Since the liberalisation of the market, the Competition Council has made decisions on several cases in the telecommunications sector. These include cases on bundling of the mobile handset and subscription, Tele Danmark's *Duet* concept (see Section 2.3), and the unified subscription charge of Tele Danmark. Currently the Competition Authority has only one or two staff with expertise in telecommunications. More expertise may be required in the future if it is to react fully to the complex issues being addressed.

Regulatory streamlining

While sector-specific regulations may be necessary to steer and facilitate the market from monopoly to a fully competitive market, however, it is also necessary to withdraw sector-specific regulations as the market becomes fully competitive. Determining the timing of when sector-specific regulations can be withdrawn remains a difficult issue that is highly dependent on the regulator's ability to evaluate the state of competition. The NTA now collects and publishes statistical data every six months.⁸⁸ However, the data collected are insufficient in that no data on the domestic fixed market are available, including Tele Danmark's share in the market.⁸⁹ It is important that NTA collects all data necessary from the operators for evaluating the state of competition in order to decide upon the possibility of withdrawing specific regulations. From this perspective, NTA's present ineffectiveness in monitoring the market, in collecting data and evaluating the state of competition, may make such decisions even more difficult. To ensure that all operators meet the regulatory requirements including the request for necessary data, certain penalties should be stipulated in legislation, if necessary. NTA should also publish all relevant data obtained to ensure transparency and to provide justification for regulatory measures. Denmark has taken important steps to streamline regulations by encouraging the establishment of industry self-regulation rather than impose regulations. Several laws have been designed to introduce detailed regulation as a default should the industry not be able to reach an agreement within a specified time. In this respect, a sector-wide agreement was established by the industry for carrier pre-selection, number portability and sharing of masts. An agreement on access to Tele Danmark's raw copper and service provision agreements is also under discussion, and the new bill on the erection of masts also indicates that detailed regulation will only come into effect in case there is no agreement among market players.

Furthermore, in mid-1998, the Ministry of Research and IT began a comprehensive review of current telecommunications regulations partly subject to the requirement in legislation.⁹⁰ It is expected that the outcome of the review will be a legislative package revising and streamlining regulations in the telecommunications sector, to be submitted to Parliament in the 1999/2000 session.

2.3. *Convergence in communications markets*

2.3.1. *The "Duet" concept*

Denmark has been in the forefront in facilitating convergence, especially in the telecommunications sector between the fixed and mobile market.

In September 1997, Tele Danmark introduced *Duet*, the first fixed/mobile integrated product not only in the Danish telecommunications market but also among many member countries. *Duet* allows incoming calls to a fixed network number to be redirected to a mobile handset when it is on, or, if the handset is off, the call is routed to a subscriber's voice mailbox. The product is provided in addition to Tele Danmark's fixed network subscription and is based on the purchase of network capacity from its mobile division on a service provision basis. *Duet* allows the customer to have both fixed and mobile subscription using a single telephone number and a single bill with a special subscription price. *Duet* had obtained approximately 75 000 customers by early 1998 and 200 000 customers at the end of 1998, a large amount of these customers were captured from Tele Danmark's major competitor Sonofon.

However, while it is of extreme importance to facilitate convergence and ensure that consumers can benefit rapidly from new services, there are also concerns if convergence and new services serve to strengthen the dominant position of dominant market players. In the case of *Duet*, it was only after Tele Danmark had launched the service, that the NTA informed the Ministry that changes to legislation could ease the possibility for other operators to create *Duet*-like services by obtaining access to Tele Danmark's fixed network on a service provision basis, and recommended such changes to be implemented. Legislation was changed in July 1998, nearly one year after Tele Danmark had introduced the service, to include service provision agreements into the scope of the interconnection regime. But negotiations between Tele Danmark and the competitors are still going on after more than six months and no agreement has been concluded yet.

A service such as *Duet* is an outcome of technology innovation based on convergence that offers consumers a service with higher quality and lower prices. However, because the product may have the impact to distort competition in the telecommunications market through Tele Danmark's dominance in the fixed and mobile market, NTA should have scrutinised the issue more closely at the initial stage. It should not have allowed Tele Danmark to market *Duet* before its competitors had access on an equal and non-discriminatory basis to Tele Danmark's resources in order to provide *Duet*-like services. Only a year after the launch of *Duet* were steps taken to provide such access.

There have been strong complaints from Tele Danmark's competitors on this case. Sonofon appealed to the Competition Council in April 1998 complaining of potential cross-subsidisation between Tele Danmark's fixed and mobile service in providing *Duet*. After ten months, however, Sonofon still has not received any response from the Competition Council. In a market which is growing rapidly and where customers migrate easily between different service providers, a ten months period is extremely long and can have an important financial impact on competitors.

When an innovative service from the dominant carrier emerges, it is vital that the regulator carefully assess, *ex ante*, whether the new service can have a potentially anti-competitive impact and will allow the dominant carrier to abuse its dominant position and distort competition in the market. Such an assessment will allow the regulator to undertake any necessary adjustment measures in a timely fashion.

2.3.2. Regulatory framework for the communications sector

Convergence is also advancing rapidly between the telecommunications and broadcasting sector at the technological, service, and market level in OECD countries. By blurring the borders between the traditionally separate telecommunications and broadcasting sectors, convergence is raising a number of regulatory challenges for many member countries. In Denmark, the telecommunications sector is regulated by a package of specific laws, while the broadcasting sector is mainly regulated by the Broadcasting Act. There are difficulties in designating individual operators and new services emerging from convergence to either of the existing regulatory frameworks. To overcome these difficulties and benefit from the full benefits of convergence, Denmark, like many other OECD countries, faces the challenge to review and establish a consistent regulatory framework for the whole communications sector. This may also include the review of the structure of regulatory institutions in Denmark, since the current fragmented structure where the telecommunications and broadcasting sector are regulated by separate bodies may raise difficulties in responding to the issues of convergence.

Table 16. Comparison of regulatory frameworks of telecommunications and broadcasting

	Telecommunications	Broadcasting
Major Acts of the Regulatory regime	<ul style="list-style-type: none"> - Act on the National Telecom Agency - Act on certain conditions in the telecommunications field - Act on universal service obligation and certain consumer interests within the telecommunications sector - Act on competitive conditions and interconnection in the telecommunications sector - Act on assignment and use of numbering resources - Act on cable laying access and expropriation etc. for telecommunications purposes - Act on public mobile communications - Act on radiocommunications and assignment of radio frequencies 	<ul style="list-style-type: none"> - The Broadcasting Act, - Act on radio and television activities
Market entry	No restriction (except for mobile services where an individual license is required)	Network: same as telecommunications Service: individual licensing
Regulatory institutions	The National Telecom Agency, The Ministry of Research and IT	Network: National Telecom Agency, Service: Ministry of Culture, Local Radio and Television Board, Satellite and Cable Board

Source: OECD.

3. PERFORMANCE OF THE TELECOMMUNICATIONS INDUSTRY

3.1. *Competition analysis*

Since full liberalisation took place in July 1996, many operators have entered the telecommunications market in Denmark, and now more than 50 operators are providing telecommunications networks and/or services.

In the fixed network sector, competition has developed mainly in the international market since full liberalisation. Tele Danmark had lost 25% of the total market share in 1997, to its competitors such as Telia and Tele2, in terms of traffic volume.⁹¹ This trend accelerated through the first half of 1998 where Tele Danmark loss expanded to 35%.⁹² The development of competition in the long distance market has been relatively slow compared to the international market, partly because the competitors entered the market only in 1997. The share of the new entrants remained at 5% in 1997, and is estimated to have reached 10% by the end of 1998.⁹³ Competition in the international and long distance market is foreseen to continue in the coming years with many major new entrants now investing in fixed backbone networks. In addition, the existence of many resellers and a number of call-back operators in the market is expected to continue the competitive pressure.

In the local fixed market, Tele Danmark had a nearly 100% market share as measured by the percentage of access lines and a 98% share measured in terms of revenue in 1997.⁹⁴ As in all member countries, Tele Danmark is expected to maintain its dominance in the local fixed market for some time. All local services provided by the new entrants have been through the use of carrier selection codes and interconnection agreements with Tele Danmark. After two and a half years since full liberalisation there is still no sign of infrastructure competition in the local loop, whereas in other OECD countries, including those which were liberalised after Denmark, there has been evidence of developments in local loop competition. There are several reasons for this relatively poor performance in local loop competition.

First, there are no major cable television operators providing telecommunications services over their networks, although the penetration rate for cable television in Denmark is higher than OECD average. This is mainly because Tele Danmark owns a substantial part of the cable television network in Denmark with the largest share in the cable television market. Allowing the incumbent to provide cable television content services at the stage where there is still no competition in the local loop hinders the possibility of developing the cable television network as an alternative network. For this reason some other countries, such as the UK and Japan, prohibited such content service provision at least at the initial stages. Second, the wireless access network has not yet been utilised in Denmark, although studies are taking place at the NTA and several new entrants have expressed their interest in this area. The final and not the least important reason is that, under current regulations where unbundling of "raw copper" is ensured, new entrants have much lower barriers to entry into the market as service-based competitors rather than undertaking heavy investments in infrastructure. The Danish policy in this context has supported service-based competition through its regulatory framework. Although service-based competition is clearly an easier way to achieve competition at the initial stage of liberalisation, infrastructure-based competition is expected to ensure more effective and efficient competition in the long term. In this context, Denmark should place greater emphasis on promoting infrastructure-based competition. One way this could occur would be to maintain the current mandatory unbundling to Tele Danmark's local loop (access to raw copper) only for a limited time period (for example of five years), phasing-out such mandatory access over a fixed period of time in order to provide an incentive to new entrants to invest in their own infrastructure. After the limited time has passed, access to the unbundled local loop would depend on the commercial negotiation between Tele Danmark and new entrants.⁹⁵

The most intense competition has been in the mobile market. Denmark was the first country to introduce competition for GSM technologies when it granted licenses to the new entrant Sonofon and to Tele Danmark in 1992. Competition expanded further when four DCS1800 licenses were granted in 1997, and two new operators, Telia and Mobilix, entered the market. In addition to the four network-based operators, there are also resale operators providing mobile services using the networks of the licensed operators. Currently, Tele Danmark and Sonofon are sharing dominance in the digital mobile market. At the end of mid-1998, Tele Danmark and Sonofon had shares of 49.6% and 44.5% respectively, but new entrants are stimulating competition in the market. Competition in the mobile market has led not only to price cuts (see Section 3.2) but also to more innovative services, including mobile voice mail, new solutions to data communications, advanced customer services and prepaid calling cards. The development of the mobile market is also creating a possibility for it to become an alternate to the fixed network market. For example, Sonofon is now marketing a “cheap zone” concept, whereby a mobile user located in his home area gets the benefit of rates approximating to rates on the fixed network (*Unofon* concept). Mobilix also has started to offer significant discount schemes to its business customers offering cheaper prices for international calls than the fixed network service during the daytime.

With no line-of-business restrictions, many new entrants are intending to become full service providers by offering both fixed and mobile services to their customers in order to compete with Tele Danmark. Telia became a full service provider when it obtained the DCS1800 license in 1997. Mobilix, which also has a DCS1800 license, also intends to enter the fixed network market. The service-based operator Tele2 also announced plans to enter the mobile market through access to existing mobile networks. This trend will allow more bundling of various fixed and mobile network/services. The *Duet* concept of Tele Danmark is an example of such integration. As in other member countries, many telecommunications operators are also providing Internet access.

Unrestricted market access, with no foreign ownership restrictions, has resulted in entry by a number of international carriers such as Global One, Unisource, AT&T and Tele8 who are providing advanced international services such as IVPN services.

3.2. *International performance comparisons*

Among the various performance indicators, price developments are the most important in evaluating the effect of competition. Prices for telecommunications services have been declining steadily in Denmark, especially since full liberalisation in 1996 (see Table 17). The Telecom Price Index (TPI), which shows the development in telecommunications tariffs for domestic fixed network calls decreased 2.5 points after liberalisation, despite the increase in the Net Price Index (NPI). The reduction shows the benefits of competition in Denmark compared to the monopoly era where the TPI showed no decrease during 1991 to 1995.

The largest decrease in Tele Danmark’s TPI was recorded in 1998, as a result of new entry in 1997 in the domestic fixed network market. At the same time, however, new entrants such as Tele2 and Telia have offered lower prices than Tele Danmark, and have also been reducing their prices. This should impose further pressure on Tele Danmark to further reduce prices.

Table 17. Development of telecommunications prices for domestic calls in Denmark

		1990	1991	1992	1993	1994	1995	1996	1997	1998
TPI	Tele Danmark	100	96.5	96.8	96.8	96.8	96.8	94.9	94.9	92.4
	Tele2								85.9	81.0
	Telia								85.7	84.0
NPI		100	102.6	104.8	106.3	108.0	110.1	12.3	114.8	--

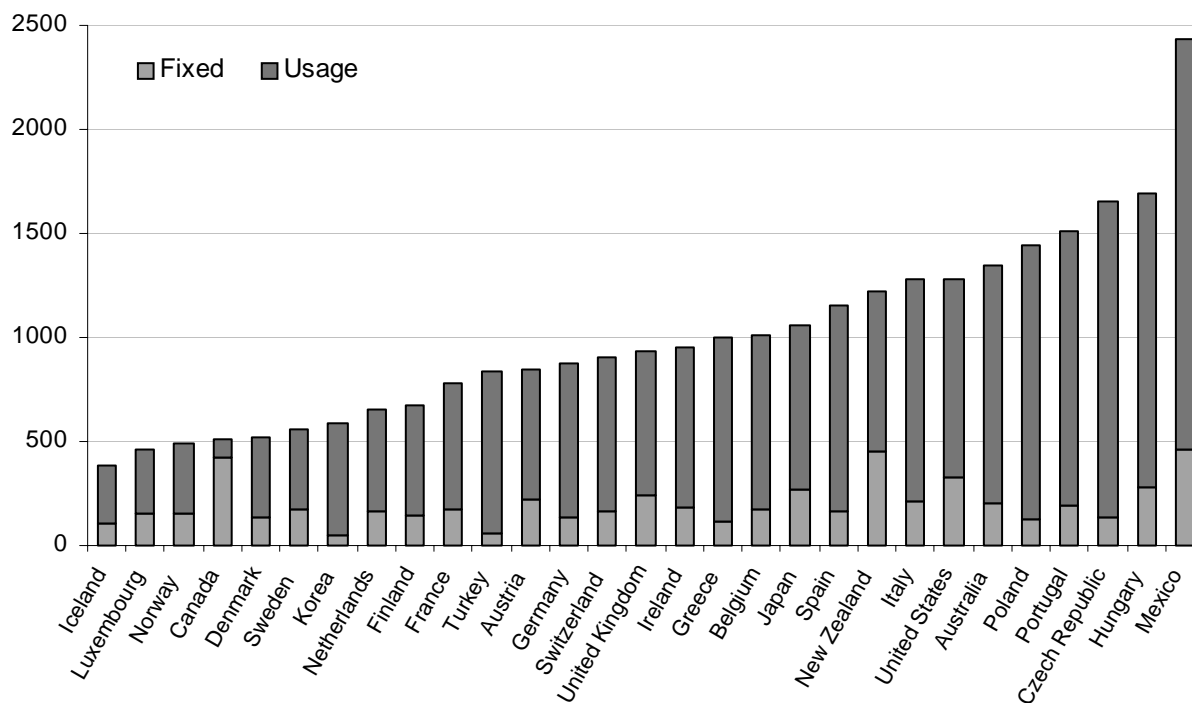
TPI= Telecom Price Index, NPI= Net Price Index published by Statistics Denmark.

Source: NTA (Tele Yearbook '97).

Together with other Scandinavian countries, Denmark has had, traditionally, one of the lowest tariffs among OECD member countries for domestic calls in terms of both the business tariff basket and the residential tariff basket (see Figure 1. and Figure 2.). This has greatly benefited industry and consumers of Denmark. The relatively high proportion of fixed charge also shows the progress of re-balancing in Denmark.

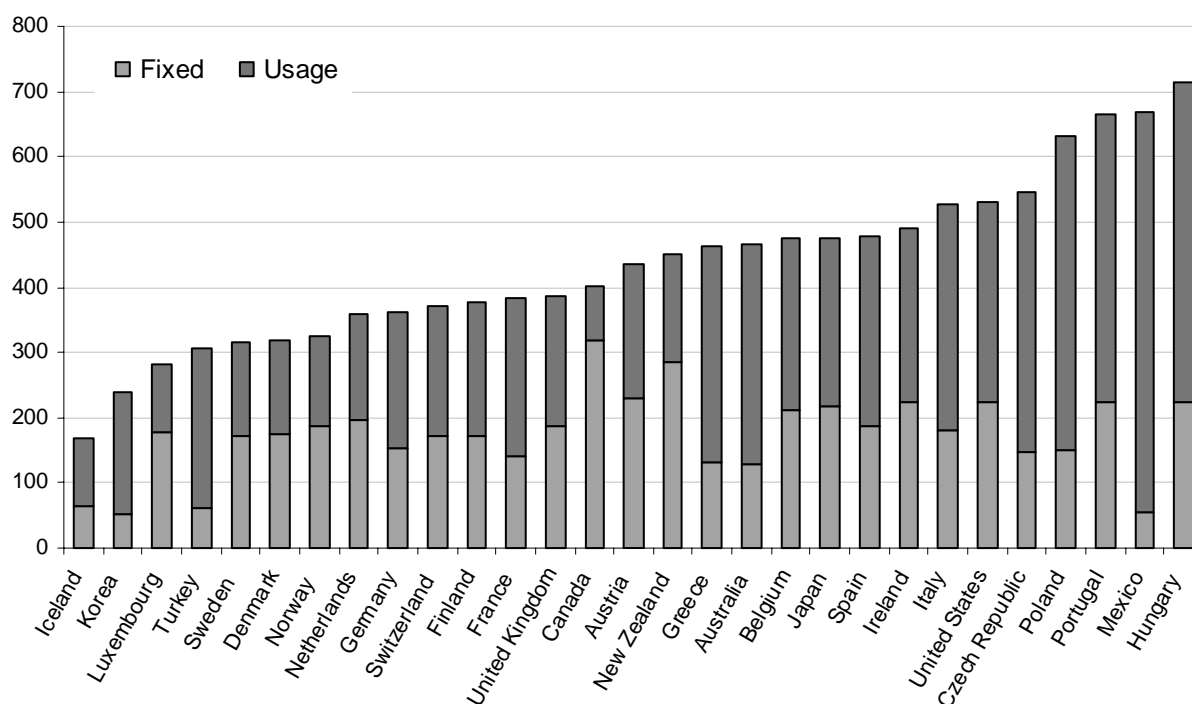
Figure 1. Comparison of national business tariff baskets, November 1999

(US\$ PPP)



Source: OECD/Teligen.

Figure 2. Comparison of OECD national residential tariff basket, November 1999
(US\$ PPP)



Source: OECD/Teligen.

Tariffs for international calls have also been decreasing in Denmark. However, the decrease in the international collection charges tariff in Denmark between 1991 and 1998 has been relatively small compared with some other countries (see Table 18). While Denmark used to have the lowest international collection charges in 1991, many other countries have caught-up and have even passed Denmark as a result of competition. This implies that the pressure of competition has not been sufficiently strong in Denmark compared to some other member countries.

Table 18. **Comparative development of international collection charges**

(Average of peak one-minute to OECD countries, expression in US\$)

	1991	1992	1993	1994	1995	1996	1997	1998
Denmark	0.80	0.74	0.82	0.77	0.69	0.62	0.73	0.60
Sweden	1.06	1.04	1.08	0.80	0.70	0.66	0.57	0.49
Norway	0.93	0.72	0.71	0.58	0.55	0.49	0.57	0.52
Finland	0.99	0.93	0.69	0.63	0.63	0.68	0.67	0.61
Netherlands	1.01	0.99	0.97	0.92	0.89	0.78	0.87	0.39
Germany	1.00	0.97	0.97	0.91	0.93	0.65	0.70	0.60
France	1.14	1.13	1.02	0.88	0.81	0.89	0.70	0.37
UK	0.89	0.79	0.78	0.66	0.59	0.61	0.50	0.52
OECD	1.34	1.26	1.24	1.06	1.01	0.95	0.93	0.78

1. The data is as of February 1998.

Source: OECD (1999), Communications Outlook 1999.

One other reason for the relative high collection charges in Denmark is that Tele Danmark has maintained high accounting rates compared to some other EU countries. This can be seen in Table 19 which shows accounting rates with the US.

Table 19. **Accounting rates with the United States**

(US\$)

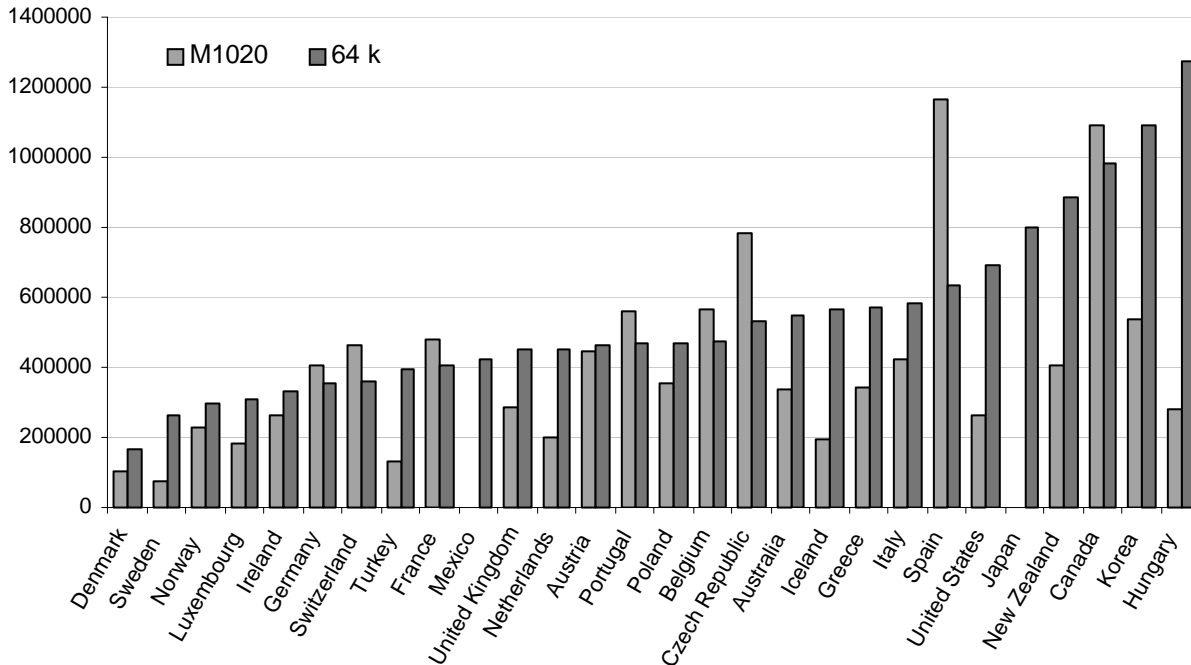
	1996	1997	1998
Denmark	\$0.145	\$0.135	\$0.110
France	\$0.175	\$0.130	\$0.105
Germany	\$0.115	\$0.100	\$0.105
Italy	\$0.260	\$0.165	\$0.110
Netherlands	\$0.180	\$0.135	\$0.095
Norway	\$0.145	\$0.110	\$0.095
Sweden	\$0.085	\$0.060	\$0.060
United Kingdom	\$0.110	\$0.070	\$0.060

Source: FCC.

Similar to the business tariff basket and the residential tariff basket, Denmark has one of the lowest tariffs for national leased lines as well among OECD member countries (Figure 3).

Figure 3. OECD national leased line basket, November 1999

(in US\$PPP)



Source: OECD/Teligen.

For mobile services, as mentioned before, no significant price decrease occurred the duopoly era when two operators – Tele Danmark and Sonofon - were providing GSM900 services. The call charges without discounts for a regular customer remained, for a considerable period, at DKK2.80 per minute on calls both to and from the mobile network, forcing the regulator to mandate lower prices. However, as a result of two new entrants - Telia and Mobilix - for DCS1800 services, the price for cellular mobile calls dropped sharply in 1997. New entrants have been offering rates of between DKK0.50 and DKK1.00 per minute on normal subscription charges, and the existing companies have also dropped their prices to keep up with competition. The prices for calling the mobile network has also dropped significantly to DKK1.75 per minute.

Table 20. Development in Tele Danmark's prices to and from mobile networks

(DKK/minute)

	1994	1995	1996	1997	1998	1999.2
Mobile calls	2.80	2.50	2.35	1.95	1.95	1.95
Calls to mobile networks	2.80	2.80	2.35	2.35	1.95	1.75

All rates are for peak hours.

Source: Tele Danmark.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. General assessment of current strengths and weaknesses

Box 4. Strengths

- Early liberalisation among the European Union countries
- Open market access and no line-of-business restrictions
- Essential safeguards for effective competition
- Generally low end-user price and innovative services
- Legislated requirement to review laws and regulations

Denmark introduced competition in the telecommunications market earlier than many other European countries. It was the first country to introduce competition in the mobile market when it granted a license to the second operator for GSM900 services in 1992, and introduced full liberalisation in July 1996, which was 18 months in advance of the deadline set in the EU Full Competition Directive. Subsequently, new licenses were granted in the DCS1900 field in 1997 allowing the entry of two additional operators. The early liberalisation has led to active competition in the telecommunications sector in Denmark especially in the mobile market and in the international market for PSTN services, although more competition is anticipated in the domestic PSTN market. Competition has benefited consumers in Denmark through price reduction and increased choice of various telecommunications services.

Complete openness in market access is also a strength of the Danish telecommunications sector. No individual licence or registration is required for market entry except for entry requiring spectrum. This factor, combined with early liberalisation, has resulted in more than 50 operators providing telecommunications networks and/or services in Denmark despite the relatively compact size of the country. The openness of the market with no discriminatory restrictions on foreign operators, including ownership restrictions, has also offered opportunities to foreign operators. All major operators in Denmark, including the former monopoly Tele Danmark, are now owned mostly by foreign companies. In addition, no line-of-business restrictions has enabled operators to become full service providers offering “one-stop shopping” to their customers. This has also encouraged operators to integrate various services such as fixed and mobile networks/services and promote convergence in the Danish telecommunications market such as the *Duet* concept of Tele Danmark.

Denmark has implemented the essential safeguards for effective competition in almost all areas including unbundling of the local loop and carrier pre-selection, though further improvement can be expected. The schedule for number portability has also been determined.

Together with other Scandinavian countries, Denmark has had, in general, one of the lowest end-user prices for telecommunications services among OECD countries. Although other countries are now rapidly catching up and have even passed Denmark in some areas since the introduction of competition, Denmark continues to have one of the lowest prices in many service areas. This has benefited industry and consumers in Denmark. In addition, the advance of competition especially in the mobile market has introduced various innovative services. This includes services such as the integration of fixed and mobile networks/services (Tele Danmark’s *Duet* concept) and the cheap zone concept for mobile communications within a designated home area (Sonofon’s *Unofon* concept).

In mid-1998, the Ministry of Research and IT began an overall review of regulations in the telecommunications sector as partly required in the law.⁹⁶ On the basis of this review, a legislative package revising and streamlining regulations in the telecommunications sector is planned to be submitted to the Parliament in the 1999/2000 session. The review also includes an analysis of the division of work among the Ministry, NTA and the two appeals boards for the telecommunications sector.

Box 5. Weaknesses

- Insufficient independence and authority of the regulator
- Delay in implementation of regulation
- Inadequate asymmetric regulation
- Weak development of alternative infrastructures in the local loop
- Complex price regulation methodology
- Insufficient evaluation by the regulator of market performance and developments

While the strengths of the Danish regulatory framework create a potential for the creation of a competitive and efficient market, there are some regulatory problems in Denmark, which if not successfully addressed, will impede the development of effective competition in the Danish telecommunications market.

The relative lack of independence of the NTA from the Ministry is of concern from the perspective of ensuring separation between the policy-function and regulatory function. There is insufficient independence due to excess control by the Ministry in several areas, including through short-term performance contracts and the annual analysis plan, as well as NTA's budget which is under the control of the Ministry. Further, the NTA in many areas plays an advisory role to the Ministry rather than making autonomous decisions. The head of the NTA should be appointed for a fixed term to enhance the independence of the agency.

The authority of the NTA as a regulator has also been weakened due to the existence of the Telecommunications Complaints Board which exists together with the right of appeal to the courts. The Telecommunication Complaints Board has weakened NTA's authority by re-interpreting the regulator's interpretation of legislation without taking into consideration the policy objectives of legislation, and slowed the process of enhancing competition in the market, as well as creating policy inconsistency. The existence of the Board has, in itself, hampered the NTA from taking aggressive regulatory actions.

Significant delays have occurred in the implementation of certain regulations, specifically for interconnection and price regulation. This is partly due to appeals by operators to the Telecommunications Complaints Board following decisions by the NTA. But, it is also due to NTA's slow performance in carrying out its task in cases such as evaluating Tele Danmark's interconnection charges and determining the price-cap for tariff regulation.

The DCS1800 license granted to Tele Danmark and other selected operators in 1997, allowed the option of providing RLL (Radio access in local loop). Because wireless access is anticipated as an alternative technology to generate competition in the local loop, NTA should have considered much carefully the impact of granting a RLL option to Tele Danmark which holds a dominant position in the local loop. The same caution should have applied to Tele Danmark's *Duet* concept. In areas such as these, regulators in many other OECD countries would have considered placing asymmetric regulation on carriers with significant market power. Another area where an opportunity to create conditions for competition was lost by not imposing asymmetric regulation on the former monopoly was in the cable television market. In this context the decision of the Danish government, in 1996, to allow Tele Danmark

to provide cable television content services when there was no infrastructure competition in the local loop, was not helpful as a means of developing alternative networks. The outcome of these types of decisions is that after two and a half years since liberalisation, there is still no sign of infrastructure competition in the local loop in Denmark.

The current framework for price regulation set up for interconnection charges and end-user prices is complex and comprises a number of various elements. Interconnection charges are required to be cost-based with a "best practice" option. End-user price is regulated by a methodology combining a price-cap and a pre-setting of maximum prices which also includes a "best practice" option. Furthermore, this price-cap is determined through a combination of rate-of-return and again a "best practice" option. Partly as a result of this complexity, the current methodology is not working in practice for both interconnection charges and end-user price, and has caused confusion and delays in development of competition.

The NTA is legally required to "collect and publish statistics currently on various matters within the telecommunications sector deemed to be necessary for a well working competitive market"⁹⁷ and has the authority through a legislative mandate to obtain such information. However, the NTA has not used its powers effectively in this area. Although surveys are now conducted biannually, the data published lack essential statistics to assess the development of competition including those on the domestic market.⁹⁸ Insufficient market evaluation can slow down the process of streamlining regulation.

4.2. *Potential benefits and costs of further regulatory reform*

As indicated in previous sections, the Danish industry and consumers have in the past benefited from relatively low prices and good service quality. Competition has brought about lower prices and some new services. However, as described in Section 4.1., there is still room for improvement in the regulatory framework of Denmark to facilitate the transition from a monopoly to a fully competitive telecommunications market. The Danish regulatory framework has not yet succeeded in providing an effective and fair competitive environment for new entrants, compared to other countries with similar market structures. This is partly due to insufficient asymmetric regulation on the dominant operator, which provides one mechanism to achieve fair and effective competition in a market which is still in the transition period. As a result, some countries that liberalised after Denmark, are starting to catch-up and pass Denmark in terms of prices for some of the telecommunication services. It is important, therefore, that Denmark takes swift action to implement necessary measures and to ensure that all market participants can compete effectively in the market.

The potential for competition, if harnessed by appropriate regulatory measures, can lead to further reduction in prices and the introduction of innovative services. In order to achieve this objective, it is suggested that Denmark considers the following recommendations.

4.3. *Policy recommendations*

The following recommendations are based on the "Policy Recommendations for Regulatory Reform" set out in the OECD report on Regulatory Reform.

1. *Ensure that regulations and regulatory processes are transparent and non-discriminatory and applied effectively*

- *To ensure sufficient independence of the NTA, the performance contract between the Ministry and NTA should be concluded for a longer period rather than on an annual basis, and the annual analysis plan should be abolished.*

The regulator should be provided sufficient independence from the Ministry's policy-making functions, in order to act consistently in carrying out its regulatory objectives to promote competition. NTA have been hampered in carrying out their legal obligations and acting autonomously through excessive control by the Ministry. To ensure sufficient independence of the NTA, the current performance contract should be undertaken for a longer period rather than on an annual basis, and the annual analysis plan should be eliminated

- *The Telecommunications Complaints Board should be abolished. This would speed the implementation of necessary regulations aimed at promoting competition. If, for constitutional reasons, this is not possible, then, at the minimum, it should be given explicit and limited objectives and criteria for accepting appeals and making decisions, which focus mainly on procedural questions and not on re-examining regulatory decisions by the NTA, together with a strict time limitation to avoid any significant delays in promoting competition.*

The Telecommunications Complaints Board as constituted has weakened the authority of the NTA as a regulator. This has also resulted in delay in the implementation of regulation in the Danish telecommunications sector, and has thus slowed down the development of competition. For this reason, the Board should be abolished. If the Board is to be maintained, at minimum, it should be provided with clearer and limited objectives and specific criteria on which to base its decision in accepting appeals and deciding on individual cases, so that it would focus mainly on procedural questions and not be re-examining regulatory decisions and judgements of the NTA, and should also have a strict time limit for making decisions. In this context, it is important that criteria on which the Board bases its decisions are compatible with the objectives of the NTA - promoting competition in the telecommunications sector and ensuring necessary consumer protection.

- *NTA should obtain required information and implement regulation in a prompt manner and avoid any significant delays. In this context, an Executive Order on Tele Danmark should be established to ensure that the incumbent provides information as requested and can be made subject to further asymmetric regulation. In addition, penalties should be imposed on operators who do not adhere to regulations and information requirements outlined in legislation.*

The NTA should be more aggressive in implementing regulations in carrying out its regulatory tasks to foster competition, and avoid any delays in its regulatory decisions. Although the NTA has the legal basis to request necessary data, it has not used this mandate effectively to obtain essential data from Tele Danmark, whose obligations are currently spelled out in individual laws. It may be necessary to consolidate and strengthen these requirements. In this context, the option of establishing an Executive Order on Tele Danmark as an operator with significant market power should be examined. Such an Executive Order would impose all the necessary obligations on Tele Danmark as an operator with significant market power, and would allow for more effective asymmetric regulation to be imposed on the dominant player. In addition, where necessary, penalties should be stipulated in legislation to ensure that all operators meet regulatory requirements including request for necessary data.

- *The Danish government should introduce the LRAIC method for calculating interconnection charges as soon as possible.*

The current calculation methodology for interconnection charges which is based on fully distributed historic costs forces new entrants to pay high interconnection charges, and the "best practice" concept adopted as an interim measure to adjust this feature is currently not functioning in the market. The Danish government should ensure that the LRAIC method based on forward looking costs, including a reasonable profit margin, is introduced as soon as possible. In the interim, however, until the LRAIC

method is established, a best practice concept based on the LRAIC method could be adopted as an alternative. Such a best-practice method could use both LRAIC methodologies and pricing structures from other countries, to achieve further cost-efficiency and to ensure that interconnection charges are reduced to keep pace with changes in retail prices.

2. *Reform regulations to stimulate competition, and eliminate them except where clear evidence demonstrates that they are the best way to serve the broad public interest*

- *The Danish government should introduce policies to promote infrastructure competition in the local loop. In this context, Tele Danmark's cable television business should be divested.*

Although it is much easier to achieve competition at the service level using a single existing fixed local network, alternative infrastructure will ensure a more efficient and stable basis for competition in the long term. From this perspective, the Danish government should view the current regulation on mandatory unbundled access to Tele Danmark's local loop as a temporary measure, phasing-out such mandatory access over a fixed period of time in order to provide an incentive to new entrants to invest in their own facilities. Temporary mandatory access to the unbundled local loop should also be extended to include unbundled access to Tele Danmark's cable TV network infrastructures (if Tele Danmark's cable television business is not divested). After a fixed time period, for example five years, access to unbundled local loop would depend on commercial negotiation. In addition, in order to promote local loop competition, the Danish government should consider divesting Tele Danmark's cable television business, and also accelerate the procedure of UMTS licensing. At the minimum, Tele Danmark's cable television business should be operated by a legally separate body, to ensure that there is clear separation between the operations of telecommunications and cable television networks.

- *A more simple methodology for price regulation using simple price-cap mechanisms should be introduced. The direct linkage between universal service and price regulation should be removed to avoid excess price regulation.*

The current price regulation regime is too complex, imposing an excess burden on both the regulator and operator, and causing delays in implementing regulation. It should be replaced by a more simple methodology which ensures cost-based pricing, and places pressure for more productivity improvements through a normal price-cap. In addition, the direct linkage between universal service and price regulation which results in universal services to be automatically subject to price regulation regardless of its condition of competition should be removed.

- *Price regulation on the long distance and international market should be lifted as soon as possible.*

Transparent policies should be in place to ensure that price regulation can be lifted where competition has progressed sufficiently. Price regulation should be restricted to those markets which there is insufficient competition. In this context, the development of competition in the international and long distance fixed voice telephony markets supports the lifting of price regulation in these areas.

3. *Review, and strengthen where necessary, the scope, effectiveness and enforcement of competition policy*

- *Both the Ministry and the NTA should use further asymmetric regulation in areas where Tele Danmark's dominance is obstructing efficient competition.*

The Danish government, in the past, had not taken the full opportunity to impose asymmetric regulation on Tele Danmark. This includes cases when the government had granted Tele Danmark the license for DCS1800 and RLL systems as a selected operator, and had allowed the company to enter the cable television business, regardless of its dominance in the local market. To avoid any further cases as in the past, the Danish government should use asymmetric regulation in specific cases where Tele Danmark's dominance will obstruct efficient competition, and avoid actions that will serve to further strengthen Tele Danmark's dominance in the market. In this context, careful consideration should be given to the competitive implications of UMTS licensing. If, as is likely, only a limited UMTS licences are to be granted, the regulator should defer providing a licence to Tele Danmark.

- *The NTA should define performance indicators that are essential for evaluating market competition and should obtain and publish data on these indicators on regular basis, in order to allow transparent and efficient regulatory decision making, including the withdrawal of sector-specific regulations to streamline regulation.*

It is extremely important that the NTA monitors and evaluates the conditions of competition in the market by collecting and publishing all essential statistical data on a regular basis. Such data are essential in establishing policies and determining appropriate regulatory measures including streamlining of regulations, and publishing such data ensures transparency and provides justification for the regulatory measures taken.

NOTE

1. OECD, *Labour Force Statistics*. Figures are for 1997.
2. OECD, *Communications Outlook 1999*.
3. OECD, *Communications Outlook 1999*. Figures of Finland, Norway and Sweden for 1997 were US\$597, US\$827 and \$US781 respectively.
4. OECD, *Communications Outlook 1999*.
5. OECD, *Communications Outlook 1999*. Telecommunications access lines include the total of fixed access lines and cellular mobile subscribers.
6. After Sweden, Luxembourg, the United States and Switzerland.
7. OECD, *Communications Outlook 1999*. Figures are for 1997. Figures for mobile networks represent per cent of subscribers to digital networks.
8. OECD, *Communications Outlook 1999*.
9. OECD, *Communications Outlook 1999*, Tele Danmark (*Annual Report 1997*).
10. The EU liberalisation directives are as follows:
 - Service Directive (90/338/EEC).
 - Satellite Directive (94/46/EC).
 - Cable Directive (95/51/EC).
 - Mobile and Personal Communications Directive (96/2/EC).
 - Full Competition Directive (96/19/EC).
11. The major EU harmonisation directives include:
 - ONP Framework Directive (97/51/EC).
 - Licensing Directive (97/13/EC).
 - Interconnection Directive (97/33/EC).
 - Revised Voice Telephony Directive (98/10/EC).
12. This allowed free access for all operators to install broadband networks to be used for high-speed connections (more than 2 Mbit/s).
13. The political agreement was made upon the Social Democrats, the Liberals, the Conservatives, the Socialist People's Party, the Social Liberals and the Centre Democrats on 6 April 1995.

14. This allowed free access for all operators to transmit television and radio programs via telecommunications networks through lines leased from Tele Danmark.
15. The political agreement made upon the Social Democrats, the Liberals, the Conservatives, the Socialist People's Party, the Social Liberals and the Centre Democrats on 6 December 1995, as the fourth supplement to the Political Agreement on the Telecommunications Structure of 22 June 1990.
16.
 - Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector (Act No. 466 of 12.6.1996).
 - Act on Competitive Conditions and Interconnection in the Telecommunications Sector (Act No. 467 of 12.6.1996).
 - Act on Public Mobile Communications (Act No. 468 of 12.6.1996).
 - Act on Amendment of the Act on Certain Conditions in the Telecommunications Field and the Act on Activities in the Radio and Television Sectors (Act No. 469 of 12.6.1996).
 - Act on Amendment of the Act on Radiocommunications.
17. The Telecommunications Complaints Board was established under the Act on Competitive Conditions and Interconnection in the Telecommunications Sector (Act No. 467 of 12.6.1996), and the Telecommunications Consumer Board was established under the Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector (Act No. 466 of 12.6.1996).
18.
 - Act amending the Act on Competitive Conditions and Interconnection in the Telecommunications Sector (Act No. 391 of 10.6.1997).
 - Act on Assignment and Use of Numbering Resources etc. (Act No. 392 of 10.6.1997).
 - Act on Cable Laying Access and Expropriation etc. for Telecommunications Purposes (Act No. 393 of 10.6.1997).
 - Act on Radiocommunications and Assignment of Radio Frequencies (Act No. 394 of 10.6.1997).
 - Act on the National Telecom Agency (Act No. 395 of 10.6.1997).
 - Act amending the Act on Public Mobile Communications (Act No. 396 of 10.6.1997).
 - Act amending the Act on Universal Service Obligation and Certain consumer Interests within the Telecommunications Sector (Act No. 397 of 10.6.1997).
 - Act amending the Act on Certain Conditions in the Telecommunications Field (Act No. 398 of 10.6.1997).
19. The first step was carried out in 1993, when the State sold its share to reduce its holdings in Tele Danmark from 93.7% to 51.0%. The second step came in January 1998, when Tele Danmark announced a strategic partnership with Ameritech which supported the partnership through the acquisition of remaining State shares. The State share fell to 17.4% at this point. As the final step, Ameritech purchased the last block of shares in June 1998.
20. The figure is calculated based on data from OECD's Communications Outlook 1999 and Tele Danmark's Annual Report 1997.

21. Tele Danmark, *Annual Report 1997*.
22. OECD, *Communications Outlook 1999*.
23. NTA, *Status '98*, October 1998.
24. The figure is calculated from data in NTA's *Status '98*, October 1998.
25. OECD, *Communications Outlook 1999*.
26. Estimated figure by the NTA.
27. NTA, *Telecom statistics – first half of 1998*.
28. NTA, *Teleprofile '98*.
29. NTA, *Tele Yearbook '97, Telecom statistics – first half of 1998*.
30. NTA, *Status '98*, October 1998.
31. NTA, *Telecom statistics – first half of 1998*.
32. According to OECD's *Communications Outlook 1999*, mobile penetration rates in Finland, Norway and Sweden for 1997 were 45.6, 38.4, 35.8% respectively.
33. OECD, *Communications Outlook 1999*.
34. NMT stands for Nordic Mobile Telephone. It is a fully automatic, common Nordic (Denmark, Finland, Norway and Sweden) analogue mobile telephone system.
35. According to NTA's *Telecom statistics – first half of 1998*, at the end of mid-1998, Tele Danmark had 679 720 subscribers and Sonofon had 609 332 subscribers in the digital mobile market.
36. According to NTA's *Telecom statistics – first half of 1998*, at the end of mid-1998, Mobilix had 10 396 subscribers and Telia had 9 900 subscribers.
37. According to NTA's *Telecom statistics – first half of 1998*, at the end of mid-1998, Debitel had 60 074 subscribers.
38. NTA, *Status '98*, October 1998.
39. NTA, *Status '98*, October 1998.
40. OECD, *Communications Outlook 1999*.
41. The major acts include:
 - Act on the National Telecom Agency (Act No. 391 of 10.6.1997).
 - Act on Certain Conditions in the Telecommunications Field (Act No. 469 of 12 June 1996, amended by Act No. 398 of 10 June 1997 and Act No. 470 of 1 July 1998).

- Act on Universal Service Obligations and Certain Consumer Interests within the Telecommunications Sector (Act No. 466 of 12 June 1996, amended by Act No. 397 of 10 June 1997 and Act No. 470 of 1 July 1998).
 - Act on Competitive Conditions and Interconnection in the Telecommunications Sector (Act No. 467 of 12 June 1996, amended by Act No. 391 of 10 June 1997 and Act No. 470 of 1 July 1998).
 - Act on Assignment and Use of Numbering Resources etc. (Act No. 392 of 10 June 1997 amended by Act No. 470 of 1 July 1998).
 - Act on Cable Laying Access and Expropriation etc. for Telecommunications Purposes (Act No. 393 of 10 June 1997).
 - Act on Public Mobile Communications (Act No. 468 of 12 June 1996, amended by Act No. 396 of 10 June 1997).
 - Act on Radiocommunications and Assignment of Radio Frequencies (Act No. 394 of 10 June 1997).
42. The fee collected for numbering resources also cover the activities of the Telecommunications Complaints Board and the Telecommunications Consumer Board.
 43. NTA, *Teleprofile '98*.
 44. With regard to NTA's decision that the scope of interconnection includes access to Tele Danmark's "raw copper", on May 18 1998, the Board made a decision rejecting NTA's decision declaring that the Act on Interconnection does not provide for lease of infrastructure capacity to demand access to the "raw copper".
 45. With regard to NTA's decision that the discount plan launched by Tele Danmark through Dec. 1996 to Jan. 1997 could not be included in the price-cap for 1996 and 1997, on July 4 1997, the Board rejected NTA's decision indicating that legislation for price-cap regulation contained no terms indicating that discounts cannot be included.
 46. With regard to NTA's determination of price-caps for 2000 and 2001, on August 17 1998, the Board rejected NTA's determination indicating that the "best practice" comparison would not be satisfied if solely based on comparisons with one single country but must be based on comparison with a "plurality of countries". The Board also added that the NTA should not solely focus on prices, but also focus on the quality of services.
 47. With regard to NTA's decision to accommodate Sonofon's request for access to document in a case of approval of Tele Danmark Mobile's key customer agreements, on October 7 1997, the Board rejected NTA's decision indicating that such access would only be possible if the Act on Public Access and the Act on USO Services explicitly had allowed for such access.
 48. Executive Order on the Provision of Telecommunications Networks and Services (Executive Order No. 712, issued on 25 July 1996).
 49. See annex of Licensing Directive (97/13/EC).
 50. Such a law or Executive Order could also provide the authority to regulate pricing which, presently, derives from the law defining universal service.
 51. Executive Order on Accounting Rules etc. for Providers of Public Telecommunications Networks or Services who have Significant Market Power (Executive Order No. 714, issued on 25 July 1996).

52. See Chapter 3 on competition law and merger policy in Denmark.
53. In 1997, prior to the draft directive of the European Commission, KPN was asked by the regulator to reduce its share holding in Casema to 20% to ensure that it would not control both telecommunications and cable television networks. As a result, KPN sold all of its cable holdings to France Telecom. In 1998, the Irish government announced plans to separately privatise Telecom Eireann and its subsidiary Cablelink, the country's largest cable television operator, so that Telecom Eireann would not control both telecommunications and cable television networks. In Germany, Deutsche Telekom announced in January 1999 that it had completed its plan to spin off its cable television business by creating a subsidiary called Kabel Deutschland on 1 January 1999. The subsidiary is planned to be divided into further regional units and parts of its shares are to be sold.
54. Draft Commission Directive to amend Directive 90/338/EEC proposed in December 1997.
55. In the Netherlands, in February 1998, two additional national DCS1800 licenses were granted to Federa and Telfort. The existing GSM license holders, KPN and Libertel were excluded from bidding for these licenses.
56. The Act on competitive conditions (paragraph 7.2) specifies a period of 1 to 6 months before the NTA may arbitrate.
57. Section 4 of the Executive Order on Interconnection Agreements in the Telecommunications Sector etc. (Executive Order No. 657 of 18 August 1997) stipulates that the share in one of the following markets will be starting point of determining an operator with significant market power:
- The overall market for fixed networks and mobile communications services;
 - The market for fixed network services;
 - The market for mobile communications services;
 - The relevant market for leased infrastructure capacity, including leased lines.
58. Due to legislation, Tele Danmark can include only 30% of the operating costs closely linked to the production of the interconnection traffic, in determining the interconnection price.
59. The Executive Order on Interconnection Agreements in the Telecommunications Sector etc. (Executive Order No. 657 of 18 August 1997) lays down regulation for cost-based interconnection charges.
60. The largest reduction was seen in the local exchange where charges fell from DKK0.12 to DKK0.06 per minute, and for leased lines with a reduction of up to 40% for 2Mbit/s circuits.
61. Section 16 of the Act on Competitive Conditions and Interconnection in the Telecommunications Sector ensures that the NTA may request all materials which are deemed necessary for supervision, conciliation or decisions stipulated under the act. In addition, Section 8 of the Executive Order on Interconnection Agreements in the Telecommunications Sector etc. also stipulates that, subject to the request of the NTA or the party requesting an interconnection agreement, the operator with significant market power apart for those in the mobile market are obliged to produce documentation to show that the interconnection charges have been calculated as required by the order.
62. Commission Recommendation on Interconnection in a liberalised telecommunications market, Part I – Interconnection Pricing, 15 October 1997.
63. See note 56 and EU's Interconnection Directive (97/33/EC).

64. Prices for leased lines are regulated through the interconnection regime.
65. Price regulation in Denmark is stipulated in the Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector (Act No. 466 of 12 June 1996, amended by Act No. 397 of 10 June 1997 and Act No. 470 of 1 July 1998).
66. The new price regulation was introduced by the Executive Order on USO Services (Executive Order No. 908 of 5 December 1997), which supplements the Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector.
67. In determining the cap, the NTA needs to ensure that there will be no marked imbalance between Tele Danmark's total costs and revenue in providing the services, and to also resort to benchmark prices in other telecommunications markets in Denmark or foreign countries assuming that those markets, usually with a more longer period of competition, will have a more efficient cost structure.
68. The existence of regional operating companies in the past had led to different subscription charges in the different operating regions.
69. The Competition Council did not object in principle to Tele Danmark's request to unify the subscription charges. However, it stated that such unification should be implemented without increasing the level of Tele Danmark's income from the subscription charges.
70. Section 22 of the Executive Order on USO Services (Executive Order No. 908 of 5 December 1997) stipulates that the NTA may demand all information from the USO provider i.e. Tele Danmark which are deemed necessary for determining the overall price-cap.
71. The Board declared that the NTA would have to refer to a "plurality of countries" to satisfy the term "best practice" and focus not only on prices but also on quality of services.
72. NTA, *Status '98*, October 1998.
73. For example, the "License granted to BT to run telecommunications systems under section 7 of the Telecommunications Act 1984" indicates that BT shall provide telecommunications services specified by the Director other than universal services to every person who reasonably requests such services at any place in the area specified by the Director.
74. OECD, *Communications Outlook 1999*.
75. NTA, *Status '98*, October 1998.
76. NTA, *Status '98*, October 1998.
77. Executive Order on Public Invitation to Tender for Establishment and Operation of DCS1800 Networks and ERMES Networks with Associated Basic Services (Executive Order No. 549 issued on 20 June 1996).
78. NTA, *Status '98*, October 1998.
79. According to NTA's *Telecom statistics – first half of 1998*, subscribers to Tele Danmark's NMT system decreased from 281 861 in 1996 to 204 770 as of mid-1998, showing a 27.4% decline.
80. NTA, *Status '98*, October 1998.
81. European Commission, Third report on the implementation of the telecommunications regulatory package (February 1998).

82. Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector Act No. 466 of 12 June 1996, amended by Act No. 397 of 10 June 1997 and Act No. 470 of 1 July 1998).
83. Interconnection Directive (97/33/EC), Revised Voice Telephony Directive (98/10/EC).
84. Competition Act 1997 (Statute No. 384 of 10 June 1997).
85. The Danish government appointed a committee in early 1997 in order to establish the most appropriate division of work between the Competition Authority and the Sector Authorities with a mandate of submitting a number of recommendations.
86. Procedures for Cooperation between the Danish Competition Authority and the National Telecom Agency (September 1998).
87. Act on Certain Conditions in the Telecommunications Field (Act No. 469 of 12 June 1996, amended by Act No. 398 of 10 June 1997 and Act No. 470 of 1 July 1998), Act on Universal Service Obligations and Certain Consumer Interests within the Telecommunications Sector (Act No. 466 of 12 June 1996, amended by Act No. 397 of 10 June 1997 and Act No. 470 of 1 July 1998). In addition, according to the draft for amendment of the Executive Order on Interconnection Agreements in the Telecommunications Sector etc., submitted by the Ministry on 29 July 1998, the Competition Council's opinion on cross-subsidisation will also be binding on the NTA.
88. Statistical data has been published biannually since data for the first-half of 1998. Previously, statistical data was published annually.
89. See NTA's *Tele Yearbook '97* and *Telecom statistics – first half of 1998*.
90. Comments on the Act on Universal Service Obligation and Certain Consumer Interests within the Telecommunications Sector (Draft Bill No. L241, 1995/1996) require an appraisal by the year 2000 to see if any amendments of the legislation are necessary. With a view to the Parliamentary session 2000/2001, it requires that a report will be presented to the Danish Parliament indicating any amendments of the present legislation.
91. OECD, *Communications Outlook 1999*.
92. Same as note 27.
93. Same as note 25 and 26.
94. Same as note 22 and 23.
95. This measure has been taken in Canada, and the Netherlands has also imposed a system whereby mandated prices for access to the unbundled local loop are progressively increased every year until they attain the retail price level.
96. Same as note 88.
97. Section 1 of the Act on the National Telecom Agency (Act No. 395 of 10 June 1997).
98. The 1997 edition of the *Tele Yearbook* published by the NTA indicates that it has not been possible to get data on operational and quality performance and on traffic handling for domestic telephony, and no statistics are therefore available on this area. The same condition applies to data of the first half of 1998.

