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## Deregulation and Enterprization in Central and Eastern Telecommunication - a Benchmark for the West?

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# **DIW** Diskussionspapiere Discussion Papers

Discussion Paper Nr. 145

## **Deregulation and Enterprization in Central and Eastern Telecommunication - A Benchmark for the West ?**

by

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## **Abstract**

The restructuring of telecommunication in Central and Eastern Europe occurs at a time when the classical structures of telecommunication are falling apart worldwide. Coming from the socialist system in which telecommunication did not exist as an independent economic activity, the Eastern European countries have created specific “post-socialist“ modes of reform, often outdoing Western countries in terms of speed and radicality. Deregulation and enterprization have dominated the process in all countries, leading to advanced technical standards and a wide segmentation of telecommunication markets. The role of foreign direct investment and technology transfer was particularly important. But the reforms also lead to an increasing social gap between the prosperous users of advanced telecommunication services, and the average citizen for which even telephony has become a luxury good.

Our thesis is that CEE telecommunication reform, rather than copying Western models, may become a benchmark for the West, in particular for Western Europe. Technically, the advanced reform countries in Central Europe are about to succeed the leapfrogging process, i.e. the jump from post-war socialist technologies to world-leading edge-of-technology standards. With regard to industry structures, Central and Eastern European countries show that the age of “classical“ integrated telecommunication activities is definitely over. Instead, most diversified telecommunication services are integrated in the emerging information sector. Finally, the very notion of telecommunication as an “infrastructure“ is put in question for the first time in Eastern Europe. We start to address the two relevant policy issues: modes of regulation, and science and technology policies to accompany the restructuring process.

JEL-classifications: L51, L96, P51

## **Zusammenfassung**

Die Umstrukturierung der Telekommunikation in Osteuropa erfolgt zu einer Zeit, da die traditionellen Industriestrukturen weltweit auseinanderbrechen. Im Sozialismus war Telekommunikation keine Wirtschaftstätigkeit, sondern ein von der Partei und dem Staat geschaffenes Instrument zur Regulierung von Informationsflüssen. In Osteuropa werden seit 1990 spezifisch „post-sozialistische“ Reformschritte unternommen, die die westeuropäischen Reformbemühungen der letzten Jahrzehnten in Ausmaß und Geschwindigkeit oftmals übertreffen. Sämtliche Länder betreiben eine aktive Deregulierung und Unternehmisierung. Dies führt zu erheblicher technischer Modernisierung und zu einer weitgehenden Marktsegmentierung in der Telekommunikation. Ausländische Direktinvestitionen und Technologietransfers tragen erheblich zur Entwicklung nationaler Netze und Dienstleistungen bei. Gleichzeitig wächst das soziale Gefälle zwischen den wohlhabenden Nutznießern moderner Telekommunikation und weiten Schichten der Bevölkerung, für die selbst Telephongespräche zu einem Luxusgut geworden sind.

In diesem Papier vertreten wir die These, daß die Reformen in der Telekommunikation in Osteuropa sich nicht an bestehenden Modellen orientieren, sondern ihrerseits zu einer Referenzgröße für weitere Reformbemühungen weltweit werden können, insbesondere in Westeuropa. Die fortgeschrittenen Reformstaaten Osteuropas stehen vor einem Quantensprung von sozialistischer Nachkriegstechnik zu weltweit führenden Technologiestandards. Was die Entwicklung der Industriestrukturen angeht, so läßt sich in Osteuropa am klarsten erkennen, daß das Zeitalter des klassischen Telekommunikationssektors vorüber ist. In Zukunft werden spezialisierte Telekommunikationsdienstleistungen verbleiben, die sich in den wesentlich umfassenderen Informationssektor integrieren werden. Es wird auch zu einer stärkeren sozialen Segmentierung der Nutzer des Informationssektors kommen. Das Papier reißt abschließend zwei aktuelle wirtschaftspolitische Problembereiche an: zum einen die Beziehung zwischen Regulierungsmodi und

Strukturreform, zum anderen die Rolle der Wissenschafts- und Technologiepolitik zur Begleitung des Reformprozesses.

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## **Deregulation and Enterprization in Central and Eastern Telecommunication - A Benchmark for the West ?**

### **Introduction**

The telecommunication industry in Central and Eastern Europe has come a long way to become one of the driving forces of industrial reform in these countries, and also one that is attracting the most interest and investment from abroad. Under socialism, telecommunication was considered a „strategic“ sector, and the information monopoly of the socialist Party was a strong pillar of keeping the political system alive. Today, deregulation and enterprization have revolutionized the use of information in all CEE countries. Modernization, technology-transfer, and the creation of indigenous, technology-based enterprises is progressing at a speed incomparable to the burdensome development of telco industries in the West over the last 30 years. Our thesis, then, is that rather than to copy any Western model, some Central and Eastern European countries are currently creating their own path of telco reform, that may in turn become a benchmark for Western Europe.

The paper proceeds as follows: section one recalls the most recent developments: the world-wide wave of technical development and deregulation have lead to the disappearance of telecommunication as an independent sector. Rather, the industrial dynamics are today centered around four specific core businesses (information production, transport, coding/decoding, services), among which the spoken or written word is but a minor part. This has important consequences on industry structures and the patterns of competition. Section two analyzes the developments of the telecommunication industry in the post-socialist countries of Central and Eastern Europe and the CIS over the last five years. Following the breakdown of the socialist system of handling information, radically new telco activities emerged, with breathtaking speed. Today, new enterprises abound in all these countries, private and public, monopolist and in competition, and the telco services offered to the residential and business sectors grow exponentially, both in quality and in quantity. The telco industry has attracted by far the most foreign direct investment in Central and Eastern Europe, and it was one of the driving forces behind the rapid modernization. On the other hand, markets were quickly segmented, and in the absence of coherent infrastructure policies, the gap between the high-end level and the average user increased x-fold.

In section three, we present three case studies that highlight some characteristics of post-socialist telco reform: the Czech Republic is often considered as the “success story“ of CEE-telco reforms, both in technical and commercial terms; investment of about 6 bn. USD is anticipated until the year 2000, and both the upstream and the downstream sectors benefit from the rapid modernization and expansion of the network. Latvia is a case of an insufficiently regulated monopoly, that has nonetheless succeeded

in creating a host of new telco enterprises. Even Ukraine, that trails far behind other countries in macroeconomic and structural reforms, witnesses a fast turnaround of its telco industry. In the outlook, we insist on the divergence of modes of telecommunication development between post-socialist CEE-countries and Western European countries.

## **1. Recent developments in the sector worldwide: the disappearance of the telecommunication industry**

When asked to characterize telecommunication about 15 years ago, the average answer would have included the notions of “natural monopoly“, “public owned companies“, “provider of a universal service to society“ as well as “essential infrastructure“. Also, there would have been no doubt that telecommunication was an industrial sector in its own, with well defined borders.<sup>2</sup> Today, none of these notions are appropriate for what has become a generic business activity: the selling of standardized products and services in highly segmented markets. In this section, we show how the telco industry has disappeared in the West over the last years; we then consider the consequences on future industry structures.

### ***1.1 The banalization of technology: from single-use telco networks to multi-use information transmission***

At the very basis of the telco revolution is nothing else but technical progress, that has changed both the societal conception and the practical use of telecommunication worldwide. The significant characteristic of the “old“, or classical telco industry was its separation from other information networks. Thus, the telco network was used for, and only for, the transmission of analogously coded information (telephone, telex). Parallely existed a variety of other information systems, such as video, newspapers, libraries, etc. These markets were segmented, leading to segmented industries, with specialized enterprises and core-businesses.

Today, all services linked to data transmission can be provided through the same medium: a set of generic strings of digital codes (0/1). At the basis of this development was the move from analog to digital information processing. The emergence of fiber-optic cables (“broadband-pipe“) has opened up almost unlimited transmission capacities. The broadband pipe integrates services that were formerly separated, such as voice communication, video, TV, tele-conferences, etc. Not only that, the integrated services digital network (ISDN) can be provided by any network company, be it a cable-TV company, an electricity utility, a railway, a water distributor, and ... a former telecommunication company.

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<sup>2</sup> The most classical definition of telecommunication would be “the transmission of information through cable or wave“ (Klodt, et al., 1995, p.4).

The diffusion of ISDN-technology and use is accelerating in the mid-1990s and will lead to the banalization of telco technology by the end of the century. The borders between classical telecommunication and new forms of information exchange are already blurred by the unexpected growth of the Internet, that has caught telco companies by surprise. Once the step to private mass-use of Internet-networks and ISDN-technology is made, there will be literally no more segmentation between the telco-business and the multi-user information business.

## **1.2 Deregulation: from “natural monopolies“ to competitive markets**

Technical progress has also inverted the appreciation of telco in terms of competition policy (DG IV newsletter, 1995, Klodt, 1996). Until the mid-1980s, state monopolies were justified on technical grounds: economies of scale and scope were considered so important as to prevent sane competition. Consequently, local and interregional networks and value added network services (VANS) were highly regulated. Telco was not a business obeying capitalistic budget constraints; instead, it was an administration following a “cost +“ pricing strategy.

None of the technical justifications for natural monopolies in the telco sector exists any longer. Today, any company that has access to a network itself can become a supplier of interregional telco services. Even local network grids, for which the natural monopoly hypothesis held the longest, can be installed and operated by different companies without high additional costs, and thus be operated under competition (e.g. mobile vs. land-based, several network companies providing different services; utilization of a railway’s telco network). The necessity to regulate VANS was mainly for compatibility purposes anyway, and its liberalization quickly generated a high level of service differentiation. Finally, coding/decoding devices should be considered as ordinary commercial goods right from the beginning; they are not very technically sophisticated. Even assuming economies of scope between grid management and devices could not justify any monopoly in that segment any longer. Today, all segments of the traditional telco sectors can be regarded as competitive or - at least - contestable markets.

Two different models of deregulating the sector have appeared in the West in the second half of the 1980s: the big bang and the conservative approach. The big bang approach consists in a complete breaking-up of the old integrated structure, and the setting-up of new, disintegrated enterprises. The deregulation of US-telecom can be regarded as a big-bang approach, characterized by the AT&T bust in 1984<sup>3</sup>. On the other hand, the conservative approach consisted of maintaining the structure of the old monopolist company, while gradually accepting new entries into the market. The conservative

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<sup>3</sup> The latest scoop of the U.S. big bang approach was the bill deregulating telecommunications totally, voted by Congress on February 1st 1996: from then on, any industrial enterprise may provide any set of services in telecommunications. Thus, AT&T and MCI will not only be in competition with the seven regional „Baby Bells“, but also with IBM, Microsoft, electricity utilities, Disney, News Corporation, and the like.



approach leads to a gradual modification of markets structures only: from monopoly towards du- or triopolies. The first example for the conservative approach was the liberalization in Great Britain following 1983; Germany in the mid-1990s is another example.

### **1.3 A standardized business: from a public infrastructure to a generic service**

The last myth of telecommunication that vanished in the early 1990s is its character as an infrastructure providing significant positive external effects, and having the obligation of providing „universal service“ to society. The breakdown of socialist infrastructures in Central and Eastern Europe, and the disappearance of classical infrastructures in Western Europe have shown that the notion of infrastructure can only be analyzed in a specific context, at a specific point in time and in a specific place. The very notion of “infrastructure“ is challenged: history shows that infrastructure does not exist per se, but it is the result of a societal decisionmaking process<sup>4</sup>.

Telecommunication is a fine example for the change in conception that an economic activity can undergo. 15 years ago, there would have been no doubt that telecommunication was a physical infrastructure. However, today telephone density is very high in the Western hemisphere. Little supplementary investment is needed to continue to provide “basic services“ (telephone, fax, access to Internet); these will be continually provided to each citizen at fairly equal prices. Yet, a series of recent development implies that telco can not be considered as an infrastructure any longer:

- easy access even for remote regions becoming relatively easy,
- wide diversification of services,
- diminishing prices and increased competition, and
- a diminished role of state agencies.

New modes of regulation will have to be developed to cope with this change. Universal services can be provided by privates, through a process of repeated bidding for the lowest state subsidies (Fritsch, et al., 1993). Satellite systems and modems may lead to cheaper solutions for remote areas, that can then even be covered several enterprises, thus automatically creating more competitive conditions.

The vanishing role of telco as an infrastructure is also evidenced by the retreat of politics and administrations in the sector. “Telecommunication and the data-highway“, “trans-european networks“, and the “information society“ have certainly become buzzwords for every modern politician. Yet

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<sup>4</sup> The debate on “what is infrastructure“ is picked up by Commissariat Général du Plan (1995a,b), first research orientations are provided by Hirschhausen and Bitzer (1996). Our thesis is that infrastructure is nothing else but what society thinks is infrastructure.

besides much rhetoric, politics have only played a minor part in the development of the sector, and will continue to do so. When compared to business enterprises, states have only very little financial means to invest. By the very way the public administrations actually apply telco services, they can certainly not be regarded as a driving force in the field. Over the last decade, politics is more and more lagging behind the technical and commercial developments in the business, and this gap is likely to increase. Last not least, with the charge of the regulator becoming evermore complex, few capacity should be left to intervene as an active industrial player in the field (EC-Commission, DG IV competition newsletter, 1995a, OECD, 1995).

#### **1.4 Impact on industry structures**

Today, everything is open in telco industrial structures. Recent deregulation in Western Europe, Japan and the US indicates that scope economies are no longer a justification for large, integrated firms. Innovation has to be financed other than out of monopolistic or oligopolistic rents. According to our analysis, the very category of a telco enterprise is a notion of the past. New enterprises are created both from unbundling of former large ones, from moving from other core businesses, or on the greenfield; soon we may also see enterprise creations ... from bundling formerly unbundled parts (such as the assembly of former Baby Bells and AT&T in the US in 1996).

While scope has lost its determination on industry structures, skills have certainly not. Instead, the banalization of traditional telco technology has lead to a diversification of skills in the business, that challenge the old, integrated „dinosaurs“. Basically, four core business can be distinguished in what used to be called the “telecommunication sector“:

- information production,
- hardware; coding/decoding devices,
- information transport, and
- services.

Network providers certainly remain big, for the time being; but niche players have already captured the easy part of the lost monopolist rents in the early years of deregulation. This has created a self-entertaining dynamic in the big bang countries, whereas the conservative approaches mainly ended up with duopolistic structures (e.g. Britain, German mobile). As concerns technical progress, it is too early to determine which institutional forms favour innovation and diffusion more.

The divergence of industry structures on the national level can also be traced on the international level. Two tendencies exist:

- one is the efforts of former monopolists, to emulate integrated structures through horizontal conglomerates. According to this strategy, “big is beautiful“ not only on the national, but also on the international level. The most striking examples come from U.S.-European partnerships<sup>5</sup> These conglomerates count on scale and scope economies and ... on oligopolistic rents;

-on the other hand, niche players are quickly developing in all four core business, thus challenging the traditional suppliers<sup>6</sup>. For the time being, these niche players can not rely on an institutional framework, favouring cooperation or “clustering“, in order to overcome their strategic disadvantages. EU-industrial polices try to establish conditions conducive to such agglomeration, but results - in particular of the EU telco policy - remain to be seen. Once small and specialized enterprises can reduce their start-up and financing problems, they will present a serious challenge to the integrated “dinosaurs“, albeit international dinosaurs.

## **2. Development of telecommunication in Central and Eastern Europe: the sector that never existed, and won't?**

### **2.1 Point of departure: socialist telco structures**

Under socialism, the notion of a “telecommunication sector“ was inexistent. Instead, the right to transmit information was exercised solely by the State and Party authorities. The state “monopoly“ on information was a basic condition to keep the socialist system alive. Continued modernization and mass consumption of telecommunication was not a goal of public policy at all. Economic incentives to produce consumer-oriented products or infrastructures could no exist in the non-Monetary, socialist system. The Communist Party only decided upon what was to be produced, and for whom, and telecommunication certainly was not on the priority list.

Some indicators highlight the peculiar and quasi-inexistent role of the telco in the socialist system:

- The complete negligence of private needs, as compared to public needs. The average telephone density of the countries of Central and Eastern Europe was way below 10 in 1989.<sup>7</sup> Yet most of the industrial factories and certainly all regional and local Party chapters did obtain a connection, as they were “authorized“ to receive and transmit information. On the contrary, waiting periods of 15-20 years for private households were considered normal;

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<sup>5</sup> Three horizontal agreements have been struck recently: AT&T and Unisource (telcos from Sweden, the Netherlands, Switzerland, Spain); MCI and British Telecom; and the Phoenix consortium of Sprint, German Telekom and France Telecom.

<sup>6</sup> Examples for successful niche providers in different segments are Canal+ (France) in information production and coding/decoding, DB Telekom in information transport, or Netscape as a service provider.

<sup>7</sup> It is impossible to obtain a precise figure, because the socialist concept of telephone density integrated not only mainlines but all ordinary lines, too. Thus, the official statistics overestimated the telephone density as defined in Western Europe. For comparison purposes: in 1991, the telephone density in OECD-countries was about 45% (Berlage and Schnöring, p.3).

- the production of telco equipment was considered a relatively unimportant means of industrial development, and hence received only little attention. Priority sectors were those directly related to developing the industrial-military complex: heavy industry (mining, metallurgy, machine construction) and microelectronics. Hence telco equipment did not benefit from any planned innovation, nor overcame the status of a generic good with little “social value“. The underdevelopment of telco equipment and infrastructure in all socialist countries is a logical result. In 1990, none of the CEEs had switched to the digitalization of the network, optic fibers were practically unheard of;

- telecommunication was not a “universal service“, respected as such by society. Infrastructural development for private use was inexistent. The state did not consider the telco development as one of its tasks. The very notion of telecommunication as a basic infrastructure did not exist. Countries benefiting from a solid pre-war equipment (e.g. Czechoslovakia, East Germany) were lucky, as this assured them a minimum of services, even through the 1970s and 80s (!) (Berlage and Schnöring, 1992).

When socialism ended in Central and Eastern Europe, the CEE countries found themselves strangely different from their Western neighbors (in which telco was considered a universal service, offered even to the last citizen between 1950 and the 70s): not only was telecommunication technically underdeveloped and inaccessible to most, but also the very notion of a telecommunication sector, or a telecommunication policy, did not exist<sup>8</sup>.

## ***2.2 Recent developments: institutional reform, rapid market segmentation, and heavy foreign investment***

The introduction of principles of a capitalist market economy threw the old socialist industrial structures apart (Bomsel, 1995, v. Hirschhausen, 1996). While this was the case for all industrial sectors, the break-up of the former telco system is particularly striking. Five years have sufficed to wipe out the socialist system of information handling, to create new institutional structures, to introduce some state-of-the-art technology, and to create a class of demanding telco consumers. This is the first big difference to Western European telco development, which underwent only slow, gradual changes between the 1950s and the mid-80s. Yet, no sign whatsoever of convergence towards one “model“ of creating a post-socialist telco sector is emerging. Instead, the situation in Central and Eastern Europe is characterized by a growing variety of approaches, a far reaching market

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<sup>8</sup> Note that our interpretation of the role of telecommunication in socialism differs from the conventional interpretation of the planned economy; the latter insists on the vertical hierarchies, state monopolies and inefficiencies to explain the inferiority of Eastern European telecommunication (cf. Welfens, 1995).

segmentation, much technical progress and quick profits, but also an absence of coherent medium term telecommunication policies.

The first and easiest step was the dismantling of the old, integrated industrial structures and the separation between governmental administration and business enterprises. In 1992 already, the first reforming countries (Poland, Czechoslovakia, Hungary, Romania, Bulgaria) had “commercialized“ their former telco combines, i.e. created commercial enterprises, and separated them from state structures, i.e. Ministries in most cases. This is what we call the process of enterprization. Almost all other CEE and CIS-countries followed soon after. Though privatization did not become a relevant issue until 2-3 years later, enterprization made telecommunication a business activity for the first time. It also introduced the notion of prices, costs, profits, etc.; in other words: telecommunication became an economic activity, just like many others.

The second step then was the liberalization of the sector. Within two years from commercialization, a large part of the sector was liberalized and opened to foreign participation. Governmental determination to reform this - suddenly “important“ - sector met with advice from international donor institutions, to “outdo the West“ in the speed of liberalization. Indeed, whereas Western Europe started from a seemingly better position to reform telco regulation, it was some Eastern countries that emerged as the most reform-oriented in the early 1990s. Reform was facilitated by the absence of incumbent industrial structures lobbying against reform, and the general institutional void created after the collapse of socialism. The result was a “Wild West frontier“ situation, with much reform and loose regulation. While this may not always favor stability, efficient pricing and social justice, it certainly makes the activities in telecommunication the most dynamic in Central and Eastern European countries.

Mobile communication is the most striking example for the reform progress. Unknown in socialist countries in the 1980s, the mobile sector has been created, liberalized, and developed within few years only, often much quicker than in many Western countries. Today, competition between mobile carriers exists already in Hungary, Lithuania, Bulgaria, and Estonia; Poland, the Czech Republic, Slovakia and Romania are supposed to introduce competition in mobile by 1997. But, also, mobile is even becoming a serious alternative to fixed network development. Indeed, with decreasing prices and much technical progress yet to come, Eastern countries start to look seriously into the generalization of GSM systems for universal service. Operators of mobile communication were created outside the national monopolists, which was also an institutional revolution (CSFR, Romania).<sup>9</sup> The disadvantage

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<sup>9</sup> Today, OECD-countries start to accept that “it is in the interests of both incumbant operators, new market entrants, regulators and users, to have a clear separation between the operation of fixed and mobile network services.“ OECD (1996, p. 10).

of an underdeveloped fixed network could thus turn out to be an advantage for the development of mobile<sup>10</sup>.

Steps one and two resulted in a third step, i.e. technical modernization and innovation. As the old, socialist technology became immediately obsolete, there was no choice other than to start with foreign, up-to-date technology. This has created some market segments that are better equipped than in any Western country (e.g. mobile infrastructure, systematic ISDN-networks for business); but it has also created a gap between the high-tech sector and the rest of the system, still depending on analog equipment of the 1960s. Yet the technical gap between foreign and domestic technology is narrowing down in some countries. Foreign direct investment, technology transfers, technology emulation and increased domestic R&D have established high skills in many a Eastern European telco supplier, be it equipment, switches, infrastructure or software. High skills and low labour costs have even made some CEE countries forerunners of investment for Western companies.<sup>11</sup>

Table 1 provides information on technical developments and the institutional structure of telecommunication in Central and Eastern Europe. While telephone density is way below EU or OECD averages, its growth over the last five years foreshadows a dynamic catching-up process.

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<sup>10</sup> The most radical example is former Yugoslavia, where fixed network infrastructure was almost completely destroyed by war; this led to a wide-spread use of analog and digital mobile as the main source of communication, and may lead to a further marginalization of fixed networks (cf. Business Central Europe, 1996, p. 55).

<sup>11</sup> The most recent sign of this trend was the move of DEC's European headquarter from Frankfurt (Germany) to Warsaw (Poland).

Country	Telephone density (%)		Dominant operator	Dominant operator strength (0-10) *	1994 revenues (USD mn.)	Mobile market status	Cellular users (end 1996)
	1983	1995					
Albania	1.1	3.3	Albanian Telecom (state owned)	3	25	1 GSM joint-venture	-
Bulgaria	15	28	BTC (Bulgarian Telecommunication Company, state owned)	3	180	Analog monopoly; 1 GSM operator	30,000
Croatia	11	26	HPT-Croatian Post&Telecommunication (state owned)	3	450	Analog monopoly; 1 GSM license awarded	55,000
Czech Republic	12	23	SPT Telecom (51% state, 27% TelSource NV = PTT Telco Netherlands + Swiss PTT); 19% private investors	4	780	Analog monopoly; GSM duopoly	56,000
Estonia	17	24	Estonia Telephone Co. (51% state, 49% Baltic Tele = Telecom Finland + Telia Sweden)	4	54	Analog monopoly; GSM duopoly	40,000
Hungary	6.3	18	Matáv (70% state, 30% Magyarcom = Deutsche Telekom + Ameritech)	4	709	Analog monopoly; GSM duopoly	356,000
Latvia	19	25	Lattelekom (51% state, 49% TILTS = Cable&Wireless + Telecom Finland)	3	63	Analog monopoly; GSM monopoly	20,000
Lithuania	14	22	Lietuvos Telekomas (state owned)	3	33	Analog monopoly; GSM duopoly	13,000
Macedonia	10	17	PTT Macedonia (state owned)	3	46	-	-
Poland	6.1	13	TPSA (Telekomunikacja Polska SA, state owned)	4	1.58	Analog monopoly; 2 GSM licences	95,000
Romania	8.0	11	RomTelecom (state owned)	3	315	Analog monopoly; 2 GSM operators	14,000
Slovakia	9.6	17	Slovenské telekomunácie (state owned)	4	280	Analog monopoly; 2 GSM licences	17,000
Slovenia	12	29	Telekom Slovenije (74% state owned, 26% employees and pension funds)	4	14	Analog monopoly; 1 GSM license)	33,000
Yugoslavia (ex-)	12	14	PTT Enterprise of Serbia (state owned)	2	740	Analog monopoly, 1 GSM license issued	40000
<b>CEE-countries</b>	<b>9.6</b>	<b>16.3</b>			<b>ca. 4,000</b>		<b>769,000</b>
<b>Belarus</b>	9.5	20	Ministry of Post, Telecommunication and Informatics (state owned)	2	N/A	Analog joint-venture monopoly	4,000
<b>Kazakhstan</b>	6.8	15	Kazakhtelecom (state owned)	3	N/A	Analog monopoly	2,000
<b>Moldova</b>	6.6	12	Moldtelecom (state owned)	2	7.5	-	-
<b>Russia</b>	9	16	Rostelecom (51% state owned=Sviazi- Invest, 35% foreign shareholders, 9% Russian shareholders, 6% employees)	3	550	Multiple regional licenses (no global GSM)	40,000
<b>Ukraine</b>	9	17	Utel (51% state, 19.5% AT&T, 19.5% Deutsche Telekom, 10% PTT Telecom Netherlands)	3	120	Analog monopoly; 1 GSM licence (not yet operational)	3,000
<b>CIS (Europe)</b>	<b>8.8</b>	<b>16.3</b>			<b>ca. 1,000</b>		<b>49,000</b>
<b>for comparison: Germany</b>	38	46	Deutsche Telekom AG (state owned, partial sale of shares (20%) in Nov. 96)	7	40000	Analog monopoly; GSM duopoly; 1 PCN operator	2.9 mn.
<b>EU</b>	36	46					15.5 mn.

\*: Dominant operator strength is an index based on the position in its domestic market of the incumbent fixed or fixed/mobile former monopoly operator in terms of market dominance, pricing, range of services, and customer contracts (cf. PNE, 1996, p.4).

Sources: PNE (1995), ITU Telecommunication Yearbook, OECD, Business Central Europe (1996)

**Table 1: Technical and institutional indicators of telecommunication in CEE- and CIS-countries**

Foreign direct investment did certainly play a major role in the modification of the telco sector, but its particular impact is yet to be understood. While FDI certainly did not intervene in step 1, i.e. the dismantling and enterprization of socialist industrial structures, its participation in steps 2 (liberalization) and 3 (modernization) was essential. Without foreign incentives, the need to commercialize the former Ministries and to create market segments would not have been felt as strongly. While technical development would have been possible without FDI (i.e. through joint ventures or purchases), the know-how transfer linked to FDI can be considered an essential ingredient for the high speed restructuring. They also established the basic funding for domestic telco development in some countries<sup>12</sup>.

Two strategies of foreign participation can be observed:

- one is the strategy of big Western telco companies, all former monopolists on their own ground, to participate in another large former monopolist in a CEE-country. This oligopolistic approach, that we had already observed in US-European co-operations, gave rise to the most spectacular deals, such as the Hungarian, the Czech or the Ukrainian co-operations. Interestingly enough, the “small“ Western European operators, such as PTT Telcom Netherlands, PTT of Switzerland, or the Scandinavians, were more successful in Eastern Europe than the big ones (France Telecom, BT, Deutsche Telecom) (cf. Berlage and Schnörig, 1992, Public Network Europe, 1996); indeed, size played a minor role only in the choice of foreign partners. Also, never has a single Western operator be chosen for participation;

- the second strategy consisted of entering into niche segments of the newly emerging markets, such as mobile communication, network and switching equipment, or value-added network services. These smaller investments got off the ground much easier, as they benefited from the loosening of regulation, and were not as sensitive politically. The second strategy was mainly applied by the emergent players in the West, that had themselves benefited from deregulation, and had a certain knowledge to export in that matter, too (e.g. Cable and Wireless).

Table 2 provides an overview of liberalization progress, investments disbursed and planned, and an evaluation of investment opportunities in telecommunication in Eastern Europe. While some countries clearly represent “big chunks“ (Czech Republic, Hungary, Russia, eventually Poland, too), the entire region features a high development potential, with an estimated investment volume of 25 bn. USD.

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<sup>12</sup> The 30% sale of Matav (Hungary) in December 1993 was worth 875 mn USD alone, the 27% of the Czech SPT Telecom (June 1995) even 1.45 bn USD. Russia and Ukraine have also raised substantial FDI already, whereas Slovakia and Romania may have waited too long, and are now lagging behind in foreign investors' attention.



Country	Liberalization index * (0-10)	Direct Investment (USD mn.)						Investment opportunities index ** (0-10)
		cumulated until end 1995			slated for 1996-2000			
		total	of which: domestic	FDI	total	of which: domestic	FDI	
Albania	3	50	20	30	160			5
Bulgaria	2	170	150	20	150			5
Croatia	3	N/A			N/A			4
Czech Republic	5	2,000	600	1,400	4,000			5
Estonia	3	130	40	90	300	100	200	4
Hungary (1994)	6	730	500	230	3,000	1,000	2,000	5
Latvia	4	110	50	60	400	200	200	3
Lithuania	3	60	25	35	N/A			3
Macedonia	3	20			216	166	50	4
Poland	4	N/A			N/A			5
Romania	2	100	50	50	600	350	250	4
Slovakia	3	400	200	200	1,000	600	400	4
Slovenia	4	N/A			N/A			6
Yugoslavia (ex-)	3	N/A			N/A			3
<b>CEE-countries</b>		<b>ca. 4,000</b>			<b>ca. 15,000</b>			
Belarus	2	N/A			N/A			4
Kazakhstan	3	N/A			800			4
Moldova	2	N/A			N/A			3
Russia	4	1,500	480	1,120	3,000			4
Ukraine	3	ca. 50			1,000			3
<b>CIS (Europe)</b>		<b>ca. 2,000</b>			<b>ca. 8,000</b>			

Sources: PNE (1996), OECD, author's estimations

\*: The liberalization index reflects the range of new business opportunities; it is derived from evaluating: basic deregulation measures, procurement policies, opening of new services, and adherence to EU market norms (cf. PNE, p.4).

\*\*: The investment opportunity index takes into account specific forthcoming opportunities for domestic and foreign investors, including new licensing, the creation of strategic ventures, and privatization (cf. PNE, p.4).

**Table 2: Direct Foreign Investment and Investment Opportunities in Eastern European Telecommunication**

### **2.3 Perspectives: towards an inexistant sector ?**

The development of telecommunication activities in CEE countries was so rapid that the major event one would have expected at the outset did not materialize: the emergence of a coherent telecommunication sector. Instead, one witnesses today a diversification of actors, products, and business strategies. Between the 100 TV-channels offered in the nations capitals through broadband-pipe VANS on one side, and the analog multiple telephone line still dominant in most rural areas on the other, there is no unity in strategies of either businesses or public policymakers. In other words: CEE-countries are coming from a system without a coherent telecommunication sector, and most of them seem to be headed in a future where telecom does not exist as a sector neither.

Three reasons may explain this puzzle:

- the absence of a coherent telco policy,
- the absence of the notion of universal service, and
- the absence of classical infrastructural development.

Most post-socialist countries did not develop nor carry out a coherent telecommunication policy, that would have been characterized by long-term goals, the definition of policies, and the application of instruments to achieve these goals. While amazing progress was made to commercialize and liberalize the sector, these did not obey an underlying rationale, governed by a certain idea of the role of telecommunication in a modern industrial society. Decisions on liberalization followed advice by Western experts and domestic enterprises trying to get rid of state governance. Creation of new market segments, through highly regulated, were mainly up to the initiative and the imagination of individuals. Central decisions on network development were rejected on the local level, and vice versa. Decisions on foreign investment were adopted, postponed, rejected, readopted, etc. In short: technical developments and the largely unregulated new enterprises created their own dynamic, running ahead of government policies rather than following them.

Telecommunication has not become a “universal service“, to which all citizens are entitled, relatively independently of their purchasing power and economic situation. The notion of “universal service“ did not exist for telco under socialism, and nothing seems to lead to such in (most of) the CEE countries. Instead, product differentiation and technical progress created a situation where noone really knows what “the“ telco sector should be, let alone may define what a “universal telco service“ would look like. Let’s consider three possibilities:

- Access to the state-of-the-art telecommunication system for all citizens? This is impossible, given the state-of-the-art (ISDN, broadband, network-access) available in the cities but impossible to install in rural areas;
- access to reasonably priced individual telephone lines? This seems difficult, given the absence of infrastructure and the (short-term) cost of a mobile network;
- the only universal service one could identify as such is the mailbox and the local post-office, and again, capitalist criteria may force these to disappear even from the smaller townships.

Finally, and largely resulting from the two former points, infrastructure development was largely neglected in CEE-countries. A lack of funding was one reason, but, much more important, a lack of a global concept of “infrastructure“ was the other. Thus, telco activities remained “islands“, dynamic islands indeed, but with a lack of interconnection that might have justified the term “telco infrastructure“<sup>13</sup>. Today, people can use telco services in particular, highly specialized market segments, but there is no global telco infrastructure.

The three case studies in the next section may clarify the peculiar development of telecommunication in post-socialist countries; they also show what the absence of a telco sector means for the respective enterprises and policymakers.

### **3. Identical point of departure, different industry dynamics: the cases of the Czech Republic, Latvia, and Ukraine**

Each CEE and CIS country choose a different strategy to develop telco structures. Divergence can be observed in the sequencing of reform, the more or less active role of the state and of new actors, the role of foreign direct investment (FDI), and the diffusion of technology and technical progress. By analyzing three very different cases (Czech Republic, Latvia, Ukraine), we try to identify some representative stylized facts. The criteria of analysis are:

- the importance of deregulation,

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<sup>13</sup> This is particularly striking in the case of small software firms situated in remote areas: they oftentimes lack the most basic physical infrastructure to communicate with the city next to them, but are able to sell their products world-wide via the Internet (Heuser, 1996).

- the interaction between state agencies, and state and private enterprises, including foreign investors,
- the emerging market structures, and
- the role of science&technology policies in the modernization process.

### **3.1 Czech Republic: the “success” story for the West to follow?**

The Czech Republic is often considered as a “success story“ of CEE telco reforms, both in technical and commercial terms. Within five years, the pre-war installations and the 1964 Telecommunication Act were replaced by first elements of a new long-distance overlay network and a complete regulatory framework. Thus, the speed of reform in the Czech Republic outperformed all Western European countries. Foreign investments of about 2 bn. USD in telecommunication and equipment producers, and contracted investments of about 4 bn USD to the year 2000 were a logical result, as was the induced modernization of upstream industries in the country. The Czech case may therefore be considered as “model“ restructuring, that both Eastern and Western European countries will have difficulties to emulate.

Contrary to most other CEEs, the Czech Republic set out a coherent telecommunication policy in first moments of post-socialism (1991). Government Resolution No. 428 (4) defined telco modernization as a national priority, calling for the doubling of line penetration and allowing the 27% equity purchase by a strategic (foreign) investor (PNE, 1996, p. 33; Czech Institute of Economic Studies, 1994). The sequencing of reform was inspired by the British model, but carried out at much higher speed. Commercialization occurred in 1992 already, when operation was separated from administration, equipment enterprises unbundled, and the first license for private networks established. Resolution 428 then defined the third step of reform, i.e. the introduction of local competition, a price-cap on the long-distance monopolist STP, and a complex regulatory framework for interconnection pricing. Though independent on paper, the newly created “Telecommunication Authority“ still largely depends on the reform-oriented Economics Ministry.

The deregulated environment attracted a host of new enterprises, public, semi-public, and private, that quickly occupied the newly created market segments. The largest chunk, 27% of SPT, was given to TelSource NV, the consortium of Europe’s two smallest telco operators (PTT Telcom Netherlands and the Swiss PTT); the Czechs thus deliberately chose to stay away from the large ex-monopolistic West European operators. This strategy was continued when 49% of Eurotel, the first mobile operator in the country, were given to a consortium of two North American “Baby Bells“ (Bell Atlantic and US West), rather than to AT&T or DeTeMobil, the direct competitors. A cable TV station, called Kabel Plus, started from scratch to reach as much as 500,000 cable TV subscribers by late-1996 (i.e. 5% of the total population). Finally, about 30 local subscriber telco networks were established as

commercial companies, though their technical equipment still hampers the development of services to individual subscribers (in terms of quantity and quality). On the equipment side, the traditionally strong Czech electronics industry benefited from the new demand: joined with Western companies (e.g. Digital, ABB, Siemens) or on an independent basis, the sector was able to overcome the disruption of socialist networks and establish firm supplier relationships to the growing telco industry.

The role of foreign investment as a catalyst of telco development was significant: the 1.45 bn. USD sale of 27% of SPT's shares represents the largest individual foreign direct investment (FDI) to date in any CEE-country. Direct cash and technology transfers were also elementary in the setting-up of the first GSM operator (Eurotel) and the cable-TV. But it is important to understand the logic of sequencing: it was only after a coherent regulatory framework was established and after the condition for deregulation were fixed, that enterprization and investment could take place, and did take place. The Czech case also challenges the wisdom that only protectionist policies for the dominant operator can attract foreign investment: the long-distance monopoly for SPT was intentionally limited to five years, i.e. it will end in 1999 already; yet competition for this (small) market was fierce.

Except for long-distance, market structures in Czech telco have become competitive. One already witnesses the links that are established between traditional telco activities and other information-related businesses. For example, Kabel Plus, equipped with US-West technology, is expanding from cable TV into the telephony market. The GSM-operators chunk into the traditional market of the fixed stationary network. Foreign companies, mainly German, but also Austrian and Polish, also try to enter the Czech market, with a view to European telco liberalization of 1998 and beyond. As a future member of the European Union, and given its central European location, the Czech Republic is indeed well positioned to benefit from the opening of the European telco markets.

The S&T capabilities of Czech companies benefited both directly (FDI, technology transfer) and indirectly (increased purchasing power and R&D funding) from the telco boom. Czech companies have in general pursued a "follower-strategy", trying to emulate foreign technology to local standards and capabilities. The Czech electronics and telco equipment industry has not only become a serious competitor to Western suppliers; also, it has established itself as a high-quality, low-cost producer for other CEE- and CIS-countries<sup>14</sup>. Thus, in terms of S&T capacities, too, the Czech Republic has become a success story that might serve as an example of deregulation driven technical competition.

### **3.2 *Latvia: how can the FDI-shrew be tamed?***

The development of Latvian telecommunication is a case of an insufficiently regulated monopoly and political hostility to capitalist foreign investors; the modernization was hampered by continued

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<sup>14</sup> In the next stage of this project, this will be the main issue of the case studies.

quarrels between politicians, business, and the public on the role and regulation of telecommunication. But the Latvian case also shows the virtues of an explicit strategy to integrate a large number of domestic companies in the restructuring process, thus providing Latvia's harassed electronics industry with at least some perspectives.

From the beginning of telco reform in 1992, Latvia chose a rather conservative policy of establishing state-owned monopolists, both in the fixed subscriber network and in the mobile market. Initially, it was thought that the highly developed electronics and equipment industry, formerly supplying half of the Soviet Union, would benefit from the maintained integration. Also, the Latvian government considered a long period of grace (i.e. monopoly) to be attractive for foreign investors. After fierce competition between the Tilts-consortium (Cable&Wireless and Telekom Finland) and the Hanzatel-consortium (Telia International of Sweden and Deutsche Telekom), the former won the tender for a 49%-stake in Lattelekom. In return, Tilts promised investments worth 160.3 mn. USD, by far the largest investment to date in all Baltic countries (Karnite, 1995).

The hassle began when Lattelekom, pushed by Tilts that sought a reasonable return on its investment, started to behave like a capitalist enterprise:

- it introduced fees for local calls, something unheard of at Soviet times;
- it demanded that each subscriber apply for a new line, even though they were already connected to the old grid;
- finally, it pushed up long-distance prices, that were negligible in Soviet times.

All these actions were in accordance with the text of the agreement, but in evident discordance with the spirit that Latvian politicians and the public had had in mind. Whereas Lattelekom argued as any "normal" capitalist enterprise would, the government insisted on the "universal service" obligation of telecommunication, denying its commercial character.

The following three years (1994-96) were filled with attempts from both sides to push through its vision of the role of telecommunication in a post-socialist society. Tilts threatened to withdraw from the investment if the management agreement with Lattelekom was not extended from 10 to 20 years, the period required to break even. In the meantime, Tilts delayed massive investments in a second international exchange. Instead, it concentrated its activities on those operations that would be immediately lucrative: the development of local exchanges and the installation of payphones all over Latvia (2,000 by 1996 already). The Latvian Ministry for Telecommunication, the regulatory authority, reacted rapidly to what it considered a contract violation: it revised the tariffs for long-distance calls downwards. The Ministry also refused Tilts to depreciate the so-called "good-will"-

investment of 90 mn. USD<sup>15</sup>. In 1995, the Latvians also made use of a secret clause in the treaty, obliging the Tilts consortium to cede 10% of Lattelekom's shares to an international lender (IFC). Thus, the foreign investors role was further weakened and the decision making process further complexified. In the public policy debate, Tilts was considered as a FDI-shrew that could only be tamed by putting more control and regulation upon.

The most recent attempt to "tame" Tilt's role in the Latvian telco sector was the threat of the Latvian Ministry for Telecommunication to revoke the initial contract, and associate yet other foreign investors to the consortium. Already, Telia International and Telecom Finland were given a 49%-stake in "Latvian Mobile Telephones" (LMT), so far the monopolist in mobile. For reasons of diffusing Lattelekom's capital further, one or even two of the Scandinavian operators might be invited to participate in the capital of the fixed subscriber network, too. For the time being, Latvia seems to have been fed-up with strong foreign participation, and reforms in telecommunication have halted, mainly for political reasons. The future is wide open.

The uncertainty over foreign investment and grid expansion has not hindered a certain revitalization of the domestic electronics and telco equipment industry. Both FDI-contracts included a minimum supply-level for domestic, Latvian suppliers (e.g. the construction of payphone cabins, some communication equipment, parts of the digital switches). Local construction firms were involved in the building of transmission systems and cabling (Karnite, 1995). Even the most socialist of all Soviet combines, VEF Telecommunication, starts to benefit from rising orders in equipment (telephones, switching equipment, etc.). Technology transfer of the foreign investors was one major element, another being the flexibility of adaptation in Latvian enterprises, benefiting from the dismantling of former socialist industrial structures (Radosevic, 1995).

### ***3.3 Ukraine: can the "planned" restructuring of telecommunication succeed?***

Telecommunication in Ukraine is a case dominated by post-Soviet state planning, but where substantial progress was made in the upgrading of the high value-added market segments, mainly through technology transfer and foreign direct investment. Deregulation went far on paper, though legal and institutional uncertainties still abound. The development of telecommunication will therefore be selective, increasing the gap between world-standard telco services in the nation's capital, and post-war equipment levels in remote countryside.

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<sup>15</sup> In the early stage of negotiation, Tilts had pretended an investment of about 90 mn. USD in immaterial assets, such as manpower and tacit technology transfers.

Since the moment of national independence, Ukraine considered the development of an independent telecommunication complex as a “national priority”<sup>16</sup>. In a typical post-Soviet manner, the entire sector was submitted to one- and five-year plans, developed by the Branch Ministry, and approved by the Economics Ministry (i.e. the former State Planning Agency)<sup>17</sup>. According to then-telco Minister Valerij Efremov, Ukraine had to achieve “the leap forward” and attain a teledensity of 50% by the year 2000, starting from around 10% only in 1992<sup>18</sup>. The planning activity of the state administration remained heavy: not only was production entirely planned, but also turnover and profitability of the main (state-) enterprises in the sector. Though privatization was (and still is) considered out of question in this “strategic sector”, the Ministry for Telecommunication accepted that some deregulation take place, and that direct involvement of foreign capital and technology was inevitable.

While the Ministry for Telecommunication retained the formal control of Ukrtelekom, the state holding company, a variety of new commercial enterprises developed quickly, and started to lead their own business lives. The most powerful was Utel, the national dominant operator who chose - after some furious competition - not less than three international partners (AT&T, Deutsche Telekom, PTT Telecom Netherlands) to supply technology, human capital, and investment. Utel then quickly developed the long distance service in the country, including the use of the ITUR fiber cable (that runs from Italy to Russia) and a digital link from Kiev to Odessa, a fiber cable link between Brody, Lviv and Poland<sup>19</sup>. On the contrary, Utel remained much more cautious on the local operations: the program to install digital exchanges in all 14 regions by 1996 was delayed, and the local telecommunication enterprises were left alone in the development of local loops. With that strategy of “creaming the market”, Utel, including the three Western former monopolists, made good profit in the two-digit mn. USD range (before taxes) in 1995.

In mobile, the situation was similar. Ukrainian Mobile Communication (UMC) is a joint venture between Ukrtelecom and three foreign mobile specialists (PTT Telecom Netherlands, DeTeMobil Germany, and Tele Denmark). Currently limited to an analog NMT-450 network, UMC was awarded the first GSM mobile license in 1995, which should be operational by 1998. Most recently, though, the subsequent Minister of Telecommunication decided to issue a second GSM-license, in order to step up competition, or ... to increase capital revenues. British Telecom was invited to join in a venture to create Ukraine Radio Frequency (URF). Thus, Ukraine is the only country in the world where the same national operator (Ukrtelecom) has majority stakes in three different telecommunication companies (Utel, UMC, URF), that are supposed to compete with each other.

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<sup>16</sup> This has recently been confirmed in the “State Concept for Industrial Policy in Ukraine”, cf. decree No. 272 of the Ukrainian Cabinet of Ministers, February 29, 1996.

<sup>17</sup> On the systematic changes in the Ukrainian economy see Hirschhausen (1996): Industrial Restructuring in Ukraine - From Socialism to a Planned Economy? DIW-Discussion Paper No. 144; November.

<sup>18</sup> Cf. Handelsblatt, 19 November 1996.

<sup>19</sup> Cf. PNE (1996, p. 122).



While the highly profitable niche-segments are well covered and may reach the “planned“ targets, overall the Ukrainian telco sector suffers from three problems:

- absence of a global infrastructure policy; in the first post-socialist years, the Ukrainian government lacked a vision or the understanding of the necessity of a infrastructure development policy. The “plans“, though technically correct, were way beyond technical feasibility, and also way beyond reasonable financial resources. The regional telco companies were not given sufficient independence to develop their own activities (those who managed to install equipment had to do it with clearance from the Centre). The financial equilibrium between the Centre (Ukrtelecom) and the 14 regions remains unbalanced;

- difficulty to declare telephony a “commercial good“. Under socialism, free intra-city calls from public phones were about the only telco service available to the average citizen. This has forged the myth of (local) public telephone as a “social right“, and free of charge. Introduction of charges for local calls therefore has been a cultural chock, that has been plainly rejected by society. Hence, local telephone calls are still free of charge today, depriving the regional telephone companies of an important resource. This problem has not at all appeared for long-distance services: as these were new services, unavailable in socialist times, it was easy to introduce them as a new “commercial good“, and to price them accordingly<sup>20</sup>;

- the planned integration of domestic upstream suppliers in the production plans of state telco-companies may become an obstacle to sustainable modernization of the system. In an effort to integrate the largest possible number of domestic producers, the Ministry for Telecommunication assigned specific domestic enterprises as suppliers of certain equipment. While in Ukraine this “forced co-operation“ is not at all limited to the telco sector, it may have a particularly drastic impact on the development of the industry<sup>21</sup>. Foreign advisors and equipment suppliers therefore lobby for state-of-the-art technology, which would necessarily have to be imported. A solution might be accelerated technology transfer, such as attempted by Siemens in the setting-up of the MKM-Telekom joint-venture in Vyshgorod/Kiev, where Western-type digital switches will be produced locally.

Five years after economic independence, Ukraine is facing a typical “post-Soviet“ state of telco activities. Deregulation has been quick on paper, but not always supported by administrative capabilities on the working level. Lucrative market niches were quickly occupied by state-owned companies, seeking foreign expertise and capital to strengthen their commercial position, but also

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<sup>20</sup> The case of long-distance calls is a unique case in Ukrainian infrastructure policy; in most other former “free goods“, price reforms have been politically sensitive, and are not yet fully carried out: e.g. railway transport, electricity, housing, public transport.

<sup>21</sup> A striking example is the plan to use the Dnjepropetrovsk DMZ switches (EATS ZA S-32) in the development of regional networks: these switches, limited to transporting 32 Kb/sec., are insufficient to assume ISDN-standards. Hence, the solution would be valid for few years only, and another replacement would be needed thereafter. Cf. Handelsblatt, 19 November 1996.

their position via the former Branch Ministries. Local telco development was neglected. Besides detailed development plans, the country still lacks a vision what telecommunication should be. Unless the (unlikely) event of a radical change in policy, Ukraine, just like Russia, is headed towards a segmentation of telco markets, both on the product side and geographically<sup>22</sup>.

Table 3 stylizes the three different modes of development of telecommunication that we have identified.

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<sup>22</sup> Interestingly, one common point with Western European development exists: the ambition of the national rail carrier to become a strong player in telecommunication. Ukrzaliznitsa, the state railway company, indeed, drew up an ambitious plan to modernize its telco network, including glass fibre cables (1,700 km: Kiev-Lviv and Kiev-Lugansk) and five digital switches (Kiev: 8,000 lines, Charkiv: 8,500, Donets: 2,500, Lviv and Odessa). Telecommunication does seem indeed to be a more lucrative business as railway transportation, the volume of which has dropped by 50%...

Table 3: Stylized Modes of Development of Telecommunication in Eastern Europe

Type	Country example	Dismantling of socialist industrial structures	Deregulation and market segmentation	Role of foreign direct investment (FDI)	Sources of modernization
<b>1) Deregulation driven competition and technical modernization</b>	- Czech Republic - Hungary - Estonia (- probably Poland)	- immediate	- far-going deregulation - competition in all market segments (except fixed subscriber network)	- technology transfer - introduce competition in mobile - capital inflow	- FDI-based technology transfer - benchmarking of domestic suppliers
<b>2) Tempered deregulation and marketization</b>	- Latvia	- immediate	- selective deregulation - strong role for regulatory agency - severe price regulations (based on social considerations)	- mainly capital inflow - but: public and political resistance to capitalistic enterprise behavior (price increases, etc.)	- FDI-based technology transfer - “quota“ for domestic suppliers - efforts to accelerate joint-ventures and vertical clustering
<b>3) Post-Soviet mode</b>	- Russia - Ukraine	- immediate	- relatively quick deregulation (at least formal) - extremely quick market segmentation; creation of structural and regional market segments	- human capital - technology transfer - selected modernization (mainly: long distance)	- “planned“ modernization: strong interventions by domestic Ministries - attempts to integrate domestic suppliers “by decree“ (but: may hamper sustained modernization)

#### 4. Outlook

The development of telecommunication in Eastern Europe is different from the West. We have shown this for the specific point of departure of reform, the rapid process of enterprization and deregulation, the particular role of foreign investment, and the sources of technical modernization. What has taken decades in the West has in some cases been achieved in a couple of months in CEE-countries. Where gradual reform is dominant in the West, radical reform was inevitable in the East. Where the “universal service“ character of telecommunication is still a matter of debate in the West, it has not even appeared in the public policy debate in the East.

Deregulation and enterprization in Central and Eastern European telecommunication may become a benchmark for the West, in particular for Western Europe. Rather than to look to the West for “models“, the CEE-countries are emerging as the “avantgarde“ in the move from classical telecommunication to global information activities: this hold both for technical aspects and for industry structures:

- technically, the advanced reform countries in Eastern Europe are about to succeed the leapfrogging process, i.e. the jump from post post-war socialist technologies to world-leading edge-of-technology systems. The networks under construction are of the same standards as their Western counterparts, but they grow faster, and there is no need to inter-operate with incumbent networks. Mobile telephony and cellular radio systems are partially substituted for fixed subscriber networks; where wired local networks remain, fiber optics (instead of copper) make the entire range of information services available to a large number of customers (i.e. multiple lines, VANS, Internet, Cable TV);

- as regards business and industry structures, the case of Central and Eastern Europe implies that the age of classical telecommunication activities is definitely over. Though dominant operators will remain, the mode of growth of the main enterprises in the sector, and the patterns of competition have changed. Telecommunication, formerly regarded simply as the “transmission of coded written or spoken information“, is but one a host of business activities in the emerging information sector. In Eastern Europe, the emergence of a host of small niche players is particularly striking.

In socialist countries, telecommunication did not exist as an economic activity, and in post-socialist countries, telecommunication will not exist as an independent economic sector, neither. This peculiar trajectory is the result of the radical systemic transformation in Central and Eastern Europe in the early 1990s. The dynamic restructuring process and technical leapfrogging was possible because the entire region had to start from scratch. Indeed, those countries or regions with the worse starting

conditions (e.g. former Yugoslavia) now come up with the most entrepreneurial solutions to develop the post-socialist information sector.

Central and Eastern Europe will not have a telco sector as did the West in the 1980s, and both may not have a telco sector in the traditional sense. The developments is not identical across CEE-countries, but the divergence and the lack of coherent telco policies are. In an effort to establish a “market economy“, these countries have indeed established niche markets for many a telco service, within the emerging information sector. Yet the coherent policy framework linking these pieces is missing. Whether this is a blessing - as it created a high degree of liberty to the actors - or a curse - as it hampered the development of universal telco service - is a question of taste. The fact of the matter is that the emerging industry structures and terms of competition in CEE countries are unique, and that from these dynamics we may anticipate some of the developments in the West to come.

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