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Encouraging Internet Diffusion Lessons from and for Transition Economies

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ABSTRACT

The importance of facilitating the increase of Internet diffusion has become widely recognized by the policymakers in transition and developing countries. A wider use of the Internet will foster both economic and political development. Based on the case studies of Estonia and Slovenia, this article proposes that the best way to encourage Internet diffusion in transition and developing economies is through the privatization of an incumbent telecom company and the opening of a telecom market. To secure maximum openness and fair play in the telecom sector a truly independent telecom regulatory agency has to be established. Telecom regulators need to become more similar to central banks in their regulatory independence and stay free of political interventions. In order for this to be successful, this article recommends that these policies be combined with a liberal trade and a foreign direct investment regime.

INTRODUCTION

Estonia and Slovenia stand out when compared to countries in the Central and Eastern Europe (CEE), having the highest Internet penetration¹ rates in the region. Furthermore, not only have they been able to adopt the use of Internet quicker than many other CEE countries, Estonia and Slovenia have even outperformed half of the member countries of the European Union (EU). Considering the transformation in the 1990s and 2000s from a command economy to a market economy in Estonia and Slovenia, their success in the Internet diffusion poses a challenging public policy puzzle. The relevance of the issue is not only limited to Estonia and Slovenia; putting together pieces of this puzzle can lead to fascinating lessons for other transition and developing economies by providing a better understanding of policies that facilitate the diffusion of information technology. Why have these two countries with substantially different economic policies and paths of transition achieved the same outcome in *per capita* Internet penetration rates.

Slovenia, for example, inherited the best economic starting position in Central and Eastern Europe. The Yugoslav brand of socialism was much milder than in any other part of the Eastern bloc. Slovenia, in particular, benefited from this looser economic control, gaining Western technology transfer as well as engagement in international trade. By the 1970s, it had the most advanced telecom infrastructure in Eastern Europe and a strong IT-skill base started to emerge. Currently, Slovenia's per capita Gross Domestic Product (GDP) of U.S.\$ 9,400 is significantly higher than that of any other applicant country and equals that of the EU's poorest countries. Its economic transition in the 1990s allows characterizing Slovenia as a "gradual transformer", which used incremental changes to better exploit its advantageous starting position.

Hence, Slovenia's high *per capita* Internet penetration rate is an outcome of its wealth and advanced starting position.

Whereas in the case of Estonia, prior to the collapse of the Soviet Union, the transfer of Western technologies was not possible due to the export controls of NATO members and Japan. Its rapid utilization of Western technologies and emergence of new infrastructure were outcomes of a radical economic opening and reform of its public sector. Free market reforms in the 1990s in Estonia consisted of a very liberal foreign direct investment regime, unilateral free trade, and low taxes. Most importantly, with a *per capita* GDP two and a half times lower than that of Slovenia, Estonia demonstrates that the Internet can be diffused and utilized in countries with different levels of wealth.

Interestingly, these highly different economic policies of both countries yielded the same result in *per capita* Internet penetration rates. This article aims to analyze the factors that contributed to this outcome. First an outline of the characteristics of the Internet diffusion in the CEE will be presented. Second, an assessment the characteristics of public policies of Estonia and Slovenia will be made. On the basis of these comparisons, the article will then develop policy recommendations for increasing Internet diffusion transition and developing countries.

INTERNET DIFFUSION IN THE CENTRAL AND EASTERN EUROPE

Policymakers in transition and developing countries who aim to increase the level of Internet diffusion in their respective countries are eager to draw policy lessons from Western Europe, the United States, and Japan. However, Internet diffusion in these countries is a product of broader social, political, and economic progress. Developed countries had decades to build up societies that, to a greater or lesser extent, facilitate the diffusion of new technologies. Furthermore, by looking at the EU average of Internet diffusion indicators and those of former European

Communist countries, the EU is far ahead of the CEE. But a digital divide exists within the EU and within the CEE, which complicates the issue further. In his study *The New Economy in Europe (1992-2001)*, Italian economist Francesco Daveri states that two-thirds of EU citizens live in the countries where Information and Communication Technologies (ICT) are as diffused as in the United States, but one-third live in the countries that are slow ICT adopters (Daveri 2002, 1).

In spring 2003 the European Commission acknowledged this fact by inviting three applicant countries (Estonia, Malta, and Slovenia) to move from the eEurope+ program to the eEurope program (European Union 2003). The eEurope+ program aims to develop the information society in applicant countries of the EU. The eEurope program, in contrast, is meant to encourage member states in developing an information society.² Hence, this is an official recognition that a large digital divide exists among the applicants despite their many similarities in overall development—and that some applicant countries (such as Estonia and Slovenia) are actually at the same level of Internet diffusion as EU members.

TABLE 1. NUMBER OF INTERNET USERS PER 10,000 INHABITANTS IN EU MEMBER STATES AND SELECTED COUNTRIES IN THE CEE FROM 1999 TO 2002.³

COUNTRY	2000	2001	2002
Austria	3,325	3,194	4,094
Belgium	2,923	3,104	3,286
Bulgaria	528	746	897
Croatia	669	559	1,629
Czech Republic	973	1,360	2,465
Denmark	3,921	5,403	4,652
Estonia	2,721	3,004	4,133
Finland	3,723	4,303	5,089
France	1,437	2,638	3,138
Germany	3,015	3,736	4,241
Greece	947	1,321	1,547
Hungary	715	1,484	1,576
Ireland	1,793	2,331	2,709
Italy	2,304	2,827	3,011
Latvia	619	723	1,331
Lithuania	609	679	1,445

Luxembourg	2,281	2,461	3,675
Netherlands	4,379	4,905	5,304
Poland	725	984	984
Portugal	2,494	3,494	3,556
Romania	357	447	806
Slovakia	939	1,248	1,604
Slovenia	1,508	3,008	4,008
Spain	1,367	1,827	1,931
Sweden	4,558	5,163	5,731
UK	2,644	3,995	4,062

Most importantly, the paths of Estonia and Slovenia have been radically different in their transition from the socialist model to the market economy. Therefore, the same outcome in Internet diffusion has been achieved through different means. Methodologically, these two cases are comparable given their relatively similar size, close proximity to Western Europe, and relatively high economic openness. Therefore, a comparison of these two countries offers practical insight about the public policies that facilitate Internet diffusion.

While the achievements of Estonia and Slovenia are increasingly recognized among policy circles in Europe, their examples are often dismissed as irrelevant for other countries. Their geographical proximity to Western Europe is often given as one reason why they are not relevant examples for other CEE countries. Geography matters. Estonia has benefited tremendously from its closeness to tech-savvy Nordic countries. However, Slovenia's proximity to Italy and Austria can hardly explain its success as neither is particularly known for being technology-orientated. Furthermore, most EU candidate countries are relatively close to Western Europe and some are also close to respective Nordic countries. However, Internet diffusion in other EU candidate countries is two or three times lower than that in Estonia and Slovenia.

Another counterargument to the relevance of Estonia and Slovenia is the small size of both countries.⁴ Though, policy literature on the diffusion of Internet does not address the size of economies as a key variable in determining the Internet diffusion, a recent book addresses the question indirectly. *The Size of Nations* by Alberto Alesina of Harvard University and Enrico

Spolaore of Brown University, indicates that the ten richest countries in terms of *per capita* GDP in the world are all small (or even very small) with the exception of the United States (Alesina and Spolaore 2003). Since several other policy articles conclude that wealth is a key determinant of Internet diffusion rates (see discussion in the following paragraph), a correlation between size of countries and Internet diffusion can be established.

Alesina and Spolaore (2003) argue that it may be harder in larger countries to formulate policy because preferences of the population in such states are more heterogeneous. Logically, it would follow that with populations of 1.4 million and 2 million, respectively, Estonia and Slovenia, have been able to change more quickly as a result of their small size, which facilitates easier adaptation. However, if size were truly a crucial factor in achieving positive policy outcomes, then the world would be full of wonderful small countries, indeed. Correlation, however, does not necessarily imply causation. Furthermore, there are several relatively small countries in the CEE, such as Latvia, Lithuania, and Slovakia, which differ greatly in terms of Internet diffusion rates despite their relatively close location to Western Europe. Evidently, the resources of small countries are also in proportion with the size of their population.

Wealth is another often-cited determinant of Internet diffusion. But even if per capita GDP is a good general indicator of Internet diffusion in some countries, it does not help to explain the outcomes showcased in Estonia and Slovenia. First, Estonia's *per capita* GDP is U.S.\$ 3,800 while Slovenia's is U.S.\$ 9,400 (ITU 2003). Estonia is an outlier as its Internet penetration rate is much higher than its *per capita* GDP might predict. Furthermore, there are countries such as Greece with similar *per capita* GDP level as Slovenia, yet their Internet penetration rates are two times less than that in Slovenia.

The number of main telephone lines per 100 inhabitants demonstrates the state of infrastructure development, a factor that is helpful for facilitating Internet diffusion. Several researchers have demonstrated that so-called teledensity⁵ is crucial for determining outcomes in the Internet diffusion rates (Beilock and Dimitrova 2003). However, the differences in the diffusion of main telephone lines are not great among the EU candidate countries. As the following table indicates, a higher number of main telephone lines per 100 inhabitants does not necessarily mean more Internet users per 10,000 inhabitants. Compared with other CEE countries, Estonia and Slovenia have significantly higher Internet penetration rates but similar rates of diffusion of main lines. For example, Hungary has 37 main lines per 100 inhabitants, which is more than Estonia's 35 but less than Slovenia's 40. However, the rate of Internet diffusion in Hungary is two times smaller than in Estonia and Slovenia.

TABLE 2. MAIN TELEPHONE LINES PER 100 INHABITANTS AND NUMBER OF INTERNET USERS PER 10,000 INHABITANTS IN EU MEMBER COUNTRIES AND SELECTED CEE COUNTRIES 2001.⁶

COUNTRY	INTERNETUSERS	TEL. LINES
Austria	3,194	47
Belgium	2,799	49
Bulgaria	746	36
Czech Rep	1,363	37
Denmark	4,472	72
Estonia	3,005	35
Finland	4,303	55
France	2,638	57
Germany	3,645	64
Greece	1,321	53
Hungary	1,484	37
Ireland	2,331	49
Italy	2,758	47

COUNTRY	INTERNET USERS	TEL. LINES
Latvia	723	31
Lithuania	679	31
Luxembourg	2,266	78
Netherlands	3,292	63
Poland	983	30
Portugal	3,494	43
Romania	447	18
Slovakia	1,203	29
Slovenia	3,008	40
Spain	1,827	43
Sweden	5,163	74
UK	3,995	59

Thus wealth, geography, and infrastructure are not plausible explanations of Internet diffusion rates in Estonia and Slovenia. The exceptionalism of these two cases encourages us to look at their public policies of the 1990s and investigate how these policies may have affected Internet diffusion outcomes. The support for this approach can be found in policy literature.

Dasgupta *et al* (2001) demonstrate that competition policy matters a great deal because low-income countries with high World Bank ratings for competition policy have a significantly higher number of Internet subscriptions per main telephone line. Therefore, “feasible reforms could sharply narrow the digital divide during the next decade for many countries...” (Dasgupta *et al* 2001, 15).

An essential element of effective competition policy in the telecom sector is the establishment of an independent regulatory agency. The higher the independence of regulators is from political interventions, the more effective the regulator will be in ensuring the fairness to market entrants and the more effective the competition will be (Taylor 2002). This is particularly important if the state is an owner or a sole owner of the incumbent telecom company which creates conflicts of interests and temptations for politicians to intervene in competition policy for the benefit of vested interests. As Heimler writes “by placing ‘distance’ between regulators and regulated companies, there is a gain in transparency, but also in the efficiency of the controlling function” (Heimler 2000, 189). Such an independent regulatory agency is crucial for reducing collective action costs in implementing sound competition policy.

In addition to the importance of the regulatory framework of the telecom sector, broader economic policy frameworks also impact technology diffusion. An underlying theme in trade policy literature is that trade protectionism reduces the benefits of technology transfer for small countries (Dollar 1993, 434). It also decreases adoption incentives created by network, market, and power externalities (Besley and Case 1993, 399). However, openness reduces transaction costs for facilitating the initial diffusion of the Internet and bolsters the competitive ways of using the network, which in turn, increases innovative uses and further diffuses the Internet.

Thus, an open economic environment, resulting from a liberal Foreign Direct Investment (FDI) regime and free trade, is directly linked to the open nature of the Internet.

ESTONIA: A RADICAL REFORMER

In the early 1990s, the local IT community became crucial in setting government policies in IT spending, procurement, and use. In 1993, a strategy paper was produced by government officials, IT specialists, and scientists with the sole aim of establishing the principles for the management of modern, well-functioning state information systems. A special IT department of central government was formed, and the central government budget included a single category entitled “number 37” for all IT expenditures of different government agencies. Government IT procurement was consequently unified, and new government purchases had a positive impact on the Estonian IT market. Since 1996, Internet-related issues have been a source of increasing public interest in Estonia (Ott and Siil 2003).

However, the Estonian government’s policies were not sector specific. In the 1990s, it did not engage in industrial policies that would target the ICT sector or companies directly. Government interest, procurement, and promotion of ICT certainly benefited domestic ICT companies, such as Microlink, as well as from foreign firms that had entered the Estonian market. The overall incentives for such widespread ICT adoption and use by the government should be seen in the context of radical reforms that Estonia implemented in the 1990s rather than as an outcome of special interests. ICT offered one of the means for the youthful government of free marketers, under the premiership of Mart Laar, to increase public sector effectiveness and demonstrate the government’s progressiveness in the early 1990s. It was a period of “extraordinary politics,” as former Polish finance minister and current governor of the Central

Bank of Poland, Leszek Balcerowics described the utilization of window of opportunity by radical reformers who enjoyed strong public support (Balcerowics 1995, 4, 145-165).

The collapse of the Soviet Union led to what Joseph Schumpeter called “[a] creative destruction” (Schumpeter 1975, 81-86). This allowed Estonia’s new elite to execute several radical reforms, such as flat income tax and unilateral free trade, without courting interest groups (Feldmann and Sally 2001, 13-14). Indirectly, the government’s radical privatization policy and move to unilateral free trade further facilitated the diffusion of the Internet. Most large companies were privatized by the mid-1990s (Organization for Economic Cooperation and Development 2001, 6). The role of foreign investments was crucial in this process, and were combined with the inflow of expertise and technology (Organization for Economic Cooperation and Development 2001, 1-4). The rapid path of trade liberalization in Estonia, which culminated in 1995 when a unilateral free trade regime came fully into existence, allowed technology transfer to occur.

In light of the enforcing interconnection between the open economy and open nature of Internet architecture, the privatization process of the incumbent telecom (which is more controversial) requires examination. In 1992, the Estonian government signed a concession agreement with *Telia* and *Sonera* of Sweden and Finland, respectively. A monopoly on fixed-line telephone calls was bestowed to the incumbent, *Eesti Telekom*, until the end of 2000 (World Trade Organization 1999, 11-12). While most would agree that a monopoly position does not create incentives to innovate and offer better quality telephone services to customers, a consideration of the broader context within which this monopoly carrier operated challenges such simplistic conventional wisdom. First, in 1992 Estonia was a poor ex-Soviet state and foreign investors were not exactly knocking on the door begging to enter: it only had 1.4 million

inhabitants and very high risk of political turmoil (e.g., possible ethnic conflict, war with Russia, etc.) (Mannik 2002). In exchange for the monopoly, the country was able to acquire needed investments for building the telecom infrastructure in this investor-unfriendly environment.⁷ Also, the potential conflict of interests between the state as a regulator and the state as a shareholder is not as much a result of decreased ownership of shares in the incumbent telecom company.

Second, the incumbent telecom company was held accountable throughout its period of monopoly. An independent regulator of the telecom sector was set up in 1998 and according to the assessment of European Commission the agency was fully independent regulatory authority (Commission of European Communities 2002, 90). Increasing the public, government, and business interest in ICT issues constituted a considerable pressure. In addition, many Nordic investors who entered the Estonian market already had experience in the Nordic markets against the same incumbents who now owned Eesti Telekom. The outcome of that pressure is reflected in the prices of Internet connection; prices in Estonia were among the lowest in the CEE in 2001 (eEurope 2003+ 2002, 18).

Third, the provision of leased lines and alternative infrastructure use was partially liberalized before the end of 2000. Estonia had a free market for data transmissions, Internet service providers (ISPs), and backbone service providers before the end of the monopoly (ESIS 1999a). Hence, companies and other large entities were able to overcome barriers imposed by the monopoly even before the end of its dominance. On balance, therefore, the monopoly situation in the Estonian telecom market demonstrates that benefits were greater than costs. The existence of a monopoly from 1992 until the end of 2000 enhanced the nature of the open network; and thus also favored the positive externalities of the Internet. Despite the existence of a powerful interest

group who could have benefited tremendously from a delay in or complete blocking of liberalization, the commitment to open the market to competition prevailed, leading to the most competitive telecom market in the CEE.

SLOVENIA: A GRADUAL TRANSFORMER

In the case of Slovenia, limited technology transfer was possible before the break-up of Yugoslavia because the impact of export-control regimes imposed by the members of NATO and Japan was not as strong as on the other Eastern Bloc countries (Gray 1999, 104, 106). Technology transfer was facilitated by extensive trade relations with Western Europe, mainly Germany. Fifty percent of Slovenia's exports went to the West in the 1989. In the 1990s Slovenia gradually increased its share of trade with the EU (Institute of Macroeconomic Analysis and Development 1998, 56). Trade barriers have been liberalized incrementally, but further reduction is required for entering the EU. Even if the change has been slow compared with the rest of the CEE, liberalization has had a positive effect on the transfer of technologies throughout the 1990s.

Furthermore, Slovenia started to focus on IT-related research and education, which started in the mid-1970s. In the early 1980s, secondary schools began to install mainframe computers. In the 1990s, the government also launched specific projects to increase the Internet diffusion at schools, public libraries, and research institutions. In addition to educational capacity, development of local IT communities was possible as a result of the existence of the local technology industry (IskraDelta). Decentralized control of the economy and "social ownership" of companies created more incentives for entrepreneurship and innovation than the Soviet command economy. Inflow of FDI in the technology sector encouraged the transfer of Western technologies further.

For example, Siemens established a joint venture with Iskratel in 1989. Slovenia's early ICT orientation allowed fairly sophisticated technology companies to grow and integrate with Western clusters (Biegelbauer *et al* 2001). Currently, many multinationals (Siemens, Cisco, and Microsoft) have invested in Slovenia or have partnered with Slovenian companies. In addition, the country has a wide range of medium-sized hardware and software companies. Most importantly, Slovenian companies hold relatively high positions in the value chains of Western multinationals.

However, in general terms, Slovenia pursued a relatively protectionist and targeted policies toward FDI (Organization for Economic Cooperation and Development 2002, 25). Instead of opening entry for all investors on an equal basis, the government discriminated against foreign investors in the privatization process and attempted to meddle with direct financial incentives instead of following rules of fair play (World Trade Organization 2002, ix, x, 13, and 26). Hence, the ratio of FDI to GDP remains well below average in the region. The World Trade Organization (WTO), Organization for the Economic Cooperation and Development (OECD), and other international organizations see the main barriers for FDI in an open privatization policy and a stable regulatory environment. Such discriminatory policy can be explained by the gradual transition process in which governments run by former *apparatchiks* of socialist Yugoslavia do their best to preserve the social democratic corporatist nature of the country. Protection against foreign investments has been used to minimize the negative distributional effects of economic change and influenced the restructuring of the telecom sector (Organization for Economic Cooperation and Development 2002, 11).

Throughout the 1990s, the Slovenian government engaged in building a "national champion" of the incumbent telecom company. While other CEE countries sold a large stake of

their incumbent companies to the strategic investors from the West, the Slovenian government still owns 74 percent.⁸ Particularly the domestic nature of complete ownership rather than just state ownership⁹ has socialized the telecom company business and allowed domestic interest groups to gain leverage against privatization. Possible privatization has been a constant topic of discussion with the EU, and the decision has not been made as of the writing of this article.

Similarly, continuous delay has also been a factor in opening the telecom market to competition. Slovenia had originally planned to open the market for competition by the end of 2000 (Institute of Macroeconomic Analysis and Development 1998, 116-117). Slovenia formally ended the monopoly in fixed lines over voice telephony by adopting the new Telecommunications Act in 2001. However, the act legislated a transition period in the market opening in areas of leased lines, the local loop, number portability, and cost-based accounting mechanism for operators with significant market power until July 2002 (Commission of the European Communities 2001, 67). Hence, the market was not opened until mid-2002, and informally the new competitive environment has not ensued because the Telekom Slovenije monopoly continues to exist in reality. The regulator of the telecom sector was set up in 2001. However, according to the assessment of European Commission in 2003, Slovenia still has to strengthen the regulator in order to make the agency truly independent (Commission of the European Communities 2003, 35-36).

In comparison with other countries' reluctance to open their markets for competition and privatize incumbent telecom companies, Slovenia's performance in the telecom sector has been good. First, the number of main lines increased from 31 lines in 1995 to 40 in 2001 (International Telecommunications Union 2003). Second, the nature of socialization of ownership—where the stakeholders are not a narrow interest group but rather a disperse group of workers, financiers,

and business people—has increased the accountability of Telekom Slovenije. This is reflected in the prices of Internet connections, which among the least expensive in the CEE region (eEurope 2003+ 2002, 18). However, the costs of such low prices may have been widely socialized as well.

Third, Slovenia had formally liberalized the market in data transmissions, but in reality, the market was still held by a monopoly. ISP services were partially liberalized but licenses were required which increased the cost of entry. Leased lines and alternative infrastructure use was partially liberalized (ESIS 1999b). Hence, there were some ways to overcome the power of the incumbent but, on balance, the gap between formal and informal rules indicates that the monopoly had *de facto* control not just in the voice telephony but also in the provision of Internet connectivity. The need to solve the issue was a part of the rationale that led to the creation of the Ministry of Information Society in 2001. The decision to create a special ministry grew out of the recognition that a more concentrated effort was needed to coordinate the government's ICT priorities. Some existing relationships between the Ministry of Communication and the incumbent telecom company did not encourage reform of the telecom sector.

COMPARISON OF ESTONIA AND SLOVENIA

By comparing the two afore-mentioned, it is obvious that Slovenia had a better initial starting position than Estonia. Slovenia had more advanced infrastructure, mainframe computer penetration, and higher personal computer penetration. Furthermore, Slovenia's ability to trade facilitated technology transfers from the West. Whereas, Estonia was part of the closed economic system of the Soviet Union and certain technologies (such as mainframe computers) never reached the country. Since Internet diffusion is dependent on the availability of existing infrastructure and information technologies, Slovenia inherited the best starting position in the former Eastern bloc.

However, a decade later, Estonia's Internet diffusion level equaled Slovenia's. Simultaneously, Slovenia progressed tremendously well, comparatively. Estonia's independence from older information technologies, that age relatively quickly, combined with proper public policies actually created strength in the adoption of new technologies. Thus dependence on older technologies may lead to higher transaction costs affiliated with the adoption of certain new technologies. Sometimes building a new house and the renovation of old house may be equally costly; at other times building a new one might be even cheaper than renovation of the old.

Estonia started as a *tabula rasa*, which allowed for the bringing in of the newest technologies. With combined new investments in infrastructure, diffusion was able to accelerate on the basis of a rapid growth rate. Slovenia's dependence on older technologies created disadvantages as the interconnectivity between older and newer technologies is not always possible. Such phenomenon is evident in Slovenia's large number of personal computers that are not connected to the Internet. Technically, it may be difficult to implement the connectivity between newer and older technologies.

Most importantly, Slovenia's and Estonia's policies towards the encouragement of ICT diffusion also reflect the general path of reform and chosen political economy models in the both countries. Estonia had a radical, shock-therapy type approach to transition and aimed at creating free-market economy. Slovenia chose a gradual reform path and a political economy system similar to social democratic corporatism where the public policies are the outcome of national consensus among left-leaning governments, industry, and centralized labor unions (Garrett 1998). What makes the Slovenian and Estonian cases educational for all countries in general and transition countries in particular, is that both nations achieved the highest outcome in Internet penetration rates under conditions of monopoly in fixed-line voice telephony. The 2001 Estonian

and Slovenian Internet access costs were significantly lower than in the Czech Republic, Hungary, Latvia, Lithuania, Poland, and Slovakia (eEurope+ 2003 2002, 18).

TABLE 3. KEY CHARACTERISTICS OF POLITICAL ECONOMY FRAMEWORK OF ESTONIA AND SLOVENIA (1991- 2002)

CHARACTERISTICS	ESTONIA	SLOVENIA
Initial Starting Position in the 1990s	Almost no Western ICT technologies; poor infrastructure; fairly developed technical skills.	Limited availability of Western technologies; basic infrastructure; strong IT skill base.
Nature of Transition	Radical across-the-board economic reforms; full liberalization of the economy.	Gradual reforms; incremental opening of the economy; many protectionist measures.
Political Economy System	Predominantly free market.	Typical characteristics of social democratic corporatism.
Trade Policy	Open trader; unilateral free trade from 1995-2000.	Fairly open trader; gradual elimination of protectionist measures throughout the 1990s.
Foreign Direct Investment Regime	Open non-discriminatory regime; rapid privatization; foreign participation encouraged.	Greenfield investments preferred; discriminatory towards foreigners; domestic investors preferred to foreigners in the privatization process.
Power of Labor Unions	Weak; fragmented.	Strong; centralized bargaining.
Dominant Ideology	Center-right; free market liberal.	Center-left; social-democratic.
Privatization of State-Owned Enterprises	Rapid; largest enterprises sold in the first half of 1990s.	Slow; privatization of large enterprises started in the late 1990s and is ongoing today.
Industrial policy	Non-existent .	Direct encouragement of specific sectors/firms.

Under monopoly conditions, local calls are usually subsidized by the incumbent telecom company at the expense of long-distance calls in order to provide universal service. Therefore, the initial diffusion of the Internet (which occurs by dial-up access) can occur relatively cheaply; i.e., at the expense of international calls. As long as monopolist local call prices are acceptable and quality of service is tolerable, the market opening in fixed calls is not a precondition for Internet diffusion. However, such an approach is not sustainable in the long run. The increased sophistication of users will raise the demand for more competitive services, which in turn, will work against the incumbent and therefore limit the diffusion of the Internet.

Hence, opening the market in January 2001 in Estonia and not delaying it like Slovenia, seems to be good timing. The market opening increased the prices of using Internet through dial-up access because the move to cost based prices meant that local telephone services were no longer cross subsidized by international telephone calls. Consequently, many users switched to broadband access as it became cheaper in relative terms. This in turn, increased the time that users spent online and gave incentives for market participants to offer cheaper and more innovative services than before.

**TABLE 4. KEY CHARACTERISTICS OF THE TELECOM SECTOR
IN ESTONIA AND SLOVENIA (1991-2002)**

CHARACTERISTICS	ESTONIA	SLOVENIA
Privatization of Telecom Company	49 percent privatized in 1992; government's stake reduced to 27 percent in 1997.	Owned by state and state controlled investment funds; 13 percent of shares belong to employees.
Nature of Ownership	International and domestic; Nordic state-owned telecoms; Estonian state; private investors; investment funds.	Dominantly domestic; Slovenian state owns 74 percent; employees own 13 percent; remainder belongs to state and domestic investment funds.
Monopoly of Fixed-line Services	Monopoly ended at the end of 2000.	Monopoly was supposed to end by the end of 2000 but was constantly delayed and transitional arrangements were granted until mid-2002.
Leased Lines	Partially liberalized before 2001; completely liberalized after 2001.	Partially liberalized before 2001.
ISP Services	Free market.	License required throughout the 1990s (not anymore).
Data Transmissions	Free market.	Formally liberalized; monopoly in reality
Governance	Ministry of Telecom represents the state in the company; independent regulator oversees.	Ministry of telecom represents the state in the company; independent regulator oversees; Special Ministry of Information Society set up in 2001.
Prices of Internet Access	Among the lowest in the CEE	Among the lowest in the CEE.

This ability to maintain relatively low prices for telecom services in Estonia and Slovenia indicate that the Slovenian and Estonian governments were able to keep the incumbent telecom company accountable, at least to a greater extent than other CEE countries. On balance, uncertainty in market opening and privatization of telecom in Slovenia reflects a higher degree of

regulatory capture of government policies by vested interests than in Estonia. A desire to minimize the negative effects of changing economic environment did not allow delivering the positive impact of “creative destruction” by wiping out the informal networks of the socialist era. That Slovenia had 179 Internet hosts per 10,000 inhabitants in 2002, demonstrates the existence of higher barriers for entry. At the same time, Estonia had 468 hosts; almost three times higher than Slovenia (International Telecommunications Union 2003). This indicates that there are structural impediments on the supply side in Slovenia.

Estonia’s experience suggests that the market opening of the telecom sector is more achievable under the existence of diverse interest groups rather than a centralized national bargaining system. Economic openness of Estonia increased competitive pressures, rendered the dominance of narrow interests unlikely. Slovenia’s engagement in selective protectionism — where trade openness was preferred to FDI and foreign ownership—and the social democratic corporatist nature of the country blocked the opening of telecom sector constantly. As Slovenia’s initial starting position was much better than Estonia’s, then obviously Estonia’s more radical approach in changing the formal rules of the game reduced the transaction costs in Internet diffusion. Certainly, Slovenia has progressed rapidly as well.

However, the country has benefited from the heritage of the previous system and the advancement of Internet diffusion could have been even greater with higher levels of competition in the telecom market. Involvement of diverse investors could have reduced inefficiencies in allocation of capital. For instance, Slovenia has more main telephone lines than Estonia, because the country has invested more money into infrastructure development. But as similar Internet diffusion rates demonstrate, such a high number of main lines is not necessary.

RECOMMENDATIONS

In general terms, these case studies demonstrate that transition and developing economies should open telecom market for competition immediately and concurrently privatize incumbent telecom companies. In order to ensure maximum benefits of such a change, such policies should be combined with a liberal foreign direct investment regime in both the telecom sector and other areas of the economy. Such openness would help to attract firms with diverse interests to the economy and would make it difficult for one interest group to dominate policymaking through regulatory capture.

ADVANCED TRANSITION ECONOMIES JOINING THE EU

The key lesson of Estonia and Slovenia is that more advanced transition economies should strengthen regulatory regimes by establishing a regulatory agency with a high degree of independence and ability to secure the fair play in the market. It is obvious that for transition countries in the CEE joining the European Union in 2004 or 2007, the telecommunication legislation of the EU means market liberalization in conjunction with setting up a stronger regulatory regime (Heimler 2000, 185-186). Formally, all of these countries liberalized their markets by 2003. However, informally many barriers for competitive market are still in place. The key is to increase the accountability of the incumbent telecom company and to try to keep the prices of telecom services down by ensuring a competitive market environment by sound regulation. Estonia achieved this outcome by allowing diverse ICT companies to enter the market while incrementally strengthening its regulatory capacity. Most importantly, the case studies demonstrate that privatization of state-owned telecoms increases competitive pressures and reduces the possibilities for political interference.

Slovenia was able to overcome the negative externalities of state ownership and monopoly power of its incumbent telecom company due to the social democratic corporatist

nature of the country where diverse domestic interests and stakeholders were involved. However, Slovenia is exceptional for purposes of drawing recommendations. More advanced transition economies can learn more from Estonia. Though they have missed the opportunity for curbing the power of incumbent company monopoly in the manner of Estonia, they can achieve the same outcome by implementing a regulatory framework that secures a higher degree of competition in the market, which will, in turn, decrease prices of telecom services.

Concretely, policymakers should create an independent regulatory agency and appoint key, long-tenured decision-makers to it. Effective and independent regulation is especially important when a country is transforming from a monopoly in fixed-line telecom services to full competition. Market dominance may help the incumbent telecom company abuse the system via rent-seeking and keeping entry barriers high. Whereas diversity of potential market participants—achieved through economic openness—minimizes the risk of predatory behavior by the incumbent. A strong regulatory agency implies more than just a simple telecom regulator. In many ways it should operate as an independent central bank that has control over monetary policy without political interference.

LESS ADVANCED TRANSITION AND DEVELOPING ECONOMIES

Of the two case studies, the Estonian experience is more relevant for less advanced developing and transition countries. By partially opening their markets, limiting an monopoly, privatizing their incumbent company, and creating a liberal FDI regime, these countries can increase rates of Internet diffusion. Unintended consequences of monopoly in voice telephony should be recognized. In addition, some countries could benefit by immediately opening their market for competition

The governments of less advanced transition economies should open their telecom market partially for competition and set a firm deadline for a complete market opening. If a country is capital-poor and needs a significant investment in infrastructure, like Estonia in the early 1990s, sustaining a monopoly of fixed lines or partial monopoly (for example, in rural areas) can advance the telecom infrastructure. Such commitment to an open market will completely be “locked in” through the engagement of international organizations such as WTO and/or via domestic, constitutional means. Furthermore, in combination with a gradual market opening, a country could raise extra cash that could be directed towards infrastructure development via incremental privatization of an incumbent telecom company. In such a case, the establishment of a liberal FDI regime in conjunction with privatization and gradual liberalization could attract additional investors to the telecom service industry which would create pressure to keep the monopoly accountable.

The key in such a case, is the avoidance of regulatory capture by the incumbent company which could delay the market opening. Hence, the diversity of different interests in this scenario, is more crucial than the creation of a regulatory agency. Here, the main aim of a regulating agency is to set price controls for services that are offered under monopoly conditions. Furthermore, the government should encourage Internet diffusion by offering government services online, which would create additional incentives for using the Internet.

CONCLUSION

The comparison of these two cases contributes to policy literature on Internet diffusion and political economy of reform by offering insights into the public policies of two advanced transition economies. On the economic side, the Internet can deliver tremendous productivity gains. Hence, transition and developing countries are trying to create suitable environments for the diffusion of this technology. Estonia and Slovenia offer broad lessons demonstrating that it would be naive to assume that a specific Internet policy without changes in the larger framework of policies will help to increase Internet diffusion. Both cases suggest that the increase in Internet diffusion is linked to broader economic and political framework. Slovenia's high rate of Internet penetration, for instance, is explained by its path-dependence derived from the former system and ability of its gradual reform process to sustain such diffusion.

Estonia's example is particularly relevant for policy reform in transition and developing countries. Often in these countries the commitment to promote Internet diffusion falls apart when serious reforms—such as liberalizing the telecom sector and ensuring a fair competition in the market—need to be carried out. It should be recognized, however, that Estonia's success in encouraging Internet diffusion owes much to the radical reforms that occurred in the country throughout the 1990s, which created an extremely open economy that allocated the adoption of the Internet. Most importantly, a regulatory framework was set in place that allowed the securing of more fair play in the market than in other transition economies. Evidence of this is that Estonia had some of the lowest Internet access costs in the region in 2001. This is demonstrated by its significantly higher number of Internet hosts than in any other state in Central and Eastern Europe.

The importance of Internet diffusion is usually cited in the punch line of policy programs that stress the need “to move toward a knowledge-based economy,” depict the ideal nature of an “Information Society”, and articulate concerns about the “digital divide.” Certainly, the role of Internet and the number of people in an economy connected to the Internet are not just symbolic, but differ in substance. The Internet can be an important force behind political and economic development, as it reduces transaction costs for the flow of information. Thus, it can have a profound impact on democratization. All nations interested in this end goal should therefore prioritize the exploration and implementation of mechanisms that facilitate Internet diffusion in transition and developing economies.

NOTES

¹ The terms Internet penetration and Internet diffusion will be used interchangeably for the purposes of this article. In the context of the article, Internet diffusion refers to number of Internet users in a country per 10,000 inhabitants. All the data concerning the number of Internet users per 10,000 inhabitants is collected from the various sections of the International Telecommunications Union website.

² The eEurope program is an outcome of European Council meeting in Lisbon on March 23-24, 2000. eEurope Action Plan was adopted by European Commission in May 2000. Necessity to have separate eEurope+ program for applicant countries was recognized at the European Ministerial Conference in Warsaw on 11-12 May 2000. The Lisbon meeting set objectives for the EU to “become the most competitive and dynamic knowledge-based economy in the world (eEurope+ 2003, 5). The existence of two separate programs is based on understanding that the level of development is different in the EU and in applicant countries. Therefore, problems are different as well. “EU candidate countries are faced with enormous challenges in their attempt to catch up with the development of a knowledge-based economy...” (eEurope+ 2003, 5).

³ Data was collected from the different documents published on the website of ITU during the years 2002-2003 (<http://www.itu.int/ITU-D/ict/statistics/>). Namely, information technology statistics published by ITU on 9 October 2003 and 12 December 2002 was used. All numbers are rounded up to closest whole number.

⁴ The argument that small size allows Estonia and Slovenia to diffuse the Internet to a greater extent than bigger countries was a common counterargument presented to the author during the presentation of his research on various occasions. Examples include a Politics and Information Systems conference in Orlando, Florida, in July 2003 and a lecture at the Central European University in Budapest in March 2003. Also, this comment has been made during numerous interviews by author with policymakers in the CEE and informal discussions.

⁵ Usually defined as a number of main telephone lines per 100 inhabitants.

⁶ The figures come from the ITU website where the key indicators of ICT diffusion are given. However, in order to simplify the figures have been rounded to the nearest whole number

⁷ The benefits of investments in exchange for monopoly are clear. In the early 1990s, most telephone lines in Estonia were analogue lines. By 2001 over 70 percent of lines had been digitalized (International Telecommunications Union 2003). By comparison, the Soviet Union had on average 9.7 lines per 100 inhabitants in 1989 (Business Week 1989). The number of main lines in Estonia was significantly higher than in the Soviet Union but still not sufficient for providing telephone connection to everybody who wanted it.⁷ Hence, investment in main lines by the privatized incumbent telecom company was crucial. In 1995, the number of main lines in Estonia was 27.7 lines per 100 inhabitants. By 2001, the number increased to 35.2 (International Telecommunications Union 2003).

⁸ Employees own 13 percent while state investment funds the remaining share of Telekom Slovenije.

⁹ In many privatized telecom companies the state is still an important shareholder and many state or partially state-owned telecom companies privatize telecom companies in other countries.

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