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The European Dimension of the Digital Economy

The economic performance of the European Union has taken on a new dimension in regard to the emerging "digital economy". Usually, it is argued that the EU lags behind the United States in most aspects of the use and diffusion of information and communication technologies (ICT). This paper argues that there are serious challenges confronting the EU in dealing with the digital economy, especially in respect to education issues, consumer confidence and the avoidance of a "digital divide". On the other hand it is pointed out that there has been tremendous progress in respect to the economic significance of electronic commerce, the development of (self-)regulatory mechanisms and the creation of a modern policy framework.

The term "digital economy" has been used extensively in recent years to describe the functioning of the US economy and in particular that part of the economy which is linked to information and communication technologies (ICT). Unfortunately, there is some terminological confusion in the economic literature. Some economists prefer to use terms such as "new economy", "internet economy" or "information economy", for example. Since these concepts usually attempt to explain and describe the same phenomena, this paper uses the term "digital economy" with the intention of including most other definitions.¹ The popular term "new economy" is deliberately avoided because it artificially separates "new" and "old" economic sectors. The most important aspect of the current trend is not the shift to high-tech industries, but the way that IT will improve the efficiency of all parts of the economy, especially old-economy firms. The term "new economy" might also imply the misunderstanding that old economic laws and mechanisms would not be valid in the "new economy".

The digital economy may be characterised by three main factors:

□ "network effects" lead to considerable spillovers, and these contribute to higher economic growth. The more participants that use a network, the greater is its value to all who use it. This so-called "Metcalfe's law" points out that the value or power of a network

increases in proportion to the square of the number of access points to the network. Thus, the value of a network increases much faster than the number of access points. Metcalfe's law can be extended to broader network issues, such as the interoperability of ways to access a network, the information on a network, and even the language used;

□ a change in the business cycle, since ICT in combination with globalisation may lower the non-accelerating inflation rate of unemployment (NAIRU) and change the short-run trade-off between inflation and unemployment. As a consequence the economy can expand for a longer period accompanied by low inflation rates;

□ more efficient business methods linked to the use of new technologies lead to higher trend growth.²

The "digital economy" discussion has focused on the role of ICT, which represents by far the most dynamic part of business investment. Although traditional factors remain important for economic performance (e.g. macroeconomic conditions, education and training and the functioning of product and factor markets) the new technologies appear to have important macroeconomic implications for economic growth and inflation. In the 1980s, when ICT started to draw attention, Solow stated that its impact seemed observable "everywhere except in the productivity

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¹ Some authors are reluctant to use the term "digital economy" because it has been the title of major US government reports published by the US Department of Commerce, see e.g. US Department of Commerce: Digital Economy 2000, Washington, D.C.

² OECD: A New Economy? The Changing Role of Innovation and Information Technology in Growth, Paris 2000, p. 17.

statistics".³ There are numerous anecdotal observations of dramatic restructuring and increased productivity, in manufacturing as well as in services, which are related to the adoption of ICT and new technologies. Assessing the impact of ICT, especially across countries, is an extremely difficult task because it is plagued by measurement problems. Rapid quality improvements and reduced prices limit the ability of traditional productivity measurements to capture the impact of ICT, and there is great variance between national statistical offices in the methods they apply. A first cross-country examination controlling for differences in measurement methodologies concludes that ICT investment exerted a significant and consistently increasing impact on output growth during the 1990s in all G7 countries. "Over the past decades, technical progress has led to a rapid improvement in the price-performance ratio of ICT capital goods and has thus reduced the user cost of ICT capital goods relative to other types of capital and labour inputs – witness the sustained growth in volume investment in ICTs that has outpaced investment in other types of capital goods. In their role as capital goods and providers of capital services, ICTs have increasingly contributed to output and therefore to labour productivity growth."⁴

Moreover, recent changes in US growth patterns have been associated with new technologies, especially ICT, and studies using new data and methodologies have lent empirical support to the notion that ICT is making a significant contribution to productivity growth. For the first time Oliner and Sichel employed an approach that allows impacts from the use of both computer hardware and software to be captured. They found for the USA that recent

data do support a rise in contributions from ICT emanating from outside the computer industry.⁵ This study, as well as the US Council of Economic Advisors, conclude that around two-thirds of the increase in US labour productivity growth in the late 1990s was due to the combined effects in the ICT-producing industry and in the utilisation of ICT equipment. Thus, although it remains difficult to capture disembodied technological transfers, the present state of the evidence points to significant impacts from ICT in the form of production as well as utilisation in the US economy.

Use of the internet and electronic commerce is a phenomenon of the second half of the 1990s and it has not yet realised its full impact on aggregate productivity. There are wide expectations also in Europe that the continued expansion of ICT and electronic commerce will have much more profound effects on production and distribution efficiency in the near future. On the other hand it has to be noted that the internet changes the environment in which the digital economy takes place, but it does not change the principles that underpin economic decisions. Basic economics is still valid: supply and demand are still the forces determining prices and choices. But

³ For this argument see e.g. Michael L. Dertouzos, Richard K. Lester, Robert M. Solow: *Made in America: Regaining the Productive Edge*, MIT Commission on Industrial Productivity, Cambridge 1989.

⁴ P. Schreyer: *The Contribution of Information and Communication Technology to Output Growth: A Study of the G7 Countries*, OECD, Directorate for Science, Technology and Industry (IST), Working Paper 2000/2, Paris 2000, p. 5.

⁵ S. D. Oliner, D. E. Sichel: *The Resurgence of Growth in the late 1990s: Is Information Technology the Story?*, Federal Reserve Board, Washington, DC 2000.

Hermann Geiger

The Comparative Law and Economics of Reinsurance

This publication deals, from a comparative point of view, with the legal and economic foundations of reinsurance. Questions pertaining to the law of insurance contracts and supervisory regulations as well as problems in respect of the conflict of laws and European reinsurance law are considered. The discussion of recent significant judgements and the analysis of dispute resolution within the reinsurance relationship enhance the benefits of this work.

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the internet does change how these forces manifest themselves: more rapid technological change and innovation increase the speed of transactions and the creation of new market-places. Information is a key component of all products and services, as well as of production processes.

ICT and Electronic Commerce in Europe

According to the European Information Technology Observatory (EITO) the European market for ICT continues to grow above the world average. EITO expected a growth of around 11.3% in 2000 for the West European ICT market. For the year 2001 EITO is expecting the European market as a whole to grow by 9.5%. The corresponding increase for the USA is 8% and for Japan 6%. A precondition for the rise of the digital economy is that customers and business have access to the internet. In terms of ICT penetration in 1999, the European IT market was one of the fastest growing compared with the global average. According to EITO there were more than 60 million web users in the EU. For 2002 EITO forecasts that the number of web users will grow to more than 140 million.⁶ Germany, the UK and the Nordic countries are relatively advanced, for example, in regard to PC penetration, number of internet hosts per inhabitant or use of the internet for commerce. Data transmission associated with the internet is becoming a major driver in the most developed and economically stronger regions. In addition, the combination of a rapid infra-structural development, lower prices and the development of more consumer-friendly applications broaden the access of households to ICT. Germany, the UK and the Nordic countries continue to show higher than average IT/GDP and IT per capita ratios.⁷ Those EU countries which are less advanced in ICT development (i.e. Greece, Italy and Spain) are now undertaking heavy investment in business-to-business electronic commerce. In the area of mobile telephony, it has been noted that Europe appears to be relatively better placed for the future. The penetration of mobile users, which reaches above two-thirds of the population in the Nordic region, is widely viewed as providing the EU with an edge in the start-up of mobile commerce (M-Commerce). This

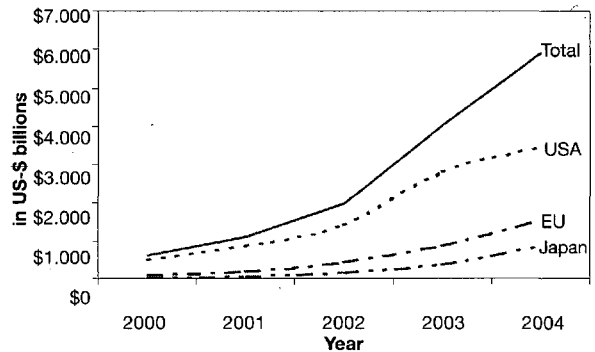
⁶ European Information Technology Observatory-EITO 2000, p. 30.

⁷ European Information Technology Observatory-EITO 2000, pp. 87.

⁸ Forrester Research predicts for Europe a percentage of electronic commerce in relation to total revenue in 2004 of 6% in comparison to 13.3% for the USA and 8.4% for Japan.

⁹ Forrester Research: Europe: The Sleeping Giant Awakens, December 1999.

Figure 1
e-Commerce Growth



Source: Forrester Research, November 2000; www.forrester.com.

can be attributed to the regulatory set-up, as the adoption of a common standard (GSM) unified the demand side in the EU, whereas four different standards competed in the United States, weakening demand and hence supply. Its single standard has helped Europe to attain the highest diffusion rate in the world. Thus, the development of the third generation of mobile networks leads to a competitive advantage in the area of M-Commerce. Related areas in which the EU may also enjoy a competitive advantage include digital TV and methods for more secure communication, e.g. smart cards or the use of digital signatures.

Electronic commerce in Europe is growing at a very high rate. The concept of electronic commerce is a shorthand term that encompasses a complex of technologies, infrastructures, processes, and products. It brings together whole industries and narrow applications, producers and users, information exchange, and economic activity into a global market-place. There is no universal definition of electronic commerce because the internet market-place and its participants are so numerous and their intricate relationships are evolving so rapidly. Studies that separate out electronic commerce from the rest of the IT sector illustrate that, while still a very small percentage of total revenue,⁸ this new method of buying and selling goods and services is growing quickly, with a beneficial effect on macroeconomic performance. Forrester Research projects that by 2004, electronic commerce in the EU could surpass US dollar 1.5 billion and show a growth much faster than in the USA or Japan (see Figure1). Ninety per cent of businesses in the EU say that electronic commerce will soon affect how they do business.⁹ Particularly important for efficiency gains are business-to-business transactions (B2B). B2B transactions, whether trade in inputs or in finished products, overwhelmingly

dominate electronic commerce, accounting for nearly 80 per cent of electronic commerce revenue. The dominance of B2B is already about 6 times the value of business-to-consumer electronic commerce (B2C), and could well grow to 12 times the B2C value.

The Legal and Policy Framework

In terms of the legal framework there are various "European issues" which play an important role in influencing the ability of the EU to adjust to and capitalise on new economic and technological opportunities. Since the development of information society services within the EU is hampered by a number of legal obstacles to the proper functioning of the internal market the enactment of the EU Directive on Electronic Commerce¹⁰ marks an important step towards the development of electronic commerce in the EU. These obstacles arise from divergences in legislation and from the legal uncertainty as to which national rules apply to such services. The Directive was enacted on June 8, 2000 and the member states have to implement it by the end of 2001. Although this Directive has been intensely debated in the EU, finally, the member states agreed on its horizontal approach and the establishment of the country of origin principle. Article 3 of the Directive clearly clarifies: "Each Member State shall ensure that the information society services provided by a service provider established on its territory comply with the national provisions applicable in the Member State in question which fall within the coordinated field."

There are still various problems and open questions regarding the content of the Directive. For example, certain areas like data protection or taxation issues are excluded from the scope of this legal provision. The protection of individuals with regard to the processing of personal data is solely governed by the "Directive on the protection of individuals with regard to the processing of personal data and on the free movement of such data" of 1995. Furthermore, problematic remains the definition of information society services. This definition covers any service normally provided for remuneration, at a distance, by means of electronic equipment for the processing and storage of data, and at the individual request of a recipient of a service. Those services which do not imply data

processing and storage are not covered by this definition. Critics refer to the shortcomings of this definition considering the current process of the convergence of information and communication technologies.¹¹ Even though the Directive excludes a wide range of the IT sector it has to be regarded as an important precondition for the development of electronic commerce and has to be continuously updated in accordance to market development.

There are some concerns in the EU that the vast size of the US market provides an edge that it would be difficult even for an integrating Europe to match. In Lisbon in March 2000, however, the European Council decided on major efforts over the coming years to turn the digital economy into an opportunity. The European Heads of State agreed on an ambitious agenda that includes upgrading ICT infrastructure, bringing ICT into schools, moving towards a unified European patents system, improving conditions for entrepreneurship and small business, and embarking on extensive "benchmarking" of competitiveness. In order to use the opportunities of the digital economy the Heads of State and Government asked the Council and the Commission to draw up a comprehensive "eEurope Action Plan". After the Commission adopted a draft Action Plan in May 2000, the initiative was discussed with Member States, with a view to agreement by the Feira European Council in June 2000. The objectives of "eEurope 2002" were revised in the light of the Lisbon European Council conclusions and the numerous reactions received, especially from the European Parliament and Member States and during the informal ministerial conference on the Information and Knowledge Society held in Lisbon on 10/11 April, 2000. As a result, the actions are clustered around three main objectives:

- a cheaper, faster and secure internet;
- investing in people and skills;
- stimulating the use of the internet (e.g. by accelerating e-commerce, electronic access to public services and European digital content for global networks).

There are three main methods by which the "eEurope" targets will be achieved:

- accelerating the setting up of an appropriate legal environment;

¹⁰ Officially the directive is entitled "Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce in the Internal Market". For details see A. Tettenborn: E-Commerce-Richtlinie: Politische Einigung in Brüssel erzielt, in: Kommunikation und Recht, 2/2000, pp. 59-63.

¹¹ G. Spindler: E-Commerce in Europa: Die E-Commerce-Richtlinie in ihrer endgültigen Fassung", in: MultiMedia und Recht, Zeitschrift für Informations- und Telekommunikations- und Medienrecht, 7/2000, pp. 4-21.

- supporting new infrastructure and services across Europe;
- applying the open method of co-ordination and benchmarking in order to ensure that actions are carried out efficiently.

With regard to benchmarking, a limited number of targeted "eEurope" benchmarks will be defined by the European Commission and the Member States before the end of 2000. There are several ongoing statistical data-gathering initiatives at national and international level related to the new knowledge-based economy. Data from EUROSTAT and Member States' statistical offices will be used where available. Industry associations and private consultants also produce statistics related to the digital economy. The need to undertake urgent actions against tight deadlines in critical areas for the digital economy is one of the key driving forces of the "eEurope" initiative. The approach of "eEurope" is to focus on concrete actions and thus ensure the quick removal of the remaining barriers and emphasise the key date – 2002 – by which all of the targets should be achieved. There will undoubtedly be remaining issues to be resolved after 2002. There must therefore be a longer-term policy perspective, and the measures taken in "eEurope 2002" will have an impact well beyond. While the Lisbon summit of March 2000 has provided an opportunity for the EU to respond, there is a need for improved conditions both for coordination between policy areas and for synergy between the Community and national levels. On the other hand, from a policy perspective "eEurope 2002" has been taken up at the highest policy level as a major opportunity to achieve a more dynamic economy in the EU.

The Increasing Significance of Human Capital

Europe has been characterised by a strong dominance of higher education in the provision of skills, and in the formulation of policies for skills upgrading. There is an increasing need for effective input from multiple actors and institutions, including industry partnerships and other forms of innovation in education and training, because an increasing discrepancy between the demand for and availability of skilled ICT professionals exists in Europe, both in qualitative and quantitative terms. According to EITO in the EU about 500,000 job vacancies for ICT professionals existed at the end of 1998, due to a lack of candidates with the appropriate qualifications. While demand for skilled ICT professionals is set to increase in the coming years, supply is likely to grow

at a slower rate, based on current trends in education and training. It is estimated that a gap of 1.6 million jobs may exist by the year 2002, if appropriate measures are not taken.¹²

The skills gap is not just the result of a temporary situation or short-term imbalance between demand and supply. It is a structural problem, which is directly related to the nature of the digital economy. The high rate of growth in the take-up of ICT and the rapid rate of technological evolution are contributing factors to this situation. All professions are subject to obsolescence, but in no other field is the pace of technological change as fast as in the digital economy. The impact of rapid technological change on the ability of older workers and the unemployed to retrain and the need for "lifelong learning" arrangements are even more pronounced. In a knowledge-based European economy, intangible investments represent the main source of competitive advantage. Skills are the most important form of intangible investment. The ICT skills gap has to be seen as a major obstacle not just to the diffusion of ICT, but also to the competitiveness of the European economy as a whole. For this reason policymakers have to make clear, for example, that immigrants should be regarded as a source of academic strength as well as entrepreneurial spirit. In addition, wage structures, pension schemes, tax structures etc. influence the incentives to invest in new skills. The knowledge-based economy also indicates that the EU is confronted with the widely spread concern of a "digital divide" – that the introduction of ICT and the accompanying social changes lead to a growing and permanent gap between those who are "users" and those who are "losers". Policymakers need to ensure – and publicly demonstrate – that the digital economy reduces prices, creates new services and leads to higher incomes. At the same time, it has to be explained that when some companies have to leave the marketplace due to rapid technological and organisational change others are being founded. Thus, it will be of considerable importance for EU policies and performances to what extent ICT will appear as a source of a "digital divide" or of benefits for all.

The Unsolved Problem: Consumer Confidence

Far reaching reforms have already taken place in the EU in key areas such as telecommunications and electronic commerce and there has been an enhanced provision of venture capital. As a conse-

¹² European Information Technology Observatory EITO 2000, pp. 53.

quence the EU has experienced extensive restructuring and the rise of new economic activities. Despite such developments there remain systemic problems for the EU. The challenge is for the European Commission and the individual Member States to progress in a consistent and mutually reinforcing manner. The EU plays a very important role in establishing the environment of certainty and trust that is the key for the internet to flourish and electronic commerce to yield both macro- and microeconomic benefits. Standards, protocols, laws, and regulations – such as technical communications and interconnectivity standards; security protocols; laws on electronic signatures, certification, and encryption; privacy and content regulations – help to create certainty and trust for the purchase and sale of products over the internet. But electronic commerce creates new trust issues for all relevant actors. It is now more difficult for countries to enforce their own standards, protocols, regulations, and laws with respect to online transactions, because the internet is transnational and ICT limits the ability of government to regulate electronic commerce. Moreover, many policymakers fear that attempts to enforce existing regulations on the internet might hamper the growth of these new technologies. Thus, the real challenge is to find the right combination of legislation and private sector action that maximises consumer confidence and the benefits of the internet and electronic commerce.

Privacy of information transmitted online is one of the most important issues related to the internet. The benefits of electronic commerce face the challenge of how to manage personal data. Electronic commerce creates information trails that allow transaction information to be tracked, collected, and compiled, providing vast amounts of information about personal details of people's lives. While personal information has been tracked for years, for example, through barcode scanners and credit cards, what is fundamentally different today is the ease with which data can not only be gathered and compiled electronically, but also manipulated and used. Data collection on the internet has become widespread, with 93 per cent of all commercial web sites collecting some personal identifying information.¹³ While the online market is still growing, consumers are increasingly concerned about the vast amounts of personal information available in the electronic world, and how it is used. If consumers fear that the information they provide online may be used inappropriately, they will hesitate to participate, thereby slowing the growth of electronic commerce and limiting the many benefits of

its full realisation. How governments respond to this lack of consumer confidence – specifically, whether they adopt market or mandated policy approaches – will have a significant effect on the future of the digital economy.

Privacy issues are also of crucial concern for businesses. Groups like the "Global Business Dialogue on Electronic Commerce (GBDe)" argue that "... it is impractical for any government to impose its regulatory models for online privacy on other jurisdictions".¹⁴ The GBDe favours a flexible approach to the protection of personal information and proposes data protection guidelines that are in part lower standards than those agreed between the EU and the USA in the "safe harbour" principles. The European Commission and the US Department of Commerce agreed to a "safe harbour" under the European Data Privacy Protection System and this is available for entities participating in a qualifying privacy protection regime. This agreement between the EU and the US government immunises private regime participants for liability to interruption of their data flows under the EC Privacy Directive.¹⁵ Only those regimes meeting certain minimum requirements qualify for the "safe harbour". If complaint and dispute resolution and enforcement mechanisms provided in a particular "safe harbour" regime prove ineffective, complaints may avail themselves of public law procedures before the Federal Trade Commission (FTC) in the USA and before data protection commissioners in Europe. Thus, "safe harbour" is a kind of immunity conferred by public law and represents an important step in realising transatlantic electronic commerce and is intended to contribute to consumer confidence.

Another area of consumer confidence is internet content. While most governments support the free flow of information across national borders, the growth of electronic commerce has forced them to examine issues related to internet content. Along with the many benefits of the internet comes the potential for it to carry unlawful and offensive activity. Child pornography, fraud, gambling, racist materials, violence, or other illegal activities are examples of the

¹³ Georgetown Internet Privacy Policy Survey (GIPPS), Washington, D.C. 1999.

¹⁴ Global Business Dialogue on Electronic Commerce (GBDe): Miami Conference Report, Miami, 26 September 2000, p. 3.

¹⁵ Council Directive 95/46/EC of 24 October 1995 on the Protection of Individuals with Regard to the Processing of Personal Data and on the Free Movement of such Data.

¹⁶ www.incore.org

harmful or offensive content now readily accessible. Governments are increasingly challenged to try to strike a balance between limiting the use of the internet for purposes contrary to social values and security on the one hand, and freedom of expression on the other. Moreover, how or whether to coordinate policy approaches across borders is an issue. The EU has an ambitious action plan to promote safer use of the internet by combating illegal and harmful content. The objectives of the four-year plan are to encourage industry and users to put in place systems of self-regulation, create filtering and rating systems, promote awareness, and encourage coordination and compatibility between European and other approaches. European firms have formed the coalition INCORE (Internet Content Rating for Europe), to promote self-regulation and create a rating and filtering system to meet the needs of European users.¹⁶

Need for Self-regulatory Mechanisms

The digital economy is redefining the powers and behaviour of government and is increasingly undermining national sovereignty. As pointed out, national and governmental institutions in the EU and the private sector are confronted with issues ranging from taxes to privacy and from internet content to consumer protection. These issues only begin to scratch the surface of what the electronic world implies for European governance. As the issues of educational reform, privacy and internet content illustrate, initiatives that aim to support the growth of the digital economy need to benefit from cooperation between industry and public authorities. What needs to be established and focused on in the EU to face the challenges of the digital economy are public-private partnerships between government and the private sector. The development of such "hybrid international institutions"¹⁷ is increasingly essential because both regulator and commercial concerns can be addressed within public-private partnerships in which public law provides an umbrella or framework within which private self-regulation and dispute resolution work out the details. For example, the public law framework may set certain minimum rights and duties that must be established by a private self-regulatory regime. If a regime meets these conditions, and if an entity participates in such a regime and commits itself to complying with the private regulations, that entity enjoys a "safe harbour" from application of public law rules. One example in this respect is the development of seal programmes. A private association offers a seal of approval to entities promising to comply with rules developed by the private association, and

promising to afford complaint and dispute resolution mechanisms by the private association. An entity promising to comply may use the seal of good approval. If it subsequently fails to comply, permission to use the seal can be revoked. Moreover, non-compliance while using the seal can subject an entity to enforcement proceedings before public tribunals for engaging in deceptive trade practices. A best practice example of such a private organisation is the German "D-21 Initiative" that intends to accelerate the transformation of Germany from an industrial society to an information society. D-21 is a non-profit registered association founded in 1999 that creates a working forum for more than 200 companies from all economic sectors and the German government. There is a managing board and also a supplementary advisory council under the leadership of the German Chancellor. This public-private partnership is currently (among other activities) implementing quality criteria for internet offerings. On the basis of self-regulation, businesses are meeting the need for customer-friendly conditions and offerings.¹⁸ Public-private partnerships avoid many of the problems of transnational adjudicative jurisdiction, choice of law, and enforcement. The private regulatory regimes are essentially indifferent to whether a participant operates in one country or another. Although public-private partnerships also present some risks (e.g. private entities may be unwilling to adopt effective enforcement procedures for violation) policymakers and the private sector should devote themselves to the design, deployment and evaluation of self-regulatory mechanisms in the digital economy.

The digital economy has important implications for the scope and type of policy intervention into the marketplace. In particular, European policymakers should want to do everything they can to enable ICT to develop its full impact on economic growth and employment. While there is a long way to go, however, there has been substantial progress in the EU. The heterogeneity and variability in Europe is not only a source of problems, but of cultural and institutional richness which provides opportunities to develop creativity and long-term dynamism. There are promising indicators that the Lisbon Summit was not the end of the process; it could prove to be a major step along the way.

¹⁷ Henry H. Perritt: Hybrid International Institutions for Regulating Electronic Commerce and Political Discourse on the Internet, in: *MultiMedia und Recht, Zeitschrift für Informations- und Telekommunikations- und Medienrecht*, 7/2000, pp. 1-3.

¹⁸ See for more details: www.i-d21.de.