Regulatory issues in telecommunications and ICT-based dynamics in open economies: introduction

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The expansion of information and communication technology (ICT) is a key element of growth, innovation and structural change in OECD countries and worldwide. In the new digital world economy telecommunications, internet services and computers are interacting on the one hand and on the other hand affecting productivity growth and market dynamics in every non-ICT sector. This special issue which is based on a project funded by the European Commission (grant 200557-LLP-1-2011-1-DE-AJM-IC) and presents important new findings on several theoretical, empirical and policy aspects of the digital economy:

Paul Welfens and Jens Perret present first estimates on the true ratio of real investment to real GDP, namely by explicitly taking into account the fall of ICT capital investment goods prices: nominal investment-GDP ratios clearly underestimate investment. Moreover, they present a first estimate of private households' value-added through the internet in selected OECD countries—based on the time budget of households and certain assumptions about households' activities as both consumers and “prosumers” (digital producers) in the internet.

William Dutton and Grant Blank present survey data on the next generations of internet users. This contribution is anchored in longitudinal survey data on how Britons

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use the internet, which illuminates the emergence of new patterns of accessing the Internet over multiple devices—some of which are portable—in everyday life and work. The new insights obtained in technology dynamics, digital behavioral change and consumer preferences are crucial. One can also understand from the authors' analysis that advanced users in the digital world increasingly use several devices at the same time while the sophistication of users continues to differ across groups of society—the leading digital societies continue raising the speed of digital transmission and the scope of networking; often also of innovation.

Is the internet expansion driving competition or market monopolization? This is the key question of the analysis of Justus Haucap and Ulrich Heimeshoff who carefully point out the role of network effects and scale effects in the digital world; moreover, key policy conclusions are suggested where Google, Facebook, Amazon and eBay are the core players considered in the internet.

Günter Knieps and Patrick Zenhäusern put the focus on regulatory fallacies in global telecommunications—the case of international mobile roaming is analyzed; the authors take a deeper look at key issues and come up with theoretically founded new policy approaches which could help to achieve a more efficient international digital communications system.

Morten Falch and Reza Tadayoni focus on the regulation of international roaming data services in the EU. With data services continuously growing as a new expansion field the issue of adequate regulation of internationally provided services becomes quite relevant: Here the authors consider key arguments and come up with innovative ideas on regulation.

The real side of the ICT is analyzed in several innovative contributions. Tony Irawan presents new findings on ICT and economic development where input output analysis for several ASEAN member countries is presented: firstly, more developed countries are expected to benefit to a greater extent than less developed countries. Secondly, the impact of ICT will depend on the intensity of ICT utilization. Thirdly, the size and structure of the ICT sector of a country's economy does matter. Stanislaw Kubiela and Magdalena Olender-Skorek consider the role of ICT modernization in Eastern Europe and find considerable differences across countries, but with a clear tendency of convergence to the EU average level while upgrading the comparative advantage in ICT trade. Empirical issues of ICT expansion are of high relevance for the business community as well as for national and international policy makers—Huub Meijers presents his analysis on the role of the internet for growth and international trade as well as relevant interdependencies. The author shows that internet use does not explain economic growth directly in a fully specified growth model, rather the trade link has to be considered as well. Based on a careful distinction of tradable goods with respect to technology intensity Evgeniya Yushkova's innovative analysis helps to identify the role of the use of the internet in the business community for international trade: A gravity model is used as a powerful analytical tool here; trade in ICT goods is, of course, also considered. Andre Jungmittag and Paul Welfens shed new light on the link between the expansion of telecommunications, output and employment where an augmented macroeconomic production function—including telecommunications services—is used; empirical results for Germany are presented with an interdependent analysis. New insights are also obtained from Christian Schröder's survey results with a focus on ICT cooperation networks in selected ICT clusters in Germany and it turns out that policy

makers apparently have problems in helping to organize efficient digital clusters; it therefore is not trivial to organize the creation of efficient clusters that generate positive network dynamics for a majority of companies involved. Grigori Feiguine presents his findings on the role of ICT investment in, and internationalization of, the Russian economy.

Smart grids will become a new expansion field of ICT. Gero Bieser's contribution gives an interesting view from the ICT industry. The paper by Nele Friedrichsen, Christina Brandstätt and Gert Brunekreeft highlights the regulatory challenges of smart grids that are expected to become a major field of investment in all OECD countries—here new ideas for a more efficient and flexible approach in regulation are developed. Firstly, the core of network monopoly starts to weaken allowing for more third party involvement. Secondly, the increasing number and heterogeneity of stakeholders makes “one-size-fits-all” regulation simply less suitable, whilst regulation needs to take account of various interests.

The range of innovative approaches and new ideas relevant for modern economic systems with digital networks presented here hopefully is a useful—albeit modest—contribution to a better understanding of a rapidly changing world economy. Key issues analyzed here for certain countries and regions or sectors are often of a broader, sometimes global, relevance. This is the second special issue of this journal devoted to ICT dynamics in an economic perspective (in 2007: Digital economy and regulatory issues, a special issue, edited by G. Knieps und I. Vogelsang) and there is no doubt that further related contributions—and special issues—will follow. It is an important analytical challenge for economists to fully understand the enormous impulses and changes related to the expansion of the digital world economy and it is unclear whether or not standard macroeconomic approaches for example will still be useful in digital open economy macro models (for innovative steps see the book Welfens, P (2002) *Internet economics.net: Macroeconomics, Deregulation, and Innovation*). It is fairly obvious that national regulation of telecommunications in an internet-based world of digital communications is inadequate so the question arises which vertical network of policy actors should assume regulatory responsibilities and in which way.

One cannot overlook that the digital world economy will raise truly distinct and new important challenges for policy makers, the business community and society at large. We hope that this special issue will contribute to a better understanding of new policy approaches and improved analytical perspectives.

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