Summary
Samenvatting

“The Internet bubble and the impact on the development path of the telecommunication sector”

Summary

In this research project the impact of the Internet bubble on the development path of the telecom sector has been explored and explained; the insights thus obtained are used to assess the implications for policy and strategy formation in the aftermath.
The period being addressed is centred around the bubble period 1995-2002, the recommendations are oriented towards the future, from 2006 and beyond. The study links the developments in the communication sector to those in the information technology sector. The geographical focus is oriented to the USA and Europe.

Research approach
The overarching research approach applied is called *critical realism*. The world is thereby perceived as complexly structured, open, intrinsically dynamic and characterized by emergence and hence novelty. The aim of the social sciences is considered as the uncovering of particular social structures of significance, whereby the *explananda* are the practices in which people are engaging, and the *explanans* are the physical, social and psychological conditions of the relevant actions. The purpose within this approach is not prediction, as this would rely on ‘constant event conjunctions’, but the identification and comprehension of the structures, powers, mechanisms and tendencies which produce or facilitate future events. In this respect historical regularities are providing the insights into, as well as the understanding of these structures, powers and mechanisms. Euphoria, separately and also as a part of the broader phenomenon of successive technological revolutions, are bringing about this type of regularity. To assess the long-term impact the focus of the research has been directed to the changes in the industry structure and the role of paradigms and technological trajectories in shaping the development path of an industry.

The impact of infrastructure related periods of euphoria:
From the accounts of historical bubbles reviewed in the context of this project it can be concluded that periods of euphoria are a recurring feature of economic development. The brevity of our ‘financial memory’, the wish to nurture economic growth and our tendency as human beings to pursue opportunities for realising quick gains, will stimulate the development of future bubbles.
From an economic perspective periods of euphoria can be considered inefficient and even wasteful. However, when they occur as part of a new technological revolution, the (over)-investments in the related infrastructure will provide the necessary basis for reaping the potential benefits of the new techno-economic paradigm, including the expected broad-based productivity improvements.
With respect to the productivity improvements, the new ‘Information and Communications’-revolution can be considered to have two ‘installation phases’. In the initial phase the emphasis was on investments in IT. Albeit, these investments

did not yield the anticipated productivity improvement at the aggregate level, and the notion of a productivity paradox emerged. Recent research at firm level has shown that the anticipated productivity improvements only occur over time and if, next to investments in IT-hardware, complementary investments are made in human asset development and in related organizational change.
The second 'installation phase' relates to telecommunication, in particular the emergence of the Internet. The Internet leverages the advancements in information and communication technologies and generates productivity improvements through changes in transaction costs, e.g. in terms of changing business models, the changing nature of the market place, and in changes in the degree of information asymmetry. The Internet also places existing institutional arrangements in a new perspective, e.g. in relation to topics such as intellectual property and digital rights management. Moreover, the Internet introduces new technical, economic and social issues to be addressed and resolved. These include issues related to privacy and (virtual) identity, to information security, to phising and spamming, as well as the governance of the Internet.

Implication and recommendation regarding policy:
While it could be argued that the telecom reform process has run its course, the linkage of the telecommunication infrastructure to the diffusion of the new techno-economic paradigm extends the scope of policy formation from telecom reform, to ICT policy and beyond. Many of the changes the paradigm shift has evoked are still very much emergent, and hence have certainly not led to a full alignment between the technological, economic and social domains. It also appears that many of the issues are being addressed in isolation, i.e. not linked to the broader phenomenon of diffusion of a technological revolution. When considered in isolation a resolution may be problematic as the broader goal that should be pursued is not being perceived. Hence, the results may be suboptimal. Therefore, it is being recommended to revisit the current policy formation process against the back drop of the diffusion process of the 'ICT-driven' technological revolution.
It should be noted that we are at a unique juncture, the transition from the 'installation' phase to the 'deployment' phase of the new techno-economic paradigm. This is a period in which the state, economic and social actors can adjust the rules and regulations to facilitate the solid expansion of production capital, with the prospect of a 'golden age' to develop.
To facilitate this process the following stepwise approach is recommended: (1) to understand and appreciate the attributes of the paradigm shift, using the Techno-Economic Paradigm framework, (2) to understand and appreciate the relationships to economic activity, using the Transaction Costs Economics framework, (3) to identify the tensions between the current institutional framework that has been optimized for the previous 'Fordist'-paradigm and the (emerging) needs of the 'ICT-driven' paradigm, (4) to assess the scope and impact of these tensions, (5) to identify the solution space (local, regional, global), (6) to identify the stakeholders involved (government, industry, and citizens), and (7) to engage and resolve the issues, as they relate to policy formation and implementation.

The prospect that upon an appropriate adjustment a period of prosperity, a ‘golden age’, may develop, should present a compelling ‘incentive for action’ for all actors involved.

Implication and recommendation regarding strategy:
In the ‘utility era’ of the telecom industry the industry structure was relatively stable and developments were evolutionary. Hence the strategic activity was primarily a matter of long-term planning. The process of telecom reform, involving privatization and the introduction of competition, fundamentally changed the ‘rules of game’ and moved strategy formation to the forefront of corporate activity.
The period of euphoria is characterized by a quickly expanding range of business opportunities. Hence the frequency of the strategy cycle increases and the strategy horizon changes to medium and short-term. In the period of frenzy ‘consensual vision’ takes over and strategic formation becomes a ‘copy-cat’ activity. Alternative views on the development of the industry are being suppressed, and in this euphoric period the incentives, in particular stock options, are driving the behaviour of managers.
In the crash and into the immediate aftermath strategic activity is aimed at survival. The aftermath provides the opportunity to reflect on the effects of the bubble on the industry ‘development path’ and the underlying changes in industry structure and paradigms. The changes in industry structure are at large the result of the telecom reform process combined with the technology induced transition from the circuit-mode paradigm to the packet-mode paradigm and from fixed to mobile communication. For the telecom operators these changes resulted in the transition from a prevailing voice-dominated business model to an Internet-dominated business model. Moreover, it implied a change in the institutional environment, from primarily government-driven into primarily industry-driven.
The translation of these changes into firm strategy has been and remains the responsibility of the individual firms, recognizing that firms differ in their resource base, in their expectations regarding the future, and in their perspectives on the process of strategy formation.

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