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Share the risk: access to Next Generation Networks

The telecommunications industry is currently in the midst of a disruptive technological upheaval. Next Generation Networks (NGN) enable higher Internet bandwidths and new applications. However, NGN deployment depends on the conditions under which investors have to grant their competitors access to the new infrastructure. This note describes how E.CA modelled different regulatory regimes for access to NGN and compared the outcomes in terms of consumer welfare.

The existing fixed-line telecommunications network was built decades ago by state-owned incumbent operators and is based on copper technology. Incumbent operators still own essential parts of that network but access regulation requires them to wholesale these essential parts to retail competitors at cost. This stimulates entry and enables competition whilst avoiding a wasteful duplication of networks.

Next Generation Networks (NGN), based on optical fibre technology, offer vastly greater bandwidths and facilitate advanced Internet applications such as HDTV, interactive gaming, 3D and so on. However, NGNs have yet to be deployed and it remains uncertain whether the new applications that require larger bandwidth will succeed in the retail market.

Against this background, access regulation for NGNs appears desirable in order to enable competition for the new services. However, traditional access regulation may put investors at a disadvantage: if NGN-based services become a success, traditional regulation requires investors to share the benefits of NGN; if NGN turns out to be a failure, the investor bears its costs alone. Thus, regulation may discourage investments in the first place.

Modelling markets and regulation

The trade-off sketched above is typical for many regulatory and competition problems. The benefits from an efficient or competitive usage of infrastructure, once they exist (static efficiency), need to be weighed against the benefits from creating new infrastructure in the first place (dynamic efficiency).[1]

Obviously, restricting the analysis to either the static or the dynamic part of the problem must inevitably yield misleading conclusions. Thus, we modelled the most important aspects of the markets and regulation within a game-theoretic framework, integrating both the static and the dynamic aspects.[2] This methodology supposes that all firms act so as to maximise their own profits and then derives the stable market equilibrium for a wide range of reasonable market conditions.

[1] Patent protection is another well-known example where the duration of the protection has to be weighed against incentives to invest in research and development so as to create e.g. a new medication in the first place.

[2] The latest version of the academic paper, including the technical model set-up, is contained in Nitsche, R. and L. Wiethaus (2010), "Access regulation and investment in next generation networks – A ranking of regulatory regimes", *International Journal of Industrial Organization*, 29, 263-272; ESMT White Paper WP-110-02 contains a number of extensions and applications, http://www.e-ca.com/sixcms/media.php/689/2010_WP-110-02.pdf.

Our framework considers two stages:

1. Investment phase: An investor determines how much she is willing to invest in NGN.

2. Competition phase: The investor and other firms compete in the (broadband) retail market – given a specific access regulation scheme.

Crucially, when determining her investments in the (first) investment stage, the investor anticipates the regulatory conditions in the (second) retail stage and adjusts investments accordingly.

We modelled a number of relevant NGN access regimes.[3] Here, we focus on two: the traditional access regime and a regime involving risk-sharing.

The traditional access regime requires the investor to grant access to its NGN at a wholesale price that covers a proportionate share of the investment costs. As a result, if the NGN is a success, all firms will cover the investor's costs proportionally. However, if NGN-based applications fail in the retail market, no other firm will seek access and the investor will bear the investment costs alone.

The risk-sharing regime resembles the traditional regime if NGN succeeds. However, if NGN-based applications fail in the retail market other firms would still be obliged to cover their 'fair share' of investment costs. For example, the access price might not distinguish between copper and fibre-based access (e.g. due to a broad market definition) and could allocate fibre investment costs to both types of access. This means all firms would cover the costs of NGN proportionately, regardless of its success.

Results: traditional regulation vs. risk-sharing

The modelling results show that an access regulation that shares the risks creates higher investments (higher dynamic efficiency) than the traditional regime. This means NGN would be deployed earlier or to a larger geographic extent. The intuition for this result is that risk-sharing partly insures the investor against the risk of failure and therefore increases the expected profitability of such projects.

In contrast, the traditional regime ensures that if NGN-based services are not (or hardly) valued by consumers then network access-seekers will benefit from lower wholesale prices and pass this advantage on to consumers (higher static efficiency). Indeed, according to the very idea of the traditional regulatory regime only efficient investments should be rewarded whilst 'gold-plating' should be discouraged.

The essential step of this modelling exercise combines both the dynamic efficiency in terms of investments and the static efficiency in terms of competitive intensity. It reveals that the risk-sharing regime creates overall higher consumer welfare than the traditional regime.

Conclusion

The analysis has a clear policy implication: traditional telecommunications regulation should be amended when it comes to risky investments in NGN. Specifically, regulation should accommodate risk-sharing between the investor and access-seekers. This stimulates investment incentives and benefits consumers because high-speed networks will be developed earlier and to a larger extent.

[3] Next to the traditional regime (e.g. long-run-incremental costs, LRIC) and the regime that distributes risks (e.g. fully-distributed costs, FDC) we modelled infrastructure cooperation in terms of risk-sharing, a regime involving a risk-premium, and a regulatory holiday. See footnote 2 for a reference to the full report.