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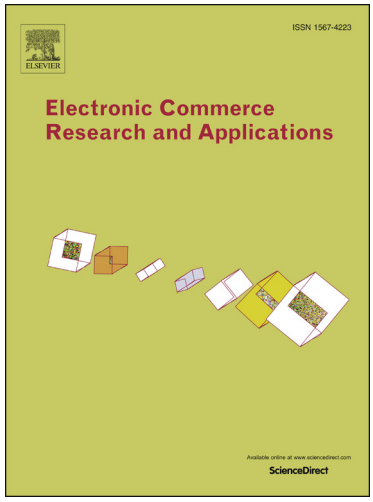


A Dynamic Model for the Evolution of the Next Generation Internet: Implications for Network Policies

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# A DYNAMIC MODEL FOR THE EVOLUTION OF THE NEXT GENERATION INTERNET: IMPLICATIONS FOR NETWORK POLICIES

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## ABSTRACT

This paper studies the deployment of next generation Internet, which will serve as crucial infrastructure for basic network services for social connections as well as premium network services. Service productions and consumptions take different forms across these service types. For example, their network externalities are one of the distinct characteristics of social connections, while premium network services contribute to investment in network assets beyond a base level, resulting in extra capital stock. This multifaceted nature of the next generation Internet raises policy issues regarding network investment and net neutrality. This study aims at developing a dynamic model with a representative user whose preferences are differentiated by service types. The fraction of usage of social connections and the level of the extra capital stock are state variables representing system behavior. My analyses identify not only interior but also boundary equilibria under various scenarios about the relationships between the relative productivity and cost of social connectedness and premium network services. The policy implications from the analysis include the effects of rapid technological development on network obsolescence, which may tip the market in favor of social connections. Net neutrality may lead to unintended consequences though, due to its effects on the sources for network investment.

**Keywords:** Dynamic model; equilibrium analysis; Internet; next generation Internet; network investment, net neutrality; network externality; network policy; service types; stability analysis

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