

Network Economics

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May 8, 2010

Research Direction and Goals

If economics is the study of production, distribution and consumption of goods and services in the physical world, then *network economics* is about these activities in the cyber world. An increasing amount of our daily activities, from banking to socializing, from information searching to entertainment, are carried out in the cyber world, it becomes necessary to understand network economics. The questions in network economics are intertwined with the network technology (that connect billions of people and service providers and bring them together), and the new business models enabled by this prevalent infrastructure.

A fundamental economical type of question is the resource allocation (distribution) policy in the infrastructure, be it resources deployed by the service providers (such as optical fibers) or public resources (such as frequency spectrum for wireless communication). Some of these policies are implemented by the underlying technology, some are controlled by the service providers, and some by the regulatory bodies in governments that choose to exert control over the service providers. A good example of the exertion of regulatory control is the *net neutrality* fight on-going in the United States. In order to promote equal access and perhaps prevent the development of monopoly in basic network service, the Federal Communications Commission (FCC) ruled that Internet Service Providers (ISP) must only provide a common connectivity and transport service for all users. This ruling was recently overturned by an appeals court that sees the need for economic gains in providing differentiated services in various circumstances. In the allocation of frequency spectrum, however, there is a trend for governments to loosen the control by allowing more spectrum to be managed by new wireless technologies to extract more efficiency out of this convenient but precious public resource.

Many new services and business models (that do not exist even 10 or 20 years ago) rely on the magic of *network effect*, a positive *externality* in economic terms. The more users (sometimes referred to as *eyeballs*) in a network, the more valuable the network is. On the other hand, the services (be it content, searchability, availability) depend on the unique contribution of the service providers. These situations often lead to what is known in economics as bargaining games between the users and different service providers that may or may not result in an equilibrium that maximizes the social welfare. The study of these questions should lead to more efficient markets, or identify any need for regulation.

The goal of this project is to bring together researchers in different disciplines in different universities, and promising postdocs and prominent visitors around the world, to elevate Hong Kong's expertise and standard in this new research area. This can hopefully create a critical mass to continue to attract funding from industry and government to maintain a world-class *think tank* in this important area. A partial benefit of this think tank is to provide recommendations to the Hong Kong and Chinese governments on important public policy issues related to network economics.