

# Research Statement

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December 2007

I specialize in the economics of information technologies, pursuing research on their market impact and strategic implications for business. My dissertation work fits broadly within the field of industrial organization, with implications for the design of information systems and public policy. My research is driven by a long standing interest in information technologies. I am intrigued by how these technologies affect society and how society drives technological change in this area. At the core of this interdependency lies the need to understand how individuals derive value from information technologies, and it is my goal to pursue original economics research by exploring novel models of this interaction.

I believe a combination of observation, intuition and formalization can improve our understanding of the economics of IT. Applying this approach to identify relevant questions and guide my research has led me to develop new economic theory, often deriving novel insights. In my job market paper, for example, the analysis of recommender systems requires a formal understanding of the value of product recommendations. This led to the design of an original search model where consumers seek to identify their preferred products within an assortment. The model captures the intuition we use to explain why the exchange of product recommendations is valuable for consumers. It also explains how personalized recommendations, such as those generated by recommender systems, create value in the market and allow the firm to appropriate a share in the process.

An overarching goal of my research is to contribute rigorous analysis that is relevant to a broad audience. I regard my work on file sharing networks as successful in this respect, and also proof of the value in collaborating with others to meet this objective. To deliver our managerial insights to MBA students, we have written an HBS case and teaching note that have already been taught at top ranked business schools. I have also presented our work to target audiences outside academia, for instance in the ultrabroadband conference at Columbia University, and have strived to make our research accessible to the public. HBS Working Knowledge published an interview on our work which ranks among the most accessed stories on their website this year.

I look forward to pursuing similar opportunities in the future. Following my current research project, I plan to write a managerial piece suitable for journals such as Harvard Business Review or MIT Sloan Management Review summarizing the managerial insights gained from my dissertation. Specifically, on how information technologies are changing the structure of artistic markets. My experience suggests that emerging questions in the IT area will continue to provide novel and valuable insights for business.

## Ph.D. dissertation overview

**Recommender Systems.** (*Job Market Paper*) Recommender systems generate personalized product recommendations for consumers and have been implemented by major online retailers such as Amazon. These systems may contribute to the lower sales concentration observed in the online channel, the 'long tail' phenomenon, as casual evidence suggests they play a significant role in electronic commerce. I present a model where consumers face a search problem to identify their preferred products in the market. I introduce word of mouth by allowing consumers to exchange product recommendations in the search process, and show that recommendations are valuable, arise endogenously in equilibrium and increase sales concentration. I introduce a recommender system that matches consumers with similar preferences, acting as an intermediary in the recommendations exchange. The recommender system improves the value of recommendations over word of mouth, increases firm profits and reduces the concentration of sales.

**Peer-to-Peer File Sharing.** This part of my dissertation is a joint project with Ramon Casadesus-Masanell. File sharing is a disruptive technology driving changes in the business models of media and telecommunications companies. We model the topology of a peer-to-peer file sharing network and analyze the allocation of resources across peers. We characterize the contribution of resources by considering peers that anticipate the impact of contributing or not to the network. Our model can explain the presence of freeriders, peers that choose not to contribute, and predict the degree of freeriding as a function of network size. It also explains why different networks coexist simultaneously and how they benefit from bandwidth improvements. The latter suggests that file sharing is a strong driver for broadband demand, as supported by bandwidth usage data. Building on these results, we study the impact of file sharing on a content provider such as iTunes. We analyze the optimal pricing strategy of the content provider and her incentives to prosecute file sharing users and control the network infrastructure.

**Broadband Regulation.** Telecommunications infrastructure in most European countries is largely under the control of incumbent operators. To promote competition in the provision of broadband services, regulators require incumbents to lease their infrastructure to third party providers. I discuss recent data from the market suggesting that incumbents are degrading quality of service for competing providers over their networks. I present a vertical differentiation model to analyze the problem, and examine the quality-wise strategy of a vertically integrated incumbent serving a price-regulated downstream market. When allowed to participate downstream, I show that it is always profitable for the incumbent to foreclose the market by degrading the quality of competitors. I discuss regulatory solutions and examine the initiative adopted in the UK to separate infrastructure ownership from downstream retail operations. This work was initiated for my Master's Thesis and extended during my visit to London Business School in fall'05 advised by Leonard Waverman.

## Research in progress.

My current research examines the impact of information technologies on the structure of artistic markets. Specifically, I am extending my previous work to analyze the changes taking place in the music industry. Emerging artists are increasingly exploiting the online medium to expand their audience. My research on recommender systems can explain how this medium provides larger incentives for these artists to participate in the market. Furthermore, artists have traditionally enjoyed two primary sources of income: music recordings and live performances. As evidenced by the crisis of major recording labels and the increase in touring activity observed in recent years, the established balance between these two income sources is shifting. Recommender systems and file sharing networks have a strong explanatory power for the changes observed in this market.