

## **From Boom to Burst: A Dynamic Analysis of IT Services**

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The IT industry has major contributions in increasing productivity and improving service quality in virtually all industrial sectors and public services. EU market growth in this sector is principally driven by software and IT services: the EU IT market growth by segment in 2006 was as follows: computer hardware 1.8%, telecommunications equipment 2.2%, carrier services 3.5%, software 5.9%, and IT services 5.6%. This paper examines competition in the IT services sector by proposing a fully dynamic structural model to estimate productivity and investment costs in labor and capital. I then use the parameters of the structural model to evaluate the impact of the 2001 IT bubble burst on cost structures for firms in different size classes. The empirical application builds on an eight year panel data-set including all IT service firms in Sweden, which is representative for many other European countries.

The theoretical framework proposed is based on the Markov perfect equilibrium (MPE) framework of Ericson and Pakes (1995). Ericson and Pakes' framework assumes that firms make competitive investments that increase their productivity. My strategy for understanding the dynamics of IT services and for quantifying labor and investment costs, and therefore evaluating the effects of the IT bubble burst in 2001 on different size classes in this industry, proceed in three distinct steps. First, I propose a theoretical model of the IT services industry, where firms make optimal decision over entry, exit, and investment given the strategies of their competitors. Second, I estimate productivity and recover revenues and optimal policy functions consistent with the underlying model. I estimate firm's productivity using an extension of Olley and Pakes (1996)' framework. Since labor is a key factor for service quality in IT industry, I back out productivity from labor demand. Third, I use the estimated revenues and optimal policy functions to recover cost structure by using the two-step procedure proposed by Bajari, Benkard, and Levin (2007). Furthermore, I use the theoretical model to simulate market outcomes with the cost structure recovered before and after the IT bubble burst. I identify the changes in the cost structure that were due to the IT bubble burst. By comparing the predictions of the model under the different cost structures, I am able to calculate the changes to a number of relevant policy measures, such as firm profits and consumer surplus, that were affected by IT burst.

My preliminary results indicate that the 2001 IT burst had a different impact on the labor and investment costs depending on firms' productivity and size class, as well as local market conditions. Specifically, the cost of labor increased relatively more for small and medium firms than for large firms. Differences in costs across size classes have potentially important implications for regulatory policy and governmental agencies that support this industry.

## References

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