NATIONAL UNIVERSITY OF SINGAPORE

School of Computing

PH.D DEFENCE - PUBLIC SEMINAR

Title:	Information Technology Firm Productivity: Investigating the Impacts of Software as a Service Model and Worker Mobility
Speaker:	Mr Ge Chunmian
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Abstract:

Productivity analysis is an important tool in assessing a firm?s ability of converting inputs into output. Previous information systems (IS) research often focused on examining the impacts of information technology (IT) capital investment on firm productivity. However, there could be other phenomena that have significantly affected the productivity of IT firms. With this in mind, this dissertation includes two studies which investigate the productivity impacts of two important phenomena regarding the IT industry. Specifically, the two studies examine the impacts of Software as a Service (SaaS) model and worker mobility on firm productivity in the IT industry.

Study 1 examines the impacts of a new business model - SaaS, on the productivity of software firms. SaaS has been one of the fastest-growing delivery models in the software industry. The industry?s trade press often considers economies of scale as the main benefit of SaaS firms because IT management and the associated resources are centralized at the SaaS vendors. However, centralized IT management also requires the associated cost of expanding the firm?s IT infrastructure to serve more customers. Intuitively, it is not necessary that the former effect must dominate the latter. Using public firm-level data from Compustat, this study attempts to analyze the economies of scale of SaaS firms relative to their traditional counterparts by using the Stochastic Frontier Analysis (SFA) approach. Our empirical findings suggest SaaS firms have smaller economies of scale than traditional software firms. By utilizing the technical efficiency score obtained from SFA, we further examine the effects of R&D expense and advertising expense on technical efficiency. The analysis suggests that it is the R&D expense, not the advertising expense, that could be the cause of smaller economies of scale at SaaS firms.

Study 2 examines the impacts of worker mobility on the productivity of IT firms. Leading software providers, such as Google, invest considerable amounts in employee training. Work experience at these firms benefits not only the employees but also the other IT firms where

these employees move to. In other words, the recipient IT firms are likely to experience productivity spillovers due to the leading firms? human resource investment. Existing literature has documented productivity spillover through worker mobility, but in general does not differentiate the sources of productivity spillover. This paper adds to the literature by scrutinizing the source of labor productivity spillover in the IT industry. Employing the new structural approach and joint General Moment Method estimation proposed by Wooldridge (2009), we show that the spillover effect in IT firms results mostly from the labor inflow from four major software platform providers? Google, Microsoft, Facebook and Oracle. Further, we find that those employees with longer work experience and post-graduate degrees contribute most of the spillover effect.

The notable findings from this research enrich the productivity literature of information technology by empirically examining the productivity impacts of SaaS model and worker mobility. The findings also provide managerial implications for IT firm managers and government policy makers, which are further discussed.