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A Study on the Relative Comparison Between ICT and its Effect on Service Industry

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Abstract: *Data and correspondence innovation (ICT's) job in assistance development is the focal point of this examination. To research how ICT as a vital innovation and non-mechanical determinants can impact firm execution, information at the firm level is utilized. The survey cultivates a conflict that ICT is one of the huge accomplishment factors at the present time, and this particularly turns out true to form by virtue of organization firms, fundamentally due to their fundamental characteristics of instinct and force of information, which are significantly practical with this development. As per the discoveries, the higher paces of efficiency and productivity development experienced by organizations in the help area can be credited to the presence of ICT. Improvement in organizations was in like manner saw to be basically associated with the level of ICT power in help firms, especially when this power is enhanced by legitimate change. Fabricating organizations and other development exercises are utilized as benchmarks, while the effect of ICT on help organizations is totally assessed.*

Keywords: Service Industry, Information Communication Technology, (ICT), Usage

I. INTRODUCTION

In the majority of developed nations, the service sector is now a significant part of the global economy. This industry has been responsible for approximately two-thirds of employment and value added in most industrialized economies over the past decade, according to evidence. So, in recent years, more and more attention has been paid to figuring out what drives (most) service industries' successful growth. Development supposedly is the significant driver of financial development, and various examinations (for instance, Barras, 1990; Evangelista, 2000; 1983, Gershuny and Miles; Miles, 2004) appear to support the beneficial connection between service industry expansion and innovation. In particular, Information and Communication Technology, or ICT, is thought to be a very important part of service innovation right now (Castellacci, 2006; 2005, Hipp and Grupp; Tidd and co., 2005). As a result, in addition to non-technical factors such as organizational change (Bresnahan et al.), 2002; 2000, 2003, Brynjolfsson and Hitt; Tether, 2005), ICT is frequently used to explain the extraordinary growth of the service industries. This study aims to add to the literature on innovation by providing evidence at the firm level to support this claim. This study employs a one-of-a-kind dataset derived from the integration of the Norwegian CIS3 (Community Innovation Survey), R&D (Research and Development) survey, and financial accounts data to investigate the ways in which ICT and organizational change have influenced the expansion of service businesses in Norway2. i) the connection between service growth at the firm level and ICT; and (ii) the way that ICT and organizational change work together.

II. LITERATURE REVIEW

The crucial question is, how did the phenomenal rise in the service sector occur so recently? ICT may be taken into consideration in this regard because it has been largely instrumental in information/knowledge transfer and interactive learning in the modern economy over the past few decades. The answer to this question may lie in the compatibility of the fundamental characteristics of these industries with their recent key economic driver. Licht et al. argue that (1999) and Hipp and Grupp (2005), ICT is currently the most important technology for service innovation. Additionally, the fact that the fundamental characteristics of the service industries are highly compatible with this significant technical source of "innovation opportunities" may be a contributing factor to their rapid expansion (Dosi, 1988). Miles (2004) brings up that administrations are regularly intelligent, including a lot of correspondence with providers and clients in

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all periods of administration exercises. An environment that is "ICT-friendly" is created by businesses in the service industries, which are naturally "information intensive" and organize their operations with a preponderance of communicative and transactional operations. Because innovation in these industries essentially focuses on adopting ICT to facilitate and improve the enormous interactions that are involved in the majority of service operations and activities, this atmosphere appears to be crucial to innovation in the services industry. ICT reduces costs while simultaneously improving the quantity and quality of the majority of service productions because of its advantageous capabilities to significantly increase information channels and speed up communication. This is especially true for services because the majority of service productions are made up of "information" components. According to Gershuny and Miles (1983), this makes the ideal environment for service innovation that takes advantage of ICT. According to Evangelista (2000), the use of ICT plays a crucial role in the innovation activities of service firms and in enhancing their performance due to the compatibility of ICT and services. According to Miles (1993), many back-office operations in service businesses can improve quality and efficiency with the help of ICT. However, ICT's value to service businesses extends beyond the supply side. Due to the (greater) importance of user-producer interaction (such as in "coproductions" of services) and customisation in service businesses as opposed to standardization in manufacturing businesses (Drejer, 2004; Gallouj and Weinstein 1997), ICT replaces physical information systems by enabling real-time and locationless monitoring of customer demands. For example, ICT diminishes the requirement for front-office staff to communicate on an eye to eye premise with clients (Miozzo and Soete, 2001), as on account of e-banking, eauction, e-shopping, e-learning, e-booking (of different sorts), to make reference to yet a couple. Barras (1986) emphasizes that ICT helps to establish a technological platform for new service innovation as well as significantly improving existing services in order to explain the mechanisms by which ICT leads to the improved innovative performance of service firms in recent times. Additionally, ICT greatly enhances and supports service companies' extensive interactions with users and suppliers, which are essential sources of innovation-related information (von Hippel, 1988; 1995, Leonard-Barton). This line of reasoning, on the one hand, tries to recognize the competitive advantage that service businesses can gain from an environment that is "ICT friendly." On the other hand, it points out that ICT is very important to these businesses' innovation activities and plays a significant role in them. As a result, ICT-based innovation helps service businesses achieve significant advancements and superior economic performance. The majority of services are engaged in innovation based on ICT, and they certainly benefit from it, according to evidence from the OECD (2000), for instance, despite the diversity of service activities across industries discussed earlier.

III. DATA AND VARIABLES

ICT intensity was previously measured in a variety of ways, such as the proportion of investment devoted to ICT (Doms et al., 2004), as ICT consumption per worker (Cainelli et al., 2004; Dunne and co., 2001), as well as the percentage of the workforce that is equipped with ICT (Maliranta and Rouvinen, 2004). The current concentrate on the other hand applies ICT Research and development (Innovative work on ICT) use, somewhere in the range of 1999 and 2001, over all out consumption (in general costs in 2001) of a firm as an illustrative variable for ICT power (ICTINTE) in the analysis.16 Steady with proof for most OECD nations (Pilat et al., 2002), point by point measurements (not revealed here, yet accessible upon demand) show that Norwegian firms in various businesses are for the most part ICT-concentrated, for example that they show a decent degree of ICTINTE. Business services, financial services, computer-related services, and telecommunications are just a few examples of these service providers, which operate in both ICT-producing and ICT-using sectors17. To put it another way, research and development on ICT is carried out not only by ICT manufacturers but also by ICT users, for instance, as a means of determining the most effective means of utilizing this technology. This point upholds the application/significance of this variable to the tested assistance (and assembling) firms considered in the examination. The relevance of R&D may be explained by the fact that many businesses invest in R&D, even though the majority of fruitful findings have already spilled out into the public domain (Cohen and Levinthal, 1989). In addition, the use of information on ICT R&D in the current study is consistent with a number of previous works that investigated the relationship between innovation and growth using R&D data.18 This is due to the fact that, on the one hand, research and development gives the company that is doing it a first-mover advantage in using the new technology that is found in-house. However, the same company can also become a rapid follower by utilizing

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its "absorptive capacity," which it has developed through research and development, to benefit from innovations of rivals (Cohen and Levinthal, 1990). This line of reasoning emphasizes that research and development (R&D) effort is essential to innovation and competitiveness, and that R&D expenditure data may thus be considered a useful source for constructing a proxy for ICT intensity.

Analysis

Comparing the growth rates (GPR0103 and GPF0103) of ICT-intensive firms (for which ICTINTE > 0) and non-ICT firms (for which ICTINTE = 0) in services, as well as of firms (both manufacturing and services) whose ICT intensity (ICTINTE) was above or below the industrial average between 1999 and 2001, allowed for a descriptive analysis of the role that ICT plays in explaining firm performance. The following are three inquiries: i) Whether and to what extent ICT-intensive service businesses have outperformed non-ICT service businesses in terms of growth rates between 2001 and 2003; ii) Whether and to what extent service businesses with an ICT intensity above the industrial average have outperformed those with a lower ICT intensity in terms of growth rates between 2001 and 2003; (iii) if and to what extent there were differences in these growth rates between above-average and below-average ICT intensive businesses between 2001 and 2003 in the manufacturing or service industries. According to Pilat et al. 2002), since this could help to explain the contribution of ICT to growth, it may be interesting from an economic standpoint to compare the performance of ICT-intensive businesses with those with low or no ICT intensity. The first step in this exercise is to compare the sizes and industries of ICT-intensive and non-ICT service companies' growth rates (see Table 2). Overall, the results show that ICT-intensive service businesses are growing faster in terms of productivity and profitability (the difference is 0.03 and 0.07 percent, respectively). However, it would appear that the (higher) growth of larger ICT-intensive service businesses is the driving force behind these outcomes. ICT-intensive service firms in sizes 2, 3, and 4 experienced higher growth rates between 2001 and 2003 than non-ICT service firms (0.09, 0.41, and 0.72 percent, respectively, in terms of productivity and 0.12, 0.08, and 0.46 percent, respectively, in terms of profitability), whereas Size 1 firms experienced the opposite trend. It could be argued that smaller ICT-intensive service firms typically have a smaller scale of business and fewer members/employees, resulting in less interaction and computerization when attempting to explain the different results for smaller and larger firms. As a result, it's possible that they won't get as much out of R&D or new technology. Except for telecommunications and computer-related services, the impact of ICT R&D on service growth across industries is relevant in most cases.

IV. CONCLUSION

The connection among ICT and the development of firms in help enterprises is of main pressing issue, with assembling firms and different kinds of mechanical advancement associated with the examination as benchmarks. In order to investigate how ICT and organizational change are related to the expansion of service businesses, organizational change is also taken into consideration. Simply put, this study focuses on two distinct areas of research: the complementarity of ICT and organizational change and the relationship between ICT and firm-level growth in services. The majority of ICT-intensive service businesses have outperformed non-ICT service businesses in terms of growth in productivity and profitability, and those with ICT intensity above the industrial average have experienced even higher growth rates, according to the study. When compared to manufacturing, the results also reveal a wider performance gap between service businesses that are more or less dependent on ICT. This is consistent with the argument that ICT is one of the primary economic drivers in the current techno-economic paradigm, particularly for service industries (Castellacci, 2006; 2002, by Freeman and Louca; Miles and Gershuny, 1983). According to Evangelista (2000), the information-based fundamental characteristics of services are largely to blame for this phenomenon. These fundamental characteristics give ICT a central role in service innovation and, as a result, assist in promoting the superior growth of service firms (OECD, 1996). The econometric findings appear to be consistent. Different estimates show that ICT has a positive effect on the growth of service businesses, but this is not confirmed (not statistically significant) in the manufacturing sector. As is normally contended, a company's size impacts its monetary presentation, however other specialized development exercises don't show a similar predictable commitment to development as ICT Research and development. This viewing appears to be as steady with the view that ICT is the main innovation for development in administrations (Licht et al., 1999), while "other technologies are of relatively minor importance" More importantly, the

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study found that ICT and organizational change have a complementary effect on a business, meaning that a business's performance can be even better if they work together. Bresnahan and colleagues (2002) bring up, it is conceivable that a firm which has put vigorously in ICT doesn't profit from it as much true to form, and this is on the grounds that ICT requires rearrangement. According to Bryanjolfsson and Hitt (2000, 2003), in many instances, true success necessitates not only the contribution of ICT on its own but also that of organizational change (Brynjolfsson, 2000, 2003). Brynjolfsson and others 2002).

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