Impact of Computer Use, Computer Skills and Computer Use Intensity: Evidence from Workplace ERS 2004

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Background

Computers and ICT have changed the way we live and work. Economists have long been interested in this process. The almost universal application of word processing, spreadsheets, and databases has increased office efficiency dramatically. The rise of email, internet services, and telecommunications offers unprecedented opportunities to access instant information, and reach new markets. As a result, computer literacy represents one of the most important basic skills necessary for an individual to function in an advanced industrial economy.

The primary objective of this research is to examine the determinants of computer use at work and to explore the relationship between computer skills and earnings. This question is of policy importance since it contributes to an understanding of how IT affects productivity, inequality and economic growth.

Key Findings

- The authors find that in the UK there is good evidence to suggest that the rate of return to computer use is between 3-10%. The precise estimate depends on the degree to which the authors can control for the unobserved characteristics of individuals, but this estimate is found to be robust.
- Computer use is directly related to education. Computer users have around 2.5 more years of schooling than non-users.
- The use of word-processing, email and programming give a clear and significant wage return.
- The greater the number of tasks a person uses a computer for; the higher is their wage return.
- The higher is the computer use at one's workplace the larger are your earnings if you use a computer yourself.

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Methodology

The authors use data from the 2004 Workplace Employment Relations Survey. This is a nationally representative random sample of establishments, which provides detailed information about workers, working conditions and industrial relations.

The main methodological problem faced by the authors is the potential endogeneity of computer use arising from the observation that the most able workers are also those most likely to work with computers. Computer use may be highly correlated with unobserved characteristics that also generate a wage return. Hence it is potentially difficult to determine whether it is innate ability that generates higher earnings and IT skills or whether IT skills per se have a direct effect on earnings over and above the influence of ability. To overcome this problem the authors control for personal background variables, establishment, industry and occupation effects on the estimated rate of return to computer use.

The authors explore the size of the coefficient on computer use in an earnings equation. Using detailed information on computer use they estimate the return to using different computer skills. They also present estimates of the return to intensity of computer use as measured by the number of tasks an individual uses a computer for. Finally, they explore the issue of whether the proportion of computer users in a firm offers an externality to the individual.

Other Findings

- Earnings of those who use IT are 48% higher than those who don't, when the authors don't control for background factors.

- Demographic groups that are over represented among computer users are females and the 22-39 age group.

- On average, workers that use a computer work three hours more weekly compared to others - this fact suggests that the type of work these two groups do is quite different, not least because part time workers have a lower computer use rate than those in full time jobs.

Conclusions and Implications

This paper provides evidence of the impact of ICT on earnings.

The main conclusion of the research is that in the UK there is good evidence to suggest that the rate of return to computer use may be between 3-10%. The precise estimate will depend on the extent to which unobserved differences and individual unobserved ability can be controlled for. The authors' discussion of the return to computer use seeks to establish the size of the differential rather than the reasons for its existence.

The results relating to the return on the use of particular distinct IT skills show that the use of word-processing, email and programming give a clear and significant wage return. The authors also show that the higher intensity of computer use (in terms of the number of tasks a person uses a computer for) the higher is their wage return. They also show that the higher is the computer use at one's workplace the larger are your earnings if you use a computer yourself. But conversely if you are a non-use then your earnings are unaffected by working in an establishment with a high fraction of computer users.

Overall, the research shows that previous studies have overestimated the return to computer use by not taking full account of the unobserved characteristics of individuals,

and industry and occupational effects. However, the return to computer use is shown to be between 3-10% when individual, occupation and industry effects are taken into account.

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