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ICT intensity and New Zealand's productivity malaise: Is the glass half empty or half full?

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Abstract

This paper contributes to the conflicting international evidence on the impact of information and communication technology (ICT) on labour productivity (LP) growth. We examine the link between ICT intensity and New Zealand's LP growth in 29 industries over the period 1988–2003, and over relevant sub-periods. After deriving an ICT intensity index to classify industries into 'more ICT intensive' and 'less ICT intensive', we compare LP growth rates for these two industry categories. We also employ dummy variable regression models to more formally test the relationships between ICT intensity and LP growth. The results prove sensitive to the time period specified. When breaks in the data series are taken into account, there is support for the view that LP growth of more ICT intensive industries has improved over time relative to that of other industries, even though overall LP growth was weak. Lack of LP growth per se, therefore, is not necessarily evidence against the beneficial productivity impacts of ICT.

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1. Introduction

The OECD has emphasized that information and communication technology (ICT) has been, and remains to be, an important driver of growth and productivity in its member countries (OECD, 2003a). Recent improvements in growth and productivity performance in the US and many other OECD countries have been linked to the expansion of the production of ICT goods and to the use of ICT to enhance efficiency and innovation (OECD, 2003a). A series of reports by the Australian National Office for the Information Economy (NOIE) also indicates that many industries in Australia seem to have gained substantial productivity benefits from the use of ICT.¹ New Zealand (NZ) is in the leading group of countries as measured by ICT uptake indicators (OECD, 2003a, p. 10).² Moreover, its reforms and policy changes implemented in order to stimulate the development of a knowledge-based economy seem to be heading in the right direction (Frederick and McIlroy, 1999). Indeed, NZ's recent rate of economic growth has remained strong despite a worldwide downturn starting in early 2001 (Shapiro, 2003).³

However, there are concerns about NZ's productivity performance. Scarpetta et al. (2000, p. 15) and OECD (2003b, p. 138) report that NZ's productivity growth has been among the lowest in the OECD during the past two decades. Bar-Shira et al. (2003), comparing the productivity performance of the 25 richest economies, rank NZ at the bottom of that group in 1990. Despite a number of NZ studies indicating that productivity growth improved from 1993 onwards (Razzak, 2003; Black et al., 2003), Shapiro (2003) argues that it has not accelerated after 1995. Färe et al. (2003) and OECD (2004) also conclude that so far the productivity improvements have not been sufficient to generate the conditions for stronger trend growth in GDP per capita that would lift NZ back into the top half of the OECD, the stated goal of government policy.

Has something gone wrong? Have the economic reforms launched in 1984 failed? There are a large number of studies that have attempted to provide answers to these questions, but most of them have little to say about the contribution of ICT.⁴ This paper begins to fill this gap by examining the impact of ICT on NZ's productivity performance for the period 1988–2003. Following Stiroh (2002a), our analysis focuses on labour productivity (LP) growth of industries that are classified as either more ICT intensive or less ICT intensive (compared to the average ICT intensity across all industries).⁵ We find that LP growth of more ICT intensive industries

¹ See NOIE (2004). Other relevant Australian studies, using different methodologies, include Parham et al. (2001) and Simon and Wardrop (2002).

² ICT investment, however, has nevertheless been reported as being relatively low in NZ, mainly due to modest expenditure on software (OECD, 2004, p. 34/5).

³ It should be noted that recent economic growth in NZ was mainly driven by rapid population growth due to net migration and also by the strength of improving terms of trade (Galt, 2000; IMF, 2003).

⁴ See Galt's (2000) review of the NZ growth and productivity literature and the NZ Treasury's (2004) recent stocktaking of its work on the country's growth performance and associated policy issues. The latter mentions ICT in one short paragraph (Treasury, 2004, p. 62).

⁵ A number of studies of the impact of ICT have similarly focused on LP as a way of circumventing the need for estimating ICT capital stocks at the industry level (Ark, 2002, p. 6).

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