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The Swedish ICT miracle — myth or reality?

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Abstract

This article investigates the productivity development in Sweden in the 1990s. The results show that much of the recorded Swedish surge in labor productivity was due to the spectacular growth of the Radio, television and communication equipment (RTC) industry. However, this article shows that the productivity growth of the RTC industry is very sensitive to value added price deflators. Unlike Sweden, the US uses hedonic price indexes for semiconductors and microprocessors which are important intermediate inputs in the RTC industry. Estimates based on the US intermediate input price deflators for semiconductors and microprocessors suggest that the productivity growth of the Swedish RTC industry during the 1990s is an artefact. This implies that the productivity growth of total manufacturing has also been overestimated. The results for Sweden are also interesting for other countries such as Finland, Ireland and South Korea where ICT producing industries have contributed substantially to labor productivity growth. © 2004 Elsevier B.V. All rights reserved.

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1. Introduction

During the 1990s productivity research increasingly came into focus. Comparisons of productivity across countries and industries are important for evaluating

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economic performance. Moreover, particular attention has been paid to productivity comparisons in industries with rapid technological change and falling prices such as the Information and Communication Technology (ICT) producing industry.¹

Comparing productivity in industries producing homogenous products is an easy task. For example, in the crude oil industry, output is arrived at by a mere counting of barrels of oil produced. Measuring productivity in industries where technology changes rapidly is a totally different matter. According to “Moore’s law” microprocessors are halved in price and doubled in capacity every 18 months. A computer based on the latest technology may become obsolete within a year or two. Is it then reasonable to compare productivity in industries with rapidly changing technology and prices across countries? Nordhaus (1997) argues that capturing the impact of new technologies on living standards is beyond the practical ability of official Statistical Agencies. The essential difficulty is that high-tech products consumed today may not even have existed a decade ago. Moreover, if they did, the quality of the goods that we consume today is much higher compared to the quality of “the same” goods a decade ago.

The increase in productivity growth in the US economy since 1995 (see Council of Economic Advisers, 2003) has resulted in an intense debate on the impact of ICT technology on productivity in different countries. In Sweden, ICT technology created an economic boom in the late 1990s. In 2000 Stockholm was named the Internet capital of Europe by Newsweek Magazine. According to Newsweek (2000) the Stockholm phenomenon could be explained by “the looming marriage of the Internet and the third-generation mobile telephony in Europe”.

Four years later, it was evident that much of the Swedish Internet era of the late 1990s was a transient hype, partly created by media. However, it has been very difficult to explain the fundamental fact that productivity growth in Swedish manufacturing and particularly in the Radio, television and communication equipment (RTC) (ISIC 32) industry increased rapidly during the 1990s. Did the increased productivity growth in manufacturing and RTC reflect some fundamental changes in the economy or was it largely a statistical illusion?

Much of the recent international debate about the ICT revolution has focused on whether ICT investments have had a substantial impact on productivity across a wide range of different industries or whether only a few industries have been affected. For the US there appears to have been an early link between the ICT investments and productivity effects in industries that are using ICT intensively (Stiroh, 2002). However, there are still some skeptics such as Robert Gordon (2000), who argue that

¹ OECD (2002) defines the following industries as ICT producing: Office accounting and computing machinery (ISIC 30), Insulated wire and cable (ISIC 313), Radio, television and communication equipment (ISIC 32), Instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment (ISIC 3312) Industrial process control equipment (ISIC 3313), Wholesale of machinery, equipment and supplies (ISIC 5150), Renting of office machinery and equipment (ISIC 7123), Telecommunications (ISIC 642) and Computer and related services (ISIC 72). In this article, ISIC 30–33, 64 and 72 are defined as ICT producing industries. This is due to the lack of reliable data at less aggregated industry levels than the 2-digit ISIC level.

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