



Does the Internet increase labor productivity? Evidence from a cross-country dynamic panel

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Abstract

The Internet has various economic functions and is a fundamental part of most economic activities and transactions. In this paper we apply a Dynamic Panel Data approach to study the impact of the Internet on labor productivity using data from 108 countries for the period 1995–2010. The results of the study show that the Internet has positive and statistically significant effects on labor productivity. Assuming other factors stay constant, increasing the number of Internet users by one percent increases GDP per employed person by \$8.16–14.6. Educational expenditures as a percentage of GNI, per capita health expenditures, trade and gross capital formation as a percentage of GDP also have positive and statistically significant effects on labor productivity.

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1. Introduction

The Internet can lead to more economic efficiency. It can reduce consumer costs and expand the range of consumer choices. From the producer perspective, the Internet can improve productivity

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and promote creativity in production. At a macro level, the Internet and its related technologies decrease the information sending and receiving costs, and in turn increase total output.

In the past two decades, several studies have been undertaken to examine the relationship between information and communication technology (ICT) and macroeconomic variables such as economic growth, productivity, inflation, and international trade (Oliner and Sichel, 2003; Oliner, Sichel, & Stiroh, 2008). In most of these studies, ICT was represented by variables such as personal computers, telephone lines, mobile (cell) phones, Internet users, and telecommunication expenditures.¹

In the last decade, the economic impacts of the Internet have been studied separately. The Internet can increase total output and affect economic growth positively (Cette, Mairesse, & Kocoglu, 2005; Choi & Yi, 2009; Holt & Jamison, 2009; Kim & Oh, 2004; Klein, 2003; Koutroumpis, 2009). Broadband expansion has positive impacts on local and cross country growth (Kolko, 2012; Koutroumpis, 2009). Furthermore, foreign direct investment (FDI) has been stimulated around the world by improving access to the Internet (Choi, 2003). Moreover, the Internet as a cost-reducing and efficiency-improving technology has led to lower inflation rates and hence benefited consumers (Meijers, 2006; Yi & Choi, 2005). The Internet has had positive effects on bilateral and international trade by reducing communication and transportation costs (Choi, 2010; Freund & Weinhold, 2004). The Internet has been able to provide favorable results at the firm level and has led to major revenue increases and cost savings in developed countries (Litan & Rilvin, 2001; Varian, Litan, Elder, & Shutte, 2002). By improving market information, identifying customers and production standards the Internet can increase exports at the firm level (Clarke, 2008).

In this paper the impact of the Internet on labor productivity is examined. To this end, data on 108 countries from 1995 to 2010 were obtained from the World Bank database to estimate an econometric model using a Dynamic Panel Data Approach.

2. Literature review

Improving Internet access influences the economy positively in terms of improving economic growth, reducing inflation and stimulating trade and foreign direct investment. Choi and Yi (2009), using cross-country panel data for 207 countries from 1991 to 2000, conclude that the Internet has a positive and significant effect on economic growth. In the estimated model, investment relative to GDP, government consumption relative to GDP and inflation were used as control variables. They were found to have positive, negative and negative effects on economic growth, respectively. Koutroumpis (2009), using a data set from 22 OECD countries from 2002 to 2007, investigated the impact of broadband penetration on economic growth. He concludes that there is a significant, positive causal relationship between broadband penetration and economic growth. These findings were repeated in Holt and Jamison (2009) using US data. Kolko (2012), in his paper using US data from 1999 to 2006, studied the relationship between broadband expansion and local economic growth and found it to be positive. He shows that this relationship is stronger in industries that rely heavily on information technology and in areas with lower population densities.

Yi and Choi (2005) have examined the relationship between the Internet and inflation by using cross-country panel data from 1991 to 2000. Their results show that if per capita Internet users

¹ These studies include, Oliner and Sichel (2000), Oliner and Sichel (2003), Litan and Rilvin (2001), Freund and Weinhold (2004), Choi (2003, 2010), Meijers (2006), Clarke (2008), Noh and Yoo (2008), Koutroumpis (2009), Yi and Choi (2005), Holt and Jamison (2009), Freund and Weinhold (2004), and Kolko (2012).

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