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The impact of e-commerce and R&D on economic development in some selected countries

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Abstract

This paper investigated the impact of e-commerce and R&D and two other variables on economy development in 21 selected countries. This study used panel data technique with Generalized Least Square Regression (GLS) method during the period of 2005 to 2013. The results showed that e-commerce and R&D had a positive and significant impact on GDP (Gross Domestic Product) per capita based on purchasing power parity, with e-commerce having a stronger development-enhancing effect in comparison to R&D. Health expenditure and government size as other dependent variables also had a positive influence on GDP per capita, which could be effective in improving and growing the economy.

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Keywords: E-commerce; Economic development; R&D; Panel data analysis

1. Introduction

These days, information and communications technology is the focus of most countries in the world. In the past two decades, the ongoing application and diffusion of the Internet and e-commerce as well as advances in information technology (IT) have radically altered global economic activity. From the firm perspective, the ability to effectively apply Internet and electronic technology has become both a major opportunity and a big challenge (Kambil, 1995). The advancement of technology has assisted international business. It is undeniable that millions of people worldwide use the Internet to do everything, from conducting research to purchasing products online. The Internet is profoundly affecting almost all businesses. Specifically the multiple uses of the Internet by business entities include the ability to advertise, generate, or otherwise perform regular business functions. Therefore, many firms are embracing the Internet for many of their activities. One impact for e-commerce is to intensify competition and produce benefits for

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consumers, with lower prices and more choices (Malkawi, 2007). In other words, the Internet and e-commerce lead to efficiency improvements, better asset utilization, faster time to market, reduction in total order fulfillment times, and enhanced customer service (Terzi, 2011).

The Internet is also dramatically expanding opportunities for business-to-business and business-to consumer e-commerce transactions across borders. For business to consumer transactions, the internet specifically sets up a potential revolution in global commerce: the individualization of trade. Technology has expanded the consumer marketplace to an unprecedented degree (Ham and Atkinson, 2001). The adoption of information technology similarly exhibits network externality brought about by more users, with the resulting benefits for the users, e.g., fax machine (Economides & Himmelberg, 1995) and cellular phone (Jha & Majumdar, 1999). Over the past few decades, numerous studies have considered R&D as a proxy variable for knowledge capital when examining the relationship between knowledge capital and productivity. Along with the substantial and rapid development of ICT, e-commerce technologies have emerged as an important type of knowledge capital for operating a business.

On the other hand, the growing size of governments during the twentieth century, and especially since the 1960s, has captured the attention of many economists. They have tried to present different theories to explain this phenomenon. According to many theories of growth in the size of governments, with the development of countries, the structure and economic needs change and as a result, the size of government is affected too (Tanzi & Schuknecht, 2000).

In economic literature, there are numerous studies regarding the impact of ICT with GDP growth and trade as macroeconomic variables, but the studies addressing e-commerce and development are so fee and most discussion has been centered on statistical expression and discretion. However, the existing literature does not clarify the impact of e-commerce on economic development very well. The main purpose of this study was to examine the relationship between knowledge capital (including both e-commerce and R&D expenditure) with GDP based on the purchasing power parity. We used a panel data for the selected countries during 2005–2013.

The paper is organized as follows. Section 2 presents a brief review of the existing literature. Section 3 describes the methodology. Section 3.1. describes research goal. Section 3.2. relates the empirical models and data sources. Section 3.3. presents the empirical results. Finally, section 4 draws the conclusions.

2. Literature Review

2.1. E-commerce, R&D, and GDP growth

Information and communication affect to both the supply and demand sides. ICT have effects on the economic behavior of consumers through the utility function on the demand side, and it is also influential on the producer treatment on the supply side. The relationship between ICT and economic growth and efficiency on the supply side of the economy is determined by some complementary factors including organization and management experience, organizational and legislative part, and communications structure as an output on the supply side of the economy, among other factors entering into the capital, thereby leading to the improvement of the production process through capital deepening, advances in technology, and the quality of the labor force. As a result, the value added to output at three levels of the enterprise, sector and country will be increased; ultimately, it will lead to economic growth, labor productivity growth, profitability and the welfare of the consumer (Dedrick, Gurbaxani, & Kraemer, 2003). Empirical studies and theories show that the relationship between ICT on the economic growth can be investigated through three ways: if the theories of economic growth have more emphasis on three factors including population, capital and alteration of technology, the effects of these factors have examined by classic economists. Adam Smith knows Large-scale production as the economy's progress, and Ricardo Malthus defined the limits of economic growth by clarifying the principle of "diminishing returns". Joseph Schumpeter knows Innovation and technological changes (traditional vs. modern) as the most important economic process leading to economic growth.

E-commerce can be defined as the use of the Internet to conduct business transactions nationally or Internationally, as represented by WTO (1998). E-commerce has come to take on two important roles; first as a more effective and