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The impact of e-commerce on international trade and employment

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Abstract

The purpose of the present study is to investigate the impact of e-commerce on international trade and employment. Electronic commerce offers economy-wide benefits to all countries. The gains are likely to be concentrated in developed countries in the short run but, developing countries will have more to benefit in the long run. The volume of international trade will increase via e-commerce. The countries open to imports from high-income economies will benefit from knowledge spillovers. In addition, electronic commerce is expected to create and destroy jobs.

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1. Introduction

Electronic commerce offers unprecedented opportunities to both developing and developed countries. In the short run, the gains are likely to be concentrated in developed countries but, in the long run, developing countries have more to benefit. In the short run, developing countries lack the infrastructure necessary to take full advantage of Internet. But in the long run, they can leap frog, skipping some of the stages in the development of information technology through which developed countries have had to pass [1].

The advancement of technology has aided international business. Millions of people worldwide use the Internet to do everything from research to purchasing products online. The Internet is profoundly affecting almost all businesses. The various 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 producing benefits to consumers in lower prices and more choices [2].

Electronic commerce is expected to directly and indirectly create and destroy jobs. New jobs will be generated in the information and communication technologies sector, while the indirect creation of jobs

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will occur via increased demand and productivity. At the same time, some reallocation and destruction of jobs are expected as a consequence of changes in the way of doing business. The net effect on employment will be the resultant of a complex set of interactions and will by no means be uniform across countries, geographic areas, industries or skill groups [3].

This article proceeds in the following manner. Following section provides an overview of electronic commerce. Section II includes some indicators that shed light on the growth e-commerce and its economy-wide effects. Section III highlights the relevant issues dealing with the impact of e-commerce on international trade and employment. Finally, Section IV presents concluding remarks.

2. E-commerce: An overview

E-commerce can be defined as the use of the Internet to conduct business transactions nationally or internationally [4]. E-commerce has come to take on two important roles; first as a more effective and efficient conduit and aggregator of information, and second, as a potential mechanism for the replacement of many economic activities once performed within a business enterprise by those that can be done by outside suppliers that compete with each other to execute these activities [3].

The Internet is dramatically expanding opportunities for business-to-business and business-to-consumer e-commerce transactions across borders. For business to consumer transactions especially, the internet sets up a potential revolution in global commerce: the individualization of trade. It gives consumers the ability to conduct a transaction directly with a foreign seller without traveling to the seller's country. The Internet allows sellers to put their storefronts, in the form of Web pages, in front of consumers all over the world. Technology has expanded the consumer marketplace to an unprecedented degree [5].

The Internet and e-commerce are transforming the way firms operate by redefining how back-end operations – product design and development, procurement, production, inventory, distribution, after-sales service support, and even marketing – are conducted. In this process, the Internet and e-commerce alter the roles and relationships of various parties, fostering new supply networks, services and business models. The end results are efficiency improvements, better asset utilization, faster time to market, reduction in total order fulfillment times, and enhanced customer service [3].

Numbers can indicate the importance of the e-commerce growth. In 1999, global e-commerce was worth over \$150 billion [6]. Around eighty percent of those transactions were between one business and another. According to Inc. Magazine although the US and Canada lead the world in ecommerce spending, other countries are increasingly shopping online. By 2014, global ecommerce spending is projected to increase more than 90 percent. A sizable portion of that growth is expected to come from Latin America, where the amount spent online is projected to more than double. If these projections are accurate, annual ecommerce spending, in billions for 2014 will be: North America \$202.8; Western Europe \$166.5; Asia-Pacific \$93.2; Latin America \$27.1; Eastern Europe & Russia \$27.0; Australia \$4.9; Africa & the Middle East \$3.0 [7].

The number of Internet users also reached two billion worldwide and is growing [8]. The influence of e-commerce stretches farther. It is used more as a trading system in which buyers, and sellers could establish a genuine market price. For example, with more than 90 million active users globally, eBay is the world's largest online marketplace, where practically anyone can buy and sell practically anything. Founded in 1995, eBay connects a diverse and passionate community of individual buyers and sellers, as well as small businesses. Their collective impact on e-commerce is staggering: In 2009, the total worth of goods sold on eBay was \$60 billion -- \$2,000 every second [9].

3. Benefits of e-commerce on economy

The benefits of e-commerce on economy are classified into three groups: firms, prices, productivity. A combination of technological and market forces have compelled companies to examine and reinvent their supply chain strategies. To stay competitive, firms have searched for greater coordination and collaboration among supply chain partners to wring out the inefficiencies that might exist within firm transactions. Many of the transactions can be done externally, via electronic markets. The Internet and its applications have thus served to enhance the process to increase efficiencies in supply chain management [3]. Moreover, ICTs allows firms to identify the market for the inputs they need in production and substantially reduces the cost of gathering and processing information about the prices and input characteristics of different goods and services. In addition, information and communication technologies make it easier to integrate and control remote operations without incurring prohibitive costs. Better ICTs enable optimized operations to be established in low cost domestic locations and countries where comparative advantage is present for the outsourced task. E-commerce thus facilitates the efforts of companies to separate and spin out every conceivable activity in the production process to entities outside the firm [3].

The available empirical evidence on price is mixed. Some of the first studies found that prices of goods sold through the Internet were on average higher than their equivalent purchased through traditional retailers. A more recent study, however, found prices for books and CDs on average to be about 10 per cent lower on the Internet compared with traditional retailers in the United States [10]. Evidence on demand sensitivity to price is also mixed, with some work suggesting a low [11] and others a high price elasticity of demand [12].

Evidence from countries where the use of information and communication technologies is widespread suggests substantial improvements in productivity. In an analysis of the contribution of information and communications technology to economic growth in nine OECD countries, over the past two decades, ICTs contributed between 0.2 and 0.5 % per year to economic growth [13]. During the second half of the 1990s, this contribution rose to 0.3 to 0.9% per year. Effects were the largest in the United States, followed by Australia, Finland and Canada [13]. Another study suggests that the rise of B2B e-commerce will in the long run increase the level of GDP by 5 per cent [14]. In addition, it has been argued that Internet related technologies could increase the speed of financial operations, which raises the issue as to how interest rates should be set and whether the short end of interest setting needs to become shorter *i.e.* time units smaller than a day [15].

Moreover, several studies conclude that information and communication technologies were an important factor in improving the overall efficiency of labor and capital, in the United States [16; 17]. Most importantly, productivity increased not only in the information and communication producing sectors but in sectors of the economy that do not produce information and communications technology [18]. In other words, users of these technologies also benefited from increased productivity. In addition, the data seems to reveal that workers in the US may have also benefited from increased productivity induced by e-commerce and ICTs [19].

4. Effects of e-commerce on international trade and employment

Electronic commerce offers important opportunities to both developing and developed countries. The development of e-commerce is likely to have both direct and indirect impacts on international trade as well as the labor markets.

4.1. E-commerce and International Trade

The use of electronic means and the internet can make the process of initiating and doing trade a lot easier, faster, and less expensive. Collecting information is a costly activity when it involves acquiring information across national borders. In fact, these costs can be so high that they can be considered a

substantial barrier to trade. Finding the right supplier, specifying the product's requirements and quality, negotiating the price, arranging deliveries and marketing products is also very costly. With the internet and e-commerce applications, a whole range of these activities can occur without having buyer and seller in close physical proximity. In this respect, the internet will likely promote trade much in the same way as lifting other trade barriers would. Thus, it is the volume of international trade will likely increase [3].

Especially, the internet when organized via electronic markets through e-commerce applications, reduces information costs and allows consumers and sellers to be matched and interact electronically, reducing the significance of geographic proximity and traditional business networks [3]. A study found ample evidence that, development of global markets via the Internet makes historical linkages less important and suggest that countries with the fewest past trade links have the most to gain from the Internet, especially for developing countries [20]. An evident from a 1998 survey of enterprises in 15 low and middle-income countries suggests that firms in these countries use search engines to research market opportunities [21].

However, whether e-commerce promote international trade will depend on the nature of the good. On the one hand, a number of products that traditionally have required physical delivery can be delivered to a customer via a network in digital form. Examples of these include media products, such as text, film and computer software. On the other hand, most of the goods traded internationally are not deliverable in digital form and therefore transportation costs will continue to play a significant role [3]. In this regard, world trade in digital media products amounted to about US\$44 billion in 1996, less than 1 per cent of total world trade. For most countries, trade in digital media products was less than 2% of total trade. The rate of growth of trade in digital media products is high and above the average rate growth of total trade: the growth in trade for digital media products on average was about 10% between 1990 and 1996, 1.5 times faster than total world merchandise trade [22].

E-commerce will also have a significant impact on trade in services. The most relevant change in trade in services is e-commerce's and information technology's ability to make non-tradable services into tradable. Activities that were previously non-tradable (i.e. research and development, computing, inventory management, quality control, accounting, personnel management, marketing, advertising and distribution) will be traded through the use of e-commerce. All that is required is that the quality, speed and cost of communication between buyer and seller be adequate. International cross-border trade in a wide range of services, financial, legal, telecommunications and customized software will increasingly be carried out by electronic means [3].

Internet effectively opens markets that were previously closed; it is tempting to think of it as another form of trade liberalization. A technical improvement lowers costs of transactions and generates far larger benefits than the triangular efficiency gains from trade liberalization. Indeed, the decline in costs increases potential benefits from trade liberalization in many services sectors [1].

As communications costs continue to fall, the potential for international outsourcing grows. As a result, outsourcing management and production activities will become more important. Obviously, some sectors and activities throughout the world are more prone than others to be affected by developments in e-commerce. In this respect, there have been attempts to identify industries or sectors that may be more predisposed to the effects of developments in e-commerce and technology [3]. For example, a research, based on criteria that weighed the effect of cost savings, increases in productivity, industry readiness and product fitness to e-commerce, has elaborated an index of Internet intensiveness. The finding based on data from the United States and Europe suggests that the most internet intensive sectors are electronic components, food, pharmaceuticals and forest/paper products. It is likely to expect that in other regions, these same sectors and industries will be affected by e-commerce via outsourcing [23]. At the same time, recent evidence suggests that transnational corporations are likely to be the most intensive users of electronic commerce [24].

The potential benefits from international e-commerce to a developing country arise from a reduction in the cost of imports as much as from an increase in the price received for exports. Even if a country does

not export any services, it can benefit from imports of services, paying for them in terms of goods. Cheaper availability of medical, engineering and architectural services, long-distance learning and reduced costs of transactions can confer benefits even if the country does not immediately export the services traded through Internet [1].

Several recent studies have suggested that trade also stimulates internet use. For example, a study suggests that the extent to which a country is integrated into the global economy can play a role in its access to IT. Countries with greater contact, either via trade, tourism, or geographical location, with the outside world, are more likely to be advanced in digital technology than other countries [25]. Similarly, another study argues that countries open to imports from high-income OECD economies will benefit from knowledge spillovers and, hence, be more likely to adopt new technologies [26]. Following figure and table shows world trade volume and the growth of world internet usage. According to figure 1, although world trade volume fluctuated between 2000 and 2010, it had a positive situation until 2008. After 2008, it declined because of the global financial crisis and then started to increase again. World internet usage increased all regions between 2000 and 2010.

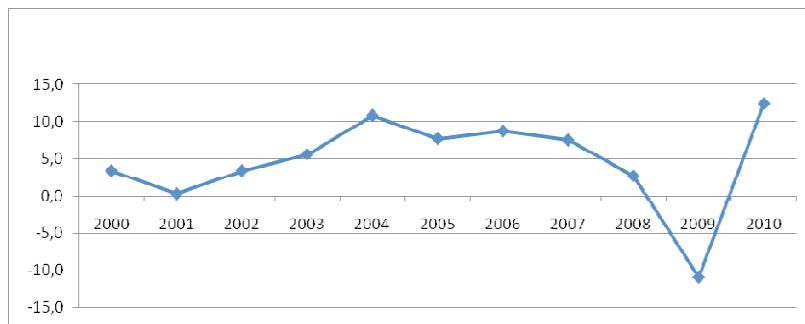


Fig. 1 World Trade Volume, 2000-2010, annual percent change. (source: IMF, WEO,2006/2011).

Table 1 The Growth of World Internet Usage, 2000-2010, percentage

World Regions	Growth, 2000-2010
Africa	2,357.3 %
Asia	621.8 %
Europe	352.0 %
Middle East	1,825.3 %
North America	146.3 %
Latin America/Caribbean	1,032.8 %
Oceania / Australia	179.0 %

Empirical studies of internet adaption have found that internet use is correlated with openness to trade, even after controlling for other factors, that might correlated with both. For example, one of the studies found that internet users made up a greater share of the population in developing countries that were more open to trade [27]. Other studies have also found that additional measures of ICT use and investment are correlated with various measures of openness. For example, a research, which looks at the determinants of IT used in 54 countries in Africa, found that IT use tended to be higher in countries that are more open [25].

One research shows that enterprises that are more internationalized are more likely to engage in business to business e-commerce, but not in business-to-consumer e-commerce [28]. Another research

shows that ICT investment is higher in countries that import more manufactured goods from countries in the OECD [26]. Finally, a study, which uses enterprise country level data on Internet use in Eastern Europe and Central Asia fails to find a positive correlation between openness to imports at the country level and internet use at the enterprise level [29]. In fact, in some model specifications, same study finds a negative correlation. This negative result, however, be due to imports from low and middle-income countries. Imports from high-income countries are positively correlated with Internet connectivity [29]. For example, a study shows that the correlation between openness and investment in ICT is stronger for countries that do not export computers [26].

Several recent studies have asked whether internet use affects trade. For example, using data from 20 low and middle income countries in Eastern Europe and Central Asia, a research shows that enterprises with internet connections export more, as a share of their total sales, than enterprises without connections [29]. In addition, using a gravity model of trade, another research find that Internet use appears to be significantly correlated with trade after 1996, although it finds only a weak correlation in 1995 and 1996. The same research also found that internet has a greater effect on trade in developing countries than it does in developed countries. In a second paper, same researchers find that exports of services to the United States grew more quickly for countries with greater internet penetration in a sample of 31 middle- and high-income countries [20].

Developing countries with higher Internet penetration export more to high-income countries than do developing countries where penetration is lower. However, they do not appear to export more to other developing countries and high-income countries with greater Internet penetration do not appear to export more to either developing or developed countries. These results make intuitive sense. First, Internet access is so common among manufacturing enterprises in high-income countries that the differences in the number of internet users as a percent of the population probably reflects differences at the consumer, rather than the enterprise, level in developed countries. In developing countries, contrarily, many manufacturing enterprises remain unconnected. Second, because Internet access is less common in developing countries than in developed countries, being connected to the Internet would seem to be a greater advantage for enterprises in developing countries with respect to exporting to developed countries. Finally, because of strong regional differences in income, and taking into account the fact that most exports from developing countries to other developing countries will be within the same region, communication costs will presumably be greater for exports to distant developed countries than it would be for exports to neighboring developing countries [30].

4.2 Employment and e-commerce

As e-commerce continues expanding, its impact on employment and wages will be the result of a complex set of interactive forces. Electronic commerce is expected to directly and indirectly create new jobs as well as cause job losses. New jobs will be gained in information-related goods and services, entertainment, software and digital products, for instance. Indirect creation of jobs will occur via increased demand and productivity. Jobs will be lost when e-commerce substitutes for the traditional way of doing business. The jobs most likely affected, as preliminary evidence suggests, are those in the retail sector, postal offices and travel agencies. However, the effects will not be uniform across countries, geographic areas, industries or skill groups [3].

Evidence for the United States and the European Union reveals that employment in ICT-related industries and in the finance, business and commerce-related sectors account for almost one- third and one-fourth of total employment, respectively. More importantly, they accounted for 28% and 35% of job creation in 1993-96 [31].

In addition to the net employment gains and losses, e-commerce will have an impact on the demand for certain skills. The evidence suggests that ICTs and e-commerce demand a whole set of new skills where responsibilities and decision-making becomes more information based. This “skilled-bias technical

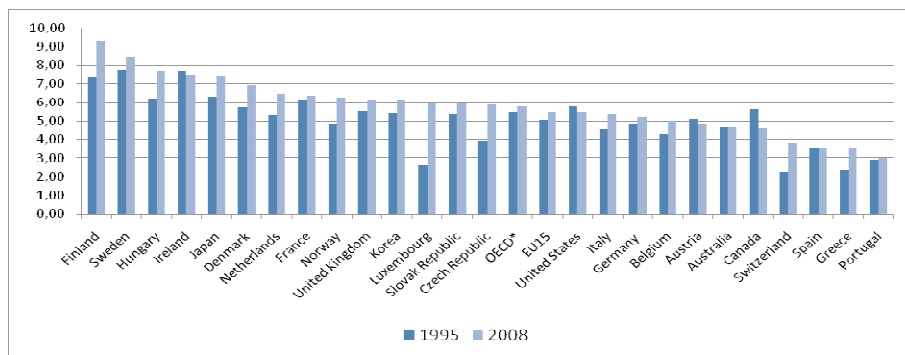
change” generates demand for individuals with skills and talents to manage not only the information technology but also to exploit the large quantities of information about customer demands and production processes. In fact, preliminary findings in a study note that new technologies will increase the demand for high-skilled workers to run them [32], but also of new managers that have to make decision in more information-intensive organizations [3].

This increased demand for high-skill workers, with augmented managerial and executive responsibilities and a greater need for specialized expertise, who will command higher wages are viewed by some researchers as a cause of worsening of income distribution. Evidence for the U.S. seems to suggest that demand has shifted from low and middle-wage occupations and skills toward highly rewarded jobs and tasks requiring specific talent, training or management ability. Much of the labor demand shift is being explained by skill-biased technical change [32]. Overall, low wage, low-skill production, did not enjoy the wage increases that IT-intensive, high productivity growth industries experienced. Thus, real wages grew in IT-intensive industries, were wages were already relatively high and did not change in IT-poor industries that faced workforce reductions and were already employing low-wage workers [3].

Among developing countries, countries best situated to benefit from e-commerce through export expansion are those with a substantial pool of skilled labor, capable of working on or near the frontier of computer technology. The case of India, which is already benefiting from e-exports in a big way, best illustrates this point [1].

A consulting firm made a estimate to calculate the multiplier effects of e-commerce on employment in France, Germany, Italy and the U.K. By utilizing input-output framework and methodology, three types of economic effects were obtained – direct effects produced by e-commerce revenues in the industries directly involved, indirect effects generated by inter-industry linkages, and second order effects determined through the basic Keynesian income-consumption circuit from the value added generated in the first-order round. The results reveal that indirect and second-order effects for employment requirements are large enough to counterbalance the direct losses of jobs (assuming a 100% substitution rate of e-commerce with traditional industries), with the exception of the case of Germany. This also confirms the potential of ecommerce to create jobs in the future. Their estimates also show that e-commerce businesses that rely on labor -intensive intermediaries will directly eliminate a larger share of direct jobs [33].

Following table shows the share of ICT employment in business sector employment between 1995 and 2008 as a percentage. According to figure, the share of ICT employment in business sector employment increased in many countries.



Source: OECD ICT Key Indicators Information Technology Outlook, 2010.

Fig 2. Share of ICT employment in business sector employment, 1995 and 2008, percentages

5. Conclusion

This article concludes following results. Internet will promote international trade much as lifting other trade barriers would. Thus, the volume of international trade will increase via e-commerce. The countries open to imports from high-income economies will benefit from knowledge spillovers. E-commerce can also have a significant impact on trade in services. In addition, electronic commerce is also expected to directly and indirectly create new jobs as well as cause job losses. New jobs will be generated in the information and communication technologies sector, while the indirect creation of jobs will occur via increased demand and productivity. The net employment gains and losses will depend on the demand for certain skills.

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