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THE GROWTH OF E-COMMERCE IN INTERNATIONAL TRADE AND ITS POSSIBLE EFFECTS ON THE SUSTAINABLE DEVELOPMENT

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ABSTRACT

Electronic commerce or e-commerce promises to be an exciting and innovative change to the way that trade is currently conducted. The methods of doing business are changing rapidly and the amount of business conducted on the internet is growing and will continue to flourish. E-commerce represents both an opportunity and a threat to international trade and the environment. Currently, there is no substantial data to support either position. In addition, there are no policies or regulations that are specifically designed for environmental issues in e-commerce. Organizations that are responsible for monitoring and implementing international trade policies and practices such as the World Trade Organization (WTO), European Union (EU), the United States Department of Commerce (DOC) and non-governmental organizations (NGOs) have only just begun to study the effects of e-commerce or have yet to review all of the issues involved. E-commerce will, in the near future, change not only the way trade is conducted, but will also change the volume of goods traded between countries. E-commerce is also changing manufacturing and distribution systems, product design, and the relationship between the producer and consumer. Whether or not the effects of these changes will be positive for developed and developing countries is yet to be determined. The changes to the current trading volume could have a negative effect on some international environmental objectives such as sustainable development. There is also a potential for developing countries to be further exploited by developed countries as e-commerce matures. In addition, there are questions as to whether the internet will increase the "digital divide" between the "have and have-nots."

INTRODUCTION

Technologies in 21st century are a very different breed compared to technologies past, as they move inexorably toward the very core of fundamental knowledge – quantum mechanics driving semiconductors, nanotechnology driving materials and manufacturing, optics driving communications, genomics driving biotechnologies, etc. Significant advances nowadays are those made at the "bottom" – molecular and atomic levels. The results are an explosive growth of knowledge and the ways in which we use the newfound knowledge. While new and rapidly advancing knowledge will be sure to become a dominant force shaping the future of mankind, experience tells us that advancing technology always bring side-effects.

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In the euphoria over the unprecedented opportunities brought on by the advent of the information economy, the tendencies are to overlook these side-effects, or simply to dismiss them so they wouldn't spoil the fun. But they are there. There are new terms emerging and spreading by this millennium: Information technology, Globalization, Internet, Electronic commerce (E-commerce), ICT, Teleporting, Dematerialization, Teleconferencing, and more. These terms are in one pool: the era of Digital Economy. The concern is that there are beliefs that the new communication methods of information technology and Internet will build up a considerable momentum towards the sustainable development. There are, though, some voices in society that disbelief in this and rather stand against it. As one of those hot issues of information technology, E-commerce (or called sometimes E-business) has increasing trends as an extra trading channel of transactions among the industries (B2B), and between the consumers and the total business sector (B2C). Such transactions are expected to influence a wide range of man-made systems of the

industrial infrastructure including systems of manufacturing/production, transportation, packaging, warehousing, yet to unknown extent and form. For example, one central hope in E-commerce is that supply chains of miscellaneous merchandise will be shortcut. This is by performing faster delivery of products with less number of nodes in the middle, in the meaning that such nodes, i.e. large and small retailers and wholesalers, and even distribution centers, vanish in the long run. This may ultimately lead to direct deliveries from the manufacturing company to the consumers. The total literature on E-commerce and environment indicates that there are both negative and positive environmental implications, with a high difficulty to weigh them over each other.

Objectives

Proponents of E-commerce expect there will be considerable environmental benefits such as decrease of paper consumption, decrease of fuel consumption, reduction of size of stores/offices/warehouses, decrease of transportation flow, etc. On the other hand, opponents are pessimistic about some significant negative environmental effects such as increase of human orders and amount of shopping, increase of electronic waste equipment, more use of faster-mode transportation (often use of airfreights) to farther destinations, etc. Some opponents were even pointing to hidden non expectable effects such as consumption of erbium minerals, which are necessary in building the cable structures of the wide band Internet communication. "Modern E-commerce will influence not only the delivery of goods, but also stores, warehouse space and perhaps also the way people use their time and how they travel. How this influence will develop must be understood to ensure that proper initiatives are taken both by companies and official agencies to develop distribution and transportation systems and a strategy for sustainable development in areas affected by the increasing use of the Internet.

It will therefore be of utmost importance to identify and study which areas will undergo a change due to E-commerce and the use of Internet, and in what way the changes will create new systems for transportation or changes in the old ones. E-commerce must be considered in a global perspective, as suppliers and consumers may function differently on different continents. This means that it is important to ensure that the understanding of differences and experiences from several countries be utilized as much as possible." Many questions need answers i.e.

- What does all that mean from an environmental point of view?
- Are the trends of transportation going to change dramatically?
- What about the type of transportation?
- Will the railway system get enhanced and become competitive to the heavy truck system? Or
- Is it the airfreight system going to increase and play a significant role in delivering orders?
- Is the industry going to increase or decrease the amount and variety of products?
- Dematerialization: would E-commerce contribute "positively" in this side?
- What about energy consumption?

No doubt that several disciplines are intervening in this regard. The trading system in the society, the economical system, the systems in supply chains, the human behavior, and the technological development in general are all pulling the ropes. This makes the future scenarios very difficult to be predicted if not impossible.

Environmental impact of e-commerce

It is hard to imagine the "environmental impact" of e-commerce. After all, it doesn't emit any pollutants or uses much energy and natural resources. It would also be hard to imagine it connected to the now familiar topics of sustainability such as climate change, and biodiversity and habitat losses. But their environmental impacts are there. And the impacts are not only significant, their nature and magnitude are such that the ways to resolve them are by no means evident or familiar to us. We should be mindful about e-commerce for it is by far the biggest "killer app" of the digital revolution, if for nothing else. In the next four to five years, depending on which market research organization you believe, the size of business-to-business (B2B) ecommerce will grow anywhere from B2B e-commerce sales will top $1.13 trillion by 2020.[1] Looking further out, in 2016, global B2C e-commerce sales are expected to reach 1.92 trillion U.S. dollars; it will likely grow to account for half of all commerce. What's happening here is nothing short of a mass migration of the world's buying and selling from their existing physical and material-based "universe" to a virtual parallel universe, and all of what has been happening with the advances in semiconductors, telecommunications, PCs, the Internet, etc. are like just things that set the stage for this migration.

Sustainable development & e-commerce

Sustainable development was supposed to integrate environmental and developmental considerations, conventional environmentalism has largely stayed within the environmental confines and rarely ventured out to the developmental aspects of things. When we think about sustainable development, we seemed automatically to focus right away on "consequences" such as climate change, losses of biodiversity, rain forests and top soils, etc., without ever really addressing their "causes". The causes are to be found over at the developmental end of things.

Is technology good or bad for sustainability?

People in sustainable development tend to talk one moment about the ravages brought by technology, and the next about how we will all be saved by new technologies. Is technology good or bad for our sustainability anyway? We pin a lot of hope on new technologies because they almost always dematerialize. A part of our evolution has always been to become more efficient, to use less and less energy and materials to produce more and more goods and services. Historically, each new generation of technologies has also been, by and large, more efficient and less material intensive. Now, if technological progress basically dematerializes, how come the results it brought on the environment were so bad? This is the typical growth vs. dematerialization situation. Technology by itself is not bad. The trouble is that new technologies are always created mainly for growth reasons

and, therefore, has always done a lot more for the growth side of the equation than the dematerialization side. And that's how it became such a killer as far as sustainability is concerned. Knowing this, we probably shouldn't regard information age technologies any differently, at least until rigorous investigations on their direct and indirect effects would indeed prove them different.

Why is the information economy so important to sustainable development?

When people in sustainable development think about "actions", their thoughts are usually centered around things like efficiency, cleaner production, recycling, industrial ecology, etc. For the sake of simplicity, I will group them all together and call it "conventional dematerialization". These measures are the most effective and least costly weapons at our disposal now for our fights to reach sustainability, and should be the first things we focus our attentions and resources on. They have, however, a fundamental problem. By themselves, they are not enough for us to win the war for sustainability. The Internet has dramatically affected the conduct of business. Markets, industries, and businesses are being transformed. The new economy demands the exploitation of new models and paradigms. Information technology (IT) now drives businesses and markets. In the new economy, the Internet has become a powerful and ubiquitous communication mechanism to facilitate the consummation and processing of business transactions. This has led to substantial changes in traditional industries and companies. Firms are attempting to understand and measure the impact of IT so that they can make intelligent decisions regarding crucial IT investments.[2] The laws of economics have not been rewritten. The long-term success or failure of companies is determined by their ability to generate positive net revenues. Similarly, there has been no change in the fundamental role of IT in facilitating business transactions and communicating relevant information to decision makers. However, the decision makers now include customers, both internal and external. Time compression and the magnitude of change may be dramatic, but IT still has the same goals and objectives.

As a consequence of increased Internet penetration some important questions are raised with some overwhelming challenges for scientists, policymakers and human society' and they are as follows.

- Can the Internet-led information technologies serve as one of the most important means to improve the environment'?
- Do demands for the development of a sustainable economy compete or coincide with the new reality of the e-commerce?
- Is e-commerce a truly clean, environmentally caring economy, which will simply lead to the substitution of information for physical resource flows along energy and transportation networks?
- Or alternatively, does e-commerce encourage more movement by generating new demands for material and energy that will further deteriorate the fragile environment?
- What kind of environmental policies should be developed in the Internet-led information age?

The study showed that e-commerce is not always the most efficient model in terms of cost, energy consumption, pollution, dematerialization, de-carbonization and demobilization; the results will not be reliable, and almost never possible to generalize. So, the assessment performance is of little benefit at we should look for something else than the current traditional way of assessment. The proposition has the vision: instead of looking at E-commerce as "a vehicle driving towards freely satisfying the market needs, we should look at E-commerce as "a cart attached to our vehicle towards sustainable development". In other words, we need to "design the end" and work towards that end instead of keep things move freely to unknown future and stay assessing and comparing with "this" unknown. The driving factor nowadays for establishing an E-business is the profits, regardless of any environmental effects that would result. The environmental concern has to take place now before it becomes late in the future to implement any environmental measures. The helping factor is that we are still in the early stage of having E-commerce as a potential effective trading channel. I believe that this understanding is more important than the assessment performance task. One reason is that E-commerce, as explained earlier, is a phenomenon of Internet, which is spreading all over the globe anyway. Another reason is that the assessment problem is usually very complex such that this stage.

Global Environment

Several global trends have been identified in the cases as common factors creating pressure for e-commerce adoption by all countries. These focuses on forces that promote stronger economic linkages across countries, including the rise of global production networks, the increased influence of multinational corporations, the creation of open trade regimes and increasing levels of global competition faced by firms in all countries. Global Production Networks Production networks in industries such as automobiles, electronics and textiles are being extended across national borders to become increasingly global. Participation in global production networks is an important driver of ecommerce diffusion, as these networks rely heavily on IT and e-commerce for coordination. Some countries have domestic firms who participate in these global networks as suppliers or subcontractors (e.g., Taiwan) or as bases for subsidiaries of multinational corporations (e.g., Singapore), while others are coordinators of such networks (e.g., the U.S. and Japan).

Although the roles differ, the integration of countries into global production networks often involves the adoption of B2B e-commerce by firms in these countries as a condition for participating in such networks. E-Commerce Cross Country Comparison MNCs Multinational corporations (MNCs) drive the process of e-commerce diffusion across global supply chains. MNCs are mentioned specifically as drivers of e-commerce in all of the country cases except Denmark. MNCs bring global competition to local markets and provide links to global production networks, as well as transferring technology and knowledge to local firms on how to conduct e-commerce. Open Trade Regimes Openness to external trade and investment is expected to enable e-commerce diffusion because openness brings foreign investment, MNCs bring IT-based business practices and IT systems, and local firms adopt these practices and systems to participate and/or compete with the MNCs. Pressures to liberalize or deregulate national

markets are driven by transnational organizations such as the WTO and OECD, as well as regional associations such as the EU and NAFTA. The case studies indicate that countries with a greater degree of trade openness and liberalization, such as Singapore and the U.S., are characterized by greater e-commerce diffusion. Global Competition Global competition is perhaps the most significant force driving e-commerce development across countries. A country's integration in global production networks, the presence of MNCs, and the extent of trade liberalization are all factors that increase the level of global competition and therefore the pressure for countries to adopt e-commerce as a means of reducing costs and/or expanding markets. In summary, global factors by definition potentially influence adoption in all countries. However, they appear to have more prominence in shaping e-commerce diffusion in countries that are part of open trade regimes, have a high proportion of MNCs, have more firms that are part of global production networks and have more firms engaged in global competition.

While these factors represent global pressures for countries to adopt e-commerce, their influence will depend upon characteristics of each country. Some countries such as Singapore, which has historically been an entrepot in East Asia, are more trade-oriented, and therefore more open MNC-friendly and part of global networks. Others such as Mexico, which is a supplier to global MNCs, are heavily engaged in production networks by virtue of trade liberalization and location adjacent to a very large market. China, on the other hand, has enormous market potential and trade regimes which require MNCs to set up production to access their markets. E-Commerce Cross Country Comparison Germany and the U.S., which have high wages, face competitive pressure to reduce labor costs. Despite these differences, the global environment is a force shaping e-commerce towards convergence. National Environment The national environment, which is one of the key features of the selection environment of firms and consumers that affect innovation outcomes, includes a country's demographics, economic and financial resources, information infrastructure, industry structure, organizational environment, and consumer preferences. Demographic Factors Country demographics are likely to act as enablers or inhibitors for e-commerce development, as they relate to market size and concentration, consumer needs and ease of access to technology.

The case studies show that densely populated nations, such as Singapore and Germany enjoy strong IT infrastructures, whereas large countries with low population density, such as China and Brazil, suffer from underdeveloped infrastructures, plus distribution and delivery problems. Urban density may enable wired cities; however, high density may also lead to strong traditional retail networks that compete with on-line purchasing, as in the case of France and Taiwan. Overall, the cases indicate that larger, wealthier countries such as the U.S., Germany and Japan seem to be most favorable to both e-commerce supply and demand. The presence of an IT labor force emerges from the case studies as another enabling condition for ecommerce, in that it provides needed skills for IT production and use. For example, China has a large IT workforce whereas countries such as Singapore and Germany import IT workers. Taiwan and Denmark restrict immigration that could supplement their small domestic IT workforces. General IT literacy enables access to both B2C and B2B e-commerce, and is influenced by demographic factors such as

income, education, age, and gender. The cases show that IT literacy is higher among the highly educated across countries, and it is highest among the younger generation as well. The U.S. has an equal gender distribution on Internet use, whereas use is heavily male-dominated in the other countries. Evidence from the case studies further indicates that the distribution of wealth is a major barrier or limit to IT usage. In Brazil and Mexico, where income is unevenly distributed, a large percentage of the population is cut off from PC and Internet access due to their inability to afford such technologies. A more equal distribution of wealth, 8 E-Commerce Cross Country Comparison such as in Japan, Germany, France, and Taiwan, is conducive to e-commerce in that a greater proportion of the population is able to participate in e-commerce through access to IT.

While the ratio of the richest 20% to the poorest 20% of the population is about 5 to 1 in these countries, in Brazil the richest 20% have 25 times the income of the poorest 20% and in Mexico the ratio is 16 to 1. National Policy In addition to features of the national environment, national policy shapes technological diffusion and e-commerce diffusion in particular. Key policy factors include liberalization of telecommunications, government promotion of ecommerce and IT more broadly, and specific legislation passed on e-commerce and IT. Liberalization Market liberalization enables e-commerce by opening up markets to allow for competition that leads to higher quality products and services and lower prices. Firms in competitive markets are motivated to adopt e-commerce technologies in order to enhance productivity and provide better services. Telecommunications liberalization, in particular, encourages IT and Internet diffusion by making rates more affordable and giving consumers a wider selection of services and options. Liberalization is taking place across all of the countries examined here, although countries have liberalized in different ways and to different degrees. E-Commerce Cross Country Comparison E-Commerce Promotion Initiatives to promote e-procurement and e-government have been established in most countries and are direct drivers of e-commerce between governments and with businesses that interact with government as sellers or applicants for services (regulatory approval, permits, and licenses).

They contribute to total e-commerce revenues; pave the way for private sector e-commerce initiatives, and build-up the e-commerce services industry thereby fueling diffusion. Government and industry promotion is mainly an enabler of e-commerce. New leaders and governments have been instrumental in mobilizing IT initiatives and promotion: the Clinton/Gore administration in the U.S. strongly pushed the Internet, the term "Fox factor" (after President Vicente Fox) has been coined to describe the Internet fervor in Mexico that has prompted public initiatives such as the eMexico program, and France's new government elected in 1997 shifted the country to an IT focus that embraced the Internet. Industry associations, especially in the IT industry, also have been strong promoters of e-commerce in countries such as Denmark, Japan, Mexico and the U.S.—sometimes in partnership with government. Government and industry promotion takes various forms from country to country, but the most common areas are promotion of IT and e-commerce in businesses, especially SMEs, by providing them with technical support, training, and funding for IT use. E-Commerce Legislation At this point, none of the countries

studied has developed comprehensive legislation regarding e-commerce. Countries have focused on different issues, but the key areas have been legislation on digital signatures, privacy, consumer protection, copyright and intellectual property, and content regulation. All countries except China have passed laws regarding recognition of digital signatures as legally binding. Country-specific legislation tends to reflect cultural values.[3] For example, France and Germany have passed privacy and consumer protection laws, reflecting an emphasis on individual rights. China and Singapore, on the other hand, have focused on content regulation, reflecting a value on social control. Internet taxation is not an issue in most countries because ecommerce is small, but could be a major enabler or inhibitor in the future. The impact of e-commerce legislation remains to be seen. For example, despite the implementation of legislation in the U.S. recognizing electronic signatures nearly two years ago, e-signatures are not yet catching on.

Conclusion

How will electronic e-commerce affect the global marketplace and the environment? The answer is unknown. The EU predicts that individuals and companies that have internet access will be presented with entirely new ways of purchasing and selling goods. They compare the overall impact on lifestyle to that of the growth in car ownership or the spread of the telephone. Currently, there are several B2C and B2B companies that will positively affect international trade and the environment. Some of these companies offer exciting and innovative approaches of using e-commerce to advance environmentally-friendly business practices. However, the positive-environmental impact of these companies on the astounding growth of e-commerce is likely to be minimal. The developed countries will likely reap any of these environmental benefits associated with e-commerce because they are the countries that are defining e-commerce and taking advantage of its efficiencies. It is likely that developing countries will suffer the adverse effects of the "digital divide" currently being felt by the consumers in the United States who are not connected to the internet. Any significant environmental benefits to developing countries as a result of e-commerce are not likely to occur for many years.

The United States Department of Commerce has been active in promoting US-based e-commerce companies overseas while the Department of Treasury is struggling to find ways to identify parties to transactions for tax purposes. The United States Environmental Protection Agency is focusing on electronic submission reports but is not actively studying the potential benefits and harms of e-commerce. Clearly, there needs to be improvement in coordination between federal agencies in order to create rules and standards for e-commerce. Most B2B and B2C companies are not taking the time to worry about tariff regulations and compliance issues; we are several years from determining the real effects on the environment of global e-commerce. If the market analyses are correct, global e-commerce will explode in the next few years. Governments and entities such as the WTO and EU need to rapidly resolve these issues. B2B e-commerce is not going to be an issue will conveniently wait between WTO meetings. The WTO needs to set policies before these cases come to the

WTO through the dispute resolution process as this procedure has strict timelines that may impede a fair solution. As B2B and B2C companies begin to take advantage of the network effect and increase the number of users, they will undoubtedly grow rapidly. In addition, as internet usage increases in WTO member countries, new users will take advantage of products and services offered by these companies. Similarly, the global consumers will not wait for the EU, WTO or sovereigns to resolve these e-commerce issues. More work similar to the study completed by CECL needs to be completed on an international level so that the environmental effects of e-commerce, positive and negative can be defined. Governments, trade organizations and e-commerce companies need to begin to focus on how e-commerce will not only change international trade [intellectual property, taxation etc], they need to focus on how these issues relate to the environment. These same entities should embrace environmental e-commerce and facilitate its growth.

Policies and regulations should be implemented to ensure that e-commerce will not adversely affect the environment. One expert believes that an e-commerce code of management practices should be initiated, addressing the potential environmental impacts of e-commerce. The NGOs along with the WTO and other organizations need to realize the implications of this revolutionary change in international trade and should to create these new policies and regulations. More work should be completed to determine what the effects of international trade and potential the environment will be, how e-commerce will affect existing multi-lateral environmental agreements and the effects of e-commerce on developing countries. Finally, NGOs and the USEPA should embrace e-commerce as a method of achieving "green"-friendly trade that strengthens principles such as sustainable development and increases practices such as debt for nature exchanges.

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