

Cambridge University Press

978-0-521-84822-0 - Global e-Commerce: Impacts of National Environment and Policy

Edited by Kenneth L. Kraemer, Jason Dedrick, Nigel P. Melville and Kevin Zhu

Excerpt

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## *Introduction*

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### **Motivation**

The new millennium coincided with an explosion in the use of the Internet for commercial purposes. Dot.com companies in the United States such as Amazon and eBay led the way, creating online services where none had existed before. Recognizing the value of e-commerce, traditional companies also jumped online, including Wal-Mart in retail, Cisco in networking, Dell in the PC industry, and Charles Schwab in banking. In just a few short years, a company without a website was considered passé and the Internet was becoming mythologized: “A few years from now business economists may include the Internet in the Schumpeterian Hall of Fame, as an economic innovation of the same magnitude as the steam engine and the assembly lines of yore” (DePrince Jr. & Ford, 1999). Radical changes toward online business models were widely believed to be ushering in a “new economy” requiring new competitive strategies, business models, and even a new economics.

Given the major role played by the United States in developing the Internet and fostering its commercialization, other nations voiced concern that it would dominate e-commerce, spreading US culture and economic influence via electronic networks. The Internet compresses time and space, making it easier for companies to expand beyond regional boundaries. Commerce emerges as a powerful force beyond the control of individual countries, with a corollary being that the relevance of differences between countries diminishes. Taking this argument to the extreme, some predicted the emergence of a borderless global economy. In his treatise on strategies for the new economy, Kenichi Ohmae (2001, p.5) argues that “the idea of Japan or America as economic aggressor is simply a ‘cartographic illusion’ – a misperception derived from the false idea that national borders represent lines of true political autonomy.” Powerful global production networks and the rise of

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offshore outsourcing would appear to be consistent with this view of a borderless global economy. The Internet may indeed be driving a shift toward a global marketplace, with significant ramifications for supply chains, business processes, customer service, and the basis of competition.

In times of rapid change, historical perspective is lacking. What is reality and what is hype? And how can we systematically distinguish between the two? Anecdotes and case studies have been the primary means of examining the impact of the Internet on societies, markets, and economies, painting detailed portraits of particular organizations and events. Exposing rich phenomena in context helps understand the “how” and “why” of e-commerce. However, their application to other contexts is limited. What happens in one country or region may not happen in another. The impact of back-office e-commerce operations may be different than customer-facing websites. Processes particular to one industry such as finance differ from those in others such as manufacturing. This leads to differences in how the Internet and e-commerce are applied, resulting in varying performance impacts.

A systematic analysis of the impact of the Internet and e-commerce across firms, industries, and economies is necessary to separate hype from reality. We focus on understanding the topographical patterns of e-commerce across diverse economies and industries in order to assess the evolution of e-commerce (transformational versus incremental change), the extent of US hegemony, and the extent to which globalization diminishes the power of nations, shapes local economies, and re-aligns national cultures. This book addresses these and other issues by reporting the results of a major research program using country case studies, secondary data, and survey data collected across ten economies, three industries, and small and large firms.

The research program, which is called the Globalization and E-Commerce (GEC) project, was supported by grants from the Information Technology Research (ITR) Program of the US National Science Foundation. Our research focused on understanding how differences in national environments and policy influenced the diffusion and impacts of e-commerce in a global context. Consequently, we examined diffusion in ten economies, including both developed and developing ones. Within each economy we further studied the three industry sectors most shaped by the early diffusion of e-commerce – manufacturing,

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distribution, and finance – and both small and large firms within these sectors. Among the various studies that comprised the GEC Project, we gathered secondary data on forty economies, historical case study data on ten economies, and original survey data on 2,139 firms across the ten case study economies (the USA, Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, and Taiwan). We refer to this latter survey data throughout the book as the “GEC Survey” or “global sample.”

The value propositions of the research program described herein are four fold. Given varying approaches to managing and controlling national economies, varying levels of technological infrastructure, and diverse national, business, and consumer cultures, we might expect significant variation in how e-commerce is adopted, how it diffuses, and how it impacts firms, industries, and countries. The first value proposition is thus to provide an enhanced and systematic understanding of the relationship between national environments and policy and the use and impacts of e-commerce. Findings also improve understanding of variation in e-commerce use and impacts across manufacturing, finance, and retail industries, as well as across large versus small and medium-sized organizations. Such results inform the decisions of policymakers who seek to develop and shape e-commerce applications to fit their specific contexts with maximal benefit. Results also assist researchers in their quest to unearth structural patterns in how technology is diffused and used, and its effects.

The second value proposition is to provide insights for firms, industries, and global e-commerce markets. Analysis of the GEC Survey data reveals substantial opportunities for the application of e-commerce to fit local contexts. Results described herein underscore, however, that a one-size-fits-all approach is not advisable. Only by carefully understanding the historical antecedents of information technology application as well as the prevailing business and cultural conditions can e-commerce application be successful.

The third value proposition is to serve as a benchmark for future studies. One motivation for the current research program was a lack of cross-country analyses of e-commerce application using systematic survey data. Having undertaken this colossal task, it is our hope that this research program, as documented herein, will serve as a rigorous scientific benchmark for future studies of national and global Internet and e-commerce trends. To this end, the editors have attempted to

be completely transparent in describing and interpreting not only the findings of the various studies but also the methodology used to derive them.

The final value proposition is to provide a snapshot in time to preserve the early facts of the e-commerce and Internet revolution. So much has been written about the Internet and e-commerce by pundits, essayists, economists, business researchers, and others. Unfortunately, however, intermingled with excellent studies and useful insights is a monumental collection of hyperbole. This book, therefore, is a counterbalance of sorts, enabling future generations to assess studies of the Internet, e-commerce, and globalization and draw their own conclusions about what really happened – or didn't happen.

### Research approach

The approach of the research described in the following chapters was to bring together academic experts to develop a common research protocol, conduct country and international analyses, and share findings at annual meetings. The research protocol was developed to achieve multiple objectives. The first was to create a team culture to facilitate knowledge development, sharing, and cross-fertilization of ideas. Second, a common survey instrument had to be developed that applied to diverse economies spanning Asia, the Americas, and Europe. Moreover, it had to be translated into multiple languages, independently checked for alignment with the original, and piloted in each country. Third, we had to collect secondary data that were comparable across countries with which to better understand their socioeconomic environments and e-commerce diffusion over time, as a way of providing perspective for our cross-sectional survey. Finally, to complement both the GEC Survey and the secondary data and to obtain a granular understanding of the Internet and e-commerce within each country, we chose to develop case studies for each country, including specific industries and/or firms. These case studies were written by local experts.

We developed several partnerships to carry out the work. First was our partnership with the academic experts in each country who signed on for the four-year effort. Second was a partnership with the International Data Corporation (IDC) of Framingham, Massachusetts. The company helped develop the survey questionnaire, secure translations into multiple languages, check the questionnaire translations with its

in-country staff, oversee conduct of the survey by the international survey firm Market Probe, and review the survey results. We chose IDC because it has experience working in many countries, conducts its own surveys in several countries, and has experts in e-commerce in each of the countries in this study. Third was a partnership with Empirica, GmbH in Germany for data and analysis related to projects sponsored by the European Commission's Information Society Technologies (IST) Directorate General. These projects – ECATT, Project Star, SIBIS, eBusiness Watch – provided additional data useful for special firm-level, cross-country analyses that complemented the basic GEC analyses.

### **Organization of the book**

The book comprises ten chapters and three appendices. The first chapter is an introduction, while Chapters 2 through 9 are individual country analyses. Chapter 10 summarizes the findings from the firm-level, cross-country analyses. Appendix I describes data-collection details and the questionnaire, Appendix II provides statistic measures by sector and size, while Appendix III provides statistic measures by country. A thumbnail portrait of each chapter follows.

#### *1. Introduction*

Looking across all countries in the study, we must conclude that e-commerce is diffusing in an evolutionary fashion, in contrast to the hyperbole of radical change. Factors promoting adoption and diffusion include globalization, economic liberalization, and appropriate public investment in information infrastructure such as telecommunications and the Internet platform. Consistent with this finding, there is significant national diversity in e-commerce adoption, particularly in downstream marketing, sales, and other customer-oriented activities. However, there is convergence in upstream activities, which is driven by the increasing importance of global production and distribution networks in the world economy. Finally, the idea of US hegemony is a myth. The influence of the United States on e-commerce developments is diminishing as other nations draw on their own cultures and technological infrastructures and local firms develop tailored business models and applications that fit their specific needs.

## 2. *United States*

Despite early experiments which were quite transformative, the development of e-commerce in the United States has been evolutionary rather than revolutionary, and its impacts have been changes in degree more than in kind. Many key e-commerce technologies and business processes were developed in the United States within the Silicon Valley model. However, it is only one dimension of e-commerce diffusion in the USA. A much larger share of e-commerce activity is characterized by a pattern of “adaptive integration,” in which existing firms incorporate the new technologies and business models offered by the Internet to extend or revamp their existing strategies, operations, and supply and distribution channels. Increasingly, e-commerce is just part of the broader evolution of commerce.

## 3. *France*

France took an alternative path to the Internet and e-commerce. It was late to the Internet because of its early adoption of Minitel and electronic data interchange (EDI) in the early 1980s. Both were earlier forms of e-commerce that were made obsolete by the rapid, global adoption of Internet-based e-commerce in the mid-1990s. The French-specific path for e-commerce has been shaped by the unique characteristics of the French economy and innovation system. The large established firms have not been well adapted to the decentralized process of innovation at the heart of the Internet revolution, and few French startups were able to develop in the Internet sector. French firms, especially in finance and retail but also in manufacturing, were well entrenched with their customers and had no reason to change. Combined with a highly regulated economy, development of e-commerce has been confined largely to dominant firms that were driven to go online in the late 1990s in response to international competition, especially within European Community markets.

## 4. *Germany*

Slow to the Internet initially, Germany has become a fast follower in adopting Internet-based e-commerce innovations. Though extensive use of established technologies such as EDI and electronic funds transfer (EFT) may have delayed adoption, Germany has since caught up

on most measures of use. German firms choose applications carefully based on their proven track records of success in other countries. Two salient factors driving adoption of e-commerce in Germany are the international orientation of its economy and the dynamism of its small and medium-sized enterprises (SMEs).

### 5. Japan

Japan's unique industrial landscape – its interlocking networks of firms (*keiretsu*), highly interwoven political economy (iron triangle), and distinctive business culture – has led to a somewhat insular business environment slow to the Internet. Despite this, Japan is comparable with other economies along various e-commerce measures. Analysis of the Internet and globalization in Japan illustrates that even in the absence of global drivers, local factors can drive e-commerce diffusion and impacts. Japan's convenience stores and i-mode applications also illustrate how the unique characteristics of national economies can be reinforced by the use of the Internet and e-commerce, rather than washed away into a global melting pot.

### 6. China

The use of e-commerce and the Internet in China is a study of contrasts. There is wide geographic inequality, yielding a digital divide of sorts between rich coastal regions and relatively poor interior areas. Coastal regions have much better infrastructure and many more Internet users than others. Moreover, larger enterprises have larger IT budgets and better-trained staffs than small and medium-sized enterprises, and are more capable of engaging in e-commerce. However, they tend to be more conservative than smaller, more entrepreneurial companies which lack the financial and human resources to engage in e-commerce. Thus, there are only a few islands of success linked to foreign multinationals, despite active government promotion to local enterprises. Overall, given its large population and islands of Internet success, China appears poised for future growth in e-commerce adoption and diffusion.

### 7. Taiwan

Taiwan is unique in that it has characteristics of both a developing economy – slowly developing legal framework, low rate of IT spending, low

number of IT professionals within firms – and a developed economy – highly developed, modern, and global manufacturing sector, as well as a high literacy rate. Given its role in global manufacturing supply chains, the most salient driver of e-commerce in Taiwan appears to be international competitive pressure, especially in manufacturing, where e-commerce is becoming a competitive necessity. However, until inequalities and concerns over rule of law, security, and privacy are mitigated, the development of e-commerce in Taiwan will be mixed.

### 8. *Brazil*

Brazil's large size and its considerable geographic distance from global production networks create a relatively inward-oriented economy. Local factors have thus driven e-commerce, especially the need for financial efficiency because of historically rampant inflation and low gross domestic product (GDP) per capita. Disproportionate wealth distribution impedes widespread adoption of consumer-oriented e-commerce. Overall, Brazil illustrates the importance of local versus global forces in driving e-commerce, shows how the financial sector can lead in e-commerce adoption, and reveals the innovation of large firms relative to small firms in the use of e-commerce.

### 9. *Mexico*

Mexico's socio-economic environment, which is similar to that of many Latin-American countries, has a large impact on e-commerce diffusion. Its highly skewed income distribution, traditional shopping culture, skewed size distribution of firms, low level of technological development of firms, and relatively informal business culture have created a complex e-commerce growth pattern that varies by industry and size of firm that can best be described as "islands of innovation" within a slowly developing e-commerce environment.

These islands occur mainly in selected manufacturing sectors where Mexico serves as a production platform for many foreign multinationals, as illustrated by its famed *maquiladoras* along the border with the United States, and special trade zones within the country at key places like Guadalajara, Mexico City, and Monterrey. These production hubs, along with a strong financial sector, are the most dynamic and modern segments of the economy, and have traditionally led in the use of IT,



as well as in the use of the Internet for e-commerce. In contrast, SMEs lag large firms in e-commerce, though evidence suggests that the gap may be narrowing. Overall, the story of e-commerce in Mexico is one of strong global finance and manufacturing sectors driving moderate use of e-commerce.

### *10. Global diffusion and convergence of e-commerce*

This chapter integrates a number of firm-level cross-country analyses focused on understanding e-commerce as a technical innovation within the context of the larger literature on the diffusion of innovations. It summarizes what we know from the study overall regarding the environmental, organizational, and technological factors that influence e-commerce adoption, the nature and extent of e-commerce diffusion and use, and the business value that firms derive from e-commerce.

### **Acknowledgments**

This research has been supported by grants from the US National Science Foundation (CISE/ISS/ITR and DST, grant numbers 0085852 and 0132911, respectively) and by the European Information Society Technologies Programme of the European Commission (ECATT, Project Star, SIBIS, and eBusiness Watch projects). Part of the data was provided by Empirica, GmbH, Bonn, Germany. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation or the European Commission.

We are especially grateful to Rosalie Zobel of the European Commission and Suzanne Iacono of the National Science Foundation who created the opportunity for this research by encouraging international cooperation, bringing together researchers at the European Commission's Conference on E-Work and E-Commerce in Venice, Italy in 2003, and supporting the research generally.

We acknowledge the following academic research participants, many of whom are chapter authors in this book but without all of whom this project would not have been possible. They worked with us over four years and were patient with the many rewrites requested by the project leaders.

- Brazil:** Paulo Bastos Tigre, Country Expert. Professor and Director, Institute of Industrial Economics, Federal University of Rio de Janeiro.
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- Germany:** Wolfgang Koenig, Country Expert. Professor, Johann Wolfgang Goethe University, Institute of Information Systems, Frankfurt University. Rolf Wigand, Researcher. Professor, University of Arkansas at Little Rock. Roman Beck, Researcher, Johann Wolfgang Goethe University, Institute of Information Systems, Frankfurt, Germany.
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