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Rule of Law and the International Diffusion of E-Commerce

Strong institutional environments serve as a foundation for e-commerce growth opportunities.

E-commerce has gone through a cycle of hype and disappointment and renewed hope in the public eye since the late 1990s. However, in actual use, the pattern has been one of continued growth as businesses and consumers have adopted the Internet to exchange information, goods, and services. According to International Data Corporation, total e-commerce (business-to-business and business-to-consumer) in the U.S. grew from $162 billion in 2000 to $991 billion in 2004 [3].

While the Internet and e-commerce first gained wide adoption in the U.S., the impacts have been felt around the world. E-commerce outside the U.S. grew from $196 billion in 2000 to $1,584 billion in 2004 [3], and the U.S. share of global e-commerce dropped from 45% to 38%. However, the level of e-commerce adoption has varied significantly from country to country. Not surprisingly, richer countries lead the way, building on their existing IT infrastructure and their experience and knowledge in deploying new technologies. On the other hand, there have been dramatic differences among countries in e-commerce that cannot be explained simply by relative income levels. To illustrate, among countries with similar income levels of approximately $25,000 per capita, total e-commerce sales as a percentage of gross domestic product (GDP) ranged from just 0.4% in Ireland to nearly 2% in Canada from 1999 to 2001 (see Figure 1).

An important question is why there is such variation between countries. Are the differences due simply to economic factors, such as income and infrastructure, or do policy-related issues also come into play? Hargittai [2] argues that an important determinant of Internet diffusion is the economic wealth of the host country and its telecommunications policy. Oxley and Yeung [7] argue that the diffusion

of e-commerce technologies depends on a variety of economic and policy factors, including the degree to which the "rule of law" prevails in a country. Rule of law can be defined as the institutional environment that establishes the basis for economic investment, production, and exchange. It includes sound political institutions, an impartial court system, legal protection of property rights, enforceable contract laws, and citizens who have confidence in the legitimacy of these institutions and accept their authority in resolving disputes [7].

In the case of e-commerce, the importance of the rule of law is magnified by the special risks associated with online transactions. Buyers do not know if they will receive the goods they pay for, or if their credit card number or other information is being collected for fraudulent purposes. Buyers also do not have a physical location to return defective goods or even to speak to someone in person if there is a problem. Sellers can also be defrauded by unscrupulous buyers, especially if they ship a product before receiving payment, as is common in business-to-business sales.

For these reasons, the rule of law is likely to be especially important in reducing the risks of e-commerce. When rule of law is strong, buyers and sellers know they have some legal recourse in the case of online fraud, effective punishment lowers the cost of reputation building for honest businesses, and people have a higher degree of trust in remote market transactions [7].

In order to better understand differences in e-commerce adoption across countries, and the role that rule of law may play in the acceptance and use of e-commerce, we analyze data from 30 countries on e-commerce transaction volumes and various national factors that may encourage or inhibit e-commerce. We then discuss the findings from the analysis in the context of other data from a set of country case studies and a large survey of business establishments conducted as part of the Globalization of E-Commerce project.[1]

[1]The project is being carried out by a team of researchers led by the Center for Research on Information Technology and Organizations (CRITO) at the University of California, Irvine. It involves collaboration with experts from Brazil, Denmark, China, France, Germany, Japan, Mexico, Singapore, Taiwan, and the U.S. For further information, see www.crito.uci.edu/GIT/project3.asp.

Country-Level Determinants of E-Commerce Activity

We developed a conceptual model of factors that are likely to explain differences among countries in the use of e-commerce, shown in Figure 2. We expect that a country's level of e-commerce activity is determined primarily by four factors: availability of financial resources to invest in e-commerce business initiatives; level of familiarity and knowledge to conduct remote transactions; availability of payment mechanisms to facilitate online transactions; and level of technological readiness to make e-commerce a reality. Our model is not meant to exhaustively capture all the possible determinants of e-commerce, but to identify some of the important determinants and to illustrate how rule of law may moderate the effect of these determinants.

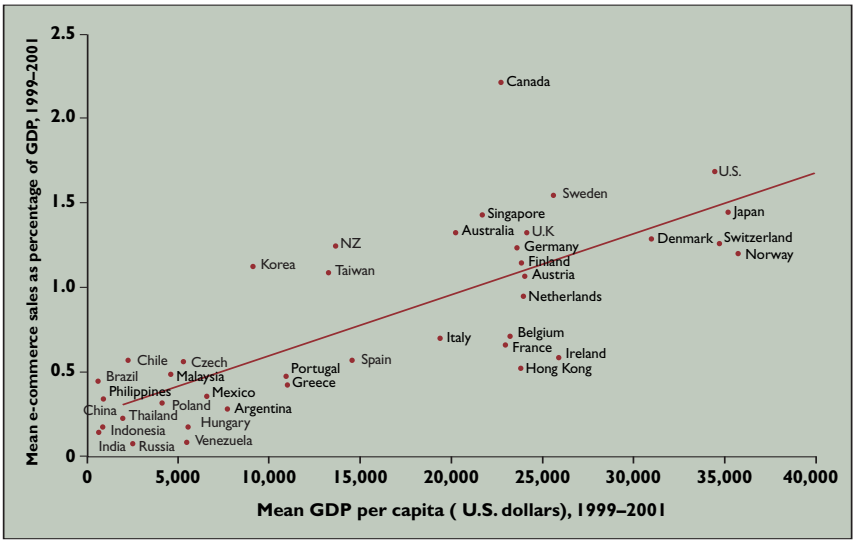


Figure 1. E-commerce as percentage of gross domestic product (GDP) and GDP per capita (source: [3]).

Investment Resources. The novelty of e-commerce often makes it a risky proposition for firms. Since many of the early commercial initiatives using the Internet came from entrepreneurial start-ups, a source of investment capital is important to sustain e-commerce activities, especially in early stages of development. Parente [8] found that firms' technology adoption decisions and output growth both depend upon the efficiency of capital markets, which diversify the risks of adopting new technologies and thus encourage earlier adoption. For e-commerce development, access to loans/credit (measured as total amount of private loans) and equity markets (measured as total market capitalization) are likely to be important.

Knowledge and Familiarity. Familiarity and experience with remote purchasing are important in

providing users with confidence in e-commerce transactions. It has been argued that direct marketing via catalogs or phone ordering is a precursor to e-commerce in that exchanges occur without face-to-face interaction between the buyer and seller. Therefore, companies that employ direct marketing methods (such as Dell Computer) are often the first to adopt e-commerce [1]. We hypothesize that countries with an active direct marketing industry should experience higher levels of e-commerce activity because companies do not need to educate customers about the nature of remote purchases, and there is already a physical and institutional infrastructure to deliver goods from sellers to buyers.

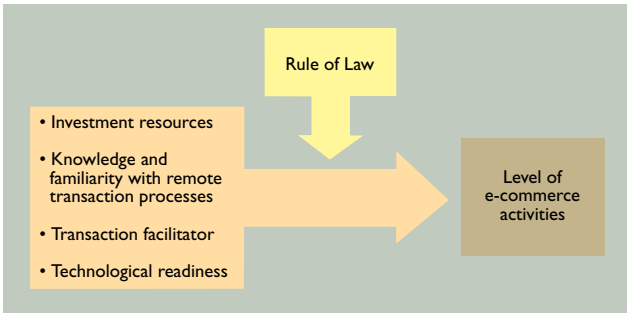


Figure 2. Model of determinants of e-commerce activity.

Transaction Facilitator. When transactions are conducted electronically, there must be widely available means to transfer payments. The most commonly used means of payment for remote purchasing are credit cards and debit cards. In some countries where such instruments are not widely available, alternatives such as cash-on-delivery or bank drafts are used but these are less convenient than credit or debit cards, which can be used while the order is being placed. Oxley and Yeung [7] found that credit card use is positively associated with adoption of e-commerce technologies. We use credit card penetration as a proxy for the availability of a convenient and secure transaction facilitator.

Technological Readiness. Previous cross-country studies of IT and e-commerce adoption have highlighted the importance of the supporting infrastructure [7]. Without access to technological infrastructure, firms and customers cannot migrate from traditional supply chains to electronic markets. Three variables we examined are Internet penetration, the number of secure servers available in a country, and the total amount of investment made in information technology.

Moderator—Rule of Law. The nature of e-commerce often requires firms to engage in remote transactions; the extent to which rules exist to ensure legal protection and thus increase trust in contracting can foster market conditions favorable for e-commerce activities. In countries without strong and effectively enforced commercial laws and rules, despite having the necessary conditions to accelerate the growth of e-commerce such as availability of investment capital and high credit card penetration, e-commerce may still be slow to develop, even in the presence of these other necessary conditions. This is because consumers may be hesitant to engage in remote transactions with unfamiliar firms when there exists potential for misconduct but lack of legal recourse if they are dissatisfied with the exchange. However, in countries with strong rule of law, we should observe a greater influence from other determinants because dissatisfied customers may seek remediation through legal means and therefore be more willing to enter into online transactions. Thus a strong rule of law fosters conditions in which determinants of e-commerce growth may have a greater impact while weak rule of law may attenuate their effects.

Data and Estimation Model

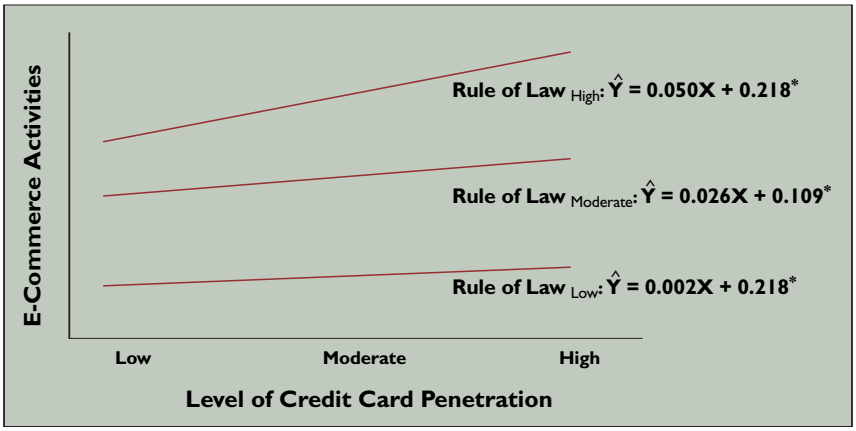
Data on e-commerce transactions, provided by IDC [3], measures the total volume of transactions in business-to-business and business-to-consumer markets. The dependent variable is total e-commerce per capita, which provides a basis for comparability across countries. Data used for our independent variables was primarily from the World Bank [10] and the International Telecommunications Union [4]. A measure of rule of law was taken from La Porta et al. [6].[2] Credit card penetration was provided by Morgan Stanley, and direct marketing revenue was from the Direct Marketing Association. Variables are normalized on a per-capita basis and complete data was available for 30 countries from 1998 to 2001 (see Table 1). Because e-commerce activity and several of our explanatory variables are likely to correlate significantly with the level of economic development, GDP per capita was used as control variable in the analysis. Pooled regression was employed for empirical analysis. Independent variables were lagged one year to ensure the direction of causality.

Results

Results of the model are presented in Table 2. Each model uses dummy variables to control for region

[2]Rule of Law is a survey-based assessment of the quality of law enforcement and law and order tradition in individual countries as reported in La Porta et al.'s [6] study of country-level commercial risks. It is an average of monthly indexes that ranged from 0 to 10, with lower score for less tradition of law and order.

When contracts are enforceable, fraud punished, privacy respected, and intellectual property protected, businesses and consumers will be more comfortable buying and selling online.



* Ignoring region and time constants in equation
High = +1 standard deviation; Moderate = Mean (0); Low = -1 standard deviation

Figure 3. Interaction between rule of law and credit card penetration.

and year. Model 1 shows that factors with a direct effect on e-commerce transactions are the number of secure servers and total IT investment, both infrastructure measures that are positively associated with e-commerce. As predicted, rule of law is positively associated with e-commerce, while Internet access cost has a negative relationship. Other factors such as financial resources (market capitalization and private loans), direct marketing revenues, and credit card penetration are not significant. Model 2 builds on Model 1 by including multiplicative interaction effects between the determinants and rule of law. Of the interactions tested, we found a moderating effect of rule of law on market capitalization, direct marketing revenue, Internet users, and credit card penetration.

Figure 3 shows that the impact of credit card penetration as a facilitator of e-commerce depends on the rule of law. High levels of credit card penetration indicate that infrastructure exists to allow for online transactions and thus should increase e-commerce activity. However, such an effect is only observed when there is higher corresponding rule of law, perhaps because consumers are less worried about theft of information and dealing with unscrupulous remote merchants when the rule of law is strong. As the rule of law weakens, accessibility of credit cards ceases to facilitate online transactions because consumers fear negative consequences of providing credit card information and merchants worry about accepting credit cards.

Discussion

The empirical analysis shows that e-commerce activity has a direct relationship only to measures of technological readiness and to rule of law, and that other posited factors such as financial resources, experience with direct marketing, and availability of payment facilitators are not significantly related. However, when we introduce rule of law as a moderator, we find significant interaction effects with several of the variables, including market capitalization, direct marketing revenue, Internet users, and credit card use. These findings support the argument that rule of law is an important factor in determining the willingness of businesses and consumers to engage in e-commerce. Especially interesting is the relationship between rule of law and the other factors, which shows that various potential facilitators or enablers of e-commerce only matter when the rule of law is strong. When the rule of law is weak, investors are not likely to invest in e-commerce businesses, consumers are not willing to use their credit cards online, Internet users are not likely to take the leap from Web surfing to online buying, and people who buy from direct marketers will prefer shopping by phone or mail to buying online.

The empirical findings presented are reinforced by

evidence from a GEC survey of over 2,100 business establishments in 10 countries conducted by the Globalization of E-Commerce Project in 2002.[3] Although not covering the same set of countries or using identical measurements as our previous analysis, it provides converging evidence on the impact of rule of law. For firms we surveyed, the biggest barriers to e-commerce adoption were legal/regulatory issues, specifically: concerns about privacy and data security; and inadequate legal protection for Internet purchases, rated as "high" by 44% and 34% of firms respectively (see Table 3). In addition, business laws that do not support e-commerce are a problem in selected countries. While these questions may have been interpreted by respondents as relating to specific e-commerce regulations as well as more general business laws and protections, they are consistent with the argument that e-commerce adoption will be hindered if the rule of law is not strong.

In the U.S., inadequate legal protection was rated high by only 11% of respondents, and business laws that do not support e-commerce by only 8%, suggesting the U.S. legal and regulatory environment is significantly better than in other countries. Compared to the full global sample, a higher percentage of U.S. firms uses the Internet for selling (43% versus 30%) and buying (73% versus 47%), perhaps because of the better legal/regulatory environment [5].

Firms in other countries show a wide variation in their perception of their legal/regulatory environment. In general, European firms have much less concern about privacy and data security, perhaps because of the European Union's strong rules for privacy protection. These rules have been criticized in the U.S. as hampering e-commerce adoption, but our findings suggest that, in fact, the less stringent privacy protection in the U.S. may be a barrier to online commerce (47% of U.S. respondents reported it as a high barrier).

By contrast, 54% of firms surveyed in China reported that inadequate legal protection for Internet purchases was a serious problem, 45% cited privacy and security concerns, while 41% stated that business laws do not support e-commerce. This supports qualitative research arguing that data security and Internet fraud are significant barriers to the adoption of e-commerce in China [5].

Our findings have important implications for business managers and for government policymakers. For managers, our findings suggest that in addition to technological readiness, factors such as level of experience with direct marketing and availability of credit cards are important criteria for deciding in which countries to initiate e-commerce activities. More importantly, our findings indicate it is likely to be costly and difficult to conduct e-commerce when the rule of law is weak. Some barriers to adoption can be circumvented; for instance, in Japan and Taiwan, customers can pick up and pay for merchandise ordered online at convenience stores. This helps mitigate the effects of consumer unwillingness to use credit cards online and addresses the desire to see the product before paying [5]. However, such solutions may add cost and reduce the convenience associated with e-commerce.

For policymakers, our research points to the need to establish effective laws and regulations such as contract law, intellectual property protection, and privacy rights, and to ensure they are enforced in the online world. In many countries, the emphasis of e-commerce promotion has been on specific policies such as digital signature recognition, e-government initiatives, or providing incentives for firms to adopt the Internet [5]. Yet the GEC survey finds that government incentives are by far the weakest driver of e-commerce adoption, far behind factors such as the desire to expand markets, respond to customer demand, or reduce costs. Likewise, there is evidence that specific e-commerce mechanisms such as digital signatures

Country	E-commerce per capita*	Rule of Law**
Argentina	18.57	5.35
Australia	230.62	10.00
Austria	219.48	10.00
Belgium	130.51	10.00
Canada	506.43	10.00
Denmark	325.69	10.00
Finland	213.22	10.00
France	123.99	8.98
Germany	223.38	9.23
Greece	32.46	6.18
Hong Kong	102.99	8.22
India	0.32	4.17
Ireland	115.14	7.80
Italy	111.45	8.33
Japan	621.80	8.98
Malaysia	13.70	6.78
Mexico	18.57	5.35
Netherlands	199.03	10.00
New Zealand	152.26	10.00
Norway	381.37	10.00
Philippines	2.85	2.73
Portugal	32.46	8.68
Singapore	282.74	8.57
South Korea	80.52	5.35
Spain	59.29	7.80
Sweden	348.74	10.00
Switzerland	389.11	10.00
Thailand	3.85	6.25
United Kingdom	295.96	8.57
United States	590.78	10.00

* From [3]; ** From [6]

Table 1. Descriptive values for countries.

[3]Data was gathered through a telephone survey in 10 countries—Brazil, China, Denmark, France, Germany, Japan, Mexico, Singapore, Taiwan, and the U.S.—that use the Internet to buy, sell, or support products and services. Data collection took place from February to April 2002. Countries were selected to include developed, newly industrializing, and developing nations in the three major regions of the world. Establishments were selected from three major industry sectors that are known to be more advanced users of e-commerce—manufacturing, distribution (wholesale and retail), and finance (banking and insurance). The sample breaks down into approximately 300 establishments in the U.S. and 200 in each of the other countries, and is evenly split by industry as well as firm size (from 25 to 249 and 250 or more employees) in each country. Respondents were primarily CIOs, CEOs, or IS managers who were responsible for making the firm's IT-related decisions.

	Model 1	Model 2
Asia–Australia	2.780**	1.237**
Western Europe	2.982**	1.512**
North America	2.623**	1.069**
South America	2.926**	1.226**
Year 2000	-0.146	-0.224**
Year 2001	-0.753**	-0.690**
GDP per capita (U.S.$ '000)	-0.011	0.003
Market Capitalization per capita (U.S.$ '000)	-0.003	0.047**
Private Loans/Credit per capita (U.S.$ '000)	0.032	0.024
Direct Mkt. Revenue per capita (U.S.$ '000)	-1.536	-1.871
Number of Internet Users per capita	0.003	0.014*
Number of Credit Cards per capita	0.008	0.026
Number of Secure Servers per capita	0.051†	0.052†
Total IT Investment per capita (U.S.$ '000)	0.000†	0.000†
Rule of Law	0.159*	0.109**
Rule of Law * Market Cap. per capita	--	0.034**
Rule of Law * Private Credit per capita	--	-0.008
Rule of Law * DM Revenue per capita	--	2.026†
Rule of Law * Internet Users per capita	--	0.017†
Rule of Law * Credit Card per capita	--	0.012**
F	65.791	68.630
R^2	0.951	0.968[a]
Adj. R^2	0.936	0.954

** p<0.01; * p<0.05; † p<0.10; [a] F-test of $\Delta R^2 = 20.718$, p<0.05

Table 2. Factors influencing e-commerce transaction levels.

Country	U.S.	Germany	France	Japan	Denmark	China	Taiwan	Brazil	Singapore	Mexico	Global
Concern about privacy of data or security issues	47	25	20	55	23	45	66	49	48	58	44
Inadequate legal protection for Internet purchases	12	21	39	21	12	54	49	41	44	45	34
Business laws do not support e-commerce	8	5	24	22	15	41	28	32	35	27	24

Source: CRITO Globalization of E-commerce survey, 2002; www.crito.uci.edu/GIT/project5.asp.

Table 3. Barriers to e-commerce.

have gone largely unused even after their validity has been established by law [9].

It appears instead that the more important issue is the general set of institutions, rules, and norms that make up the rule of law in a country. When contracts are enforceable, fraud punished, privacy respected, and intellectual property protected, businesses and consumers will be more comfortable buying and selling online. When the rule of law is strong, nations mostly need to address the specific problems of the online environment, such as providing online security measures, establishing opt-in policies to protect private information, or protecting intellectual property in peer-to-peer networks.

In countries where the rule of law is weak, the importance of establishing rules and institutions to support well-functioning markets obviously goes far beyond e-commerce. But the perception that a country is falling behind on the Internet might provide additional motivation to improve the rule of law. In addition, in countries such as China and Brazil, government agencies have moved procurement and other business transactions online specifically to increase transparency and reduce the likelihood of fraud or corruption [5]. So in this sense, it is possible that the Internet and e-commerce can serve as both a reason and a tool for improving the rule of law. C

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