

Governance of Electronic Commerce in Consumer and Business Markets

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Abstract

Contract law provides a framework within which economic relationships can be established and administered, while electronic commerce (e-commerce) provides tools for reducing the costs of those activities. Application of traditional contract law concepts to e-commerce may result in uncertainty which may diminish the efficiency gains from technological innovation. This paper looks at the impact of e-commerce on the governance structures of commercial relationships generally, and in three specific major areas of commercial activity that have been most affected by e-commerce in recent decades. With regard to business-to-consumer electronic commerce and issues related to the security of e-commerce (including electronic signatures), “liberal market economies” (LME) such as the US have treated the growth of e-commerce as an opportunity for further deregulation of markets, while “coordinated market economies” (CME) including most EU members have responded with significant new regulations. By contrast, both LMEs and CMEs have allowed market forces to determine the direction of business-to-business e-commerce developments.

I. Introduction

Contract law provides a framework within which relationships can be established and administered for the mutual benefit of the parties; electronic commerce (e-commerce) provides tools for reducing the costs of establishing and administering those relationships. When traditional contract law doctrines are applied to electronic commerce, however, the result may be uncertainty, the costs of which may offset any efficiency gains from technological innovation. In order to prevent the application of traditional contract law doctrine from impeding the use of new technologies, some changes may be needed. Precisely what changes are needed is not

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always clear, however, so the reform of contract law to accommodate technological innovation has been the subject of some controversy in recent decades. This paper will consider some major challenges to contract doctrine created by the use of e-commerce and the range of regulatory responses that different national and regional authorities have adopted, and assess the practical impact they have had on technological innovation in the governance of markets.

In some situations, conventional legal reasoning and traditional contract law are completely adequate to resolve issues related to electronic contracts. For example, in an early US case, *Howley v. Whipple*, 48 N.H. 487 (1869), the court found that a telegram could meet a requirement that a contract be in writing, noting “it makes no difference whether the operator writes the offer or acceptance with a steel pen an inch long attached to an ordinary penholder, or whether the pen is a copper wire a thousand miles long. In either case, the thought is communicated to the paper by the use of a finger ...”. In other situations, however, established contract law may not provide an adequate framework. In such cases, parties interested in adopting e-commerce technologies can be expected to lobby for law reforms and other institutional changes.

The emergence in the 1980s of “electronic data interchange” technology to support “just-in-time” manufacturing processes was perceived as causing disruptive changes in business behavior because, unlike telex or fax technology, it became possible for the first time to form contracts with nothing more than machine-to-machine communications. Managers who wished to adopt innovative e-commerce technologies were worried that if lawyers and judges applied anachronistic legal concepts to new business practices, then use of EDI technology might deprive them of all recourse to the courts. Such concerns triggered law reform projects around the world designed to remove irrational impediments to the growth of e-commerce. One of the most significant efforts was spearheaded by the United Nations Commission on International Trade Law (UNCITRAL). The 1996 UNCITRAL Model Law on Electronic Commerce (EC Model Law) was initially designed merely to remove obstacles to the use of EDI, but was later expanded to cover all forms of e-commerce including Internet commerce. At the heart of the EC Model Law are the principles that old and new methods of forming contracts should be treated as functionally equivalent in contract law, and that contract law reforms should be “technology neutral,” i.e., not used to promote specific e-commerce technologies. The EC Model Law influenced law reform efforts around the world in developed and developing countries alike. The spread of B2B e-commerce technologies made possible in part by these law reform efforts has been a major factor fueling the growth of the supply chains and global markets integrating buyers and suppliers around the world.

In recent years, the volume of e-commerce appears to be continuing to grow, although the rate of adoption by businesses of e-commerce technologies is not easy to determine. Several years ago, the US Census Bureau began estimating the volume of e-commerce transactions within selected market segments in the US economy, and those statistics provide a rough measure of the degree of acceptance of e-commerce technologies by US businesses. Based on statistics for 2004, the Census Bureau estimated business-to-business (B2B) e-commerce accounted for more than 90% of all e-commerce transactions, and that e-commerce accounts for nearly \$1 trillion or 24% of all transactions in the manufacturing sector, and over \$800 billion or 17% of all merchant wholesale transactions (United States Department of Commerce 2006). Although business-to-consumer (B2C) Internet commerce has attracted more attention in the mass media, e-commerce accounts for only 2% of retail transactions.

Law reforms based on the EC Model Law appear to have satisfied the most broadly based business demands to remove legal obstacles to the use of e-commerce technologies. It appears to be the case that sophisticated businesses in developed market economies now

believe that they are unlikely to face any arbitrary or irrational obstacles to enforcing contracts formed using new technologies, as evidenced by the lack of any ongoing controversy surrounding their use of e-commerce technology to form contracts. While the regulation of e-commerce in producer markets has been less politically controversial than the regulation of e-commerce in consumer markets, major innovations in contract law have nevertheless occurred as a result of growing adoption of B2B e-commerce. The most significant innovation has been the growth of technical standards as a form of commercial law in global markets. In markets where B2B e-commerce is well established, technical standards and standard-developing organizations play a role at least as important as national contract laws in regulating e-commerce between businesses. As a result, in producer markets, the most important e-commerce regulatory challenge may be finding and implementing the optimal standards infrastructure, while in end-user markets, the challenge remains finding and implementing the optimal legal infrastructure.

While some sophisticated businesses began forming electronic contracts using EDI technology on a routine basis in the 1980s, in consumer markets, electronic contracts did not become a major issue until a decade later when the Internet was finally opened to commercial activity. Beginning in the 1990s, there have been many major national and regional efforts to overhaul consumer protection laws to address the new challenges of consumer Internet commerce. With regard to law reforms targeting technology end-users rather than producers, regulatory strategies adopted in the EU and in the US have diverged significantly. The US has favored a “hands off” approach, letting market forces play a significant role in defining consumers’ rights in Internet markets as well as the appropriate form of security for Internet transactions. By contrast, the EU has tried to use regulation to establish minimum levels of both consumer protection and transaction security. While e-commerce adoption rates in both business and consumer markets appear to be higher in the US than in the EU, it is unclear whether differences in regulatory strategies are a major cause of the difference, or simply another reflection of important cultural and institutional differences between the two systems. For example, American enthusiasm for e-commerce and for “deregulation” in recent decades may both reflect a higher tolerance for allocating economic risks to individuals rather than collective entities in American society compared to most European societies (Whybrow 2005).

II. Governance Framework

Regulators within developed economies have been remarkably consistent in their efforts to promote e-commerce because it offers the promise of reduced information asymmetries and lower transaction costs within their national markets, and opportunities for businesses and consumers to participate in markets that were previously inaccessible (Clinton & Gore 1997; Commission 2005). This consensus with regard to the social value of e-commerce does not necessarily extend to regulatory strategies to achieve it, however. Strategies for regulating e-commerce include: private law doctrines such as contract law combined with market competition and minimal government intervention; direct government intervention in the form of legislation to promote interoperability by promoting the adoption of specific standards; direct government intervention to prohibit or mandate particular contract terms; and *de facto* or *de jure* delegation of regulatory authority to intermediaries such as standard-developing organizations. Policies adopted to promote e-commerce have been remarkably consistent with other national policies regarding economic activity: the US has favored a more market-oriented approach that strives to narrowly limit government intervention in markets, while many European countries have relied more heavily on non-market forms of coordination, including direct government intervention to achieve goals that would be perceived as social

rather than economic in the US. Political economists have used the label “liberal market economy” (LME) to describe the US approach, and “coordinated market economy” (CME) to describe the European approach (Hall and Soskice 2001).

Differences between LME and CME approaches to the regulation of e-commerce are clearest in consumer (or end-user) markets rather than in producer markets now dominated by supply chains. In consumer/end-user markets, the US and Europe have taken different approaches to the regulation of consumer Internet markets, and the regulation of the security of Internet contracts. The US has left its existing consumer protection laws substantially unchanged, allowing a process of “creeping deregulation through statutory obsolescence” with regard to some activities in consumer Internet markets. It has also adopted a “hands off” approach with regard to the security of Internet contracts, allowing market competition to determine the appropriate level of security. By contrast, the EU has updated consumer protection laws at the European level in an effort to insure that consumers enjoy no fewer protections in Internet commerce than in traditional commerce, and has expanded the scope of consumer protection in all markets by requiring the application of unfair contract terms law throughout the internal market. It has also tried to harmonize the regulation of electronic signatures as a technology to increase the security of Internet contracts, an effort that has so far met with a deplorable lack of success.

With regard to the regulation of B2B e-commerce, an important difference between the US (as the leading LME) and most other countries (including European CMEs) is in the organization of standard-developing institutions (Tate 2001). Decentralized control over markets under US federalism and a cultural preference for “bottom up” (i.e., market driven, private-sector controlled) standardization efforts has produced fragmented, decentralized standard-developing processes in the US. By contrast, standard-setting processes within most other countries tend to be centralized in a single organization. In Europe, the work of “national standards bodies” in different member states are now often coordinated at the EU level by the work of European standards organizations.³ These institutional differences in approaches to standard developing often matter a great deal with regard to competition to set information and communication technology (ICT) standards in global markets (Winn 2006). With regard to the markets for B2B e-commerce standards, however, the impact of such regulatory competition in recent years has often been relatively muted compared with ICT standards competition other markets, such as mobile telephony. This may be due in part to the fact that B2B e-commerce technologies now bring only incremental instead of radical innovation to the business processes of firms adopting them.

At first glance, US dominance in many markets for e-commerce products and services would seem to suggest that the “light regulation” approach favored by LMEs such as the US provides a better governance structure to promote e-commerce than does the more traditional regulatory approach favored by CMEs in Europe. More careful analysis reveals that this conclusion may not be warranted, however. LME governance models tend to subordinate public regulation of economic activity carried out by government agencies to private initiatives within market institutions, but in the absence of actual competition, that deference to private control may lead to market failure rather than greater productivity. The divergent approaches taken in recent years by US antitrust and EU competition regulators with regard to the operation of *de facto* ICT standards controlled by Microsoft illustrates this point. While US regulators

³ CEN (European Committee for Standardization/ Comité Européen de Normalisation), CENELEC (European Committee for Electrotechnical Standardization/ Comité Européen de Normalisation Electrotechnique), and ETSI (European Telecommunications Standards Institute).

seem willing to treat almost any market outcome as the result of market competition, EU regulators seem more concerned about potential abuses of monopoly power that may result when strong network effects drive convergence around ICT standards controlled by private parties.

Industrial organization models show that if markets are not competitive or at least contestable, dominant players could provide users with a too low level of services. Indeed, digital industries are known for the “winner takes all” type of competition. This is also a recognized characteristic of competition among standards. Recent experience in markets affected by e-commerce technologies shows that new entrants can compete by implementing new “concepts” in Internet-based services and that the possibility of such innovation creates an ongoing threat to the positions of established providers of e-commerce products and services. This potential for new competitors to suddenly emerge helps explain why large e-commerce players may have the right incentives to continue to deliver high products and services. In addition, traditional commerce remains a permanent competitor for e-commerce players. If actual competition or the threat of innovation giving rise to new competitors is not present, however, then government enforcement of competition law may be a key variable in the optimal governance structure for e-commerce regulated more by ICT standards than by contract law.

III. Business to Consumer Electronic Contracts

By the late 1990s, the explosive growth in popularity of the World Wide Web among relatively unsophisticated consumer computer users led to the growth of large-scale B2C Internet businesses, and unprecedented numbers of consumers engaging directly in cross-border trade, a practice which had formerly been limited almost exclusively to businesses. As might be expected, reactions from regulators in the United States and Europe to the growth of domestic and international B2C markets diverged markedly. EU regulators have been expanding their oversight of consumer markets, and expanding the role of administrative agencies in enforcement, at precisely the time that US contract law has turned away from public regulatory models. The growing gap in contract law doctrine with regard to consumer transactions appears to be yet another example of diverging long-term trends in political culture and economic regulation on either side of the Atlantic (Löfstedt et al. 2001). The US was very active in enacting consumer protection laws during the 1960s and 1970s while there was relatively little activity in this area in Europe. The trends reversed during the 1980s, when the US embraced more market-oriented approaches that require individuals to bear more risk in consumer transactions, while the EU has embarked on a sweeping program of legislation to protect consumers from many of those risks.

The US adopted a “light regulation” strategy based on deference to merchant-drafted standard form contracts and judicial precedent rather than new legislation, while the EU opted to enact new laws to ensure parity between Internet and traditional markets with regard to consumer rights. The EU followed up major consumer law reforms such as the 1994 Unfair Contract Terms Directive with a broad package of law reforms designed to make B2C markets as safe for consumers as traditional bricks-and-mortar retail markets. The efforts of EU regulators to build confidence in B2C e-commerce do not appear to be having much effect, however, while the failure of US regulators to intervene in B2C markets with new regulations does not appear to have diminished the enthusiasm of US consumers for Internet commerce. US Internet businesses have successfully leveraged their US market position to expand in Europe, taking the higher level of regulation in stride, while EU Internet businesses have yet to have much impact on the US market. While it is unclear what impact the more restrictive legal environment for

European Internet retailers is having on their success in global markets, they certainly do not appear to be profiting from a “race to the top” (Porter 1990).

Political scientists and economists distinguish between “economic regulation” aimed at supporting competition in markets, and “social regulation” aimed at protecting health and safety. Consumer protection laws are now treated as a form of economic regulation in the US; government intervention is treated as appropriate only when it is clear that competition is not doing an adequate job of meeting consumer needs (Epstein 2006). EU lawmakers appear to be skeptical that mere economic regulation will provide enough support for online consumer markets in Europe. The Commission has repeatedly emphasized the idea that online commerce is unlikely to grow in popularity in Europe unless consumer confidence can be enhanced, and the most obvious means of achieving that end is greater regulation of B2C transactions to protect consumers (Council of the European Union and Commission for European Communities 2000). The EU has proceeded on multiple fronts in its efforts to make Internet commerce safe for consumers, including strong data protection legislation, which is clearly considered a form of social regulation in the EU (Kuner 2003), and legislation governing the terms of “distance contracts” in addition to legislation limiting the enforcement of “unfair contract terms” in any consumer transaction, online or offline. These law reforms have in effect turned EU consumer contract law into another form of social regulation.⁴

Many elements of EU consumer protection policy do appear to be motivated by just a desire to level the playing field among consumers to insure that social rather than economic policy objectives are met (Howells and Weatherill 2003). By mandating a high minimum level of protection, EU online consumer contract law forces all merchants to internalize high compliance costs and constrains the range of possible innovation in marketing channels. By contrast, US online consumer contract law sets a much lower mandatory minimum level of protection (Winn 2005), which appears to have opened the door to more rapid growth and greater innovation in online retail marketing, although of course many of these innovations ultimately fail (German 2005). If the US approach has allowed more of the costs associated with innovation to be borne by disgruntled individual consumers than the EU approach would permit, then it would not be the first time that changes in the interpretation of American contract law have had the effect of subsidizing the growth of new markets (Horwitz 1977).

Laws governing consumer contracts generally and Internet contracts in particular diverge in the US and EU in large part because of the Unfair Contract Terms Directive (European Community 1993), which regulates form contracts offered by merchants to consumers whether online or offline; the Distance Selling Directive (European Community 1997), which regulates transactions between remote merchants and consumers, whether by means of television, telemarketing, Internet or other electronic communications medium; and the Electronic Commerce Directive (European Community 2000), which promotes transparency and accountability in online commerce have had a significant impact on B2C transactions.⁵ Unlike the statutory framework established by the Unfair Contract Terms Directive, US contract law protects consumers from predatory merchant practices with the weaker equitable doctrine of

⁴ For example, within the Commission, consumer protection matters are handled by the Health and Consumer Protection Directorate General, which also oversees health and food safety regulations, while in the US federal government, they are often handled by the Federal Trade Commission, which also has jurisdiction over antitrust law enforcement.

⁵ As a general rule, EU Directives do not affect the rights and obligations of individuals until the directive has been transposed into national law. This paper will focus on the provisions of the relevant directives as indicative of the law of individual member states.

“unconscionability.” While unconscionability doctrine may target the same kind of unfair commercial practices as unfair contract terms law, its application is much less predictable because of the wide variations in judicial precedents applying the doctrine. As a result, most—although not all—US courts reviewing Internet consumer contract terms do not hesitate to enforce terms that would be invalidated as unfair contract terms in any European country (Winn and Webber 2006).

US companies competing in B2C markets, including Amazon.com, Google, Yahoo!, eBay and Microsoft, have managed to develop powerful brands and achieve significant market share, not only in the US market, but in most European markets. At a minimum, this suggests that the EU commitment to raising the level of protection offered European consumers throughout the internal market has not precipitated a “race to the top” that fuels the growth of globally competitive European Internet companies (Porter 1990). The competitiveness of US Internet companies in global markets may be due in part to the fact that the challenges of global markets are equivalent to those they face in intensely competitive US retail markets. Another possible explanation is that, since the crash of the dot.com bubble in 2001, there has been a substantial “flight to quality” among US consumers, which has favored the growth of a handful of dominant Internet merchants such as Amazon.com or eBay in the place of the teeming anarchy of B2C Internet markets in the late 1990s. If this is the case, then the relatively lax US regulation of B2C Internet markets may paradoxically create an opportunity for some Internet merchants to distinguish themselves based on their commitment to providing more than the minimum level of service required by law. Internet retailer Amazon.com, like the mail-order retailer Lands End, built brand recognition by voluntarily providing US consumers with an unconditional money-back guarantee of satisfaction, which is an even higher level of protection than that mandated by EU consumer protection law. By contrast, any European merchant hoping to challenge Amazon.com in European Internet markets cannot try to build brand recognition by guaranteeing consumers’ satisfaction with their offerings because such a policy is mandatory, not optional, under European consumer protection laws. Thus, the US laissez-faire approach to regulating Internet consumer markets might paradoxically have fueled the growth of national “champions” in global markets, while the EU approach of setting high mandatory minimum levels of protection to build consumer confidence in the Internet market may have inadvertently slowed the growth of local companies.

IV. Security of Electronic Contracts

One of the most fundamental problems that must be solved in order to make the switch from traditional commerce to e-commerce is finding a way to ascertain the identity of a transacting party communicating within a network of computers. Authenticating computer users poses serious, but not insurmountable, business and technological challenges. Before the Internet made the use of open, insecure networks for commerce commonplace, the problem of authentication was normally solved with a combination of business processes and technologies that established a closed network of computers. Examples of successful, well-established e-commerce systems that operate in global markets using closed networks of information systems include bank wholesale funds transfer networks, electronic data interchange trading partner relationships that use value-added networks, airline computer reservation systems, credit card systems, automated clearing houses, and automated teller machine electronic funds transfer systems. Participation in each of these systems is either limited by government regulation and licensing systems, or by an individual enrollment process that has significant screening functions, and in some cases, an existing network participant to act as guarantor before a new entrant is accepted. In such a closed system, the process of formalizing security policies, defining roles,

establishing access controls and taking the other steps required to deploy an effective system for authenticating users may be difficult and expensive, but not impossible.

When Internet commerce first became possible in the mid-1990s, there was widespread agreement about the need for new forms of strong authentication technologies that could be used efficiently in this new environment. Given the consensus that lack of security of Internet communications created an acute need for new forms of strong authentication that would be widely adopted and broadly interoperable, it is not surprising that regulators in many countries believed law reforms could promote Internet commerce by eliminating competition among authentication standards. Lerner and Tirole (2006) have noted that owners of intellectual property or mere sponsors of an idea (e.g., authors, security issuers, sponsors of standards) often need to persuade potential buyers or adopters of the worth of their property or idea. To accomplish this, they often resort to more or less independent certifiers. Many reformers thought they could help establish a system of such certifiers through regulation.

Developers of “digital signature” technologies promoted the idea that “public key infrastructures” maintained by “certificate authorities” would make reliable, effective authentication widely available. While some regulators might have thought that simply requiring the use of such technology would have been the most appropriate law reform, the law reform model that ultimately won out was more indirect: parties seeking enforcement of contracts signed with digital signatures would enjoy an evidentiary presumption that the signature was valid, which would simplify the process of enforcing the contract in court. While the first round of law reforms to promote this technology used the term “digital signature” to describe it, this was roundly criticized as too “technology specific,” so subsequent law reform efforts used the term “electronic signature” and described it in what were intended to be more technology-neutral terms. A decade of experience of trying to implement these laws has shown, however, that there is only one type of technology that meets the requirements of the legislation—the technology formerly known as “digital signatures.”

Once again, CMEs and LMEs adopted very different regulatory strategies for dealing with the challenges of Internet commerce security. CMEs tried to provide a centralized, coordinated solution, while LMEs deferred to market demand. While electronic signature laws have proven popular in civil law jurisdictions, including many leading CMEs, whose legal professions include notaries and whose commercial laws place a heavy emphasis on signature formalities in traditional commerce, common law jurisdictions without exception resisted enacting them. Commercial law under the common law tradition is in practice quite flexible with regard to requirements of form, often treating them as questions of proof at trial rather than mandatory elements of transactions. Commercial lawyers practicing in common law jurisdictions also had confidence that case law would develop to guide courts and transacting parties with regard to how parties to e-commerce transactions should be authenticated.

Immediately after the Electronic Signature Directive was issued in 1999, the Commission took the further step of convening the European Electronic Signature Standardization Initiative, which published a comprehensive suite of standards to promote the adoption of interoperable electronic signature applications in Europe. In 2003, the Commission sponsored a study of the impact that electronic signatures were having on European markets, and discovered that it was negligible outside the context of “e-government” applications where member state or local governments required businesses to use them in order to gain access to necessary government services. Although there was no evidence that private parties were using electronic signatures to form contracts, this might merely reflect a slow initial adoption rate as the implementing standards had only recently been issued. A few years later, however, the evidence that the strategy to create certifiers through law reform was a failure was less ambiguous. A study by

the Commission in 2006 conceded that market adoption of electronic signatures had not developed as expected. The Commission study identifies as possible factors contributing to this failure the complexity of the technology and the reluctance of certification service providers to act as “trusted third parties” out of liability concerns.

Common law jurisdictions such as the US, Canada, Australia and New Zealand (which are also leading LMEs) which resisted calls for such legislation have left it up to the market to decide what authentication technology was appropriate for Internet commerce, and what standards would guarantee interoperability. In the ensuing unregulated competition among technology vendors, many compelling technical solutions have been brought to market but none have been able to gain decisive market share. As a result, the default for retail Internet transactions in the US remains user ID and password logons even though the security problems associated with such systems are very well known. This appears to be a clear instance of the problem frequently encountered in markets where interoperability is essential to maintain the operation of networks, namely that migration from one standard to another can be very difficult. Demand among businesses and consumers for reliable, interoperable authentication technologies continues to grow, however. The vulnerability of Internet e-commerce has attracted the attention of organized crime, which now operates on a global basis and routinely evades national law enforcement efforts, resulting in rising levels of identity theft and financial account fraud in the US and other jurisdictions where Internet commerce has gained in popularity.

Competition among developers of authentication technology in the US has led to the development of new “identity management” standards. Developers of different identity management standards may soon be engaged in a “standards war” to decide which among the competing standards will achieve widespread adoption. The Liberty Alliance is a consortium started by Silicon Valley technology companies including Sun Microsystems, Oracle, and Hewlett-Packard that now includes such diverse organizations as General Motors, France Telecom, Nokia, NTT DoCoMo, American Express and MasterCard. The Liberty Alliance’s original mission was to develop a comprehensive suite of ICT standards to permit two business enterprises to create a “federated identity system” that permits sharing of trustworthy credentials across organization boundaries.

Not to be left behind, Microsoft and IBM organized the Web Service Interoperability Organization (WS-I) which developed a competing comprehensive suite of ICT standards for strong authentication. This effort has been joined by other leading technology companies, including Hewlett-Packard, Intel, Oracle and SAP AG, among others. Microsoft also announced the development of a “user-centric” identity management system together with its new Vista operating system. This identity management system—CardSpace—is designed to serve as a platform from which authentication systems developed by Microsoft or its competitors can be accessed. The open source community has also developed standards for a very “lightweight” form of identity management—OpenID 1.0—which provides weak authentication for social commerce, such as blogs and social networking sites. OpenID is not currently adapted for use in conventional commercial transactions, although the developer community supporting the project has announced its intention to produce OpenID 2.0, which should be suitable for commerce. While it is too soon to declare whether any of these competing standardization efforts will achieve widespread adoption in the US, let alone in global ICT markets, early indications are that at least one of them might.

With regard to the Lerner and Tirole forum-shopping analysis, the credibility of the Liberty Alliance as a certifier of strong authentication technology comes from its broad base of support among many global technology companies. However, the governance challenges facing such a broadly based participatory organization may undermine its credibility. The credibility of

the WS-I is based on the market power of Microsoft and IBM, its leaders and strongest members; the ability to leverage significant market power and simpler governance structure may confer a form of *de facto* rather than *de jure* credibility in the minds of some end users. Microsoft's credibility as a certifier of authentication technologies was undermined by the failure of Passport, one of its early efforts in this area, but that credibility may be restored if the identity management system embedded in its new Windows Vista operating system achieves widespread popularity. The credibility of the OpenID standards developers is based on the enormous popularity of social commerce, especially among technologically sophisticated young people around the world. In the case of digital signatures, it appears that the sponsors of a less attractive technology chose a certifier that lacks both competence and credibility, with the result that end users disregard the technology and the certification.

This situation can be analyzed in general as a coordination game, or in particular as a "battle of the sexes" game (Mattli and Büthe 2003). A simple coordination game would require two players to both choose the same of two possible strategies in order to receive a higher payoff. In the more complicated "battle of the sexes" variation, one player is the husband who wants to go to a sporting event while the other player is the wife who wants to go to the opera. While the husband does not like the opera and the wife does not like sports, they each prefer to be in the other's company to attending an event alone. In the context of end users trying to agree on a technology for strong authentication, the end users will maximize their payoffs by agreeing on a single authentication standard, although some end users prefer the Liberty Alliance standards and other end users prefer Microsoft standards. Adoption of either standard would result in a Nash equilibrium. Once a critical mass of end users agree which standard to adopt, it would become the market standard and, as a result of network externalities, would be expected to achieve near universal adoption. Up until now, however, there has been no consensus among end users with regard to a standard for strong authentication, and adoption rates for strong authentication technologies have been low as a result. Risks associated with change in technology standards and uncertainty over the sharing of costs and benefits among trading partners have impeded the adoption of strong authentication technologies, even though it is clearly in the best interest of end users to find a common solution.

V. Business to Business Electronic Contracts

The use of e-commerce between businesses is one of many factors that have contributed to the transformation of business contracting in recent decades. That transformation is in part a response to the globalization of markets, resulting in the organization of production and distribution into global networks known as supply chains. For enterprises struggling to adapt to these new conditions, the use of e-commerce is a necessary but not sufficient condition of success. When successfully implemented, e-commerce technologies allow enterprises to radically reduce waste and inefficiency in production and distribution by increasing the coordination among trading partners to a degree that was formerly possible only with vertical integration. Migrating management systems from traditional administrative processes to those using e-commerce is a difficult and dangerous task, in part because of the complexity of the business information systems required and the lack of standardization among business enterprises.

Standards play an indispensable role in the administration of supply chains because of the large volumes of information that must be exchanged between separate enterprises. In the absence of standards, the administrative overheads associated with translating to and from incompatible data formats can be substantial (Gibb and Damodaran 2002). Modifications to business information systems to permit the high-volume exchange of data between trading

partners are required on an ongoing basis as each enterprise's system is upgraded. The wide variety of information flows and the diversity of customer-supplier interactions make the standards infrastructure very complex, resulting in a large absolute number of standards. For example, the RosettaNet consortium has identified more than 100 separate business processes for which standard protocols, called Partner Interface Processes (PIPs), are necessary within the electronics sector.

Firms within an industry can put needed standards infrastructures in place to support integration efforts in several ways, and each approach has implications for the efficiency and completeness of the resulting systems. If the industry is dominated by a single firm, usually an Original Equipment Manufacturer (OEM), that firm can create standards and impose them on the rest of the industry. AT&T took this role in telecommunications during the era of regulation and developed and implemented most of the standards used within that sector. In the case of personal computer operating systems, Microsoft's dominance has allowed it to set standards that hardware and software firms alike are obligated to support. In an alternative scenario in imperfectly competitive markets, each large OEM can develop its own standards and insist that its suppliers comply to enjoy continued business. This has long been the practice in the US automotive sector, in which the Big Three (General Motors, Ford and DaimlerChrysler) have routinely imposed their unique standards on direct suppliers. Potentially, many or all of the firms in an industry can work together to create a mutually beneficial infrastructure for integration, either by forming a consortium through an industry trade or technical association, or with the help of one or more standards development organizations. Still, it is difficult to manage power and influence issues within consortia and other voluntary organizations, and success in creating efficient standards is not assured. In addition, incomplete representation of entire industries linked through supply chains within these groups means that important suppliers and customers may be left out of the process.

From the standpoint of economic theory, this approach to standardization is likely to lead to inadequate standards infrastructures for at least two reasons. The first arises from the public goods nature of these standards, which inevitably leads to a free-rider problem and resultant under-provision of the good. The second reason is coordination failure, in which asymmetric incentives lead participants to pursue investments that are suboptimal for the industry as a whole. This problem appears particularly acute in the case of ICT (Brousseau 2002). Coordination failures arise from asymmetries in incentives between market participants, either among competitors or among levels in a supply chain. In the competitive case, firms acting in their self-interest may invest in standards or other forms of human capital that are not optimal for the industry as a whole. This is especially critical in imperfectly competitive markets, where strategic interaction is important. As an example, the separate and incompatible systems created by the automotive OEMs for the exchange of technical data are a direct result of the focus on private optimum among the oligopolistic Big Three. A second type of failure may occur between customers and suppliers along the supply chain, especially if the size and technical capabilities of the partners are quite different. Small firms in the lower tiers may have an interest in improving their information infrastructure but may lack the financial resources or technical capability to make it happen. Their incentives to invest are further reduced if they believe that any cost advantages they obtain from increased efficiency will be quickly competed away through lower prices. The larger firms might more easily take on the burden of developing improved information systems. If, however, most of the initial benefits will accrue to their

suppliers, these firms and OEM corporations may conclude that their investment might not pay out over their required time horizon (Deffains and Demougin 2006).⁶

From a theoretical perspective, the problem of a supplier selling through multiple competing retailers has received significant attention. The literature on this problem has focused on the design of coordination schemes, such as contractual arrangements between the parties that allow the decentralized supply chain to perform as well as a centralized one. Mathewson and Winter (1984) show that when the supplier has all the bargaining power, the joint profit of the supply chain is maximized in equilibrium (see also Segal 1999). By contrast, Bernstein and Marx (2006) demonstrate that when the retailers have bargaining power, supply chain profit is not maximized. In addition, they show that some retailers may be excluded from trade with the supplier. In other words, the maximization of the joint profit implies an advantage for the supplier.

Other than the “media neutral” reforms to contract law described earlier, there have been no changes in the law applicable to B2B contracts in either the US or EU. Unlike consumer contract law, where large variations between the laws of different countries are found, the general principles of contract law applicable to transactions between businesses are often substantially similar.⁷ Furthermore, even though the move from traditional markets and vertically integrated firms on the one hand to supply chain hybrids on the other has been little short of revolutionary in many markets, conventional contract law doctrines in both the US and EU appear to be adequate to accommodate major changes in the character of B2B contracts. The terms of contracts between businesses are presumed to reflect competitive forces and the self-interest of the parties to a greater degree than contracts between merchants and consumers, and general contract law doctrines are presumed to be adequate to permit the parties to respond to competition and express their self-interest (Schwartz and Scott 2003).

Empirical research into whether traditional principles of contract law work equally well in supply chains or traditional markets is not easy to conduct, however. One recent study of supply chain contracts in the US automobile industry suggests that even global multinationals may be less rational in their contract negotiations than economic theory would suggest (Ben-Shahar and White 2006). Unlike B2C transactions, where the terms and conditions are generally posted by merchants on the Internet for all the world to see, and about which there has been a large volume of litigation in the US resulting in a significant number of reported judicial decisions, the terms of B2B contracts generally remain confidential and appear to be rarely if ever litigated, even in the US. Given that trillions of dollars worth of contracts have been formed using e-commerce technologies over the last 20 years, it is likely that the dearth of judicial decisions resolving disputes arising out of B2B contracts formed using IT reflects a lower rate of litigation for these contracts than contracts formed by traditional means. Assuming that B2B contracts formed by means of e-commerce do indeed give rise to fewer litigated disputes, then the lower litigation rates may be due at least in part to the greater accuracy of sophisticated electronic contracting systems. Human error in preparing orders or confirmations may be eliminated before performance begins, reducing the number of disputes about what are the actual terms of contracts. While the greater accuracy of B2B electronic contracting systems

⁶ This is the classical hold-up problem.

⁷ Similar is not the same as identical, however; the desire of businesses engaged in cross-border trade to reduce the costs associated with such differences as do exist have helped produce the UNCITRAL Convention on the International Sale of Goods and the UNIDROIT Principles of International Commercial Contracts.

clearly provides part of the explanation for what appears to be a lower rate of litigation, it seems unlikely that it is a complete explanation.

A more complete explanation may require examination of the business behavior of firms that have achieved competitive advantages by increasing their use of information technology in their relationships with customers and suppliers. Early analysis of the impact of increased use of ICT among business contracting parties provided the “electronic markets hypothesis” (EMH): that as ICT reduces coordination costs between firms, market-based forms of economic activity will grow in importance (Malone et al. 1987). According to this hypothesis, the immediate connection between a buyer and a supplier increases cooperation and efficiency between firms. The success of worldwide retail chain Wal-Mart frequently has been attributed to the EDI system installed among its pool of suppliers. Also, the ubiquity of the Internet allows more companies to operate on a common platform without heavy investment in closed information networks such as EDI. The more those companies conduct trades online, the more profitable Internet-based supply chain management will become (Garicano and Kaplan 2001).

The EMH assumed that reductions in transaction costs enabled by new communication technology would fuel the growth of decentralized market systems at the expense of either cooperative or hierarchical systems. Major sources of transaction costs identified in the EMH included coordination costs, complexity of product description, and asset specificity, and it was assumed that new communication technologies could reduce all of these costs (Brousseau and Quélin 1996). If one of the primary determinants of asset specificity is the unequal diffusion of knowledge, then the growth of the Internet would indeed lead to a reduction in asset specificity, and so favor the growth of markets (Park and Yun 2004). While the use of the Internet and other ICTs may reduce coordination costs and diminish the problem of complexity of product descriptions, there is no evidence that it is having any impact on the degree of asset specificity generally.

Furthermore, the relationship between investment in ICT and reducing coordination costs may not be as simple as the authors of the EMH assumed. A recent study of investment in supply chain technologies showed that although investments in technology to improve the efficiency of supply chains normally increases the efficiency of the firms making the investment, a significant number of companies that invested heavily in supply chain technologies were actually less efficient after their investment than before (Kanakamedala et al. 2003). In light of the shortcomings of the EMH, others have suggested a “move-to-the-middle” hypothesis (MMH), arguing that greater use of ICT will fuel the growth of supply chains as a new form of hybrid economic organization between market and hierarchies (Clemons et al. 1993; Park and Yun 2004).

Economic theory predicts that hybrids will emerge whenever they offer lower transaction costs than either markets or firms (Williamson 1996). ICT-enabled supply chains allow trading partners to enjoy some of the stability and continuity associated with firms, while maintaining the sharp incentives provided by markets. Under the conditions of unregulated competition that prevail in global markets, the combination of continuity with accountability permits manufacturers to compete profitably. Under the MMH perspective, choice of governance mechanism is dependent on the costs of coordination and the transaction risk associated with the coordination. Normally, decreases in coordination costs would cause increases in transaction risk. By contrast, under the MMH perspective, ICT would create a unique environment where both coordination costs and related transaction risk could be reduced simultaneously and therefore two highly coordinated, interdependent firms would be a dominating governance mechanism in supply chain management. The success of such a governance mechanism, however, may depend on the degree to which standards are

successfully developed for the exchange of information among trading partners joined together in supply chains.

VI. Conclusion

The spread of e-commerce within market institutions has created pressure for legal institutions to adapt to technological innovation. Early reforms carried out in the 1980s and 1990s to remove irrational impediments to the adoption of e-commerce technologies enjoyed widespread success. As a result, the sophisticated businesses that were early e-commerce adopters are no longer demanding any law reforms. For B2B commerce, attention has shifted to the development of ICT standards as a form of e-commerce regulation and as part of the process of optimizing supply chain operations. By contrast, regulation of e-commerce in consumer markets has been the subject of intense political controversy and diverging regulatory strategies in LMEs and CMEs.

With regard to B2C commerce, the US has adopted a strategy of incremental deregulation through statutory obsolescence. A considerable body of judicial decisions upholding standard form contracts that would be unenforceable in Europe allows merchants engaged in Internet commerce to decide unilaterally what rights American consumers should have. However, intense competition in US retail markets may have blunted some of the impact of such judicial deference to merchant contract-drafting. EU regulators have tried to respond to the greater cautiousness of European consumers by establishing high mandatory minimum levels of online consumer protection throughout the internal market. This strategy does not yet appear to have triggered a “race to the top” that would support the growth of strong European global B2C market players that can compete with US giants such as Amazon.com or eBay, nor to have overcome the persistent fragmentation into national markets that still hinders the growth of the internal market in many sectors of the European economy.

The fascination of lawyers and legislators with the notion of electronic signatures appears to have short-circuited the normal process of discovering the requirements of business and consumers for authentication standards and technologies. As a result, even though the system of certificate authorities established according to electronic signature laws remains underdeveloped, the use of electronic signatures in commercial transactions appears to be even more underdeveloped. The US market-led effort to develop authentication technologies and promote standards for interoperability has not yet succeeded, but as those efforts more closely track actual user requirements, they seem more likely to succeed in the future.

In both the US and EU, B2B merchants have organized into supply chains with their trading partners, which appear to operate with little or no government intervention once technology-neutral laws removing irrational impediments to the use of electronic contracts had been enacted. The ability of sophisticated B2B contracting parties to resolve their disputes outside of courts suggests that these parties involved in supply chains rely even less on formal public legal institutions than parties to conventional commercial transactions. Unlike the first two examples of electronic commerce governance, significant differences in US and EU approaches to the governance of supply chains and B2B electronic contracts are much more difficult to detect. The governance of successful B2B supply chains likely owes more to market competition and the successful development of standards than to law reform.

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