

Digitalization of Maritime Transport Documents

A study of the interplay of public rules and private norms amid social changes

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Table of Content

Abbreviation List	V
Introduction.....	1
Chapter 1 –Digitalization of Maritime Transport Documents: What and Why	7
A. Maritime Transport	8
I. International Seaborne Trade.....	9
1. Maritime Transport Service	9
2. Delivery and Payment.....	11
3. Cargo Insurance	15
4. Summary on the International Seaborne Trade.....	16
II. Maritime Transport Documents	17
1. Maritime Transport Documents: An Overview.....	18
a) Bills of Lading	18
b) Sea waybills and other non-negotiable instruments	20
c) Other Documents	22
2. Maritime Transport Documents in Digital Environment: Which is the Most Suitable Research Subject?	23
III. Summary	26
B. Digitalization of Maritime Transport Documents	27
I. Introduction to Digitalization	27
1. Digitalization.....	28
2. Digitalization and Maritime Transport Sector	30
a) Maritime Transport Sector and Information and Communication Technology ...	31
b) Challenges	33
3. Conclusion	34
II. Legal Issues Relating to Digitalization of Maritime Transport Documents	35

1. Procedural Law Issues	35
a) Void <i>ab initio</i>	36
b) Void by Court.....	38
2. Substantive Law Issues	40
a) Legal Recognition of Electronic Bills of Lading.....	41
b) Transfer of Electronic Bills of Lading	42
III. Summary: Role of Law.....	45
C. Conclusion.....	47

Chapter 2 – Examining the Harmonization Status of Laws Governing Digitalization of Maritime Transport Documents49

A. Legislative Approach to Promote Harmonization in Electronic Law	49
I. Lawmaking Bodies and Methods	50
II. UNCITRAL Legislations	53
1. Law Principles	53
a. Non-Discrimination.....	53
b. Functional Equivalence.....	55
c. Technology Neutrality.....	56
d. Party Autonomy	57
2. Summary.....	57
B. Comparing Laws on Digitalization of Maritime Transport Documents	59
I. Comparative Method	60
II. Laws and Practices on National Level	62
1. The US Law	62
aa. Law Principles.....	63
bb. Summary	64
b. Form.....	64
aa. Writing.....	64
bb. Originality	67

cc. Signature.....	68
c. Transferability	69
2. EU Law	70
a. Law Principles	72
aa. Principles	72
bb. Summary	74
b. Form.....	75
aa. Writing.....	75
bb. Originality	78
cc. Signature.....	78
c. Transferability	79
3. Chinese Law.....	80
a. Law Principles	81
aa. Principles	81
bb. Summary	82
b. Form.....	82
aa. Writing.....	82
bb. Originality	83
cc. Signature.....	85
c. Transferability	86
III. Comparison	87
C. Evaluation of Possible Future Steps of Public Regime.....	89
I. Eclecticism of Hard Law Instruments on Authentication.....	90
II. Hollowness of Soft Law Instruments on Transferability	93
III. Summary on Future Steps	95
Chapter 3: Using Private Regulatory System to Create Order	97
A. Private Regulatory System.....	99
I. Definition.....	100

II. The Legitimacy of Private Regulatory Models	103
1. Tradition: The Legitimacy Gene	104
2. Democratic Characteristic.....	107
III. Functional Advantages.....	108
1. Information Advantage	108
2. Lower Costs	109
3. Higher Flexibility.....	111
B. Private regulatory system in Digitalization of Shipping.....	113
I. Electronic Documents Processing	113
1. Bolero.....	114
2. essDOCS	117
3. e-title TM	118
II. Payment Arrangement.....	119
III. Cargo Insurance	120
IV. Maritime Transport	122
V. Summary.....	122
C. Public and Private Interplay.....	126
I. Why Public Interference still Matters	126
II. The Extent of Public Interference	131
1. Management-Based Regulation	132
2. Outcome-Oriented Regulation	133
3. Process-Oriented Regulation	135
III. Appropriate Regulation Approach for Digitalization of Shipping Documents	137
1. Analysis of the Three Regulation Approaches.....	137
2. The Regulation Approach for Digitalization of Shipping Documents.....	142
IV. Co-existence and Competition: The New Normal.....	146
Conclusion	150
Literature Index	153

Abbreviation List

AI	Artificial Intelligence
BIL	Bolero International Limited
BIMCO	Baltic and International Maritime Council
CIF	Cost, Insurance and Freight
CISG	Vienna Convention on the International Sale of Goods
CMI	Comité Maritime International
COGSA	Carriage of Goods by Sea Act
CS	Current Status
DDG	Databridge Development Group
DSUA	Databridge Services & Users Agreement
E-SIGN Act	Electronic Signatures in Global and National Commerce Act
EDI	Electronic Data Exchange
EDIFACT	United Nations/Electronic Data Interchange for Administration, Commerce and Transport
eIDAS	Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market
eUCP	UCP Supplement for Electronic Presentation
EU	European Union
GATS	The General Agreement on Trade in Service
HBL	House Bill of Lading
ICC	International Chamber of Commerce
ICS	International Chamber of Shipping
ICT	Information and Communication Technology
Inco terms	International Chamber of Commerce's International Rules for the Interpretation of Trade Terms
LCs	Letters of Credit
LMAA	London Maritime Arbitrator's Association
MBL	Master Bill of Lading
NCCUSL	National Conference of Commissioners on Uniform State Laws
NGO	Non-Governmental Organization
NVOCC	Non-Vessel Operating Company

NYPE	New York Produce Exchange
OED	Oxford English Dictionary
PKI	Public Key Infrastructure
SMA	Society of Maritime Arbitrators
SWIFT	Society for Worldwide Interbank Financial Telecommunication
UCC	Uniform Commercial Code
UCP	Uniform Customs and Practice for Documentary Credits
UETA	Uniform Electronic Transaction Act
UNCITRAL	United Nations Commission on International Trade Law
UNCITRAL MLEC	UNCITRAL Model Law on Electronic Commerce
UNIDROIT	The International Institute for the Unification of Private Law
U.S.	United States
UN/CEFACT	United Nations Center for Trade Facilitation and Electronic Business
UNCTAD	United Nations Conference on Trade and Development
URBPO	Uniform Rules for Bank Payment Obligations
UK	United Kingdom

Introduction

Nowadays, someone attending academic seminars, conferences, or events will probably find certain themes that are ceaselessly discussed. An even closer look at these themes may reveal that they all pertain to issues such as the exhaustion of natural resources, challenges and opportunities of technological revolution, and limitations of current economic growth models. These issues constantly haunt the minds of politicians, professors, scientists, entrepreneurs, and citizens all around the world. Facing these conundrums, a broad spectrum of communities are embarking on providing their own answers. Some of the answers are conservative, which lead to oil wars, trade wars, protectionism, unilateralism, and populism. Other solutions are more liberal, which include proposals for green energy, free trade agreements, liberalism, and multilateralism. The competition between the two discourses has become the main theme of this era, and either side is showing any sign of triumph. Worse, people are unsure if any of these current concerns can be solved by supporting either discourse.

Nevertheless, a promising way for people to climb out of the mire of staggering economy, distributive inequality, and environmental pressure is through technological innovations. Past experience has demonstrated that science and technology have tremendous potential to create a better life, but solely depending on the advancement of technologies is insufficient. Despite the many benefits that can be brought about by technological developments, they cannot naturally resolve most of the aforementioned issues. The blessings of technology come along with problems and challenges. In fact, as the technological revolution transpires in every corner of society, the number of cases in which technologies worsen the situation if they are not used properly grows. Hence, two voices emerge when confronting disruptive technologies. One focuses on their downsides and is prone to take active actions to restrict their applications, whereas the other emphasizes the bright side of technological advancements and is inclined to approve the development of new technologies. Asserting that one of the two contentions is right and the other is wrong is difficult. What is certain is if exploiting technological progress is considered a solution to the current issues, then focus must be turned to themes beyond technologies. These themes include policy formulation, institution, governance, business model, and thinking mode. The ultimate result of the mutual influences of these elements decides whether technological solutions constitute the elixir or Pandora's box.

To shed light on the relationship between technologies and the social systems beyond them,

this doctoral thesis selects the well-known conservative shipping industry as research field.¹ In this industry, conflicts between conservatives and reformists are sharp in face of revolutionary changes. Other industries are passionately exploring new opportunities for business growth, but the shipping industry appears to be slow and unwilling to adapt to new technologies and rules. However, as the wave of digitalization inevitably shocked the industry, many actors in the sector realized that the shipping industry is on the brink of a technological revolution. Numerous mature technologies already applied in other sectors can now be employed by maritime transport and bring about radical changes. The advancements in information transmission, data analytics, and encryption technics can reshape the business landscape and enable managerial innovations as well as new forms of governance. Applications such as autonomous ships, green energy, and automated transactions are now within reach. Yet the industry as a whole has not taken the decisive step toward such technologies. What has caused the hesitation? This doctoral thesis attributes this refusal to the unreadiness of society, especially the lack of a commonly accepted law. To prove this point, this research examines the specific topic of digitalization of maritime transport documents. Two features highlight this topic. First, the digitalization of documents has brought the industry to the immaterial world and freed commercial transactions from geographical restrictions. This situation amplifies the transnational characteristic of maritime transport and requires an urgent international solution instead of a regional one. Accordingly, this research will be meaningful to readers all around the world. Second, maritime transport documents have always been the tie which link all participants in the transnational trade. By the aid of maritime transport documents, an in-depth analysis can reveal the intricate connections between relevant branches. This doctoral thesis intends to clarify the duplex interactions between public laws and private norms and between relevant industrial standards by examining the rules governing digitalization of maritime transport documents,

Currently, abundant literature exists regarding maritime transportation and digitalization, but prior research have combined both elements only since the late 1980s as the container ships started to outpace the movement of documents. The popularization of computer technology allows for electronic documents to be transmitted instantaneously, thus sparking hope in relation to the settlement of this problem. The early studies focus mainly on the legal characteristic of maritime transport documents and discusses whether these characteristics can

¹ The shipping industry is conservative because of its long traditions, the long operation period of ships, and capital intensiveness. Henrik O. Madsen, the former CEO of DNV GL, the world's largest classification society, has also expressed in different occasions that the shipping industry is too conservative and too passive to changes.

be reserved if documents are no longer in physical form.² The conclusions vary depending on the national laws, but most researchers believe that electronic documents should enjoy the same legal recognition as paper documents. In the 1990s, the focus shifted to specific technologies and their impact on the digitalization of documents.³ The EDI technology is among the most frequently discussed technologies at that time. Numerous papers have examined the legal details of EDI usage according to its functioning mechanism, its reliability, and the governing laws. The idea of functional equivalence has emerged in these articles to guide the development of laws concerning electronic documents.⁴ The equivalence of form has gradually been transformed to the equivalence of functions. With this transition comes the introspection of the title function of certain types of documents. A minor debate has started on the possibility of replacing negotiable bills of lading with sea waybills, which cannot be used as a document of title.⁵ The debate ended with the new millennium, as the financial value of negotiable title documents has been proven indispensable due to commercial needs.⁶ Law comparison also represents a major portion of the research in the first decade of the 21st century with the laws passed by the UNCITRAL, the US, the EU and many other jurisdictions with regard to authentication of electronic documents as central concerns.⁷ The prescriptive, minimalist, and two-tier approaches are the three broadest methods in legislating for authenticating electronic documents.⁸ Since 2010, the new topical issue in the digitalization of maritime transport documents has become the application of the newest breakthroughs in the blockchain area.⁹ Moreover, the impact of the UNCITRAL Model Law on Electronic Transferable Records and the United Nations Convention on Contracts for the International Carriage of Goods Wholly

² See Chandler III, George F. *The electronic transmission of bills of lading*, J. Mar. L. & Com.20 (1989), on page 571; or Merges, Robert P., and Glenn H. Reynolds. "Toward a computerized system for negotiating ocean bills of lading." *JL & Com.6* (1986), on p. 23.

³ See Livermore, John, and Kraierk Euarjai. *Electronic bills of lading: a progress report*, J. Mar. L. & Com.28 (1997), on page 55; also, Yiannopoulos, A. Athanassios N., ed, *Ocean bills of lading: Traditional forms, substitutes, and EDI systems*, Martinus Nijhoff Publishers, 1995.

⁴ Livermore, John, and Kraierk Euarjai. *Electronic bills of lading and functional equivalence*. Journal of Information, Law and Technology (JILT), 1998.2 (1998), pp. 1–13.

⁵ See Panesar, Sukhninder. *Is a Straight Bill of Lading a Document of Title?*, Business Law Review 25.8 (2004), on pp. 196–199 and Alexopoulos, Aristotelis B., Nikolaos Konstantopoulos, and Anthi Z. Vaxevanou. "Managing Problems In Sea Transport Related To The Delivery Of The Cargo: Letters Of Indemnity Vs. Bills Of Lading." *Marketing and Management Sciences* 2010: 237–244.

⁶ See Dubovec, Marek. *The problems and possibilities for using electronic bills of lading as collateral*, *Ariz. J. Int'l & Comp. L.*23 (2005), pp. 437–466.

⁷ See Ma, Winnie, *Lading without bills-how good is the Bolero bill of lading in Australia*, *Bond L. Rev.*12 (2000): 1; Gaskell, Nick. "Bills of lading in an electronic age." *Lloyds Maritime and Commercial Law Quarterly*2 (2010), pp. 233–284 and Brzeziński, Krzysztof M, *US and EU regulatory competition and authentication standards in electronic commerce*, *International Journal of IT Standards and Standardization Research (IJITSR)* 5.1 (2007), pp 84–102.

⁸ Mason, Stephen, *Electronic signatures in law*, Institute of Advanced Legal Studies for the SAS Humanities Digital Library, and Barton, April. "Electronic Signatures in Global and National Commerce Act." *Weekly Compilation of Presidential Documents* Sep/Oct (2001).

⁹ See Takahashi, Koji, *Blockchain technology and electronic bills of lading*, *The Journal of International Maritime Law* published by Lawtext Publishing Limited 22 (2016), pp. 202–211 and Letourneau, Keith B., and Stephen T. Whelan. *Blockchain: Staying Ahead of Tomorrow*, *The Journal of Equipment Lease Financing (Online)*35.2 (2017), pp. 1–6.

or Partly by Sea on the electronic bills of lading has also drawn considerable attention from academia.¹⁰

In summary, past research around the digitalization of maritime transport documents emphasize mostly the legal value of different types of electronic documents and examine the proper mechanisms and standards to apply to electronic documents. Only few studies pay attention to the regulatory competition between different jurisdictions. Among them, jurisdictions in Asia are constantly neglected. With the economic upheaval of the Asian region, this kind of neglect is a great loss to the legal community. This doctoral thesis fills this gap by conducting a comprehensive research on the relevant statutes and legal practice in China and performing a comparison against the statutes and practices in the US and the EU. Accordingly, the legal landscape of electronic transport documents on the global sphere is more accurately delineated. The second gap filled by this study is the effect of private actions. Most research on the digitalization of maritime transport documents view private actors as passive receivers of public laws and ignore the reverse effect of private actions on public lawmaking. This study shows that private actors have been actively constructing their own set of rules which transcend the natural boundaries of state jurisdictions. The competition between different private norms contributes to the diversity of legal sources and possibly leads to the formation of a global law. The last major gap filled by this research is the examination of the influence from relevant sectors of the shipping industry. The old perception of one branch or one industry creating norms for itself is no longer valid, and the articulation of relevant industries renders such belief obsolete. Previous literature note the influence of the UCP Supplement for Electronic Presentation on the electronic bills of lading,¹¹ but in-depth analysis is not conducted to reveal the universal interactions between several relevant branches and the interplay of their norms. This doctoral thesis investigates the norms of banking, insurance, shipping, electronic procession platforms, and NGOs through the lens that considers such interactions and established a model to simulate their mutual interference.

This research explores what the role of law confronting technological developments is and whether the current model of legislation can fulfill such a role. Three steps are taken to shed light on these questions. First, the empirical study shows that digitalization of maritime transport documents is not an isolated issue. The reluctance of the industry to embrace

¹⁰ See Özdel, Melis. *Enforcement of arbitration clauses in bills of lading: where are we now?* Journal of International Arbitration, 33.2 (2016), pp. 151–169 and Hashmi, Sabena. *The Rotterdam Rules: a blessing*, Loy. Mar. LJ 10 (2011), pp. 227–268.

¹¹ See Dubovec, Marek. “The problems and possibilities for using electronic bills of lading as collateral.” *Ariz. J. Int'l & Comp. L.* 23 (2005), pp. 437–466, and Chan, Felix WH, *In Search of a Global Theory of Maritime Electronic Commerce: China's Position on the Rotterdam Rules*, J. Mar. L. & Com. 40 (2009), pp.185–202.

digitalization should not be attributed solely to its conservatism, the weakness of technologies, or the absence of a uniform law but should also be regarded as a systematic issue. While addressing the problems of digitalization, attention should be paid to the relevant industries in international trade and their concerns about digitalization. Second, using the functional method of comparative law and case study, this doctoral thesis reveals that either soft law instruments or hard law instruments is insufficient to prevent the laws from further fragmentation. This doctoral thesis confirms that private regulators have already developed a set of rules to function parallel to the public laws and suggests that the competition and cooperation of private and public regulations are actually beneficial to the formation of a uniform law.

In accordance with the research questions, this doctoral thesis starts with an outline of the maritime transport industry to determine the boundary of maritime transport. By including the necessary parts of delivery and payment of international seaborne trade into the maritime transport system, the circulation of documents in this business is outlined. Following the operational mode of maritime transport, this research studies the different types of documents employed in international shipping and finally narrows the research scope down to the study of ocean bills of lading. In the next part, a scrupulous analysis on the concept of digitalization is conducted to delineate the content of digitalization. This analysis shows that digitization is a systematic process that involves the co-evolution of multiple parties and result in the revolutionary change of the current operation model. Among others, international private law will be significantly challenged in the digital era.

With the above research results as basis, the second chapter examines the existing efforts of legal harmonization of electronic bills of lading on the global sphere. This chapter compares the legal principles and practices of electronic bills of lading in the US, the EU, and China. By comparing the functions of laws governing electronic bills of lading in the respective jurisdictions, the effectiveness of the public international legislative approach is examined. Economic analysis of law and game theory is also employed in this chapter to further evaluate the feasibility of applying various legal instruments to improve the harmonization of law.

The third and final chapter examines an alternative legislative approach that incorporates additional participation from the private actors to the rulemaking in the digitalization of maritime transport documents. This doctoral thesis suggests that as long as the industry has a stable normative expectation in relation to the use of electronic documents, the source of this expectation is irrelevant. To prove this point, the first part of the chapter introduces the long history of private regulation and its advantages relative to public regulation. The intention is to demonstrate that private regulation has a certain degree of legitimacy due to its broad

acceptance and functional superiority in some areas. The second part reveals the situation of the now co-existing privately created norms regarding electronic documents in the shipping industry. Given the limitations of private regulation, the last part of the third chapter addresses the question of an adequate mode of public–private interplay. Some privately created norms involve the commercial secrets of many companies, so this research is unable to conduct a thorough examination of these rules to investigate the subtle connections between them.

The ultimate goal of this doctoral thesis is to convince people, especially lawmakers and practitioners, that people are living in a changing society where everything is drifting away from its original path. Given that the onslaught of scientific discoveries and technological innovations is exercising increasing influence on the social environment, the regulatory environment will be changing faster and faster. In this context, the last thing that should be done is to resist this change out of fear. Instead, a new path should be discovered for laws to evolve at the same pace and become more efficient in various fields. This doctoral thesis aims to point out a possible path for laws to transform and thereby free society from the fear of innovations.

Chapter 1 –Digitalization of Maritime Transport Documents: What and Why

"Just because we cannot see clearly the end of the road, that is no reason for not setting out on the essential journey. On the contrary, great change predominates the world, and unless we move with change we will become its victims."¹²

—Robert F. Kennedy

The industrial logic of value chains facilitates in breaking down production by dividing labor, thereby producing efficiently as a result of specialization, and then putting everything back together through trade.¹³ Although all modes of transport contribute to the linkage of these stages, maritime transport undertakes 80% of the total trade volume.¹⁴ Thus, unsurprisingly, the improvement of the maritime transport system has received considerable attention. At present, one of the most promising ways to improve efficiency is by introducing digitalization into the branch.

Despite the constant calls from the maritime transport sector to embrace digitalization, the process thereof lags behind. One of the main obstacles holding back digitalization in maritime transport is the lack of certainty in the current legal framework owing to the absence of universally recognized means for vesting an electronic document the same legal effect as the corresponding paper document. To cope with this challenge, two issues need to be addressed. The first is the full replacement of the functions of maritime documents into an electronic environment, which includes their functions as evidence, valuable papers, and negotiable instruments. The second is related to the application of digitalization, such as the formation of digital documents, recognition of electronic signatures, and authentication. By illustrating the process of maritime transport and roles of transport documents therein, the first section may be

¹² The Quotable Lawyer § 18.19, at 38 (David S. Sharager and Elizabeth Frost eds.,1986) (citing Robert F. Kennedy's farewell statement, Warsaw, Poland, which was reported in the N.Y. Times, July 2, 1964).

¹³ Quitzau, Jörn et al. *Shipping in an era of digital transformation*. No. 25e. Strategy 2030-Capital and Life in the Next Generation, 2018, p.18.

¹⁴ United Nations Conference on Trade and Development, *Review of Maritime Transport 2017*, UN, 2017, see Executive Summary.

able to shed light on the special characteristics of maritime transport documents. Based on the context provided by the first section, the second section focuses on the general issues regarding the digitalization of documents, including the content of digitalization and legislation impediments.

A. Maritime Transport

Maritime transport is the integrated component in global freight transportation, and it is one of the cornerstones of globalization.¹⁵ Each day, thousands of ships sail the seas to bring large amounts of cargo from one country to another. To date, maritime transport is the only available means to move cargo across great distances in an inexpensive and efficient manner. A highly developed maritime transport service enables “products from all over the world to be procured in any country by means of low-cost services, while any country could supply products of its country throughout the world.”¹⁶ Not only do the rise and decline of the maritime transport lie with the well-being of the global economy, but the opposite also applies: the cost and safety of maritime transport service, to a large extent, accounts for the price of the end product and affects traders’ confidence in global markets.¹⁷ Since the maritime industry has transformed over the last few decades, the following part shortly illustrates the process of international seaborne trade and the role played by maritime transport documents. Closely examining the current maritime transport can help reader understand the digitalization of maritime transport documents as the next breaking point for the shipping industry and world trade.

¹⁵ Hoffmann, Jan, and Shashi Kumar, *Globalisation—the maritime nexus. The handbook of maritime economics and business*, Informa Law from Routledge, 2013, p. 65.

¹⁶ OECD Doc. No. DSTI/DOC/TIMTC(99)7, “Strategies for the GATS 2000 Negotiations- Contribution of the OECD Maritime Transport Committee” (May 17, 1999), p. 5.

¹⁷ See Korinek, Jane, and Patricia Sourdin. “*Maritime transport costs and their impact on trade*”, Organization for Economic Co-operation and Development TAD/TC/WP (2009) 7 (2009). “A ten percent increase in maritime transport costs is estimated to decrease trade by six to eight percent, other things being equal.”

I. International Seaborne Trade

1. Maritime Transport Service

As Sir Walter Raleigh said, “all trade is world trade; all world trade is maritime trade.” Although this statement was made five centuries ago when the rail and air transport system did not exist, this formulation remains somewhat true today. With over 80% of global trade by volume and more than 70% of its value being carried on board ships and handled by seaports worldwide, maritime transport is the backbone of world trade and prosperity.¹⁸ The essence of maritime transport is the safe and accurate physical transfer of the traded goods from one place to another passing through water, but the maritime transport service has a wider spectrum of functions in virtue of its close link to global trade. According to the General Agreement on Trade in Service (GATS), the overall maritime transport service can be classified into three groups: a) transport services, b) auxiliary services, and c) port services.¹⁹ Transport services is the main part of maritime transport services and can be divided into three categories: passenger transport, liner, and non-liner freight transport.²⁰ Among these three categories, liner and non-liner freight transport fulfill the shippers’ variable needs for transporting goods with container ships or tankers, whereas passenger transport is conducted by cruise ships and ferries and exercises only remote influence on freight transport.²¹ As this study focuses on international freight transport, passenger transport is not investigated.

Although the liner and non-liner shipping are both freight transport, they represent different types of seaborne trade. These two services can be distinguished by the cargo they carry and customers they serve. Liner vessels transport mostly small parcels of general goods, which include manufactured and semi-manufactured goods, and they are responsible for several shippers at the same time. Liner shipping is an organization-intensive business because

¹⁸ Supra note 14.

¹⁹ See World Trade Organization, Services Sectoral Classification List, MTN. GNS/W/120, available at http://tsdb.wto.org/Includes/docs/W120_E.doc.

²⁰ UNCTAD, *Maritime Transportation, Guidelines for Importers*, Chapter 4; OECD Doc. No. DSTI/DOT(2001)3, March 8, 2002, p. 12.

²¹ Rasmussen, Neils, *Le Transport Maritime International/ International Maritime Shipping* (Montreal: Center d'Etudes en Administration Internationale (CETAI), Ecole des Hautes Etudes Commerciales (HEC), 1994), p. 34.

various types and amounts of goods from numerous shippers must be transported in every voyage,. Therefore, a freight forwarder or non-vessel operating common carrier (nvocc) is usually required to act as the agent of a group of shippers. The freight forwarder or nvocc's duty is to consolidate the shipments and negotiate the transport with the carrier on behalf of all shippers. Depending on the circumstances, the transport contract can be evidenced either in a Master Bill of Lading (MBL) issued by the shipping companies or a House Bill of Lading (HBL) issued by the agent. If the former is issued, the consignee can receive the goods directly from the shipping company (carrier); otherwise, the consignee must exchange the HBL for a delivery order before he/she can take delivery of the goods.

Contrary to liner shipping, non-liner shipping handles dominantly bulk cargo, which is single cargo in large volumes, and it is only responsible for a single shipper. Consequently, the shipper does not seek an ocean transport intermediary to reserve a space on board a vessel; instead, the shipper prefers to hire a shipbroker to charter an entire vessel for his/her use.²² In this scenario, the transport contractual relationship between the shipper and carrier is bound under a charterparty. Thus, the shipper is also known as charterer; the carrier, shipowner. A bill of lading (B/L) is still issued to prove each voyage, but it must comply with the charterparty, so it is named Bill of Lading under Charterparty. Another distinction is the resale of goods in bulk shipping. Unlike liner shipping, the resale of goods on a voyage is common practice for bulk shipping.²³ In certain cases, especially in crude oil trade, goods are purchased in transit by middlemen who have no intention to obtain the cargo but only wish to resell them.²⁴ Sometimes, the goods can be sold many times that the original shipper eventually reacquires them under a "circle" contract.²⁵ To suffice this commercial need, the B/L in non-liner shipping is usually negotiable and, thus, grants the transfer of ownership of the goods through endorsement.

²² Todd, Paul. *Principles of the carriage of goods by sea*, Routledge, 2015, on p. 4.

²³ Ibid on p. 360.

²⁴ See *A/S Hansen-Tangens Rederi III v Total Transport Corp (The Sagona)* [1984] 1 Lloyd's Rep 194, 201. "When the master of the *Sagona*, who had been commanding tankers for 14 years, was asked how often an original B/L had been presented to him prior to discharge, he answered: 'I have never seen it'."

²⁵ Treitel, Guenter Heinz, Francis Martin Baillie Reynolds, and Thomas Gilbert Carver. *Carver on bills of lading*. Vol. 16. Sweet & Maxwell, 2011, p. 236.

In addition, auxiliary and port services are equally indispensable to provide an interface between shipping and commerce. These services include cargo handling, storage and warehousing, customs clearance, container and depot, and freight forwarding as well as navigation, maintenance, and repair of vessels. A special document issued for these processes is the warehouse receipt, which is issued by a public or terminal warehouse company to certify the storage of goods. The warehouse receipt is special because it indicates ownership of the stored goods and, as such, can be used as collateral for a loan.²⁶ The warehouse receipt can also be issued in either non-negotiable or negotiable form. In the latter, the warehouse receipt, like negotiable bills of lading (B/Ls), can be transferred by endorsement. In light of this characteristic, warehouse receipts are often used as financial instruments to facilitate business.

2. Delivery and Payment

Delivery and payment are the most essential elements in the international sale of goods.²⁷ Completing delivery and payment simultaneously is usually impossible, so parties in an international transaction must spend considerable time to negotiate the main delivery and payment terms.²⁸ When the consignor and consignee of a transaction are part of one enterprise, the negotiation of delivery and payment is straightforward. However, this type of transaction composes only a small proportion of international trade. Owing to the arm's length principle,²⁹ even sister companies must arrange an agreement that can stand up to legal scrutiny. In this sense, the seller and buyer not only determine the price and number of the goods but also specify which of the parties thereto should arrange the seaborne transport and, therefore, which should enter into a contract with a carrier.³⁰ The carrier then acts as an important nexus between the buyer and seller.

Upon arranging the transport of the agreed goods, the transport contractual relationship is

²⁶ Brigham, Eugene F., and Joel F. Houston. *Fundamentals of financial management*. Cengage Learning, 2012, on p. 197.

²⁷ Nelson, Brian. *Law and ethics in global business: how to integrate law and ethics into corporate governance around the world*. Routledge, 2013, on p. 65.

²⁸ Baatz, Yvonne, ed. *Maritime law*. CRC Press, 2014, on p. 94.

²⁹ In the arm's length principle, the buyers and sellers of a product act independently and do not have any relationship. The concept of this principle assures that both parties in the deal are acting in their own self-interest and are not subject to any pressure or duress from the other party. It also assures third parties that the buyer and seller are not colluding.

³⁰ Packard, William V., *SEA-TRADING, VOLUME 3: TRADING*. 1986, on p. 2.

evidenced in the form of a booking note, a shipping note, a B/L, or other documents.³¹ Given the circumstances that the seller should arrange the shipment, he can, after concluding a contract with the carrier, send a copy of the agreed transport terms to the buyer and inform him about the crucial information. Such information includes, *inter alia*, the name of the vessel, port of discharge, and number and type of packages. As soon as the consignee (in this case, the buyer) receives the goods and the payment is cleared, the transaction is completed. However, in an international context wherein parties are normally distant and may not know each other, divergence can occur in delivery and payment. A seller will be reluctant to release the cargo if he is uncertain of his payment, and the buyer will be equally unwilling to pay unless the goods are in safe hands and proven to be in good condition. Five primary methods of payment are used for international transactions, namely, cash-in-advance, letters of credit (L/Cs), documentary collections, open account, and consignment.³² These payment methods range from the buyer paying cash in advance (cash-in-advance) to transferring the ownership of goods before payment (consignment/open account). In the event that the buyer and seller have built profound mutual trust or are simply part of the same enterprise, payment methods in favor of only one party can be adopted. Unfortunately, not all parties in international transactions share this degree of trust. More often, transactions occur between parties with limited trust. In this case, the method of transfer of goods and money must be chosen carefully so that the seller and buyer are convinced that their contract will be respected. For both parties to feel assured, a satisfactory alternative is to invite trusted banks to play the role of an intermediary. To be an intermediary, banks usually take possession of the critical documents in the transaction and arrange the sequence of the exchange. In documentary collections, the bank acquires documents of title and valuable paper, which in most cases are B/Ls and the bill of exchange (draft). The B/Ls are issued by the carrier³³ to the shipper, and the original must be surrendered to the shipping company in exchange for the goods. Considering the nature of the B/L, the bank

³¹ Documents containing contractual terms accepted by the carrier are often regarded as binding contracts between shipper and carrier. See *MSC Mediterranean Shipping Co S.A. v BRE Metro Ltd* (1985) 2 Lloyd's Rep 239, on p. 240 ("contract of affreightment contained in a liner booking note"); *George Kallis (Manufacturers) Ltd v Success Insurance Ltd* (1985) 2 Lloyd's Rep. 8 at 11 (contract of affreightment contained in shipping note).

³² Guide, Trade Finance. "A Quick Reference for US Exporters (April 2008), Washington: US Department of Commerce." *International Trade Administration*.

³³ The issuer of B/L can be the carrier, captain, or agents of carrier.

first instructs the buyer to fulfill his/her obligation in the draft, and after having successfully collected the payment, the bank forwards the B/L to the buyer and remits the proceeds to the seller (see Figure 1). Thus, the seller can retain control of the goods via the bank until his/her receipt of payment is certain, and the buyer can be sure of the delivery because the bank guarantees the transfer of B/Ls.

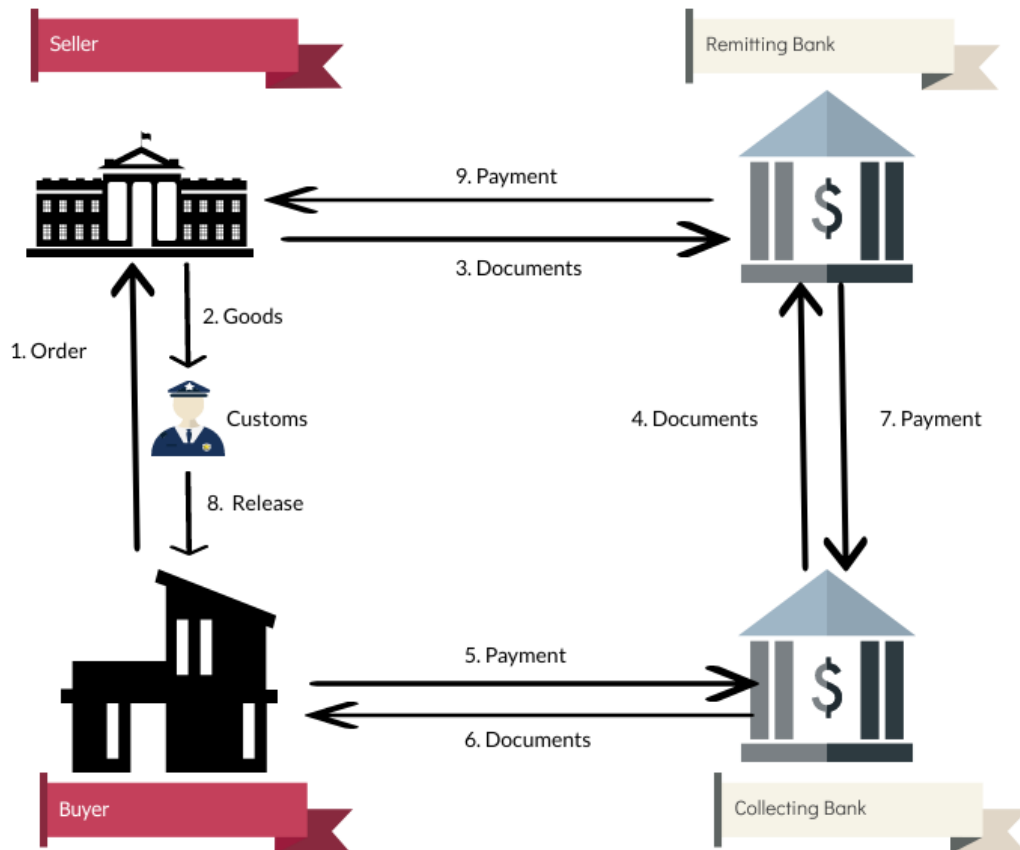


Figure 1. Documentary Collection: Procedure

A similar mechanism is L/Cs. Instead of relying on the bank to collect the payment from the buyer, the payment in the letter of credit (L/C) is secured by another bank known as the issuing bank. When adapting this mechanism, the buyer must first establish credit in the issuing bank. The issuing bank then makes a commitment of payment to the seller. Such a commitment is embodied in the form of L/C, which states that the payment will be made as soon as the terms and conditions stated therein are met. Examining the goods on the spot is impracticable for either of the banks, so the L/C requires the submission of certain documents to substantiate the shipment of goods. The required documents include B/Ls, receipt or invoice of the goods,

certificate of origin of the goods, and insurance papers (either a policy or certificate). After issuance, the L/C will be delivered to the bank of the seller, which is also known as the advising bank or notifying bank because this bank is primarily responsible for authenticating the L/C and notifying the seller that an L/C has opened. The advising bank is not responsible for the payment of the credit as the debt relationship exists solely between the issuing bank and the beneficiary (i.e., “seller”). The condition and shipment of the goods are examined entirely on the basis of the description provided by the B/Ls, so the bank must be meticulous about the compliance of the B/Ls with the documents and usually requires a clean B/L.³⁴ As long as qualified documents under the L/C are submitted, the issuing bank must pay the seller unconditionally by releasing the amount of funds stated on the L/C to the advising bank. The buyer then receives the B/L and subsequently hands it over to the carrier in exchange for the goods. The modus operandi of an L/C is depicted in Figure 2.

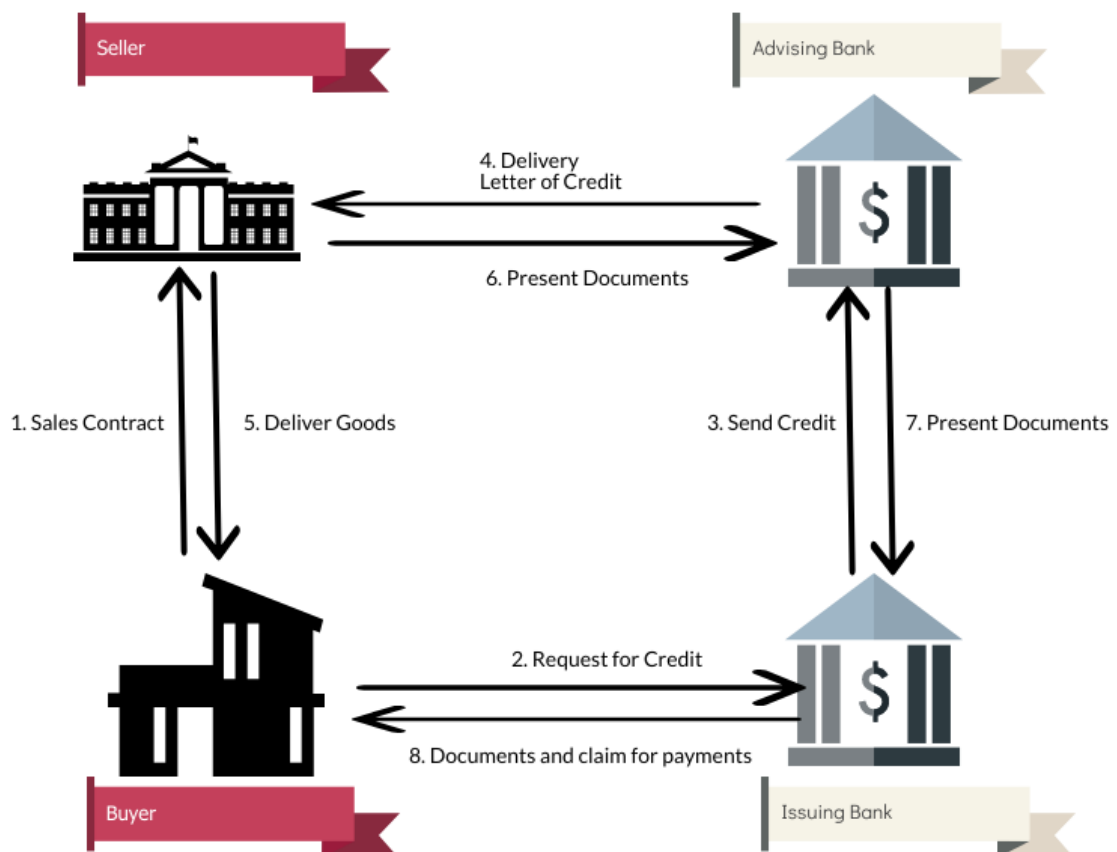


Figure 2 Letter of Credit: Procedure

³⁴ A type of B/L is free from any adverse remarks or notations, and it is made by the shipping company about the condition, packaging, or quantity of the goods being shipped.

Among the aforementioned payment methods, L/Cs and documentary collections are the most efficient mechanisms to mitigate the risks in international trade and provide satisfactory terms to both parties in the transaction. As such, they are the most widely employed financing tools, and they are preferred especially in large transactions.³⁵ By assessing the transaction process, the credibility of these two methods comes from, inter alia, the transport documents because the transport documents can prove the ownership, quantity, and quality of the carried goods. Assuming that the buyer can take delivery of the goods without surrendering the ownership document, this situation either leaves the seller with improper risk, as the buyer can take possession of the goods without receiving the document of title, or give the buyer additional burden by demanding higher credit from the bank because the bank has no security at all under this circumstance. Either way burdens the trade and causes inconvenience to the trading parties. As a result, the transport documents provide indispensable connectivity between the commercial parties and constitute an essential link in international trade.

3. Cargo Insurance

In international seaborne trade, the transported goods must be insured against damage or loss for the period of the carriage. Either the seller or buyer can place insurance for the cargo depending on the terms of agreement in their sales contract. Whoever concluded an insurance contract with the insurer will be receiving a document that indicates the terms of the insurance contract and the person who has a claim under it. This document can be a policy or a certificate of insurance, and both are available for assignment without asking for the permission of the insurer.³⁶ The assignability of the documents allow the real owner of the cargo to receive cover from the damage or loss of the goods, and it is extremely useful for international seaborne trade. For example, when the seller and buyer agree on a CIF term³⁷, the seller should be responsible

³⁵ Klotz, James M. *International sales agreements: an annotated drafting and negotiating guide*. Kluwer Law International, 2008, at 121. See also Niepmann, Friederike, and Tim Schmidt-Eisenlohr. “=International trade, risk and the role of banks, *Journal of International Economics* 107 (2017): on pp.111–126.

³⁶ The English Marine Insurance Act 1906, S 50 stipulates that “a marine policy is assignable unless it contains terms expressly prohibiting assignment. It may be assigned either before or after loss.” Although certificates are not included in this act, the case *Diamond Alkali v. Bourgeois* in 1921 ensures that certificates are also assignable. See Goldby, Miriam, *Electronic Documents in Maritime Trade: Law and Practice*, Oxford University Press, 2013, on p. 210.

³⁷ CIF is the abbreviation for cost, insurance, and freight. In this case, the seller should be responsible for the transport and

to place cargo insurance and hold the insurance policy or certificate. If the buyer has completed payment and becomes the holder of the B/Ls, i.e., the real owner of the goods, the seller should assign the policy or the certificate to the buyer through endorsement so that the buyer can collect the cover from the insurer if any damage occurs. With regard to reselling of goods in transit, the policy and certificate that should be transferred as the ownership of the goods are to be passed to another party.

4. Summary on the International Seaborne Trade

Upon examining the process of international seaborne trade, the efficiency and safety of maritime transport is not determined by the transport process alone but is also based on the interactions of all subjects participating in the provision of transport services. Banks, warehouses, ports, and customs authorities must cooperate with one another. Up to 50 different parties may be involved in a cross-border transaction.³⁸ In this complex goods movement system, nexus between all parties is created by various documents, and each party to a transaction may either issue, secure, or require documentation.

However, paper documents can be expensive. Statistics show that the cost of running a paper system equals 5% to 10% of the total value of the traded goods every year.³⁹ In addition, when documents are processed in paper and verified manually, a minor documentary transcription error can result in failure of delivery and payment.⁴⁰ Moreover, the physical movement of documents can delay the transport in short-distance journeys, thus postponing delivery. The digitalization of transport documents can be an answer to all these impediments of using tangible documents for international trade. Electronic documents can be issued and processed faster, cheaper, and more efficiently than paper documents. Before substituting the paper documents with their digitalized equivalent, the functions that paper transport documents

insurance.

³⁸ Thomsen H B, Wheble B., *Trade Facilitation and Legal Problems of Trade Data Interchange*, Int'l Bus. Law., 13, 1985, on p. 313.

³⁹ The United Nations electronic Trade Documents (UNeDocs) Project -- a Synopsis, available at https://www.unece.org/fileadmin/DAM/trade/workshop/wks_capbld/unedocs_summary.pdf.

⁴⁰ See Todd, P. *Dematerialisation of shipping documents*. In C. Reed, I. Walden & L. Edgar (eds), *Cross-border Electronic Banking: Challenges and Opportunities*, London, Informa Business (2000), on p. 71.

have and whether these functions can be fully replaced in a digital manner must be examined. For this reason, the following section lays a foundation for examining digitalization by expanding the major functions of maritime transport documents.

II. Maritime Transport Documents

The word “document” derives from the Latin word “documentum” that means “lesson, proof.” The term originally denoted a written proof useful as evidence of a truth or fact. With the passage of time, a document today is “a) something tangible on which words, symbols, or marks are recorded; b) written instruments used to prove a fact.”⁴¹ In the context of international trade, documents entered the picture as a key player. Documents are essential for customs, transport, and transaction because they can identify the owner of the goods (negotiable B/Ls, warehouse receipt), substantiate the quality and quantity of the goods (invoice, certificate of origin, packing list), and prove receipt of goods (dock receipt, mate receipt).⁴² Despite the various types of documents, they all serve the sole purpose of proof. They only differ in function because of their characteristics. The characteristics of commercial documents (commercial invoice, certificate of origin, import–export declaration), certificates (tonnage certificate, ship security certificate), and other documents (health certificate for animals, transport of dangerous goods certificate) determine that they have the one function, that is, proving bilateral relationships or facts. Documents, like B/Ls, sea waybills, delivery orders, warehouse receipt, and mate’s receipt, are more complicated because they can also function as document of title, thus either be used as collateral for banks or as orders to deliver the transported goods. The functions of maritime transport documents are the key points of this doctoral thesis because the digitalization of these documents equals replication of their functions in the electronic environment. The principal types of documents (i.e. B/Ls, sea waybills, delivery orders, warehouse receipt, and mate’s receipt) are paid closer attention in this section.

⁴¹ Black, Henry Campbell, Bryan A. Garner, and Becky R. McDaniel, *Black’s law dictionary*, 9th edition. St. Paul, MN: West Group, 2009, on p. 555.

⁴² See Hinkelman, Edward G., and Gilbert Mansergh. *A Short Course in International Trade Documentation: The Documents of Exporting, Importing, Transportation and Banking*. World Trade Press, 2002, on p. 1.

1. Maritime Transport Documents: An Overview

a) Bills of Lading

A B/L is a document issued by or on behalf of a carrier to a shipper. It was developed by the mercantile custom to prove that goods have been received or shipped.⁴³ After centuries, it became one of the most globalized transport documents with multiple functions under common law and civil law.⁴⁴ The definition of a B/L varies across jurisdictions.⁴⁵ Although no definition of a B/L is universally applicable,⁴⁶ a document can be recognized as one by examining three characteristics: whether it constitutes a) a receipt for the goods shipped or received by the carrier, b) a possessory right for such goods, or c) evidence of the contract of carriage by sea relating to the goods.⁴⁷ Once a document is confirmed to have these three attributes, it can be treated as a B/L. Conversely, a document describing itself as a B/L is not one without these attributes.

The tripartite characteristics of B/Ls are also supported by the United Nations Convention for the Carriage of Goods by Sea, also known as the Hamburg Rules.⁴⁸ In this convention, a B/L is defined as “a document which evidences a contract of carriage by sea and the taking over or loading of goods by the carrier, and by which the carrier undertakes to deliver the goods against surrender of the document. A provision in the document that goods are to be delivered to the order of a named person, or to order, or to bearer, constitute such an undertaking.”⁴⁹ Pursuant to this definition, all B/Ls can prove the receipt of goods and the contract of carriage.

⁴³ Secretariat of UNCTAD, Report by Secretariat of UNCTAD, *Bills of Lading* (New York: United Nations, 1971) at 5, citing S.D. Cole, *The Hague Rules 1921 Explained* (London: F. Effingham Wilson, 1922), on p. 9.

⁴⁴ See W. Tetley, *Marine Cargo Claim*, 3rd ed. (Montréal: International Shipping Publications Blais, 1988) on p. 215; W.P. Bennertt, *The History and Present Position of the Bill of lading as a Document of Title to Goods* Cambridge University Press. 1914), on p. 4. citing J. M. Pardessus, vol. 5. infra note 81.

⁴⁵ In the United States, B/L means “a document evidencing the receipt of goods for shipment issued by a person engaged in the business of transporting or forwarding goods.” (U.C.C. §1-201(b)(6)); see also *Federal Bills of Lading Act, 1994* § 80103(a)(1). Under English law, the Carriage of Goods by Sea Act, 1924, S.1(2): References in this act to a B/L (a) do not include references to a document that is incapable of transfer either by endorsement or as a bearer bill, by delivery without endorsement but, (b) subject to that, do include references to a received for shipment B/L. In Germany, “The bill of lading shall be issued once the carrier has taken over the goods. By virtue of the bill of lading, the carrier confirms receipt of the goods and enters into obligation to carry them to their destination and to deliver them to the person entitled by virtue of the bill of lading against return of said bill of lading” (HGB §514 (1)).

⁴⁶ Aikens, Richard, Richard Lord, and Michael Boole, *Bills of lading*, CRC Press, 2015.

⁴⁷ Heiko Giermann, *The evidentiary value of bills of lading and estoppel*. Vol. 15. LIT Verlag Münster, 2004, on pp.10–13.

⁴⁸ United Nations Convention on the Carriage of Goods by Sea, March 31, 1978, 1695 UNTS 3 (entered into force November 1, 1992) (hereinafter Hamburg Rules).

⁴⁹ *Ibid.*, art. 1(7).

Although the definition does not expressly require that a B/L is a document of title, in common law, a document that permits delivery only against production of the document is generally a document of title.⁵⁰ Whether the transfer of a B/L constitutes a transfer of title have also been discussed. The rules regulating the transfer of property differ in various national laws, and whether a property can be transferred by the transfer of a B/L depends on the applicable law.⁵¹ Regarding the different types of B/Ls, they are all document of title. The only difference between straight B/L, order B/L, and bearer B/L is whether they are negotiable. Straight B/L is issued to make the goods deliverable to a named consignee and, thus, is non-negotiable. Order and bearer B/Ls are, by contrast, not issued specifically to a particular party, so they can be transferred by endorsement. In practice, sellers prefer order B/Ls over straight B/Ls because the ownership of the goods will be transferred to the consignee if no reservation of the right of disposal is made under English law.⁵²

In the domestic law regime, common and civil law jurisdictions have also reached universal consensus on the receipt and evidential functions of B/Ls.⁵³ Opinions between common and civil law jurisdictions diverge on the “negotiability” of B/Ls. Although both types of jurisdictions consider B/Ls as a document of title and recognize that the holder of this document retains title upon the shipment, divergences arise on whether the contractual rights embodied in the contract of carriage can be transferred along with the endorsement. These divergences include the right to bring suit, the right to replace consignee, and the right to change the place of delivery. These rights are transferred through the transfer of the negotiable B/L in civil law,⁵⁴ but they are not assignable under common law because of the doctrine of privity.⁵⁵

⁵⁰ *MACWILLIAM (JI) Co Inc v. Mediterranean Shipping Company SA*, The *Rafaela S* [2003] 2 Lloyd’s Rep. 113, para. 143 (C.A.), [2005] 2 A.C. 423, 142; see also *Lickharrow v. Mason* (1787) 2 T.R. 64, *Sanders Brothers v. Maclean & Co.* (1883) 11 QBD 327, *Sewell v. Burdick* (1884) 10 A.C.74. *The Aliakmon* (1986) A.C.785. These cases indicate that the general rule in English law is that property is transferred when the parties so intend.

⁵¹ See Pejović, Časlav, *Documents of title in carriage of goods by sea under English law: Legal nature and possible future directions*, *Poredbeno pomorsko pravo* 43.158 (2004), on p. 55. In this article, Prof. Časlav pointed out that in French law, the transfer of property happens when consensus has researched (Civil Code article 1583), whereas German law provides that the delivery of a B/L has the same effect as delivery of the goods (HGB§ 524). The next section introduces applicable law.

⁵² See Articles 18 and 19 of the English Sale of Goods Act 1979.

⁵³ Bury, David A., *Electronic Bills of Lading: A Never-Ending Story*, *Tul. Mar. LJ* 41 (2016): 197, on p. 202.

⁵⁴ *Ibid.*, at 58. Civil law makes the B/L an “abstract” document of title, independent from the underlying contract of carriage. The contractual rights and obligations of the holder are based on the contents of a B/L, regardless of the position of the previous B/L holders.

⁵⁵ England partially addressed this problem by passing the Bills of Lading Act of 1855 (BLA), but the act linked the transference of contract rights to the transfer of property rights, instead of possessory rights. Under the Sale of Goods Act

The situation makes sense for the doctrine of privity because a third person who is not a party to the contract should not be made liable under terms to which he/she has not agreed. However, depriving the holder of a B/L the right to seek recovery from a carrier who has caused damage, loss, or delay to the represented goods is unreasonable. In the case of *Dunlop v Lambert*⁵⁶ and the more recent decision in *The Albazero*,⁵⁷ the House of Lords explained that the consignor was acting as an agent of the consignee as he/she signed the contract of carriage with the carrier. Therefore, the consignee is entitled to sue the carrier for the loss and damage. Later, through the passage of the Carriage of Goods by Sea Act (COGSA 1992), England addressed this dilemma thoroughly by approving that the lawful holder shall have all rights of suit under the contract of carriage as if he/she had been a party to that contract.⁵⁸ The American law has also recognized the same right of a transferee under the Pomerene Bills of Lading Act.⁵⁹ Although a few legal regimes such as Canada remain under the influence of the UK Bills of Lading Act 1855 and refuse to give the transferee of a B/L the contractual rights, common and civil law reached a certain degree of harmony regarding the functions of B/L in a broad sense.

To further understand the nature of a B/L, it should be compared with other types of document that may be similar. The content of non-negotiable instruments, such as sea waybills, are looked into in the next paragraph.

b) Sea waybills and other non-negotiable instruments

Sea waybills are broadly similar to straight B/Ls. A sea waybill is a receipt for goods and contains or evidences a contract for the carriage of goods by sea. It identifies the name of the consignee in accordance with the contract of carriage. As the carrier undertakes only the delivery of the goods to the named consignee, the sea waybill is non-negotiable.⁶⁰ The main

1979, property in goods generally passed when parties intended for it to pass. Therefore, a property can pass independent of the consignment or endorsement of the B/L. *Id.* See for example *Brandt v. Liverpool*, [1923] 1 KB 575 (C.A.), [1923] 1 Lloyd's List L. Rep. 8 (appeal taken from Eng.); *Obestain, Inc. v. Nat'l Ineral Dev. Corp (The "Sanix Ace")*, [1987] 1 Lloyd's Rep. 465 (Q.B) (Eng.); *Owners of Cargo Lately Laden on Board the Ship Aramis v. Aramis Mar. Corp. (The "Aramis")* [1989] 1 Lloyd's Rep 213 (C.A.) (appeal taken from Eng.); *Leigh and Sillavan Ltd. v. Aliakmon Shipping Co. (The "Aliakmon")* [1985] 1 Lloyd's Rep. 199, *affd.*, [1986] AC 785 (H.L.), [1986] 2 Lloyd's Rep. 1 (appeal taken from Eng.).⁵⁶ (1839) 7 ER 824.

⁵⁷ (1976) 2 Lloyd's Rep 467.

⁵⁸ Carriage of Goods by Sea Act 1992, c. 50, § 2(1)(a).

⁵⁹ 49 U.S.C. § 80105(a)(2) (2012).

⁶⁰ *Supra* note 44, § 1(3).

difference between a sea waybill and a straight B/L is that the named consignee does not need to present the waybill upon delivery but only have to prove his/her identity. Accordingly, the delay or loss of sea waybills does not affect the delivery of goods. Owing to such characteristics, sea waybills are often used as alternatives to B/Ls in short voyages in which the transport is fast and the goods in transit are not intended for reselling.⁶¹

The other document commonly used in practice to avoid the issuance of B/Ls is the delivery order. This document is applied when the owner of a bulk cargo wishes to sell the cargo in smaller portions to different buyers when still at sea. “Splitting” the already issued B/Ls or issuing new sets of B/Ls is possible, but such a practice is cumbersome and likely to result in fraud or heavy liability on shipowners.⁶² To address this problem, delivery orders come into use. The owner of the goods gives order to the person in possession of the goods (usually the carrier) about the disposal of the carried goods. The possessor then issues delivery orders to inform an undertaking for delivering the mentioned amount of cargo to the bearer. “Splitting” the original B/L or issuing new ones is unnecessary. Delivery orders are only undertakings of constructive possessors, so they constitute neither a contract of carriage nor a document of title. These traits make the document a double-edged sword: it is convenient to use but lacks the legal effect.

In conclusion, although the two documents are alternatives of B/Ls when confronting inconveniences in the industry, they cannot replace the B/Ls even when the transfer of property does not occur. Apparently, the obstructions come primarily from the legal perspective. To be precise, one problem lies in the application of law and the other in the contractual rights embodied in these documents. The former problem is mainly because sea waybills and delivery orders are relatively “new” inventions in maritime transport. Most widely accepted international legislation such as the Hague Rules⁶³ and Hague–Visby Rules⁶⁴ were adopted before these documents came into existence. As stipulated in the Hague Rules Article 1 (b), the

⁶¹ See P. Todd, *Modern Bills of Lading 1990*, Chapter 17; C. Debattisa, *Sale of Goods by Sea*, Chapter 8.

⁶² See [1983] 2 Lloyd’s Rep. 548, 522; *Noble Resources Ltd. v Cavalier Shipping Corp.*, (The Atlas) [1996] 1 Lloyd’s Rep. 642, at 644; [1952] 2 Lloyd’s Rep. 9, on pp. 18–19.

⁶³ International Convention for the Unification of Certain Rules Relating to Bills of Lading, August 25, 1924, 51 Stat. 233, 120 L.N.T.S. 155 (hereinafter Hague Rules).

⁶⁴ Protocol to Amend the International Convention for the Unification of Certain Rules of Law Relating to Bills of Lading, February 23, 1968, 1412 U.N.T.S. 128 (hereinafter Hague–Visby Rules).

term “contract of carriage applies only to contracts of carriage covered by a bill of lading or any similar document of title,” and Article 2 of the Hague Rules only applies to “every contract of carriage of goods by sea.” Pursuant to these rules, controversy arises whether the Hague and Hague–Visby Rules are applicable and incorporable for these documents.⁶⁵ Given that most B/L acts do not apply to sea waybills, a similar situation takes place when applying domestic legislation. In explaining the latter obstruction, comparing between a B/L and its substitutes is preferable. When B/Ls are issued under common law, the holder can benefit from statutory estoppel against the carrier,⁶⁶ and third parties (e.g., stevedores or terminal operators) can benefit from immunities in the Himalaya clause.⁶⁷ However, whether these rights can be incorporated in the substitutes remains controversial. In addition, the holder of B/Ls can, without doubt, claim his rights stated on the bill against the carrier, but the consignee named in a sea waybill or delivery order is not necessarily vested with the shipper’s right to bring suit.⁶⁸

c) Other Documents

Apart from the aforementioned documents, other documents and certificates are necessary for maritime transport. These documents are indispensable for loading of goods, ship stores declaration, cargo declaration, and customs clearance. However, enumerating the names of each document is pointless because these documents perform the sole function of proving facts regarding either the condition of the cargo or the ship. The list of required documents and certificates is summarized in the work of *Branch*.⁶⁹ The characteristics of these documents, such as formation, originality, or authentication, are either common problems in digitalization or unimportant in a digital environment, so these issues are discussed together with the

⁶⁵ See William Tetley, *Marine Cargo Claims, 3rd Edition*, International Shipping Publications, 1988, on pp. 944–945; see also Tetley, William. “Waybills: The Modern Contract of Carriage of Goods by Sea-Part II.” *J. Mar. L. & Com*15 (1984): on p. 41.
⁶⁶ 49 U.S.C. §102.

⁶⁷ The clause takes its name from a decision of the English Court of Appeal in the case of *Adler v Dickson (The Himalaya)*. It is a contractual provision expressed to be for the benefit of a third party who is not a party to the contract. See Yuzhuo, Si. “A study on the development and theoretical basis of Himalaya Clause-review the maritime performing party under UNCITRAL Transport Law (draft)[J].” *Journal of Dalian Maritime University (Social Science Edition)*2 (2004).

⁶⁸ See section 2 of the Bills of Lading Act, R.S.C. 1985: according to this section, it allows the endorsee to sue the carrier based on the contract if he proves that he acquired title on or by reason of endorsement. In other words, the endorsement must cause the transfer of property. Since sea waybills are not document of title, the holder of sea waybills cannot sue the carrier based on the contract of carriage; see also Beatson, J., and J. J. Cooper, *Rights of Suit in Respect of Carriage of Goods by Sea*, *LmCLQ* 1991 (1991), on p. 196.

⁶⁹ Branch, Alan Edward. *Elements of shipping*. Routledge, 2007, on pp. 105–115.

characteristics of B/Ls in the next chapter. Only mentioning their function of proof is needed when referring to the topic of digitalization.

2. Maritime Transport Documents in Digital Environment: Which is the Most Suitable Research Subject?

Whenever confronting the issue of digitalization of maritime transport documents, the first question is which types of documents need to be digitalized, and the second question is how to digitize them. Regarding the latter, the UNCITRAL Model Law introduced the “functional equivalence” principle, that is, to transfer the same functions of paper documents in a dematerialized environment.⁷⁰ Accordingly, analyzing functions of every document used in maritime transport is of little significance. Only studying the document that possesses all the functions is crucial. As examined above, majority of documents used in maritime transport serve the exclusive purpose of providing evidence of the facts stated in them. Other key documents can either contain or evidence the terms of the contract of carriage or be documents of title to the goods to which that contract relates. To meet the commercial needs, some documents can provide a mechanism for the transfer of rights arising under that contract and for the imposition of liabilities arising under it on the persons who were not originally parties to the contract.⁷¹ After going through all the principal types of maritime transport documents, the most valuable research subjects are B/Ls and sea waybills. B/Ls perform not only the evidential function as a normal document but also possess unique functions, such as proof of contract and symbol of ownership. Sea waybills, as a simpler document, have partly undertaken the role of B/Ls when the transit time is short.

However, is analyzing documents that are competitive in practice and overlapping in functions imperative? From a popularity perspective, although sea waybills are dominantly used on the Short Sea Liner routes like the North Atlantic routes,⁷² negotiable B/Ls continue

⁷⁰ Faria, Jose Angelo Estrella. *E-Commerce and International Legal Harmonization: Time to Go beyond Functional Equivalence*, S. Afr. Mercantile LJ 16 (2004), on p. 531.

⁷¹ Treitel, Guenter Heinz, Francis Martin Baillie Reynolds, and Thomas Gilbert Carver. *Carver on bills of lading*. Vol. 16. Sweet & Maxwell, 2011, on p. 1.

⁷² See UNTAD document TRADE/WP.4/R.1218, January 30, 1996.

to be dominant in many other trade routes.⁷³ Many voices in shipping and banking industry argue that this situation is simply due to the lack of awareness among shippers, banks, shipowners, and their agents to use sea waybills. However, a survey by the UNCTAD regarding the status quo of the use of transport documents in international trade reveals that 88% of the respondents, who are all stakeholders in maritime transport sectors, indicate that they use negotiable B/Ls in their practice. Among them, 70% use mainly or exclusively negotiable B/Ls.⁷⁴ Only 23% of the respondents use sea waybills for the majority of transactions.⁷⁵

The reasons behind this phenomenon are also revealed in this survey. Among the many factors that contribute to the continued use of negotiable B/Ls, the prevailing motivation is to use negotiable B/Ls as collateral under an L/C (75%). Others choose the negotiable documents because it is “requested/suggested by trading party (seller/importer/shipper/consignee)” (35%) or the “document ensures application of mandatory transport legislation” (31%). Approximately a quarter of the respondents state that they choose the negotiable B/Ls because they intend to sell the goods during transit (25%). Only 20% of the interviewees use negotiable B/Ls for “no particular reason or standard practice.”⁷⁶

The survey clearly indicates that the three greatest incentives that encourage the use of negotiable B/Ls are a) banks need the document as collateral to issue documentary credit, b) the laws demand it, and c) owners wish to sell the goods in transit. To replace B/Ls completely, sea waybills must fulfill these needs as well. The legal status of sea waybills prohibits them from achieving this goal because the advantages of sea waybills over B/Ls are built at the expense of the document of title and negotiability functions. This approach makes the sea waybills only suitable for businesses in which goods are not intended to be used as collateral. For banks and traders, negotiability is rigid demand: banks prefer to issue L/Cs based on B/Ls consigned “To the Order of XYZ Bank” so that they can acquire possessory rights over the goods to protect its own security interest in the collateral and its proceeds.⁷⁷ By contrast,

⁷³ See report by International Chamber of Shipping.

⁷⁴ See the Report of the UNCTAD, *The Use of Transport Documents in International Trade*, UNCTAD/SDTE/TLB/2003/3, dated November 26, 2003., para. 46, available at http://unctad.org/en/Docs/sdtetlb20033_en.pdf.

⁷⁵ *Ibid.*, at para. 47.

⁷⁶ *Ibid.*, at para. 53.

⁷⁷ Kozolchyk, Boris. “*Evolution and present state of the Ocean Bill of Lading from a Banking Law Perspective.*” *J. Mar. L. & Com.* 23 (1992): 161, on p. 242.

traders, especially in non-liner shipping in which bulk cargo is transported, still sell their cargos in transit.⁷⁸ They will be glad to be financed through documentary credits because they cannot easily carry all the expenses on their own, and the banks check the creditability of buyers for them. Finally, yet importantly, the laws governing the use of B/Ls are relatively uniform, whereas laws governing sea waybills are more divergent.⁷⁹

Sea waybills is excluded from the research scope for the technological reason. Sea waybills emerged to resolve the conflict of late-arriving original B/Ls and fast container ships. B/Ls must be presented in the original upon delivery, so the consignee and carrier need to wait for the B/Ls to arrive to complete a transaction. Conversely, sea waybills are not documents of title, and, consequently, they are not required to be presented for delivery of goods. Thus, lateness or loss of sea waybills will not affect the delivery.⁸⁰ Nevertheless, this advantage is not diminished in a digital environment where the physical movement of documents is no longer necessary.⁸¹

In sum, although the legal nature and basic functions of B/Ls continue to provoke scholastic disputes, the application of this document in the commercial world has, without doubt, reached universal recognition. The functions of B/Ls and sea waybills are overlapping to some extent, but the unique function of the former as negotiable documents of title certainly outperformed the latter in bulk shipping and finance. Most importantly, unlike sea waybills, the common and civil law regimes have reached a certain consensus regarding the proprietary and contractual functions of B/Ls. This consensus helps lay a solid cornerstone for the legal development of B/Ls' electronic alternative. Hence, this doctoral thesis concentrates on the B/Ls during the digitalization of maritime transport documents.

⁷⁸ Ibid., on page 4.

⁷⁹ See section 1(a) of the doctoral thesis.

⁸⁰ See *The Rafaela S*, [2005] 1 Lloyd's Rep. 347, 360 (H.L.), citing Schmitthoff's *Export Trade: The Law and Practice of International Trade*, 10th ed., 2000, para. 15-033, on p. 281.

⁸¹ Various authors frequently underlined that this kind of problem is by far less likely to happen in cases in which electronic transport documents are used. See for example Chan, Felix W.H., "*In Search of a Global Theory of Maritime Electronic Commerce: China's Position on the Rotterdam Rules*", *Journal of Maritime Law & Commerce*, April 2009, on p. 186; Mallon, Paul, "*The Legal Implications of Electronic Commerce in International Trade*", *Computers and Law* (1997) 8 (October/November): on p. 24.

III. Summary

This brief introduction on international trade and maritime transport indicates that maritime transport documents are vital in today's cross-border transactions by evidencing transport, facilitating finance, and proving rights of involved parties. Some of these documents have been used as early as the Sumerian times,⁸² whereas other documents have only been invented a few decades ago to adapt to the transport innovations and fulfill the urgent needs of merchants. The "new" documents, such as sea waybills and delivery orders, are gradually gaining favor from cargo interests to substitute the use of traditional B/Ls. However, B/Ls continue to be extensively used in non-liner shipping in which bulk cargoes are transported and reselling of goods is commonplace. B/Ls also have incomparable advantages when used as collateral. Therefore, despite the constant proposal to substitute B/Ls with sea waybills, this attempt is unsuccessful.

Meanwhile, as the increasing use of electronic means of communication and the internet reshape the maritime transport industry, today's paper maritime documents are inevitably undergoing tremendous transformation to fit the electronic era. One of the methods is to transpose the functions of paper documents into a digital environment so that the use of electronic records or data messages enjoys the same legal recognition as the use of traditional paper documents. As examined in the previous sections, the following functions of maritime transport documents are emphasized: a) as receipt of goods, b) as evidence of contract of carriage, c) as document of title, and d) transfer of rights on the contract to a third party. After comparing all the principal types of maritime transport documents, this doctoral thesis chooses B/Ls as the research subject of maritime transport document digitalization. Although used increasingly frequently by the traders and easier to replicate in electronic form, seaway bill has been proven incapable of fulfilling current mercantile needs because it does not provide its holder with rights to the carrier nor the possibility to negotiate.⁸³ This presumption is also

⁸² Hinkelman, Edward G., and Gilbert Mansergh. *A Short Course in International Trade Documentation: The Documents of Exporting, Importing, Transportation and Banking*. World Trade Press, 2002: By excavating the ruins of the ancient Sumerian city of Ur, it is discovered that the Sumerians record business transactions and transport details in clay tablets.

⁸³ *Supra* note 44, on p. 59.

supported backed up by a survey by the UNCTAD that confirming that the negotiability of B/Ls is indispensable by gathering opinions from the maritime transport sector.⁸⁴ Furthermore, the laws governing the use of sea waybills are rather divergent and can be problematic for electronic commerce legislation.

Pointing out the functions of maritime transport documents constitutes only a small piece of the blueprint of document digitalization. The development of digitalization and the laid-down principles regarding the related legal obstacles are examined in the next section.

B. Digitalization of Maritime Transport Documents

I. Introduction to Digitalization

The central themes in the information era are digitizing information and putting it into proper use. Compared with analog data, digitized data are in the form of binary numbers, allowing them to be copied or transmitted without any loss of quality. The first application of digitalization technology was telegraph. Combined with signal techniques, telegraph allows digitized information to travel long distance in a very short time through telegraph cables. After 150 years of development, the telegraph cable system has been built worldwide and has expedited the movement of information to a great extent. However, the telegraph system has obvious shortcomings. The encoding and decoding are processed manually, only a limited amount of information can be transmitted, and the cost is relatively high. To improve the efficiency of information transmission, the degree of automation must be enhanced. The breakthrough comes from the invention of computers and the World Wide Web (the Internet). Computers can process electronic data automatically, and internet can provide high-speed connections between users. The convergence of the two makes the instant exchange of a large amount of information possible and, thus, has revolutionized the way of communication. Today, even the most old-fashioned companies and individuals use computers to store and process

⁸⁴ UNTAD document, UNCTAD/SDTE/TLB/2003/3, available at http://unctad.org/en/Docs/sdtetlb20033_en.pdf.

data and transmit it via internet. When referring to digitalization, people no longer think about telegraph but rather immediately associate it with computers and internet. The physical transfer of paper still exists but is declining. Compared with digital information, analog information is slow, costly, and easy to forge. Paper documents are irreplaceable only when the originality of information is required.

Like how telegraph changed the face of branches that are not part of telecommunication or information sectors, digitalization ignited by the application of new information and communication technologies can also bring enormous transformations to the maritime transport sector. Therefore, understanding the functioning theory of the technologies before diving into the digitalization of documents is crucial. For this purpose, this section introduces digitalization and its effects on maritime transport documents in a progressive way. It begins with an analysis of the content of digitalization, followed by the illustration of the digitalization process and trends in the maritime transport sector. Finally, substantive and procedural legal issues in relation to the digitalization of maritime transport documents are investigated.

1. Digitalization

Today, the business world expects faster service, simpler processes, and better efficiency from all companies and individuals. Whoever fails to catch up with the pace loses competitiveness. As companies and organizations begin to design their digitalization strategies, they also interpret digitalization from different perspectives. Their different patterns of thinking resulted in a misconception of the term “digitalization.” For many scholars and entrepreneurs, digitalization is the process of converting information into digital strings of 0 and 1, marking the term with mathematical and technological features.⁸⁵ However, this understanding of digitalization is *ex parte*. The Oxford English Dictionary defines digitization as “the action or process of digitizing; the conversion of analogue data (esp. in later use images, video, and text) into digital form,” whereas digitalization is “the adoption or increase in use of digital or

⁸⁵ Vogelsang, Michael, *Digitalization in Open Economies: Theory and Policy Implications*, Springer Science & Business Media, 2010, on p. 4.

computer technology by an organization, industry, country, etc.” A concise definition of digitalization offered by digital business consultancy I-SCOOP states that “digitalization means the use of digital technologies and of data (digitized and natively digital) in order to create revenue, improve business, replace/transform business processes (not simply digitizing them) and create an environment for digital business, whereby digital information is at the core.”⁸⁶

Despite different formulations, these definitions portray digitalization as more than the sole conversion of data forms but also a series of cultural and economic changes resulting from the collective adoption of digital technologies.⁸⁷ In *Digitalization and Digitization*, Brennen and Kreiss (2014) pointed out that digitalization “concerned less with the specific process of converting analogue data streams into digital bits or the specific affordances of digital media than the ways that digital media structure, shape, and influence the contemporary world.” Moreover, digitalization encompasses the “structuring of ... diverse domains of social life around digital communication and media infrastructure.”⁸⁸

The root of the term “digitalization” is traced back to determine its meaning. The first contemporary use of the term in conjunction with computerization appeared in a 1971 essay published in the *North American Review*. The author used the phrase “digitalization of society” to indicate a life wherein computers and numbers play a decisive role.⁸⁹ From then on, the term “digitalization” has been frequently used in various reports and articles. Later studies undertaken by academics across a range of science disciplines expand and elaborate the content of digitalization by observing and analyzing it from the perspectives of society,⁹⁰ media,⁹¹ and communication.⁹²

In summary, the concept of “digitalization” possesses a more abundant connotation than that of digitization as it reflects the influence of digital technologies upon not one but myriad

⁸⁶ i-SCOOP (2016) *Digitization, digitalization and digital transformation: the differences*, available at <https://www.i-scoop.eu/digitization-digitalization-digital-transformation-disruption/>.

⁸⁷ Strachan, Robert, *Sonic Technologies: Popular Music, Digital Culture and the Creative Process*, Bloomsbury Publishing USA, 2017.

⁸⁸ Brennen, Scott, and Daniel Kreiss. *Digitalization and digitization*, Culture digitally 8 (2014).

⁸⁹ Wachal, Robert, *Humanities and computers: a personal view*, North American Review 256.1 (1971), on p.30.

⁹⁰ Castells, Manuel, *Globalisation, networking, urbanisation: Reflections on the spatial dynamics of the information age*, Urban Studies 47.13 (2010): 2737-2745.

⁹¹ Beniger, James, *The control revolution: Technological and economic origins of the information society*, Harvard University Press, 2009.

⁹² Blum, Karl. *Density matrix theory and applications*. Springer Science & Business Media, 2013.

domains of social life and interweaves the daily practice of every walk of life with each other. In the maritime industry, the use of digitalization ranges over new technologies, maritime logistics management, harbor service, custom declarations, and legal design domestically and internationally. Pursuant to the systematic literature review of Markus Fruth and Frank Teuteberg, which examines 124 relevant contributions covering the topic of digitalization in maritime sector from 2003 to 2017, the current research topics focus mostly on the application of artifacts such as big data, simulation and modeling, and sustainable transport concerning future management in logistics, autonomous navigation, risk control, and cyber security.⁹³ Only one article concentrates on the legal framework regarding digitalization in the maritime industry.

Looking into the legal issues in relation to the digitalization of maritime transport industry is needed because it is a domain with foreign elements and unique legal features. To fill the gap, this doctoral thesis focuses on the laws governing the digitalization of maritime transport documents. The following part briefly introduces the digitalization in the maritime transport sector to deepen the understanding toward digitalization and scrutinize the influence of digitalization upon the maritime industry.

2. Digitalization and Maritime Transport Sector

Although many people view the freight industry as reactive rather than proactive in adopting technological innovations owing to its complexity and regulatory requirements, this opinion is wide of the mark. All types of new technologies, such as big data, cloud computing, and blockchain technology, bring enormous changes to the maritime industry, and the industry is actively adapting itself to these changes. Considering that the maritime industry is more than simply moving cargo from one place to another, these technologies are changing the faces of cargo handling, cargo control, custom clearance, and port inspection. The maritime transport sector is an organization-intensive branch and collaborations between different sub-sectors are

⁹³ Fruth, Markus, and Frank Teuteberg, *Digitization in maritime logistics—What is there and what is missing?*, Cogent Business & Management 4.1 (2017).

of utmost importance, so control of the supply chain is increasingly based on connectivity in the flow of information rather than on direct ownership.⁹⁴ Imagining that data can be transmitted between ships and shores anytime in a massive value spurs the automation of existing processes and functions, decreasing downtime and avoiding unnecessary maintenance. Thus, digitalization should be given first research priority in maritime transport sector.

The current conceptual models about unmanned vessels, big data platforms, and full automation are mostly based on information and communication technologies. To better understand the effects of these technologies on the maritime industry, first understanding the working principles thereof is necessary. The first subsection outlines the theory of information and communication technology (ICT). In addition to picturing the bright future of shipping, considering the restructuring of society resulting from these technologies is indispensable. The laws on maritime labor will not be the same once unmanned vessels are extensively used. The second subsection examines the possible challenges in the maritime transport sector in relation to digitalization.

a) Maritime Transport Sector and Information and Communication Technology

ICT refers to the integration of telecommunications (telephone lines and wireless signals), computers, middleware, and the data systems that support, store and transmit information between systems.⁹⁵ Many scholars believe that ICT has been entwined with major changes in society since the invention of electrical telegraphy in the 1830s.⁹⁶ Through ICT, the entire shipping process can be integrated, allowing information to flow freely between all participants. One good example of ICT application is the use of electronic data exchange (EDI) technology. This technology is inspired by the 1948 Berlin airlift, in which vast quantities of data and information about the transported goods need to be processed. EDI provides a technical basis for automated commercial “conversations” between two entities. By establishing a uniform

⁹⁴ Evangelista, Pietro, *The role of ICT in the logistics integration process of shipping lines*, Pomorski zbornik 40.1 (2002), on pp.61–78, on p. 65.

⁹⁵ Murray, James, *Cloud network architecture and ICT-Modern Network Architecture*, Retrieved from TechTarget Expert Community: <http://itknowledgeexchange.techtarget.com/modern-network-architecture/cloud-network-architecture-and-ict> (2011), available at <https://itknowledgeexchange.techtarget.com/modern-network-architecture/cloud-network-architecture-and-ict/>.

⁹⁶ For historical studies, see Braudel (1981), Castells (1996), Innis (1950, 1951), Freeman and Soete (1997), Marvin (1988), and Mattelart (1996/2000).

standard, the message sent by the originator can be processed automatically by the recipient's computer. For example, when a customer sends a purchase order to the vendor, the purchase order will be automatically logged into the vendor's system as a sales order. As soon as the sales order is agreed and merchandise is shipped, the vendor's computer sends a shipment notification to the customer's computer. Again, the customer's computer automatically updates the purchase order, noting that the merchandise is in transit. The same process continues by exchanging other information about the transaction, and the entire process works autonomously. By applying the EDI, substantial amount of labor and time is saved, and the occurrence of errors is minimized.

Today, the public controlling sectors also use EDI as a means to improve productivity. The United Nations Center for Trade Facilitation and Electronic Business (UN/CEFACT) has suggested to establish "a system that allows traders to lodge information with a single body to fulfill all import- or export-related regulatory requirements," indicating that all the data and documents related to the release and clearance of an international trade only need to be submitted once on a system named "Single Window System."⁹⁷ This one-stop service has been realized in logistics hubs like Singapore and Hong Kong. The platform "TradeNet" provided by the Singapore Customs connects 35 governmental controlling authorities and spares traders from multiple submissions, long waiting times, and high processing expenses.

EDI represents merely one of the possibilities of ICT. Other technologies can achieve more than expedite and simplify the information flow. Whether these technologies are internet or blockchain technology does not matter as they have the same essence of minimizing manual operation and replacing it with automation. In addition to the dissemination of the ICT, the maritime industry can provide real-time information on the status of the cargo, accurate time of ship arrival, and even remote control over the vessels from on-shore in a foreseeable future. In the meantime, the road to full digitalization has many hurdles. The prominent issues include the absence of a uniform rule, the anxiety about cybersecurity, and the fear of artificial

⁹⁷ UN/CEFACT. The single window concept. Technical Report ECE/TRADE/324, International Trade Procedures Working Group (IT-PWG/TBG15) of UN/CEFACT, 2009. available at <http://unpan1.un.org/intradoc/groups/public/documents/UNECE/UNPAN019892.pdf>.

intelligence (AI), which are detailed in the next part.

b) Challenges

Digitalization in the maritime transport sector offers a wealth of opportunities, but challenges exist as well. The challenges come mainly from establishing a uniform set of rules and a secure cyber environment. In this sense, a uniform set of rules means not only a uniform commercial standard but also a uniform legal framework. These two purposes illuminate each other and should be carried out in the same pace. Using EDI communication as an example the document standard is the foundation of EDI because it sets out the precise syntax for the compilation of EDI messages and a vocabulary of already developed messages. Thus, only two systems conforming to the same standard can enjoy the benefits of EDI. The best approach is for all participants to accept one standard; otherwise, companies must constantly invest in their IT systems to make them compatible with the formats of their business partners. However, owing to the development model of EDI, the individual business first set out rules with their trading partners. These rules then evolved naturally into standards within their particular industries. At the time, endeavors were made to reach a unified standard. Various standards already exist in different branches and regions, and the diffusion of such standard becomes difficult because persuading the business to abandon the use of their ongoing EDI standards is inevitable. Altering the standard on a national level is even more difficult. Although the EDIFACT, which is a standard developed by the International Standards Organization, has been agreed to become the international standard, the actual implementation of EDIFACT within the US is moving at a snail's pace. The de-facto standard of choice for US-based EDI operations remains the ASC X12 standard set out by the American National Standards institute.

The case of EDI is only the tip of the iceberg. The co-existence of multiple standards prevails in many other aspects of digitalization, making the establishment of a uniform legal framework a challenge to all participants.

Another issue concerning the potential users of digital technologies is security. This problem encompasses confidentiality, authentication, and integrity of the data, but data storage and non-repudiation are also generating anxieties. These anxieties do not solely come from

technological imperfections. Technological advancements in the past decades actually enable electronic communication technologies to provide high-level security procedures for the legal transactions executed by electronic means. However, these technologies are not enough to convince the users to apply them on a massive scale. This embarrassing situation is associated with the lack of confidence from the stakeholders and various legal uncertainties on the road to digitalization. Confidence can only be built through fruitful mercantile practices, but these practices cannot interact smoothly with incomplete and poorly harmonized regulatory regimes. At present, whether an electronic record can be recognized as an adequate replacement for a paper document depends on the standards that vary from one jurisdiction to another. These accompanying legal uncertainties have, undoubtedly, discouraged users and, thus, represent the key obstacle toward achieving common use of electronic records.

3. Conclusion

In this section, the content of digitalization and its effect on the maritime industry are discussed. A short glimpse into the future of the maritime transport industry has been given as well. In the future opportunities are presented and challenges are posed. While the maritime transport industry evolves into an automatized and integrated system, the inconsistency in applying standards and concerns about cybersecurity hinders its development. Establishing harmonized rules via uniformed legal framework governing all these issues in this domain is a possible solution, but doing so is formidable that the chance of realizing it is slim. Instead, a breaking point can result from the attempt of establishing uniformity from one aspect. The uniform rules in one sector can bring standardization to other related sectors in a subtle way. For example, if a law governing the electronic B/Ls has been generally adopted, the standards set by the law regarding data security and electronic signature can become a good model for other electronic commerce legislation. Thus, bringing harmonization into the maritime world is promising.

To achieve this goal, the next part analyzes the procedural and substantive law issues concerning digitalization of maritime transport documents.

II. Legal Issues Relating to Digitalization of Maritime Transport Documents

Maritime transport is an international activity, and the cargo must travel across many jurisdictions, which means legal disputes arising in maritime transport are potentially exposed to many foreign jurisdictions. This section aims to determine whether electronic maritime transport documents can function well without building a harmonized regulatory institution worldwide. The proposition can be true if only either one of the two prerequisites can be fulfilled. a) All disputes resulting from maritime transport can be satisfactorily resolved by at least one regulatory institution, and the parties to this dispute can bring their cases to this regulatory institution with assurance. b) The regulations governing the documents are unified worldwide, or at least similar so that a predictable result can always be drawn if any disputes occur.

To verify the first prerequisite, the practicability of choice of forum and law clause must be examined. This examination falls into typical procedural law issues, so the first possibility is examined in the first subsection. The second prerequisite can be tested by looking into the substantive legal rights regarding electronic maritime transport documents. The research on these two prerequisites using electronic B/Ls as research object reveals that neither of the two prerequisites stand; thus, the proposition of not needing a harmonized regulatory institution remains false. The following subsection details the demonstration process.

1. Procedural Law Issues

Incorporating a choice of forum and law clause into B/Ls to govern possible controversies arising from the transport is common practice in the maritime transport industry. However, such a clause is not always valid, especially when an electronic B/L is issued. In some jurisdictions, the fear of giving powerful trade corporations from abroad leads to the denial of the validity of such choice of forum and law clauses.⁹⁸ In academia, scholars have expressed

⁹⁸ One of the most prominent example is Brazil. See Stringer, Dana. "Choice of Law and Choice of Forum in Brazilian International Commercial Contracts: Party Autonomy, International Jurisdiction, and the Emerging Third Way." *Colum. J. Transnat'l L.* 44 (2005), on p.959.

their concerns for the entire scheme. Juenger argued that “methodological uncertainties” and “inherent difficulties” arise in the choice of forum and law clause, leading to frustration of the business community’s quest for certainty and predictability in commercial dealing.⁹⁹ In this part of the doctoral thesis, the two possibilities of rendering a choice of forum and law clause void in maritime law are presented to demonstrate that even when a desirable choice of forum and law clause has been made in the agreement, the legal result of applying electronic B/Ls can lack predictability.

a) Void *ab initio*

A well-written choice of forum and law clause incorporated in an electronic B/L can still be rendered void *ab initio* if one of the two situations occurs. The first situation is that the electronic B/L is not recognized as a valid B/L or the choice of forum and law clause does not meet the validation requirements. The latter can happen if the procedural rules require the choice of forum and law clause to be expressed in accordance with a certain form. Article 22 of the Hamburg Rules states that “parties may provide by agreement evidenced in *writing* that any dispute that may arise relating to carriage of goods under this Convention shall be referred to arbitration.”¹⁰⁰ In this case, if the choice of forum and law clause is expressed only in an electronic B/L, such a clause can be null because it does not fulfill the requirement of writing. The former can happen if the jurisdiction in which the litigation is brought up does not recognize electronic B/Ls at all or if the jurisdiction has relatively strict form requirements for electronic B/Ls and the B/Ls in use fail to fulfill these requirements. In this case, the choice of forum and court clause is likely considered void as well.¹⁰¹ Only a few countries have clearly recognized electronic B/Ls as B/Ls; more countries have only provided general recognition and provisions to electronic documents, making the legal effect of electronic B/Ls undecided.¹⁰² As disputes arising from maritime transport will not always be heard by the

⁹⁹ Juenger, Friedrich K. “*The lex mercatoria and private international law.*” *La. L. Rev.* 60 (1999): 1133, at 1136–1140.

¹⁰⁰ See United Nations Convention on the Carriage of Goods by Sea, March 31, 1978, art. 22, 17 I.L.M. 603 (hereinafter Hamburg Rules). Article 22.

¹⁰¹ Controversies exist about whether a choice of forum and law clause can still be valid if the underlying contract is invalid. However, only a handful of cases ruled for the choice of forum and law clause despite the voices of supporting the separability of arbitration clause. See more at Ware, Stephen J. “*Arbitration Law’s Separability Doctrine After Buckeye Check Cashing, Inc. v. Cardegna.*” *Nev. LJ* 8 (2007): 107 and Domke, Martin, *Commercial arbitration*, *Ann. Surv. Am. L.*(1972): 291.

¹⁰² This part is presented in the next chapter.

contractually agreed court and the effect of the choice of forum and law clause on electronic B/Ls is unknown, the danger of rendering choice of court and law clause ineffective *ab initio* is relatively high.

Even when electronic B/Ls and the choice of forum and law clause on it are recognized in the courtroom, the choice of law clause can still be void because other laws are compulsorily applicable. In this case, the choice of law clause will also be invalid. As a matter of law, all three valid maritime transport conventions are compulsory applicable under certain conditions. If the conditions are met, then the contracting states must apply the conventions themselves or the domestically enacted version thereof. The contractual agreement on applicable law cannot violate the international agreement. In the case of *Yemgas Fzco & Ors v Superior Pescadores S.A. Panama*,¹⁰³ when the cargo was damaged during a voyage from Antwerp to Yemen, the cargo owner contends that he was entitled to the limitation figure for cargo damage provided by the Hague Rules because the B/Ls have contained a paramount clause stating that the Hague Rules shall apply. The court of first instance denied the claim for the reason that Belgium is a contracting state of the Hague–Visby Rules, and by reason of Article X of the Hague–Visby Rules, the carriage from a port in a contracting state should be governed by the Hague–Visby Rules. In the court’s view, “because the Hague-Visby Rules do apply compulsorily anyway, the parties must have realized that a contractual choice of the Hague Rules would be largely ineffective.” Although the paramount clause has contractually incorporated the Hague Rules, the choice of law clause remains invalid. The court of appeal also dismissed the appeal, reaching the same conclusion as the lower court.¹⁰⁴ In line with this paradigm, one tricky circumstance is likely to occur in the era of digitalization: the B/Ls can be issued in any other place and therefore must apply the convention of the contacting states. Taking the Hague Rules and the Hague–Visby Rules as an example, both conventions stipulate that they should apply to all B/Ls issued in any of the contracting states. However, electronic B/Ls can be issued in a computer far away from the loading port. If the loading port is situated in a contracting country

¹⁰³ [2014] EWHC 971 (Comm).

¹⁰⁴ For more details of the case, read *Maritime Law in 2016: a review of developments in case law*, authored by Dr. Johanna Hjalmarsson, on p. 5. Available at https://eprints.soton.ac.uk/407443/1/FINAL_brochure_for_good_law_article_sec.pdf.

of the Hague–Visby Rules, but the computer is situated in a contracting country of the Hague Rules, which Convention should apply then is highly disputable. In addition to the compulsory application of international conventions, some jurisdictions claim that their domestic laws are compulsorily applicable to all the transport to or from their ports.¹⁰⁵ This situation entails the same problem. Under these circumstances, the effect of the choice of law clause is extremely challenged.

b) Void by Court

Even if a choice of forum and law clause is not rendered void *ab initio*, risks that the choice of forum and law clause will be overruled by courts based on one of the following three objections remain. The first objection is that a choice of forum and law clause can constitute *forum non conveniencie*; in other words, such a clause can be rendered void because it lessens the liability of the carrier. In the case of *Indussa Corp. v. S/S Ranborg*,¹⁰⁶ the American Second Circuit precluded the validity of a forum selection clause contained in that B/L because “from a practical standpoint, to require an American plaintiff to assert his claim only in a distant court lessens the liability of the carrier quite substantially, particularly when the claim is small.”¹⁰⁷ Although the American Supreme Court overruled the interpretation of Second Circuit 28 years later in *Vimar Seguros Y Reaseguros, S.A. v. M/V Sky Reefer* by announcing that liability by explicit obligations and procedures designed to correct certain abuses by carriers does not address the separate question of the particular forum or other procedural enforcement mechanisms, the influence of this rationale remains in many jurisdictions. Australia, Canada, South Africa, and New Zealand treat privative clauses ousting the national jurisdiction as invalid.¹⁰⁸ In France, Article 48 of the *Nouveau Code de Procedure Civile* provides that forum

¹⁰⁵ For example, the 1936 US COGSA stipulates that the law applies to carriage “to or from ports of the United States in foreign trade,” see 46 U.S.C. app. § 1312 (1988). Other countries like Belgium and the Philippines are also following this rule.

¹⁰⁶ 377 F.2d 200, 1967 AMC 589 (2d Cir. 1967).

¹⁰⁷ *ibid*

¹⁰⁸ Section 11 of the Australian Carriage of Goods by Sea Act 1991, as amended by the Carriage of Goods by Sea Regulations 1998 stipulates that an agreement (whether made in Australia or elsewhere) has no effect so far as it purports to inter alia oust the jurisdiction of the Australian courts in respect of a contract of carriage, B/L or other nonnegotiable instrument to which the amended Hague Rules apply. Under section 210(1) of the Maritime Transport Act 1994, the New Zealand courts will not recognize a clause in a B/L stipulating that dispute resolution must take place in a foreign forum. In Canada, the Marine Liability Act 45 provides the marine cargo claimant with the option of suing or arbitrating in Canada despite the presence in the B/L of a foreign jurisdiction or foreign arbitration clause if (a) the actual port of loading or

selection clauses in B/Ls may only be invoked against merchants, and these clauses must figure prominently in the bills.

The second objection is that the B/Ls between shippers and carriers are usually preprinted in a standard form before the contract of carriage is concluded. Given that holders of the B/L are usually the weaker party in a contractual relationship, jurisdiction or choice of law clauses are mostly set by the shipping companies. In practice, the shipper is not in a position to negotiate terms, but they are only able to choose between “take-it-or-leave-it.” Some scholars see this type of conduct as a violation of freedom of contract and contend that the form terms contained in such contracts should be considered presumptively unenforceable.¹⁰⁹ Rendering all the form terms unenforceable may be overreacting, but the dominant position of one party certainly raises doubt to the terms in such an agreement. The court may question whether the party with better bargain power has abused this power by inserting clauses that will unreasonably burden the shipper before accepting them in court. In addition, the jurisdiction and choice of law clauses printed in a B/L are usually not expressed but through incorporate arbitration clause from the charterparty with texts like “all terms and conditions, liberties, exceptions and arbitration clause of the Charter party, dated as overleaf, are herewith incorporated.”¹¹⁰ This situation can be acceptable for the shipper if he/she has personally concluded the charter party with the carrier, but negotiable B/Ls can be transferred several times before the stated cargo is delivered. Although the transferee negotiating with the shipping company about the terms and clause is impossible, forcing the transferee to institute an action in a foreign court only because of an agreement he/she did not agree on is unfair. The Hamburg Rules, for example, states that “where a charter-party contains a provision that disputes arising thereunder shall be referred to arbitration and a bill of lading issued pursuant to the charter-party does not contain a special annotation providing that such provision shall be binding upon the holder of the bill of lading, the carrier may not invoke such provision as against a holder

discharge, or the intended port of loading or discharge under the contract, is in Canada; (b) the person against whom the claim is made resides or has a place of business, branch or agency in Canada; or (c) the contract was made in Canada. These jurisdictions prohibit the ousting of national jurisdiction for they believe that it is unfair for the dispute party to travel a long way and at great expense to gain access to justice. See more at Laurent, Deborah A. “Foreign Jurisdiction and Arbitration Clauses in the New Zealand Maritime Context.” *Austl. & NZ Mar. LJ* 21 (2007): 121.

¹⁰⁹ See Rakoff, Todd D. “*Contracts of adhesion: An essay in reconstruction.*” *Harv. L. Rev.* 96 (1982), p. 1173.

¹¹⁰ This term stems from a standard form of BIMCO named Congenbill 2007.

having acquired the bill of lading in good faith.”¹¹¹ Some scholars even suggested that vesting the holder of B/Ls the right to choose jurisdiction to balance the shipper-carrier relationship is reasonable.¹¹²

The third objection lies in the ship arrest that results from the unique *action in rem* in maritime law. Despite a choice of forum and court clause, a maritime claimant with any maritime claims can file a petition to the appropriate judicial authority to impose a “warrant of arrest” on the ship.¹¹³ The 1952 Arrest Convention indicates that the arrest of the ship will give the arresting court jurisdiction to determine the case.¹¹⁴ Although a choice of forum or arbitration clause commonly excludes the arresting court to hear the case, the effectivity of a choice of forum clause must face examination first. This situation increases the exposure risk of the validity of an electronic B/L and its clause because the meaning of the parties’ choice of law formulation is usually decided by the law of the situated forum, i.e., *lex situs*. If the clause is seen as invalid for these reasons, then the disputes can be subject to the arresting court, thereby increasing the legal uncertainty.

2. Substantive Law Issues

After proving that parties to a transaction cannot use a choice of forum and law clause, the modern international law has become more than just a coordination order.

Regarding the procedural issues concerning the application of electronic B/Ls, considering the substantive law issues is inevitable. In the previous section, the legal effect of electronic B/Ls is acquiesced as paper B/Ls so that the discussion around the choice of jurisdiction and choice of law can be confined in a reasonable scope. However, the electronic B/Ls are not spontaneously vested with the same legal effect as paper B/Ls. Neither “custom of merchants” nor statutory definitions support the validity of electronic records as transferable and possessable documents. As long as these impediments remain unsolved, the general

¹¹¹ Article 22(2) of the Hamburg Rules.

¹¹² Boggiano, Antonio. *International standard contracts: a comparative study*. Martinus Nijhoff, 1981, on pp.55–60.

¹¹³ See Article 2(3) of the 1999 International Convention on Arrest of Ships, art. 7, 3, U.N. Doc. A/CONF. 188/L.2 (March 12, 1999).

¹¹⁴ International Convention Relating to the Arrest of Sea-Going Ships, May 10, 1952, 439 U.N.T.S. 193, art. 7, 3 [Brussels Convention of 1952].

application of electronic B/Ls will be prolonged indefinitely. In this subsection, the two overlooked issues, legal recognition and negotiability of electronic B/Ls, are scrutinized.

a) Legal Recognition of Electronic Bills of Lading

Electronic B/Ls are defined a series of electronic messages, in a form similar to e-mails; they contain information or instructions relevant to the goods concerned and their carriage and delivery of the same type as in a paper bill.¹¹⁵ In other words, electronic B/Ls are simply B/Ls in electronic form. Despite the great resemblance, the electronic replications have not retained the same legal effect as their paper counterparts. The reason is that the traditional common laws and statutory laws see a document as a piece of tangible and signable paper that can be possessed and endorsed physically. One clear indicator of evidence is that a carrier is only obliged to deliver goods against the surrender of an original B/L. As electronic B/Ls do not have a physical existence, they cannot fulfill these accustomed legal requirements such as writing, signature, and authentication. For the same reason, the admissibility and evidential value of an electronic record before courts or dispute settlement fora are also ambiguous.

Legislatures in various jurisdictions have realized this complication and have been making efforts to address it. In English law, for example, the COGSA 1992, which modernized the COGSA 1971, renewed its definition of B/Ls, and allows the Secretary of State to extend the application of the act by secondary legislation so that a document issued, endorsed or delivered by “an electronic communication network or any other information technology” can obtain the same legal effects as paper documents.¹¹⁶ In Australia, the 1996 Sea-Carriage Documents Act stipulates that electronic sea-carriage documents have the same legal effect as a written document.¹¹⁷ The endeavors to embrace the use of paperless documents can also be seen in continental countries: the newly reformed German maritime legislation suggests that the electronic B/Ls fulfill the same functions as paper documents as long as the authenticity and

¹¹⁵ Supra note 46.

¹¹⁶ See section 1(5) and (6) of COGSA 1992.

¹¹⁷ See Emmanuel T. Laryea, *Paperless Shipping Documents: An Australian Perspective*, 25 TUL. MAR. L.J. 255, 265 (2000). For additional information, see Sea-Carriage Documents Act, 1996, section 4 (Austl.), available at http://classic.austlii.edu.au/au/legis/qld/consol_act/sda1996202/s4.html.

integrity of the electronic records can be guaranteed.¹¹⁸ Internationally, attempts to legitimize the electronic B/Ls have been made as early as 1978 when the Hamburg Rules defined “writing” as including “inter alia, telegram and telex” and the signature on B/Ls may be “made by any other mechanical or electronic means.”¹¹⁹ Specific and direct regulations come from the CMI Rules for Electronic Bills of Lading 1990,¹²⁰ the Rotterdam Rules,¹²¹ and the UNCITRAL Model Law on Electronic Transferable Records.¹²² The Baltic and International Maritime Council (BIMCO) also included an electronic bill clause in its latest version of the NYPE form to permit legal effects to the use of electronic documents. Moreover, developments can be detected outside the transport sector. In the finance sector, the ICC adopted in 2013 the Uniform Rules for Bank Payment Obligations, a system for payment developed by SWIFT whereby payment takes place on successful electronic matching of data.

The rules and legislation indicate that the legal acceptance of electronic B/Ls is considerably high. Electronic B/Ls are unlikely to be denied of legal effects in many jurisdictions solely because of their electronic form. However, even the most active pro-paperless legislations treated the electronic B/Ls with reserve. As an effective electronic document, regardless of being issued or used in a certain country, must comply with certain standards. To date, these standards remained either unexplained or ambiguous.¹²³

b) Transfer of Electronic Bills of Lading

One of the unique features that empower B/Ls to play an unparalleled role in the international carriage of goods by sea is its transferability. Given that the rightful possession of a bill gives the holder contractual and proprietary rights embodied in this bill, being the holder

¹¹⁸ See § 516 and § 526 of the HGB.

¹¹⁹ See Article 1(8) and Article 14(3) of the Hamburg Rules.

¹²⁰ Comité Maritime International Rules for Electronic Bills of Lading 1990 (CMI Rules).

¹²¹ The Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea December 11, 2008, 63 UNTS 122 (Rotterdam Rules).

¹²² United Nations Commission on International Trade Law, *UNCITRAL Model Law on Electronic Transferable Records (2017)*, (Vienna: United Nations, 2017), available at http://www.uncitral.org/pdf/english/texts/electcom/MLETR_ebook.pdf. The Rotterdam Rules provide expressly for “electronic transport records” and has been described as “technology neutral”.

¹²³ The COGSA 1992 implies that the application of this act to electronic bills depends on the regulations being issued, although none have been issued to date. See also Goldby, Miriam, *Legislating to Facilitate the Use of Electronic Transferable Records: A Case Study*, UNCITRAL Colloquium on Electronic Commerce, 2011, at 3. In German law, the details about the issuance, delivery, and endorsement of an electronic B/L will be regulated by the Federal Ministry of Justice and Consumer Protection, see § 516 of the HGB. In Australian law, the electronic B/Ls can only enjoy the same legal effects as paper B/Ls under the premise of “with necessary changes.” See section 4 of the Australian Sea-Carriage Documents Act 1996.

of the document allows merchants to trade them or to use them as collateral.¹²⁴ However, using the electronic B/Ls for the same purpose can be problematic because the relevant legal rules usually require transfer via a valid endorsement and exchange of possession.¹²⁵ Endorsement is expressed in the form of handwritten signatures and the exchange of possession is processed physically, so the two concepts must be reinterpreted in accordance with the electronic environment. To achieve this process, examining the purposes of signature and possession is essential.

In principle, the signature is the method to provide for the authenticity of the person using the signature along with the function to verify the validity or genuineness of a particular piece of information.¹²⁶ Possession of the B/Ls is a necessary prerequisite to identify the holder to complete delivery. Therefore, obstacles that hinder the development of electronic documents are a) guaranteeing that this data message is unique and authentic, b) proving that the “holder” of this data message is the rightful holder and has exclusive control over the goods, and c) confirming that the transfer of electronic records is valid. From the technical aspect, at present, two types of management systems are used to address these challenges: “token”-based systems and “registry”-based systems.¹²⁷ The former system means that by entering valid usernames and passwords or biometric features, the user obtains a time-limited token in return, with which he/she can fetch a specific resource without providing the authentication for each step. The latter system aims at fulfilling the aforesaid requirements by registration: each time an electronic B/L is issued or transferred electronically, a record is made in a register of the name of the person to whom it is issued or transferred, and that entry in the register indicates that person is the holder of the bill. Technically, both systems can satisfy the functions of signature and possession while providing no less security. However, the legal effect of this transfer does not acquire the same security because it lacks the support of centuries-long mercantile custom

¹²⁴ Schmitthoff, C. (2007), *Schmitthoff's Export Trade: The Law and Practice of International Trade*, 11th ed., Thomson/Sweet & Maxwell, London, on p.590.

¹²⁵ M Goldby, *Electronic Bills of Lading and Central Registries: What is Holding Back Progress?*, (2008) 17:2 Information & Communications Technology Law 125, on p.37.

¹²⁶ Mason, Stephen, *Electronic Signatures in Law*, Cambridge University Press, 2012, on p. 1.

¹²⁷ UNCITRAL Report of Working Group IV (Electronic Commerce) on the work of its forty-sixth session (Vienna, October 29 to November 2, 2012) (A/CN.9/761), at para 23. Available at <https://documents-dds-ny.un.org/doc/UNDOC/GEN/V12/571/34/PDF/V1257134.pdf?OpenElement>.

and legal practices like traditional endorsement. Therefore, transferring the B/L via electronic systems can be treacherous. For example, under English law, whether the transfer of a B/L will affect the transfer of property depends upon the intention of the parties. Normally, the physical transfer of a B/L raises a *prima facie* presumption of an intention to pass the property in the goods to the transferee. However, if the seller sends the B/L with reservations or if the B/L is passed wrongly, then the property is still not transferred. Whether an electronic transfer can constitute such an intention and a reservation is possible are undecided.

These two management systems are built upon different technology bases, so their levels of security vary. By comparison, the registry management system is considered more reliable than the token system based on the technical feature.¹²⁸ In this regard, jurists need to ask “how reliable is considered reliable” and “could the documents processed through a less reliable systems acquire the same legal effect?” International initiatives such as the UNCITRAL Model Law on Electronic Commerce,¹²⁹ the UNCITRAL Model Law on Electronic Signatures,¹³⁰ and the UNCITRAL Model Law on Electronic Transferable Records¹³¹ have been enacted and provided general answers to these questions. However, subject to the principle of “technology neutrality,”¹³² these model laws cannot move further into technological details. Recent legislation developments indicate that different jurisdictions have already revealed their respective preferences on technological requirements. These disparities certainly worried scholars.¹³³ If this tendency continues, then the lack of a technologically impartial and legally harmonized framework will eventually become a great burden for the validity of the transfer of electronic B/Ls.

¹²⁸ Ibid.

¹²⁹ United Nations Commission on International Trade Law, *UNCITRAL Model Law on Electronic Commerce (1996)*, (Vienna: United Nations, 1996), available at http://www.uncitral.org/pdf/english/texts/electcom/V1504118_Ebook.pdf.

¹³⁰ United Nations Commission on International Trade Law, *UNCITRAL Model Law on Electronic Signatures with Guide to Enactment 2001*, (Vienna: United Nations, 2001), available at <http://www.uncitral.org/pdf/english/texts/electcom/ml-elecsig-e.pdf>, Article 3 and Article 6.

¹³¹ Supra note 122.

¹³² The principle of “technology neutrality” can be interpreted from many perspectives, but in the context of the Model Laws, it means that technical standards should be designed to describe the results that should be achieved. However, users are free to adopt whatever technology is most appropriate to achieve the result. See details in chapter 2.

¹³³ See Spyrelli, Christina, and Electronic Signatures. *A Transatlantic Bridge? An EU and US Legal Approach Towards Electronic Authentication*, *The Journal of Information, Law and Technology (JILT)* 2 (2002): 02-2. The authors were concerned that the legal inconsistencies between the US and the EU can render the international effort of establishing uniformity of e-transaction in vain. See also Blythe, Stephen E. “*Digital signature law of the United Nations, European Union, United Kingdom and United States: Promotion of growth in E-commerce with enhanced security.*” *Richmond Journal of Law & Technology* 11.2 (2005), on p. 6.

III. Summary: Role of Law

In this section, the meaning and challenges of digitalization of maritime transport documents have been briefly introduced. Upon examining both sides of digitalization, the digitalization of documents is far more than simply changing documents from paper to electronic messages. By contrast, digitalization is a catalyst that will lead to a series of changes that even the most experienced experts in the industry cannot foresee. How should lawmakers position themselves in this background? Some of the prerequisites for the successful adoption of digitalization are sophisticated technical infrastructure and the readiness of the industry. Laws and lawmakers can do relatively little for the former, and as mankind has witnessed the remarkable advancement of information and communication technologies in the recent decades, deficiencies in technology seem dwindling to be the primary obstacle to digitalization. In this context, the lack of confidence from potential users to apply electronic documents is prominent. Specifically, stakeholders in the maritime transport sector rather stick to the costly, slow, paper documents because they do not have sufficient incentives to apply the digital solution. The lacking in such incentives can be attributed to two aspects. First, the industry cannot evaluate the total gain from practicing digitalized documents because many risks are unknown. Second, digitalization of maritime documents remains the pioneering project in the industry. The conservative majority may feel the common enthusiasm in the industry to try new business models, but such enthusiasm has not yet turned into peer pressure.

Knowing the bottlenecks of digitalization, this doctoral thesis believes that law can play an active role. The analysis in the second part of this section on ocean B/Ls shows that one of the most decisive risks derives from legal uncertainty. Despite the full-scale superiority of electronic documents against its paper counterparts, the laws governing paper documents are comprehensive and uniform in a global sphere, whereas the rules on electronic documents are at an initial stage, with their future unknown. By observing the procedural and substantive issues in relation to such documents, some of the long-standing legal issues in paper B/Ls remain in the electronic world. Owing to the features of digitalization, new challenges on electronic bills are posted to the industry and lawmakers.

The question now is what should the role of law be to encourage the industry to embrace digitalization in a massive and coherent manner? Making a law to eliminate all the obstacles, balance all the interests, and provide the actors with a safe and predictable environment is ideal, but these initiatives cannot be realized. When the legal framework needs to be built from scratch, the law will be imperfect and ambivalent for a long time. Therefore, law should not be portrayed as a panacea for all the obvious or potential problems in digitalization. Accepting imperfect laws is reasonable. Furthermore, the idea of belittling law as a set of commercial standards or an institution merely aims at reducing transaction costs is not supported in this thesis. Although some sorts of order can be built in a lawless background by private actions, this order is not necessarily just or right. This thesis holds the idea that law in digitalization of maritime transport documents is irreplaceable and should be regarded as a state between a panacea and a chip in pottage. To be precise, law should, on the one hand, be able to list basic behaviors and principles that are permitted. These basic behaviors and principles should include the legitimate usage of electronic documents, evidential function of electronic documents, and title function of certain documents. Actions that may sabotage the fair use of electronic documents should be discovered in time and should be prohibited. On the other hand, law should be able to adapt to the changes that may come from technological innovations, business model variations, and social developments. Electronic documents are subject to technological innovations and count as a means to connect different branches and business sectors. This high degree of openness means that the laws governing it must be equally open. To summarize the two features using the words of legal sociologists, the legal system governing digitalization of maritime transport documents must be normatively closed and, at the same time, cognitively open.¹³⁴ Legal rules counterfactually stabilize expectations and are secured against disappointment.¹³⁵ Finally, maritime transport and digitalization are all operating beyond national borders; thus, the law as an answer should also be an international one instead of a regional one.

¹³⁴ See Luhmann, Niklas. "Law as a social system." *Nw. UL Rev.* 83 (1988), pp 20–27.

¹³⁵ N. Luhmann, *Ausdifferenzierung des Rechts: Beiträge zur Rechtssoziologie und Rechtstheorie*, (1999), 17 [Luhmann, *Ausdifferenzierung*]; id, *Rechtssoziologie*, *ibid*, 342; H. Wilke, 'Das Recht der Weltgesellschaft', in G.-P. Calliess (ed.), *Soziologische Jurisprudenz* (2009), on p. 887, 894

C. Conclusion

The first part of this chapter clearly depicts maritime transport as a delicate process with the involvement of many interested parties. Given that all these parties are connected with each other by “a fine net of documentation,” the digitalization of maritime documents is essential to the digitalization of shipping.¹³⁶ Although the maritime transport documents have many functions, using documents as collateral to facilitate financial purposes or transferring them as an intention to transfer ownership of the represented goods is commonplace. Insurance companies are also closely associated with the sellers and buyers in the transport process. As one of the major principles of digitizing documents is to replicate all the functions of paper documents in the electronic environment, considering the commercial and financial value of maritime transport documents is indispensable. Just as paper money represents the monetary unit it describes, paper B/Ls represent the material goods they describe.¹³⁷ As B/L represents the unique functions of maritime documents and will continue to be central in a paperless environment, it is chosen as the major research subject of this doctoral thesis. Upon examining the digitalization of B/Ls, the greatest challenge of digitalization does not come from technological insufficiencies but due to the lack of legal certainty. The second part of this chapter reveals the legal uncertainty from substantial and procedural law perspectives. From the substantial law perspective, the form and use of electronic B/Ls remain ununified. Given that most jurisdictions are inclined to treat electronic documents as digitalized paper documents and design the framework of electronic B/Ls on the basis of the laws governing paper B/Ls, many issues such as signs and endorsements, become open to discussion. From the procedural law perspective, the current international private law rules are limited in many aspects. Owing to these two deficiencies, the majority of participants in the maritime transport sector continue to use hand-signed, original B/Ls instead of the electronic equivalents. Whether electronic B/Ls can achieve the same legal effect as their paper counterparts remains questionable, and the

¹³⁶ Hans B. Thomsen & Bernard S. Wheble, *Trade Facilitation and Legal Problems of Trade Date Interchange*, 13 INr’L. Bus. L. 313, 313 (1985), on p. 3.

¹³⁷ George F. Chandler III, *It's the Information That's Important, Not the Paper*, LC MONITOR, April 2000, available at <http://www.globaltradecorp.com/archives/lleminfo.html>.

major obstacle is the undecided standards on the validity of electronic B/Ls.

To date, different organizations and governments have promulgated diverse criteria of a valid electronic B/L and a valid transfer thereof. The key controversy lies in the form and signature of the electronic bill. The form of electronic bill decides the validity of the document, and the electronic signature shall guarantee the integrity and authenticity of the endorsement. The observation of statues and regulations on the electronic documents in different jurisdictions indicates that the standard setting has gradually become a battle between political powers. As long as the battle continues, the uncertainty of using electronic documents will never end. Every attempt to use the electronic documents will be a venture into the unknown. No one knows what will come out of it. To end this chaotic situation, first understanding the objective of these jurisdictions and seeing if a possibility exists to draw on their merits to reach a higher degree of legal harmonization are critical. The following chapter introduces the electronic B/Ls legislations in major trading entities and the efforts from international organizations and private sectors using the functional comparison approach of comparative law.

Chapter 2 – Examining the Harmonization Status of Laws Governing Digitalization of Maritime Transport Documents

“The end of law is not to abolish or restrain, but to preserve and enlarge freedom. For in all the states of created beings capable of law, where there is no law, there is no freedom.”

—John Locke¹³⁸

The previous chapter has presented the model of international maritime transport and thoroughly investigated the digitalization of maritime transport documents. Law harmonization in this domain has been proven indispensable, and the form and transferability of electronic transport documents remain the greatest obstacles. This chapter aims to investigate how these problems are handled within the current international context. Research on current legal norms reveals that international legal bodies that draft laws for the purpose of legalization by nation-states are the major driving force for legal harmonization in electronic documents. The first part of this chapter introduces this legislative approach by inspecting the legal body and its methods. By comparing the relevant laws in three different legal systems that have been greatly influenced by international law, the second part intends to discover the harmonization effect of this legislative approach. The final part examines the feasibility of fixing the deficiencies of the current legal system by using hard and soft law instruments.

A. Legislative Approach to Promote Harmonization in Electronic Law

“Markets are migrating from geographic space to cyberspace,”¹³⁹ and electronic records will inevitably replace the usage of paper one day. As these circumstances become clear, lawmakers around the world move to adapt legal rules to modern technologies. Owing to the transnational nature of e-commerce and the challenges it presents to traditional jurisdiction

¹³⁸ Locke, John. "Two Treatises of Government." (1698), on p. 234.

¹³⁹ Stephen J Kobrin 'Economic Governance in an Electronically Networked Global Economy' in R Hall & T Biersteker (eds) *The Emergence of Private Authority: Forms of Private Authority and Their Implications*, Global Governance (2002) 11, accessible at <<http://www-management.wharton.upenn.edu/Kobrin/research/revision1.pdf>>.

rules, the world needs international solutions rather than individual state initiatives. In this regard, international organizations, such as the UNCITRAL, the UNIDROIT, the ICC, and the CMI, have undertaken a major role in establishing a uniform legal framework concerning digitalization. This section presents the process and result of the main legislative approach to promote harmonization in electronic law.

I. Lawmaking Bodies and Methods

Given that several functioning technical solutions are available to replicate the functions of paper B/Ls in the electronic atmosphere,¹⁴⁰ this doctoral thesis recognizes that the legal uncertainty resulting from unharmonized legal framework worldwide is one of the greatest hurdles that hinder the application of electronic maritime documents. The existence of this legal uncertainty makes the application of electronic B/Ls in transactions daunting for participants in maritime transport.

As the number of legislators who recognize this impediment grow worldwide, they have gradually reached a consensus that an internationally harmonized solution is what the industry desires.¹⁴¹ Currently, the most commonly used approach in electronic law is the enactment of new international legislations either in the face of binding or soft law instruments. This approach has been one of the most frequently used to achieve a high degree of legal harmonization in international trade law since the beginning of the nineteenth century.¹⁴²

Given the lack of international public legislature, legislation is usually initiated by “private” international lawmaking bodies. They are characterized as private because they are not owned by any sovereign state, although they are generally treaty-based organizations

¹⁴⁰ One clear evidence is that several running projects have provided platforms, on which electronic B/Ls can be freely issued, amended, and transferred. The Bolero, for example, has been providing such services since 2000. Another company named essDocs has also been providing paperless trade solutions to the industry for more than 12 years.

¹⁴¹ See Jeffery B. Ritter & Judith Y. Gliniecki, *International Electronic Commerce and Administrative Law: The Need for Harmonized National Reforms*, 6 HARV. J.L & TECH. 263, 271 (1993). “Conflicting national rules, even if intelligent and internally coherent as national schemes, will present nearly as great a problem for global electronic commerce as would an absence of rules altogether.” See also Martin I. Behn, *The Illinois Electronic Commerce Security Act Too Much Too Soon or Too Little Too Late?*, 24 S. Ill. U. LJ. 201, 231 (2000). “It appears more likely that a lack of consistency among the state statutes is a detriment that is more likely to inhibit the growth of electronic commerce than the failure of the states to enact any legislation at all.”

¹⁴² Stephan, Paul B, *The futility of unification and harmonization in international commercial law*, Va. J. Int'l L. 39 (1998), on p.745. In this article, the author concluded that a systematic effort to enlist sovereign nations for unifying the law of international commerce is the most common approach in the last century.

consisting of states. Some scholars posit that they are sub-state actors though.¹⁴³ These international bodies commonly convene experts from all relevant fields to hear their opinions while drafting the law. Upon completing the draft, representatives from the member states of these international organizations are gathered to review the draft along with the possibility of enactment.¹⁴⁴ Revising a draft before it can be finally promulgated usually takes years. After promulgation, the governments can adopt the law either as treaties or as domestic legislation.¹⁴⁵ Despite the distinct traditions, cultures, and agendas of different international legislature bodies, their approach to enacting laws is universal: drafting them for national legislatures to adopt. Examples of this legislative approach include The Vienna Convention on the International Sale of Goods (CISG),¹⁴⁶ the Warsaw Convention on the Unification of Certain Rules Relating to International Transportation by Air (Warsaw Convention),¹⁴⁷ the International Chamber of Commerce's International Rules for the Interpretation of Trade Terms (Inco terms),¹⁴⁸ and the Uniform Customs and Practice for Documentary Credits (UCP),¹⁴⁹ which are the most successful legislations.

In the lawmaking process regarding digitalization of maritime transport documents, the influence of this legislative approach is ubiquitous. The UNCITRAL, which is the core international body in international trade law that focuses on further harmonizing and modernizing the law, has followed this approach. The UNCITRAL has a commission in charge of selecting topics for every year's work program. The topics will be assigned to its working groups, which consist of experts, usually from academia, selected for the special needs of the

¹⁴³ See for example Hollis, Duncan B., *Why State Consent Still Matters-Non-State Actors, Treaties, and the Changing Sources of International Law*, Berkeley J. Int'l L. 23 (2005), 146. In this article, sub-state actor is defined as "semi-autonomous territorial entities that are legally dependent upon, or associated with, independent sovereign states." See also Bruner, Christopher M., *States, Markets, and Gatekeepers: Public-Private Regulatory Regimes in an Area of Economic Globalization*, Mich. J. Int'l L. 30 (2008), on p. 128.

¹⁴⁴ See Schmitthoff, Clive Maximilian. Clive M., *Schmitthoff's select essays on international trade law*, BRILL, 1988. Schmitthoff wrote in his book that the decisive feature of the modern *lex mercatoria* is that it is largely the deliberate creation of formulating agencies, such as UNCITRAL, Unidroit, the ICC, the Hague Conference on Private International Law, the Comité Maritime International, and the International Law Association.

¹⁴⁵ *Ibid.*, at p. 753.

¹⁴⁶ United Nations Convention on Contracts for the International Sale of Goods, Apr. 10, 1980, U.N. Doc. A/Conf/97/18, reprinted in 52 Fed. Reg. 6264 (1987) [hereinafter CISG].

¹⁴⁷ Convention for the Unification of Certain Rules Relating to International Transportation by Air, October 12, 1929, 49 Stat. 3000, 137 I.N.T.S. 11 [hereinafter Warsaw Convention].

¹⁴⁸ INTERNATIONAL CHAMBER OF COMMERCE INCOTERMS-INTERNATIONAL RULES FOR THE INTERPRETATION OF TRADE TERMS 1990 (I.C.C. Publ. No. 460, 1990 ed.).

¹⁴⁹ INTERNATIONAL CHAMBER OF COMMERCE, UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS 1993 (I.C.C. Publ. No. 500, 1993 ed.) [hereinafter UCP].

assignment. After receiving the assignment, the working group will operate independently from the commission except to present an annual report on the progress of their work. To collect ideas for and feedback on the drafting work, the working group will hold one or two sessions per year and invite member states and international organizations to send delegations to attend the session. The delegations can provide suggestions, and the working group shall address these concerns.¹⁵⁰ The making of the draft law is not decided by votes, but a certain degree of consensus should be reached. Equipped with this method, the UNCITRAL has adopted three conventions, three model laws, and one legislative guide in relation to the usage of electronic maritime transport documents.¹⁵¹

The first two model laws published by the UNCITRAL have been highly successful.¹⁵² Many countries, including the greatest economies, have used them as benchmarks to modernize their electronic laws. The four principles of non-discrimination, functional equivalence, technology neutral, and party autonomous, which are embodied in these model laws, have been accepted by a considerable number of countries as fundamental principles of electronic commerce law.¹⁵³ Other international legal bodies, including the Comité Maritime International (CMI), have attempted to adopt a different legislative approach by publishing a voluntary set of rules which will only be applicable if actors incorporate the rules in their contracts.¹⁵⁴ The CMI Rules have turned out to be unpopular in the shipping industry due to their inherent flaws.¹⁵⁵

On the account that UNCITRAL is the most influential lawmaker and its model laws established the first regulatory legal framework in international electronic law, the next subsection introduces the laws of the UNCITRAL by presenting its law principles.

¹⁵⁰ For additional details about the UNCITRAL, see *A Guide to UNCITRAL, Basic Facts about the United Nations Commission on International Trade Law*, available at <http://www.uncitral.org/pdf/english/texts/general/12-57491-Guide-to-UNCITRAL-e.pdf>.

¹⁵¹ The data reflect information posted on the UNCITRAL homepage. UNCITRAL, Status of Conventions and Model Laws (visited December 5, 2018), available at <https://uncitral.un.org/en/texts>.

¹⁵² The two model laws are the UNCITRAL Model Law on Electronic Commerce and the UNCITRAL Model Law on Electronic Signatures. Both have been adopted by a large number of states, including those with strong economic power.

¹⁵³ See Status of UNCITRAL Model on Electronic Commerce (1996), available at http://www.uncitral.org/uncitral/en/uncitral_text/electronic_commerce/1996Model.html.

¹⁵⁴ Comité Maritime International Rules for Electronic Bills of Lading (hereinafter, CMI Rules), prepared by the CMI on June 1990.

¹⁵⁵ Dubovec, Marek., *The problems and possibilities for using electronic bills of lading as collateral*, *Ariz. J. Int'l & Comp. L.* 23 (2005), on p.451.

II. UNCITRAL Legislations

Among the fruitful results achieved by international organizations from the last few decades, the work of UNCITRAL has most systematically addressed the uniform private law standards for electronic commerce and accomplished the broadest acceptance.¹⁵⁶ A case in point is the first promulgated UNCITRAL Model Law concerning electronic commerce.¹⁵⁷ This model law has been adopted in 71 states in 150 jurisdictions. To allow states with divergent legal heritage, telecommunication infrastructures, and economic capabilities to favor the enactment of the law, the UNCITRAL chooses to provide a great degree of flexibility in the legislation and takes the form of a set of principles to put forward a universally accepted legal framework for the application of electronic documents. Among the principles set by the UNCITRAL, the most significant ones are non-discrimination, functional equivalence, technology neutral, and party autonomy. The success of these UNCITRAL legislations has made these principles the founding elements for modern electronic commerce law. The following section introduces these principles to provide a comprehensive overview of the laws on digitalization.

1. Law Principles

a. Non-Discrimination

The principle of non-discrimination refers to the equal treatment of indigenous and alien products. However, this concept suggested an unprejudiced attitude toward data in paper or electronic form when it was first mentioned in the electronic context. The UNCITRAL Model Law on Electronic Commerce is the first international law that addresses the non-

¹⁵⁶ See Faria, Estrella, and José Ángel, *Legal Harmonization through Model Laws: The Experience of the United Nations Commission on International Trade Law (UNCITRAL)*, (2011). In this article, the author noted two limitations of the organizations other than the UNCITRAL. The first is that uniform rules and standards produced by non-governmental organizations can only achieve the expected harmonization effect to the extent that private parties agree to use them and courts uphold the agreement. The second is that the membership of intergovernmental organizations is typically limited to the developed economies of the West, with little involvement from developing or socialist countries. The UNCITRAL, by contrast, is beyond these limitations and is truly a universal organization in the trade law harmonization. The UNCITRAL also has a close cooperation relationship with almost all the aforementioned international organizations. Therefore, the legislations of the UNCITRAL are, in a sense, representative.

¹⁵⁷ UNCITRAL Model Law on Electronic Commerce with Guide to Enactment 1996 with additional Article 5 bis as adopted in 1998, available at http://www.uncitral.org/pdf/english/texts/electcom/V1504118_Ebook.pdf. (hereinafter MLEC).

discrimination principle by using legislative language in electronic commerce. Article 5 of the Model Law states that “Information shall not be denied legal effect, validity or enforceability solely on the grounds that it is in the form of a data message.”¹⁵⁸

This provision indicates that the form wherein certain information is presented or retained cannot be used as the only reason to deny the information of its legal effectiveness, validity, or enforceability. This same perception of non-discrimination is restated in paragraph 1 of Article 8 of the United Nations Convention on the Use of Electronic Communications in International Contracts.¹⁵⁹ However, this interpretation is only a rough sketch of the principle of non-discrimination.

According to the UNCITRAL, the principle of non-discrimination, as one of the fundamental principles of electronic commerce law, is designed to eliminate the nature of the medium as a reason to deny effect or enforceability to an electronic record, signature, or contract.¹⁶⁰ Clearly, the aforementioned provision is insufficient to fulfill this goal. Electronic communication can still be rejected by courts or other authorities because the data do not satisfy certain form requirements of domestic laws. Therefore, the content of this principle must be expanded. The UNCITRAL Model Law on Electronic Signatures stipulates that the place of origin of an electronic signature should not be a factor in determining the legal effect thereof.¹⁶¹ This provision broadened the principle of non-discrimination with fair and equal treatment of alien information. This model law also highlights that the legal effectivity of an electronic signature should not depend on geographical factors but solely on its technical reliability.¹⁶² This statement actually goes beyond the concept of non-discrimination and can be interpreted that electronic documents should be treated as equivalents of paper documents as long as they are proved reliable. Inspired by this idea, the principle of functional equivalence was established to set forth standards for reliable electronic documents. The next subsection reveals

¹⁵⁸ Ibid.

¹⁵⁹ United Nations Convention on the Use of Electronic Communications in International Contracts, available at https://www.uncitral.org/pdf/english/texts/electcom/06-57452_Ebook.pdf.

¹⁶⁰ A/CN.9/WG.IV/WP.115, United Nations Commission on International Trade Law Working Group IV (Electronic Commerce) Forty-fifth session Vienna, 10-14 October 2011, available at <https://documents-dds-ny.un.org/doc/UNDOC/LTD/V11/855/64/PDF/V1185564.pdf?OpenElement>.

¹⁶¹ See Article 12 of the Model law on Electronic Signatures.

¹⁶² Ibid.

the detailed content of this principle.

b. Functional Equivalence

The principle of functional equivalence supplements the principle of non-discrimination to an extent. Merely regulating that electronic data should not be denied their effect solely on the ground that it is in electronic form cannot guarantee the free use of electronic documents. Legal requirements in many jurisdictions prescribing the use of traditional paper-based documentation embody a significant obstacle to developing modern means of communication. To allow states to adapt their laws to the developments in digitalization without the overall removal of paper-based requirements, the principle of functional equivalence suggests that when the functions of paper-based documents can be fulfilled by their electronic alternatives, the latter should enjoy the same level of legal recognition as the former.¹⁶³

Given that documents in paper and digital format are different in nature, the UNCITRAL seeks to establish the functions that paper documents will perform and subsequently provides criteria that, if met, will enable electronic documents to be recognized in the same way. The Model Law on Electronic Commerce represents an implementation of the principle of functional equivalence. Instead of defining an electronic equivalent to any particular kind of paper document, the model law singles out the basic functions of the primary paper-based form requirements.¹⁶⁴ The model law then sets forth criteria for the equivalence of basic functions of paper documents such as “writing,” “signature,” and “original.” When these criteria are met, the electronic equivalent should be granted equal legal value as the paper document. These criteria are designed in a general manner and usually constitute minimal requirements. For various types of documents, the requirements of functional equivalence should also change accordingly. A manuscript signature on a written contract for the rent of an apartment does not necessarily need to be highly secured. An electronic signature that indicates the signatory’s approval should suffice. By contrast, a transaction wherein cargos with great value are traded

¹⁶³ Ibid. para 156.

¹⁶⁴ See Introduction to the Model Law Part B paragraph 16. The functions of a paper document include: (a) to provide a document that will be legible by all, (b) to provide a document that will remain unaltered over time, (c) to allow for the reproduction of a document so that each party holds a copy of the same data, (d) to allow for the authentication of data by means of a signature, and (e) to provide a document in a form acceptable to public authorities and courts.

calls for a notarized contract. The requirements for an electronic equivalent in this case are high.

Although developing specific standards for all types of documents is desirable, it can also create the risk of giving preference to one or several technical solutions. Following the belief not to intertwine in technological developments, the UNCITRAL has established the principle of technology neutral.

c. Technology Neutrality

The principle of technology neutrality is derived from that of media neutrality.¹⁶⁵ When international legislatures realized that paperless communication can be the future, they first focused on the legal reorganization of the information carrier. The Hamburg Rules, which is adopted by the UNCITRAL on March 31, 1978, first addressed the legal status of intangible B/Ls by providing legal effect to the media carrying the information. Article 14(3) of this convention reads: “the signature on the bill of lading may be in handwriting (...) or made by any other mechanical or electronic means, if not inconsistent with the law of the country where the bill of lading is issued.”¹⁶⁶ This regulation first laid the foundation of media neutrality by affirming the legal status of electronic B/Ls.

This idea was subsequently promoted in the UNCITRAL Model Law on Electronic Commerce and absorbed in a manner consistent with the principle of non-discrimination to remove obstacles caused by the nature of the medium.¹⁶⁷ The UNCITRAL is aware that in certain commercial situations, the involvement of technologies in relation to issues other than medium is requested. For instance, digital signature requires the application of encryption technologies. Taking this concern into consideration, the UNCITRAL broadens the concept of medium neutrality and takes note of the application of new technologies. Given that electronic technologies evolve at a rapid pace, the UNCITRAL decides to avoid legislation that may preclude innovations or new applications. Consequently, the principle of technology neutrality

¹⁶⁵ “Media Neutrality” indicates that the media on which the information is affixed should not be a factor in determining the legal effect of the information.

¹⁶⁶ Art. 14 (3) of the Hamburg Rules.

¹⁶⁷ See subsection 1 of this section.

is implemented to facilitate the development of electronic commerce in a way that neither helps nor hinders particular types of technology.

d. Party Autonomy

Aside from the aforementioned three principles, the UNCITRAL also supports the traditional civil law principle of party autonomy. This section has already explained that the UNCITRAL does not desire to develop fixed standards for all types of electronic records.¹⁶⁸ Instead, the UNCITRAL allows the free will of the contracting parties to decide which technology should be applied in their transactions. Other issues, such as the division of liability, offer and acceptance, and place of business and performance, should also be in the range of party autonomy. At the same time, the UNCITRAL is very careful not to let parties derogate from mandatory rules or otherwise invite states to restrict the freedom of parties.¹⁶⁹ Of note, the mandatory rules in this sense indicate the statutory rules of sovereign states and refers to the “minimum acceptable form requirements” set by the UNCITRAL laws.¹⁷⁰ In addition, the MLEC explicitly expressed that the “minimal requirements” do not mean that states should establish requirements stricter than those cited in the model law. On this ground, the principle of party autonomy is widely supported in the laws of electronic commerce, but this support is not unlimited. The principles serve the important role of allowing participants to apply electronic technologies that they regard as appropriate under the premise that the minimal acceptable form requirements are met.

2. Summary

The four principles range from legislative guidelines to general civil law principles.

¹⁶⁸ See subsection 2 of this section.

¹⁶⁹ For example, Article 3 of the United Nations Convention on the Use of Electronic Communications in International Contracts stipulates that parties are allowed to exclude or derogate from any of the provisions. However, the explanatory note of this convention states that “The principle of party autonomy in Article 3 ... should not be understood as allowing the parties to go as far as relaxing statutory requirements on signature in favor of methods of authentication that provide a lesser degree of reliability than electronic signatures. Generally, it was understood that party autonomy did not mean that the Electronic Communications Convention empowered the parties to set aside statutory requirements on form or authentication of contracts and transactions.”

¹⁷⁰ See UNCITRAL Model Law on Electronic Commerce, paragraph 44, “the provisions contained in chapter II of part one should be regarded as stating the minimum acceptable form requirement and are, for that reason, to be regarded as mandatory, unless expressly stated otherwise.”

Altogether, they constitute the legal framework of electronic commerce and represent the tolerant and open attitude of the international legal community toward the use of electronic documents. The broad acceptance of these principles provides an anchor for future legislative work so that international harmonization in electronic commerce can be achieved. The success of these principles should be attributed to the brilliant legislative techniques and the generality and flexibility provided by these legislations. The problem is that generality and flexibility in the legislative context can also mean ambiguousness. For instance, the principle of technology neutrality roughly indicates an unbiased attitude toward all technologies and is seen as an important guide to legislation. However, in circumstances where special issues are raised by specific technologies, should the legislation address these issues according to this principle? If not, does it count as hindering the development of this technology? If so, does it constitute a violation of this principle by only addressing issues raised by the specific technology?¹⁷¹

When confronted with these dilemmas, sovereign states incline to interpret the principles in an interest-oriented manner, but these principles clearly cannot be realized unless the legislators in different jurisdictions ensure harmonization while crafting the rules. As this trend tends to endanger further harmonization of electronic commerce law, states decide to propose legislation with a globally coordinated approach. An unprecedented level of communications between drafting committees in different countries has occurred. The US and EU have made a joint statement on December 5, 1997 in Washington that "...the electronic commerce requires a coherent, coordinated approach internationally...and we also commit ourselves to work together... to reach coherent and effective solutions preferably at a global level."¹⁷²

Another idea about achieving a high degree of harmonization emerges when the laws published by the UNCITRAL do not seem to achieve the same degree of success as the first two model laws.¹⁷³ Scholars suggested that the soft law approach of formulating model laws

¹⁷¹ See Smedinghoff, Thomas J., and Ruth Hill Bro, *Moving with change: Electronic signature legislation as a vehicle for advancing e-commerce*, J. Marshall J. Computer & Info. L. 17 (1998), on p. 761.

¹⁷² European Union - United States: Joint Statement on Electronic Commerce. (1998). *International Legal Materials*, 37(3), 667-668. doi:10.1017/S0020782900016053.

¹⁷³ The United Nations Convention on the Use of Electronic Communication in International Contracts (2005) has only been ratified by a handful of countries, and the United Nations Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea (New York, 2008) (the "Rotterdam Rules") has not obtained sufficient signatories to take effect.

should continue¹⁷⁴ because legislation in the digitalization domain is remarkably different from legislation in international sales of goods, bank credits and payments, or contracts of carriage. Almost no universally accepted usage or practice in electronic documents exists when the legislative work began. Although customs in private law are not normatively desirable and views of scholars about whether custom is presumptively efficient in the private law context vary, the mercantile customs remain the main source of international business law and are welfare enhancing to an extent. With no customs are present to rely on, the UNCITRAL should continue to adopt the soft law instruments to promote harmonization in electronic law. Other scholars called for new rounds of legislation in the form of binding instruments.¹⁷⁵ They argued that model law can be adopted with variations, thus undermining its uniform effect. In this regard, asking whether this legislative approach can truly provide a desirable degree of legal harmonization that the commercial world needs and how effective are the soft and hard law instruments in electronic law is inevitable. This chapter emphasizes these two questions.

This doctoral thesis intends to draw upon a law comparative method to answer the aforementioned questions. Particularly, two objects are compared, namely, a) the law principles of the UNITRAL and the selected legal systems regarding electronic B/Ls and b) the form requirements and transferability of electronic documents. Comparing these two objects can reveal the deficiencies of the current legal harmonization approach.

B. Comparing Laws on Digitalization of Maritime Transport Documents

This section aims to evaluate the harmonization effect of this legislative approach in virtue of examining the laws governing electronic B/Ls in different legal systems. Pursuant to this purpose, this section compares the three greatest economic entities in the world, i.e., the US,

¹⁷⁴ See Smeele, Frank. "Harmonising the Fragmented Law of Transport through Soft Law?," *Harmonising the Fragmented Law of Transport through Soft Law?* European Journal of Commercial Contract Law, 2015.

¹⁷⁵ See "Legal Aspects of Electronic Commerce: Proposal by France," United Nations document A/CN.9/WG.IV/WP.93., March 1, 2001. accessible at <http://www.uncitral.org/english/workinggroups/vg-ec/4p-93e.pdf>. In addition, the US proposed that the UNCITRAL should consider drafting an international convention on electronic transactions (see United States Government Working Group on Electronic Commerce, First Annual Report 15 (1998), accessible at <<http://www.doc.gov/ccommerce/E-comm.pdf>>).

the EU, and China. Given that UNCITRAL has invited delegations from all three entities to attend its drafting meetings and the legislation in these entities have certainly been greatly influenced by the model laws of the UNCITRAL, this comparison should provide convincing results.¹⁷⁶ The yardstick of the comparison is the possibility of using electronic B/Ls in and across these three legal systems. These three entities have different legal heritage, legal structures, legal institutions, and legal culture, so a functional method of comparative law, which focuses on the effect rather than the rules or doctrinal structures, best serves the purpose of analyzing the legal effect of electronic B/Ls in these three legal systems.

This doctoral thesis takes three steps. The first part of this section introduces the methods of the functional comparative approach. The second part presents the law principles and practices governing electronic B/Ls in the three legal systems. The final part reveals the comparison results.

I. Comparative Method

Former judge at the German Federal Constitutional Court and law comparatist Konrad Zweigert postulated a methodological monopoly in one of the leading textbooks on comparative law. He said that “The basic methodological principle of all comparative law is that of functionality.”¹⁷⁷ He believed that all the other rules, which determine the choice of laws to compare the scope of the undertaking, and the creation of a system of comparative law, among others, stem from this principle.¹⁷⁸ Although this statement has been shared by many other functional comparatists, later comparatists regarded it as overstating the content of functional comparison or lacking conceptual clarity.¹⁷⁹ Nonetheless, this statement and its critics have implied the abundance of the functionalist comparative approach and the incoherence of this methodology. Seeing that numerous research methods have been undertaken in the name of functional comparative approach, the method that is applied in this article should be

¹⁷⁶ Supra note 147 and 148.

¹⁷⁷ Zweigert, Konrad, and Hein Kötz., *Einführung in die Rechtsvergleichung auf dem Gebiete des Privatrechts*. Mohr Siebeck, 1996, on p. 34.

¹⁷⁸ Zweigert, Konrad, et al. *Introduction to comparative law*. Vol. 3. Oxford: Clarendon Press, 1998, on p. 38.

¹⁷⁹ See Michaels, Ralf. “*The functional method of comparative law*.” (2005), on p. 5.

explained.¹⁸⁰

This section aims to answer to what extent do the legislative efforts of the UNCITRAL contribute to the harmonization of laws regarding electronic B/Ls. To achieve this goal, what can happen if electronic B/Ls are used in different jurisdictions should be clarified. If electronic B/Ls can freely circulate across the world and the international rules governing electronic B/Ls are coherent to the UNCITRAL legislations, then the UNCITRAL can be regarded as fully capable of harmonizing international law. Otherwise, the weak points should be identified. Hence, the functional method is used.

Similar to most of the functional comparative law methods, this doctoral thesis takes the following steps: a) understanding the law, b) finding out the comparability of different legal systems, c) emphasizing their similarities and dissimilarities, and d) introducing evaluations. Unlike the suggestions of many functional comparatists, this doctoral thesis has no intention to pick up a better law¹⁸¹ but merely uses functional method as a means to evaluate the feasibility for merchants to apply the electronic B/Ls domestically and internationally. Prof. James Gordley claimed that “one must interpret rules and define the concepts which inform them in terms of the purposes that they serve.”¹⁸²

Studying the statutory rules and legal cases concerning electronic B/Ls in the aforementioned three legal systems reveals that the three legal systems have not adopted legislation directly regulating electronic B/Ls. Instead, they all addressed the use of electronic documents in electronic law. AS electronic laws remain at its initial stage and many fields of the law are far from complete, the law principles of the electronic law is explored in this doctoral thesis. Moreover, all three legal systems have sought to adopt a functional equivalent approach to replicate the functions of paper documents in the electronic environment. The three

¹⁸⁰ Ibid., see p. 3. Many methods have been undertaken in the name of a functional comparative method, but not all of them are recognized as one. For example, the work of Stefan Vogenauer, *Die Auslegung von Gesetzen in England und auf dem Kontinent*, does not use a functional method, but the author claims that he did. The case of Mitchel de S.-O.-L'E. Lasser with his work “Judicial Deliberations” is on the contrary.

¹⁸¹ Konrad Zweigert, *Die kritische Wertung in der Rechtsvergleichung*, in Fritz Fabricius (ed.), *Law and Trade – Recht und Internationaler Handel. Festschrift für Clive Schmitthoff zum 70. Geburtstag* (1973) 403, 405; Max Rheinstein, *Teaching Comparative Law*, (1937-38) 5 U. Chi. LR 615, 617 f. “[E]very rule and institution has to justify its existence under two inquiries: First: What function does it serve in present society? Second: Does it serve this function well or would another rule serve it better? It is obvious that the second question cannot be answered except upon the basis of a comparison with other legal systems.”

¹⁸² Gordley, James., *Comparative law and legal history*, The Oxford Handbook of Comparative Law. 2006, on p. 113.

functions of B/Ls are receipt of goods, evidence of contract of carriage, and title of goods, so whether these three functions are successfully replicated in the electronic environment should be examined. Considering that the receipt and evidential functions are embodied in the form requirements of writing, originality, and signature, the two functions are examined by analyzing the three form requirements. The title function of B/Ls concerns the transfer of ownership and requires specific laws, so it is compared separately.

As the comparability in the three legal systems are determined, the next subsection presents the laws in the three selected legal systems to find out the similarities and disparities.

II. Laws and Practices on National Level

This section introduces the laws and principles regarding the legal status of electronic B/Ls in the three greatest economic entities, namely, the US, the EU, and China. Statutory rules governing the writing, originality, and signature requirements for the electronic records in respective legal systems are carefully looked into.

1. The US Law

The US is a signatory country to the UNCITRAL Model Law on Electronic Commerce, and it has enthusiastically participated in the drafting phase of the UNCITRAL Model Law on Electronic Signature and the UNCITRAL Model Law on Electronic Transferable Records. The UNCITRAL Model Laws have a visible impact on the US electronic law. The technology-specific method, which is represented by the Utah Digital Signature Act,¹⁸³ is repealed by the US. The US has published two laws similar to the UNCITRAL Model Laws. One is a federal law that applies to the entire US, whereas the other is a state law enforced in 47 states. The differences between the two laws are small-scale. If the states have adopted the state law without amendments, the state law shall always apply; otherwise, the federal law shall have the preemption. The two laws have unified the electronic laws in the US and have led the country to a liberal path. The following paragraph introduces the law principles and regulations

¹⁸³ Utah Digital Signature Act, Utah Code §§ 46-3-101 to 46-3-504 Enacted by L. 1995, ch. 61.

regarding form and transferability.

aa. Law Principles

The US is the driving force in e-commerce and internet development and is also one of the first states that addressed issues raised by electronic commerce. Under the administration of President Clinton, the US has published “A Framework for Global Electronic Commerce” to guide its policy development early in July 1997.¹⁸⁴ Five general principles are established in this document to express the position and philosophy of the US, and they are as follows:

- a. The private sector should lead.

This principle affirms the guiding position of private sectors in the domain of technological application and innovations and in the area of regulations. The US government believes that electronic commerce can develop best under a market-driven strategy. Even where collective agreements or standards are needed, the government trusts the private entities to develop such standards themselves.

- b. Governments should avoid undue restrictions on electronic commerce.

This principle repeats the importance of self-regulation, and parties should be able to enter into legitimate agreements to buy and sell products and services across the Internet with minimal government involvement or intervention. Governments should not impose new and unnecessary regulations, bureaucratic procedures, or taxes and tariffs on electronic commercial activities.

- c. Where government involvement is needed, its aim should be to support and enforce a predictable, minimalist, consistent, and simple legal environment for commerce.

This principle suggests that the law should be designed on a decentralized and contractual model base in areas where government agreements may be necessary to facilitate electronic commerce. In other areas where government intervention is necessary, its role should be not to regulate but ensure competition, protect intellectual property and privacy, prevent fraud, foster transparency, and facilitate dispute resolution.

¹⁸⁴ The White House, *A Framework for Global Electronic Commerce* (July 1, 1997). Available at <https://clintonwhitehouse4.archives.gov/WH/New/Commerce/read.html>, last access on November 28, 2018.

- d. Governments should recognize the unique qualities of the Internet.

The Internet is a technology with decentralized nature and bottom-up governance tradition. These two features distinguishes the Internet from other technologies. Assuming that the regulatory framework established for telecommunications, radio, and television fits the Internet is incorrect. Therefore, governments should amend existing laws and regulations when they may hinder the development of electronic commerce.

- e. Electronic commerce over the Internet should be facilitated on a global basis.

This principle is derived from the perspective that the Internet is a global marketplace. In this manner, the legal framework supporting commercial transactions should be consistent and predictable based on common principles. The geographical position of the parties should be irrelevant.

bb. Summary

The US favors an industry self-regulation approach while the public sector plays a minimal role. Lawmakers are certain that the public sectors should only follow and provide support but never get in the way in areas that require governmental interventions, such as protection of intellectual property and privy, prevention of fraud, and construction of telecommunications infrastructure. In addition, the US acknowledges that the well-functioning of digital technologies must be created on a global basis.

The resemblances are rather detectable when international principles are compared. Despite different formulations, the US clearly shares the principles of non-discrimination, functional equivalence, technology neutrality, source neutrality, and party autonomy.¹⁸⁵

b. Form

aa. Writing

The US clearly recognizes the validity of an electronic record when the law requires a record to be in writing. The legal effect of an electronic record is conferred by the Uniform

¹⁸⁵ This argument is also supported by the proposal of the US to the UNCITRAL. See PROPOSAL BY THE UNITED STATES OF AMERICA, U.N. GAOR Comm'n on Int'l Trade Law, 33rd Sess., Note by the Secretariat, U.N. Doc. A/CN.9/WG.IV/WP.77 (1998), Note 30. Available at <http://undocs.org/en/a/cn.9/wg.iv/wp.77>, last visited November 29, 2018.

Electronic Transaction Act (UETA), which is issued in 1999, and the Electronic Signatures in Global and National Commerce Act (E-SIGN Act) issued in 2000.¹⁸⁶ Both laws define the term “electronic record” broadly and in technology-neutral terms.¹⁸⁷ The former act is proposed by the National Conference of Commissioners on Uniform State Laws (NCCUSL), which is a non-profit unincorporated association that aims to promote uniformity of state laws. Given that the UCCUSL is not a legislature and can only make propositions, the laws it proposed can only become effective when state legislature ratifies them. Thus far, 47 states have adopted the UETA. New York, Illinois, and Washington, have introduced similar rules to grant electronic records with same “force and effect as those record not introduced by electronic means,” although they have not enacted UETA.¹⁸⁸

In addition to the UETA, the US Congress promulgated the E-SIGN Act a year after the UETA in fear of slow adoption and variation of UETA rules from states. This act borrows numerous concepts and provisions from the UETA, but they are not identical. Both laws recognize that records should not be denied legal effect solely because of its electronic form, and electronic records must be capable of being stored by the time the recipient receives the record. In addition, the sender must not interfere with the receiver’s ability to print or store the information.¹⁸⁹ The E-SIGN passively explains its preemption when a conflict occurs over the writing requirement by regulating that it does not “limit, alter, or otherwise affect the requirement imposed by a statute, regulation, or a rule of law relating to the rights and obligations of persons...other than a requirement that contracts or other records be written, signed, or in non-electronic form.”¹⁹⁰ By contrast, the UETA clearly addresses the “regulatory competition” by stating that if a law requires a record or a signature to be written, an electronic equivalence suffices.¹⁹¹ In the Arkansas case of *Barwick v Geico*,¹⁹² the plaintiff applied an

¹⁸⁶ Pub. L. No. 106-229, 114 Stat. 464 (codified at 15 U.S.C. §§ 7001-7031), hereinafter E-SIGN Act.

¹⁸⁷ In the UETA, an “electronic record” is a record created, generated, sent, communicated, received, or stored by electronic means, whereas the E-SIGN defines “electronic record” as a contract or other record created, generated, sent, communicated, received, or stored by electronic means.

¹⁸⁸ See New York Electronic Signatures and Records Act, N.Y. STATE TECH. LAW §§ 101–09, § 305 (3); Illinois Electronic Commerce Security Act, 1998 Ill. Laws 4191 (codified as amended at 5 ILL. COMP. STAT. ANN. 175/1-101 to 175/99-1 (West 2005)), sec. 5-130; Washington Electronic Authentication Act, ch. 250, 1996 Wash. Sess. Laws 1190, § 1.

¹⁸⁹ See UETA §7(a) and 15 U.S.C. §7001, §101(e) in E-SIGN Act.

¹⁹⁰ See E-SIGN Act, §101 (b)(1).

¹⁹¹ See UETA §7(c) and (d).

¹⁹² *Barwick v Government Employee Insurance Co., Inc.* Case No. 10-1076 (AR S.Ct., March 31, 2011)

insurance policy online while waiving the medical benefits coverage and electronically signed to that effect. Later, as the plaintiff came across a car accident, she submitted medical bills under the policy and the insurer rejected the claim because of the electronic waiver of coverage. The plaintiff brought the case to court and claimed that the waiver was not effective because the Arkansas law requires a rejection of coverage to be written.¹⁹³ The court ruled that the online rejection of coverage and electronic signature satisfied the statutory requirement for writing. A higher court upheld the ruling, saying that Arkansas' implementation of UETA backed them up.

Moreover, an agreement to use or accept the electronic means is unnecessary in the US; thus, an implied consent is sufficient for the application of electronic transaction. The legal value of an electronic record or signature does not require any non-governmental party to the transaction to reach an agreement on using electronic means forward or afterward. Whether the parties agree to conduct a transaction by electronic means is determined from "the context and surrounding circumstances, including the parties' conduct."¹⁹⁴ One notable exception is that the E-SIGN Act provides an extensive consumer provision that does not exist in the UETA.¹⁹⁵ This provision requires the transaction-related information provided to the consumer to obtain consent from that consumer if it will be in electronic form or to obtain a confirmation, which clearly expresses the consumer's capability to access the electronic information. Interestingly, the law also inserts a saving provision stipulating that the "legal effectiveness, validity, or enforceability of any contract executed by a consumer shall not be denied solely because of the failure to obtain electronic consent or confirmation of consent by that consumer."¹⁹⁶ Although the practical value of this clause remains to be seen, this provision does not affect the electronic maritime documents because "consumer" in this act is defined as "an individual who obtains, through a transaction, products or services which are used primarily for personal, family, or household purposes, and also means the legal representative of such an individual."¹⁹⁷

¹⁹³ See Arkansas Code Annotated section 23-89-203 (a).

¹⁹⁴ See UETA §5(b), and E-SIGN Act, §101 (b)(2).

¹⁹⁵ See E-SIGN Act, §101 (c) (1).

¹⁹⁶ Id. §101 (c)(3).

¹⁹⁷ Id. § 106(1).

Therefore, electronic maritime transport documents, which are used in commercial behaviors between legal persons, satisfy the legal requirements for writing in the US.

bb. Originality

The US laws have not laid a heavy burden for the originality requirements of an electronic record. The UETA and the E-SIGN Act likewise emphasize the integrity, accuracy, and accessibility of the electronic record instead of laying down rigid requirements for the “originality” of the electronic records. The UETA requires only that the electronic records “accurately reflect [] the information set forth in the record after it was first generated in its final form as an electronic record or otherwise,” and that the records should be accessible for later reference.¹⁹⁸ When these two requirements are satisfied, the electronic record fulfills the requirements for retention and originality simultaneously. In comparison, the E-SIGN provides slightly stricter rules than the UETA. Similar to UETA, the E-Sign provides for validation of electronic records only when such records “accurately reflect [] the information in the contract or other record.”¹⁹⁹ However, the E-SIGN specifically provides that the electronic records must be “capable of being retained and accurately reproduced for later reference by *all parties* or persons who are entitled to retain the contract or other record.”²⁰⁰ Otherwise, such record may be legally void.

Despite the slight differences, both laws do not delve into technical details on the “accuracy” requirements and the length of “later reference” of electronic records. Although one regulation that allows federal and state agencies to use their interpretive authority to require retention of records in a “tangible printed or paper form,”²⁰¹ it generally refers to criminal matters of high national interest, such as drug law enforcement, and not to the enforcement of any and every

¹⁹⁸ UNIF. ELEC. TRANSACTIONS ACT § 12(a). Section twelve of UETA provides in its entirety: (a) If a law requires that a record be retained, the requirement is satisfied by retaining an electronic record of the information in the record which: (1) accurately reflects the information set forth in the record after it was first generated in its final form as an electronic record or otherwise and (2) remains accessible for later reference.

¹⁹⁹ Section 101(d)(1) of E-Sign provides for the validity of electronic records that: (A) accurately reflects the information set forth in the contract or other record and (B) remains accessible to all persons who are entitled to access by statute, regulation, or rule of law, for the period required by such statute, regulation, or rule of law, in a form that is capable of being accurately reproduced for later reference, whether by transmission, printing, or otherwise. Electronic Signatures in Global and National Commerce Act § 101(d)(1), 15 U.S.C. § 7001(d)(1) (2000).

²⁰⁰ Id. § 101(e).

²⁰¹ Id. § 104(b).

law or regulation.²⁰² In summary, both laws agree that as long as an electronic record can accurately reflect the information set forth in the record and is accessible for later reference, the electronic record fulfills the requirement of original.

cc. Signature

The previous subsection describes that (a) electronic signature has acquired legal recognition along with electronic records under the US law. The E-SIGN Act defines an electronic signature as an “...electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record.”²⁰³ This definition of an electronic signature permits any format of electronic signature to be acceptable, but what exactly constitute a valid electronic signature remains unexplored from this definition. In general, a valid electronic signature must be capable of associating to the document that is being signed and should be attributable to the signatory. In this regard, the UETA § 9 stipulates that:

(a) An electronic record or electronic signature is attributable to a person if it was the act of the person. The act of the person may be shown in any manner, including a presentation of the efficacy of any security procedure applied to determine the person to which the electronic record or electronic signature was attributable.

(b) The effect of an electronic record or electronic signature attributed to a person under subsection (a) is determined from the context and surrounding circumstances at the time of its creation, execution, or adoption, including the parties' agreement, if any, and otherwise as provided by law.

This section assures that as long as the electronic record or signature is a result of a person's act, regardless if done by the person, the person's human agent or the person's electronic agent, then it will be attributed to that person. This section still asks for a secured procedure to prove that the credibility of the signature according to the surrounding circumstances. In the case of *Adams v. Superior Court of Orange County*,²⁰⁴ the appeals court shed light on the requirement

²⁰² See Wittie, Robert A., and Jane K. Winn., *Electronic Records and Signatures under the Federal E-SIGN Legislation and the UETA*, The Business Lawyer (2000), on p. 313.

²⁰³ Supra note § 106(5).

²⁰⁴ *Adams v Superior Court* [Adams v. Quicksilver, Inc.], no. G042012 (Cal. App. 4th Div. February 22, 2010)

for methods of attributing electronic signature. In this case, the key issue is the validity of the plaintiff's electronic signature on an arbitration agreement. The plaintiff argued that she did not type in her full name at the second blank, and she clicked a button that said "save," instead of "I agree," at the end of the document. The appeal court held for the plaintiff and denied the effect of the electronic signature for mainly two reasons. First, the form is presented to the plaintiff with a link in an e-mail, and the plaintiff does not have to enter a password or other credential to prove her identity. Second, no safeguarding against post-signing alterations exists in the documentation system. In fact, the post-execution audit trail showed two access to the record after it was saved for storage.

In another case of *Zulkiewski v. American General Life Insurance Company*²⁰⁵ that took place in Michigan, the court recognized the validity of the electronic signature when the plaintiff challenged the authenticity of the signature by questioning the security procedures of the online program of the defendant. The signature in this case was typed into the online system along with other personal information, such as policy number, social security number, and maiden name of mother. Moreover, the signatory subsequently received an email to notify him of the change. The court concluded that the procedures provided by the defendant is acceptable, and showing the efficacy of security procedures to establish the validity of an electronic signature is only one of many ways to prove the attribution under the UETA. In this case, the submission of many personal information met the burden.

Based on the two cases, an understanding that the UETA implemented a flexible standard toward the validity of electronic signature is reasonable. The essential issue is whether the intent is manifested and the method is appropriate to the particular transaction. However, the E-SIGN Act has not published similar regulations related to attribution. Thus, the efficacy of electronic signature under the E-SIGN Act is difficult to tell.

c. Transferability

The issue of transferability is regulated in the UETA and the E-SIGN Act. However, the

(unpublished).

²⁰⁵ No. 299025, Marquette Circuit Court LC NO. 09-047293-CZ, 2012 Mich. App. LEXIS 1086.

legal result can differ according to both legislations. The E-SIGN Act defines the transferable record as an electronic record that is a “note” under Article 3 of the Uniform Commercial Code (UCC). A “note” under the UCC means a “written undertaking to pay money signed by the person undertaking to pay.”²⁰⁶ Accordingly, a document of title is not an undertaking to pay money, so it is not a note in the E-SIGN Act. Consequently, negotiable B/Ls and other title documents are overlooked in the E-SIGN Act.

By contrast, the UETA sees a transferable record as an electronic record that is a note under Article 3 of the UCC or a document under Article 7 of the UCC.²⁰⁷ The subject of Article 7 are documents of title, and by definition, B/L, dock warrant, and warehouse receipt are in this category according to Article 1 of the UCC.²⁰⁸ Therefore, the UETA governs transferable B/Ls and requires the issuer of the electronic record to expressly agree that this record is transferable.

Similar to the Rotterdam Rules, the UETA substitutes “possession” in the paper analog with “control” over the transferable electronic record. A person in control of the transferable record shall have the same rights and defenses as a holder of a correspondent paper document. The “control” may be evidenced by a system that meets the requirement set forth in the Section 16(c). The specific provisions listed in Section 16(c) are derived from Section 105 of Revised Article 9 of the UCC and generally requires the transferable electronic record to be unique, identifiable, and unalterable. Any revision and change to the record must only be made under the consent of the person asserting control.

2. EU Law

The EU is a political and economic super-national organization with 28 member countries located in Europe. It is empowered by its member countries through a series of treaties to adopt legislations for the purpose of promoting peace, enhancing solidarity, and fostering the well-being of its citizens, among others. Shortly after the wave of digitalization landed on the

²⁰⁶ UCC § 3-301 (a)(12)

²⁰⁷ See UETA § 16(a)(1).

²⁰⁸ *Ibid.* § 1-201(b)(6) and (16).

continent of Europe, the EU noticed its potential and realized the necessity to embrace this technological innovation in a European-coherent manner. Before the EU took legislative actions, two EU member countries, Germany and Italy, have all published their own laws governing electronic signature.²⁰⁹ Both countries have adopted a technology-specific method, i.e., the PKI method,²¹⁰ to ensure the security of the electronic data. Given that this method is not shared by other EU countries, the EU detected that individual action can endanger the internal market for Internet commerce services. Therefore, the Internal Market Directorate of the Commission must carry the responsibility to provide a uniform solution for all the EU member states.

Given that the EU can only operate within the authority conferred by treaties, including the Treaty on European Union,²¹¹ it cannot intertwine if an issue can be dealt with effectively by member states at the central, regional, or local level. With regard to the issue of electronic data, the EU must respect the independence of the member states and ensure the freedom of the internal market of the EU. Therefore, the EU has employed a double-lateral legislative structure to ensure the functionality of electronic documents across the EU without interfering in the domestic affair of member States. The double-lateral structure divides the electronic documents into two categories, namely, qualified and non-qualified documents. Qualified electronic documents must fulfill several strict requirements in relation to security and reliability. The EU member states are obliged to recognize the data when these requirements are met. The legal effect of non-qualified documents can be determined by the regulations in respective member states. Establishing another set of uniform standards toward electronic documents and making the standards EU-wide applicable with the help of mutual recognition treaties can possibly be done by the EU member states. Such an effort has not been witnessed

²⁰⁹ Germany has enacted its electronic signature law as part of its Information- und Kommunikationsdienste-Gesetz in 1997. Italy has enacted "Regulations establishing criteria and means for implementing Section 15(2) of Law No. 59 of 15 March 1997 concerning the creation, storage and transmission of documents by means of computer-based or telematic systems" on November 10, 1997.

²¹⁰ PKI refers to the "public key infrastructure" within which trusted third parties issue certificates binding an identity to a public key. For more information, see "What is a PKI?" at the Web site of Public Works and Government Services of Canada, www.solutions.gc.ca/pki-icp/beginners/whatisapki/whatisapki_e.asp.

²¹¹ For example, the principle of proportionality, which is laid down in Article 5 of the Treaty on European Union, requires that the action of the EU must be limited to what is necessary to achieve the objectives of the treaty. See Official Journal C 326, 26/10/2012 P. 0001-0390,

in the field of electronic B/Ls. Some countries, including Germany, have not even determined the details about electronic B/Ls.²¹² Dealing with the EU as an entirety, this section emphasizes on the laws applicable across the whole EU.

The EU has not yet passed a law that specifically governs the electronic B/Ls until now, but the regulatory framework built by the EU in relation to electronic documents can provide useful insights into the possibilities of applying electronic B/Ls in the EU. Therefore, this section focuses on introduction of law principles and rules on the EU level.

a. Law Principles

aa. Principles

The EU has published a series of documents regarding electronic commerce since the Commission of the European Communities first proposed “A European Initiative in Electronic Commerce” on April 16, 1997.

In this document, the Commission has not only set up a framework for the future development of electronic commerce in Europe but has also established four guiding principles for legislation in the domain of electronic commerce. The four principles are as follows:

1. Internal market principle

The building of a single internal market, which allows the free movement of goods, capital, services, and labor, has always been at the heart of the EU policies. The establishment of an integrated electronic commerce market is certainly a part of this objective. “A European Initiative in Electronic Commerce,”²¹³ which was proposed by the Commission of the European Communities on April 16^t, 1997, stated that the Commission regards the “development of divergent legislative approach in member states” as one of the greatest risks of fragmenting the internal market, and a coherent regulatory framework for electronic commerce at European level must therefore be ensured.²¹⁴ In the later published “Directive on

²¹² See section 516(3) of the German Commercial Code. “The Federal Ministry of Justice is hereby empowered to determine by regulation, issued in agreement with the Federal Ministry of the Interior and not requiring the consent of the Federal Council (Bundesrat), the details of issuing, presenting, returning and transmitting an electronic bill of lading, as well as the particulars of the process of posting retroactive entries to an electronic bill of lading.”

²¹³ Available at <http://aei.pitt.edu/5461/1/5461.pdf>.

²¹⁴ Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=LEGISSUM:l32101&from=EN>, on pp.37–38.

Electronic Commerce,” the EU further explained that the regulatory framework can be achieved through “eliminating legal obstacles by coordinating certain national laws and by clarifying certain legal concepts at Community level to the extent necessary for the proper functioning of the internal market.”²¹⁵

Based on this principle, the legislations adopted by the EU should be drafted in a coherent manner and should be effective across all EU member countries. Data or service that comply with the EU laws should be able to circulate freely in the internal market.

2. Minimal regulation principle

This principle is based on the fact that the free movement of electronic commerce services can be effectively achieved by mutual recognition of national rules and of appropriate self-regulatory codes. The EU should only take actions when mutual recognition and self-regulation are insufficient. Besides, although taking legislative actions is needed, the acts should be drafted with respect to the business reality and under the premise that fewest burden will be imposed on the market participants.

3. General interest principle

General interest stands for privacy, data security, and consumer rights, among others. The EU believes that safeguarding the recognized general interest will help boost confidence and trust to win over business and consumer to electronic commerce. More importantly, in virtue of this principle, the EU is legitimated to provide a uniform safety standard at the EU level without violating the minimal principle. This provision can effectively prevent individual member states from adopting their own rules to safeguard the legitimate concerns of their citizens.

4. Technology neutrality principle

The principle of technology neutrality has been one of the major principles of the EU from the outset.²¹⁶ However, the interpretation of technology neutral in the EU is not exactly the

²¹⁵ Directive 2000/31/EC of the European Parliament and of the Council of 8 June 2000 on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market ('Directive on electronic commerce'), *OJL* 178, 17.7.2000, on pp. 1–2.

²¹⁶ See European Commission, *Towards a new framework for Electronic Communications infrastructure and associated services*, COM (1999) 539; Korber, *Der Grundsatz der Technologieneutralität im Telekommunikationsrecht*, Expert Opinion, Jena 2007, on p.7 f.

same as in the UNCITRAL.²¹⁷ The Recital 18 of the Framework Directive 2002/21 defined the principle of technological neutrality as

*The requirement for Member States to ensure that national regulatory authorities take the utmost account of the desirability of making regulation technologically neutral, that is to say that it neither imposes nor discriminates in favour of the use of a particular type of technology, does not preclude the taking of proportionate steps to promote certain specific services where this is justified, for example digital television as a means for increasing spectrum efficiency.*²¹⁸

A close look into this definition reveals that the EU also approves a non-discriminative and market-leading attitude toward different technologies, but this attitude ends when it is justified to promote certain services. Although the “justification” causes for the promotion of certain specific services remain questionable, the definition of this principle clearly grants the imposition of influence from legislative sector on market outcomes.²¹⁹

bb. Summary

The law principles at the EU level are apparently distinct from the principles set by the UNCITRAL and the US. First, the EU prioritizes to build a coherent regulatory framework inside the EU internal market. The EU is a super-national organization empowered by treaties, so it cannot regulate the electronic law in its member countries directly like a sovereign state, which means that the EU cannot adopt a liberal path as the US; otherwise, it will result in a number of different legislations in its member countries. Thus, although the EU also proposed a minimal principle with the idea of letting an industry to be in a suitable position to choose the most suitable technology for themselves, it does not provide the industry with the same degree of freedom as the UNCITRAL or the US. Second, the EU has interpreted the principle of general interest in a broad sense and therefore compressed the space for a functional equivalence approach. That is, merely mirroring the functions of a paper document is

²¹⁷ See the UNCITRAL interpretation in Part B, Section 1(3) of Chapter 2.

²¹⁸ Directive 2002/21 on a common regulatory framework for electronic communications networks and services (Framework Directive) [2002] OJ L108/33.

²¹⁹ For a detailed analysis on the principle of technological neutrality, see Kamecke, Ulrich, and Torsten Korber. *Technological neutrality in the EC regulatory framework for electronic communications: A good principle widely misunderstood*, European Competition Law Review 29.5 (2008), on p. 330.

unacceptable in the EU, and the electronic data circulated in the EU market must also fulfill security requirements. Besides, adhering to the general interest also provides the EU with rightful authority to pass additional detailed regulations in promoting harmonization. Third, the meaning of technological neutrality is narrowed down in the EU context. Unlike the absolute neutrality hold by the UNCITRAL and the US, the EU can influence the adoption of technology by promoting certain services. This different thinking mode can certainly make a difference regarding the application of electronic documents. The following section presents results of the EU law principles regarding the formation and transferability of electronic B/Ls.

b. Form

The legal requirements for the form of electronic documents on the EU levels are mostly set down in the Regulation (EU) No 910/2014 on electronic identification and trust services for electronic transactions in the internal market, also known as the eIDAS Regulation.²²⁰ The concept “trust service” is crucial to understand the impact of this regulation on electronic data. As the term suggests, it is a service used to boost the trust of the participants in electronic transactions. The trust services are associated with the entire lifecycle of electronic transactions, such as electronic documents, electronic time stamp, electronic seal, and electronic signatures, among others. These data produced by trust service can gain a higher degree of trust than those is not and can thereby circulate freely in the internal market. If the data are generated by a “qualified trust service,” then the security degree of the data will increase.

This regulation has been published on August 28, 2014, and a transition period has been established before the regulation has to be effectively applied; thus, the regulation has entered into effect for only a short time.²²¹ This regulation has not been applied in the Court of Justice of the European Union;²²² therefore, no case study is carried out in this section.

aa. Writing

Electronic data and information in the EU do not have to be written down in paper to

²²⁰ Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC, OJ L 257, 28.8.2014, pp. 73–114, hereinafter the eIDAS Regulation.

²²¹ The date of effective application of the provisions regarding trust services is July 1, 2016.

²²² Last checked on January 11, 2019.

obtain legal effect, but the acknowledgement to their legal effect is not absolute. Article 46 of the eIDAS Regulation provided a similar rule as in the UNCITRAL Model Law on Electronic Commerce that forbids the authority to deny the electronic document's legal effect and admissibility as evidence in legal proceedings solely on the grounds that it is in electronic form.²²³ However, instead of reinforcing the legal effect of electronic documents by introducing a functional equivalence method as the UNCITRAL suggested, the eIDAS Regulation limits the use of electronic documents by creating a new concept named "electronic registered delivery service."

The "electronic registered delivery service" aims to help data be electronically transmitted between third parties and provide evidence regarding the handling of the transmitted data.²²⁴ In line with this concept, the legal effect of electronic data depends on the "electronic registered delivery service" if the data are to be transmitted. Interestingly, the eIDAS Regulation used almost the same text when describing the legal effect of the data processed by this service as by normal electronic document except for one difference: "Data sent and received using an electronic registered delivery service shall not be denied legal effect and admissibility ... on the ground(s) that... it does not meet the requirements of the qualified electronic registered delivery service."²²⁵ This provision clearly indicates that the data sent and received via a qualified electronic registered delivery service has a high degree of validity under the EU law, but what is a "qualified electronic registered delivery service"?

The eIDAS defines "qualified electronic registered delivery services" as services that are "sufficiently secured" and therefore should be recognized in every member states. The qualified registered delivery service must fulfill six requirements: (a) they are provided by one or more qualified trust service provider(s); (b) they ensure a high level of confidence on the identification of the sender; (c) they ensure the identification of the addressee before the delivery of the data; (d) the sending and receiving of data is secured by an advanced electronic

²²³ See Article 5 of the UNCITRAL Model Law on Electronic Commerce.

²²⁴ Ibid., Article 3 (36): "electronic registered delivery service" means a service that makes it possible to transmit data between third parties by electronic means and provides evidence relating to the handling of the transmitted data, including proof of sending and receiving the data, and that protects transmitted data against the risk of loss, theft, damage or any unauthorised alterations."

²²⁵ Ibid., see, Article 43(1).

signature or an advanced electronic seal of a qualified trust service provider to preclude the possibility of the data being changed undetectably; (e) any change of the data needed for the purpose of sending or receiving the data is clearly indicated to the sender and addressee of the data; and (f) the date and time of sending, receiving, and any change of data are indicated by a qualified electronic time stamp.²²⁶ If data are sent and received using such a qualified electronic registered delivery service, the data will be granted a “trust mark.”²²⁷ The integrity of that data, time sent and recipient, and the identities of the sender and receiver can all be presumed as true.²²⁸

Aside from all the particular requirements for the qualified electronic registered delivery service, the eIDAS also provided a supervisory system to ensure the accountability and security of its operations. The qualified electronic registered delivery service will be *ex-ante* and *ex-post* audited by supervisory bodies that are designated by respective member states. Non-qualified service does not have to be examined unless the supervisory body is called up.²²⁹ By providing such a comprehensive and functioning system for the qualified electronic registered delivery system, the eIDAS provided such service with an extremely high level of legal certainty.

Based on these regulations, the EU showed a double-lateral legislative structure. Particularly, by dividing the same service into qualified and non-qualified service, the EU leaves a great deal of space for member states to develop their own standards while a common standard across the EU is established and the reliability of the services conform to this standard shall be recognized by all member states.²³⁰

In summary, the EU should be extremely careful in generating and transmitting data information. Determining whether the information is legally valid or admissible at a EU member state court if it is generated by a normal software or transmitted by a non-qualified service provider is difficult because the eIDAS Regulation has only granted a minimal

²²⁶ Ibid., see Article 44(1).

²²⁷ Commission Implementing Regulation (EU) 2015/806 of 22 May 2015 laying down specifications relating to the form of the EU trust mark for qualified trust services, OJ L 128, 23.5.2015, pp. 13–15

²²⁸ Ibid., see Article 43(2).

²²⁹ Ibid., see Recital (36).

²³⁰ Ibid., see Article 4(2), it states: “Products and trust services that comply with this Regulation shall be permitted to circulate freely in the internal market.”

recognition to such information. Moreover, the legal effect of this document depends on the particular domestic law. By contrast, using a qualified electronic registered delivery system in the EU is highly secured and is admissible all across the EU. The eIDAS has built a comprehensive and functioning system around qualified electronic registered delivery service with liability regime which is “entirely based on the model of traditional registered mail services provided by postal service provider.”²³¹ Data processed by such a service provider are presumed valid in all EU member states, and the burden of proof should lie with the service provider when damage occurs during this process.

bb. Originality

The EU law recognizes that originality in the electronic environment stands mostly for the integrity of the data. The issue “originality” or “integrity” is not specifically addressed under the eIDAS Regulation. Instead, the integrity and origin of data is dependent on an “electronic seal” or an “electronic signature.”²³² Recital (59) of the eIDAS Regulation states that “Electronic seals should serve as evidence that an electronic document was issued by a legal person, ensuring certainty of the document’s origin and integrity.” Furthermore, Recital (58) stipulates that a “qualified electronic signature” is equally acceptable when a transaction requires a “qualified electronic seal.”²³³

Given that the originality of a document is entirely dependent on the effect of electronic signature and electronic seal, the document signed or sealed with a qualified electronic signature or seal will be regarded as original. However, if the document is not associated with a qualified electronic signature or a qualified electronic seal, such document does not suffice the requirement for originality.

cc. Signature

The rules governing electronic signatures in the eIDAS Regulation evolved mostly on the ground of the European Directive 1999/93/EC.²³⁴ Electronic signatures are categorized into

²³¹ Dumortier, Jos. “Regulation (EU) No 910/2014 on Electronic Identification and Trust Services for Electronic Transactions in the Internal Market (eIDAS Regulation).” (2016), on p. 23.

²³² Details about “qualified electronic signature” are offered in the following subsection.

²³³ Ibid., see Recital (58) and (59).

²³⁴ Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures OJ L 13, 19.1.2000, pp. 12–20.

three types with a security level from the lowest to the highest in the eIDAS regulation. The three signature types are: electronic signature, advanced electronic signature, and qualified electronic signature.

An electronic signature is defined by Article 3(10) as “data in electronic form which is attached to or logically associated with other data in electronic form and which is used by the signatory to sign.” Similar to an electronic document, an electronic signature shall not be denied of legal effect and admissibility given that evidence in legal proceedings is solely on the grounds that it is in an electronic form or that it does not meet the requirements for qualified electronic signatures. An “advanced electronic signatures,” listed in Article 26 of the Regulation, is: (a) uniquely linked to the signatory; (b) capable of identifying the signatory; (c) created using electronic signature creation data that the signatory can use under his sole control with a high level of confidence; and (d) linked to the data signed therewith in such a way that any subsequent change in the data is detectable.²³⁵ Despite the stringent requirements, the validity of an electronic signature and an advanced electronic signature must depend on the characteristics and on whether they offer sufficient guarantee on authenticity and integrity. However, qualified electronic signatures are presumed to have fulfilled the requirements.

The difference between a qualified electronic signature and an advanced electronic signature is whether the signature is created by a qualified electronic signature creation device.²³⁶ A qualified electronic signature creation device must be based on a qualified certificate issued by a qualified trust service provider. The eIDAS Regulation indicates that qualified electronic signatures have the equivalent legal effect of a handwritten signature and shall be recognized as a qualified electronic signature in all other member states.²³⁷

c. Transferability

For the time being, the EU has neither addressed the legal position of electronic document of title nor taken any move to adopt the UNCITRAL Model Law on Electronic Transferable Records, which covers documents such as B/Ls, bills of exchange, promissory notes, cheques,

²³⁵ Ibid., Article 26.

²³⁶ ‘electronic signature creation device’ means configured software or hardware used to create an electronic signature.

²³⁷ Ibid., See Article 25.

and certificates of deposit. Although creating an electronic B/L to fulfill the form requirements raised by the EU law is possible, EU remains undecided on whether electronic B/Ls will be recognized as negotiable document of title. This deduction is in accordance with a survey conducted by the Clyde & Co. International Law Firm for the ICC Banking Commission.²³⁸ Experts from Germany and England likewise assert that no regulations in force exist in these two jurisdictions to recognize the electronic B/Ls as transferable document of title.²³⁹

3. Chinese Law

China is signatory to the UNCITRAL Model Law on Electronic Commerce and the UNCITRAL Model Law on Electronic Signature. The Chinese electronic law has been greatly influenced by the UNCITRAL Model Laws and has adopted a “functional equivalent” approach toward the form requirements of electronic data. The Law of the People’s Republic of China on Electronic Signature²⁴⁰ indicates that electronic data fulfilling certain requirements can be regarded as written, original, and signed.

Notably, three issues are not clearly defined in the regulatory framework governing electronic data. The first issue is about the agreement of parties to adopt electronic means, and the second is regarding the validity of electronic data evidence in respect of original. The third issue is the two-tier approach adopted by the Chinese Electronic Signature Law, which provides a special type of electronic signature similar to handwriting signature, whereas the rest only enjoys minimal recognition. The practice has reacted flexibly as it faces the three drawbacks in the current regulatory framework. The People’s Courts in China have generally undertaken a light touch upon the electronic data. They determine the effect of the data not solely on the law texts but on the factual methods used to generate, store, and transmit the data. When counterevidence emerges against the data message, the People’s courts followed the principle of preponderance of evidence to decide the validity of the data.

²³⁸ This report is available at the website of Clyde & Co International Law Firm, the site address is: <https://www.clydeco.com/insight/reports/the-legal-status-of-e-bills-of-lading>

²³⁹ Ibid.

²⁴⁰ Law of the People’s Republic of China on Electronic Signature, effective data 04.01.2005, revised in 2015.

a. Law Principles

aa. Principles

The Electronic Commerce Working Group set by the Economic Affairs Committee of the National People's Congress has published a research report in 2016.²⁴¹ In this report, four legislative principles regarding electronic data have been set up. These four principles are:

1. Principle of equal treatment

The principle of equal treatment under Chinese law means providing electronic data with equal legal position as traditional documentary evidence and material evidence. Compared with the UNCITRAL principle of non-discriminatory, the equal treatment principle in China is narrowed down on the evidential function of electronic data and fails to include the equal treatment of data with foreign sources and the equal treatment between paper message and data message.

2. Principle of technology neutrality

The principle of technology neutrality in China has the same meaning as in the UNCITRAL, namely, the law has to keep an unbiased position between different technologies. The slight difference is that the Chinese electronic signature law has also provided a legal framework for electronic certification service. The law does not provide data produced by this service with further legal effect nor recognition, but it tends to favor authentication agencies and can bring distortion to the market.

3. Principle of party autonomy

Party autonomy is the most important principle under the Chinese electronic law. The parties can feel free to arrange reliable form of electronic data and division of responsibility. The well-functioning electronic commerce in China today relies ultimately on the parties' agreements.

4. Principle of security

The principle of security in the research report stands primarily for the security of personal information. The law calls for the protection of personal information and business secrets, thus,

²⁴¹ The Electronic Commerce Working Group set by the Economic Affairs Committee of the National People's Congress, *China Electronic Commerce Legislation Research Report*, China Financial and Economic Publishing House, 1. March 2016.

leaking, selling or providing such information without permission is against the law. Only few substantial laws governing this issue are available so far.

bb. Summary

China, as a signatory country to two UNCITRAL Model Laws, has drawn a number of lessons from the law principles of the UNCITRAL. China has basically followed the law principles of non-discrimination, functional equivalence, technology neutrality, and party autonomy. China has also shared the EU's two-tier approach in certain aspects by establishing regulatory framework regarding certification service and categorizing electronic signature as reliable and non-reliable types. In addition, China has not really addressed the issue of electronic data from foreign countries.

b. Form

aa. Writing

The Maritime Code of the People's Republic of China has not specifically prescribed the forms of B/Ls. Nonetheless, the Maritime Code stipulates a provision regarding voyage charter. The Maritime Code requires the voyage charter to be in writing, and telegrams, telexes and telefaxes have the effect of written documents.²⁴² Solely based on this provision, determining whether data information generated by computer and transmitted by the Internet has the effect of written documents is hard to tell. Considering the fact that the Maritime Code is enacted in 1993, this law does not include electronic data generated by other devices such as computer.

This deficiency is addressed in the Law of the People's Republic of China on Electronic Signature, which is promulgated in 2004 and revised in 2015. This law agrees that parties can either stipulate to use or not to use electronic signatures or data message in the contract or documents or documentation, and the legal effect of these data or signature shall not be denied only because it takes an electronic form.²⁴³ This provision acknowledges the legal effect of all

²⁴² Article 43 of the Maritime Code of the People's Republic of China. This article reads: "The carrier or the shipper may demand confirmation of the contract of carriage of goods by sea in writing. However, voyage charter shall be done in writing. Telegrams, telexes and telefaxes have the effect of written documents." The sentence listing telegrams, telexes, and telefaxes as effective alternatives of written documents is an independent sentence and can be understood as a general recognition of these three media, not specific to voyage charter.

²⁴³ See Article 2 of the Electronic Signature Law of the People's Republic of China.

data message but fails to regulate the situations where no agreements about using electronic means are reached. In practice, the People's courts usually determine the agreement by the conduct of the parties. Moreover, the second paragraph of this provision includes an exclusion clause prescribing that three types of documents do not fall into the jurisdiction of this clause. The three types of documents are the documents concerning personal relations, transfer of real estate rights, and public utility services. Given that B/Ls belong to neither of the three document types, it should fall into the governance of this provision. According to the principle of *lex posterior derogat legi priori*, issuing B/Ls in electronic form should not be denied legal effect only because it is in electronic form.

Regarding the evidential effect of electronic data, the Civil Procedure Law of the People's Republic of China has granted electronic data admissible as evidence in civil disputes.²⁴⁴ Further, Interpretation of the Supreme People's Court on the Application of the Civil Procedure Law of the People's Republic of China specifically include e-mails, electronic data interchange, online chatting records, blog, micro-blog, SMS, electronic signatures, domains, and other information formed or stored in electronic media into electronic data.²⁴⁵ In the case of *Zhangzhou Xinjiahua Furniture Co., Ltd. v. Unitex International Forwarding Ltd.*,²⁴⁶ an electronic B/L is issued from the forwarding company to the furniture company via e-mail. Without presenting the original B/L, the court accept the electronic B/Ls as valid evidence and invoked the information on the electronic B/L to determine the actual carrier in this case. In the other case where only electronic B/Ls are issued, the Higher People's Court of Shandong has also admitted the electronic B/L as valid evidence.²⁴⁷

bb. Originality

Although electronic data are commonly granted with evidential effect, whether it can be admitted as valid evidence before court depends largely on the originality of the data. Prof. Liu

²⁴⁴ See Article 63 of the Civil Procedure Law of the People's Republic of China.

²⁴⁵ See Article 116 of the Interpretation of the Supreme People's Court on the Application of the Civil Procedure Law of the People's Republic of China.

²⁴⁶ 《漳州市新和家具有限公司诉汇利达国际货运代理（广州）有限公司等公司海上货物运输合同纠纷案》，(2016)粤72民初1405号。

²⁴⁷ 《优特埃国际物流（中国）有限公司与迪马克轮胎（青岛）有限公司公司海上货物运输合同纠纷上诉案》，(2017)鲁民终415号。

at the Renmin University of China conducted a survey and found out that among the 1770 cases he reviewed from 2003 to 2018 regarding validity of electronic data or electronic documents, only 48.53% of the reviewed cases recognized the validity of the electronic data, 36.03% denied the validity, and 15.44% evaded the question. However, if the electronic data have been recognized as original, 88.46% of the cases ruled for the validity of the data. Only 42.73% of the cases ruled for the validity of the data if they have not been recognized as original.²⁴⁸

This survey corresponds with the rules set forth in the Some Provisions of the Supreme People's Court on Evidence in Civil Procedures. The provisions state that the Supreme People's Court requires the original evidence submitted to the People's court. If the evidence is computer-generated data or audio-visual material, such as sound recording and visual recording, then the carrier of the relevant data should also be provided.²⁴⁹ This provision certainly undermines the evidential effect of electronic data and is not practical in today's sense. The China Electronic Signature Law has detected the inefficiency of this provision and has provided a more flexible path. Article 5 of the China Electronic Signature Law indicates that the electronic data shall be regarded to satisfy the requirements of originality if the data meet the two following requirements: a) capable of effectively showing the contents it specifies and may be picked up for reference and use at any time and b) capable of unfailingly ensuring that the contents are complete and unaltered from the time when it finally comes into being. Both requirements are not to be strictly interpreted because a 100% guarantee of the truthfulness of the data is too heavy a burden for the claimer. Three criteria are provided by the China Electronic Signature Law to determine the truthfulness of the data, namely, a) the reliability of the methods for creation, storage, or transmission of data message, b) the reliability of the methods for keeping the integrity of the contents, and c) the reliability of the methods for identifying the addresser. In practice, the data should be regarded as truthful if the device is functioning well when the data evidence is generated and if this device is used in a daily basis in the branch to store and process data.²⁵⁰

²⁴⁸ 刘品新, "论电子证据的理性真实观", 法商研究, 2018年04期, 第60页

²⁴⁹ See Article 10 and 22 of the Some Provisions of the Supreme People's Court on Evidence in Civil Procedures.

²⁵⁰ *Supra* note 238, on p. 67.

cc. Signature

The Chinese law has adopted a similar approach regarding electronic signature as the EU. The electronic signature is divided into two types, namely, electronic signature and reliable electronic signature. Rules governing the legal effect of electronic signature are few, one of which is that it shall not be denied legal effect only because it is in electronic form. By contrast, a reliable electronic signature has the same legal effect of a hand signature or seal.²⁵¹ Article 13 of the Chinese Electronic Signature Law indicates that an electronic signature can only be recognized as reliable when it fulfills the four following requirements, namely, a) the data to produce electronic signature must be exclusively owned by the signatory when signing, b) the signatory controls the production data when signing, c) any alteration on electronic signature after signing can be found out, and d) any alteration on the data message associated with the signature can be found out.

However, the interpretation of reliable electronic signature is rather different in practice. This doctoral thesis reviews the 26 cases exhibited on the Pkulaw databank from 2016 to 2018 with reference to Article 14 of the Chinese Electronic Law. Among the total 26 cases, 14 are disputes regarding the use of pin code or similar methods to access bank account. All courts ruled for the entering pin code as reliable electronic signature. The rulings are clearly inappropriate given that entering pin codes or other similar behaviors alike does not meet the requirements stated in Article 13. However, the judges have no alternatives other than to refer to this article, for no other rules are applicable for non-reliable electronic signature.²⁵²

The other controversial provisions are related to the electronic certification service. The Chinese Electronic Signature Law prescribes that if an electronic signature is required to be certified by a third party, the certification service shall be provided by a legally established electronic certification service provider. The service provider must comply with the national safety standards and should apply for an electronic certification licensing certificate at the department of information industry of the State Council. Without a license, service providers

²⁵¹ See Article 14 of the People's Republic of China on Electronic Signature.

²⁵² Prof. Yu has also conducted a similar survey, and the result turns out to be identical. See 于海防, "我国电子签名框架性效力规则的不足与完善", 《法学》, 2016年01期.

are not allowed to operate. Certifications from foreign service providers have pending effectiveness. Whether such certifications are valid or not depend on the judgement of the Chinese department of information industry of the State Council.²⁵³ However, the law has not provided certified electronic signatures with more legal effect than other electronic signatures. In practice, the court still determines the effectivity of the electronic signature based on the reliability of the methods, through which electronic data were generated, stored, and transmitted. Unlike in the EU, certification agents in China are only responsible for the truthfulness of the electronic signature. Therefore, other issues, including proof of time, can be undertaken by unlicensed institutes. In the case of *Getty Images China Ltd. v. Fuzhou Baolong Business management Ltd.*,²⁵⁴ the plaintiff used a time stamp from an unauthorized service provider to preserve evidence online. The court of first instance ruled against this evidence because it is not provided by an authorized service provider. The court of appeal overruled the case by admitting the validity of the time stamp. The court decided that the methods used to generate, store, and keep integrity of the information are all reliable methods, despite the fact that the electronic time stamp is given by an unauthorized service provider.

A possible explanation to the paradoxes between theory and practice in the Chinese electronic signature law is that a substantial number of electronic signatures using different authentication methods were produced before the electronic signature law was promulgated, and these signatures are still operating on a large scale. Chaos will occur if these electronic signatures are categorized as void or illegal. Hence, the Chinese courts are deciding on the validity of electronic signatures based on the principle of preponderance of the evidence. That is, under the circumstance where no counterevidence is presented, the truthfulness of the data evidence should be admitted.

c. Transferability

Electronic B/Ls should be fundamentally able to perform the function of negotiability

²⁵³ Supra note 112, Article 26.

²⁵⁴ 华盖创意(北京)图像技术有限公司与福建省福州宝龙商业经营管理有限公司侵害著作权纠纷上诉案, (2016)闽 01 民初 165 号; (2016)闽民终 1450 号.

under the Chinese law. The above discussion reveals that owing to the principle of functional equivalence, the transfer of title documents should be governed by the Chinese Electronic Signature Law. The third paragraph of Article 5 of the Chinese Electronic Signature Law prescribes that “the integrity of the data message will not be influenced by the adding of endorsement in the data message.” Although the law has not specifically described the methods of endorsement, the behavior of endorsement is clearly recognized by the Chinese law. A cooperation between some Chinese banks and reliable electronic B/L trading systems, such as the Bolero and essDocs, exists.²⁵⁵ Albeit most of the cooperation is still viewed as experimental, electronic B/Ls can certainly be accepted as transferable document of title in the praxis of banks. Besides, the People’s Courts in China commonly applies the principle of preponderance of evidence to determine the validity of electronic evidence. If the endorsement is genuinely expressed and made by a “reliable” method or no counterevidence strong enough to prove the false of the endorsement is provided, then the endorsement is likely to be recognized as valid.

III. Comparison

After the law principles and statutory rules in relation to electronic B/Ls in the US, the EU and China are presented, the legal institutions in the three legal systems evidently share common grounds, which are mostly congruent with the UNCITRAL regulations. Nevertheless, quite a few disparities between these legal institutions are noted; some of which are unique, whereas others are shared by the majority of the three researched jurisdictions. This part of the doctoral thesis targets to reveal these similarities and differences with the purpose of finding out the consequences and motivations behind the legislation. Discovering why the same seed planted in different soil can grow into different shapes possibly contributes knowledge to build an improved system.

Regarding the similarities, the three legal institutions have all provided electronic data

²⁵⁵ See Chan, Felix WH. “*E-commerce all at sea: China welcomes digital bills of lading under the Electronic Signature Law 2005*,” *Oklahoma Journal of Law and Technology* 3.1 (2007), on p.3.

with at least minimal degree of recognition as the UNCITRAL prescribes. Electronic data are not regarded as invalid solely on the ground that they are in electronic form in all three legal systems. None of the three legal systems have prescribed a technology-specific method toward the creation, transition, and presentation of electronic data. This similarity ensures that all kinds of technology can be applied. On top of that, all three jurisdictions have adopted a functional equivalent approach toward the form requirements of electronic data. Criteria regarding writing, originality, and signature can be found in the statutory rules of all three legal systems. This apparently fills a huge gap between paper and electronic data. Lastly, the private sectors have all been given, more or less, a large degree of freedom to develop their own rules and standards. Party autonomy is respected in all three legal systems.

The disparities between these legal systems are also noticeable. The first difference is the recognition of electronic data with a foreign background. Comparing the statutory rules reveals that only the US has acknowledged the legal effect of data with a foreign source. The EU and China have not directly recognized the legal effect of electronic data created aboard. The EU requires a foreign country to initially conclude an agreement with the EU about the trust service. The service can then be equivalent to qualified trust service in the EU. Similarly, China recognizes the foreign certification service based on relevant agreements and the principle of reciprocity. The second distinction is the equal treatment of all types of electronic data. Under the US law, no deliberate differentiation of various types of electronic data exists, thus, the legal effect of all kinds of electronic data is in basically equal, whereas a hierarchy of different levels of legal effect regarding electronic data is built under the EU law. China has adopted a middle path and only made a differentiation between electronic signature and reliable electronic signature. In addition, the two types of electronic signature exert basically the same legal effect in the Chinese courts. The last divergence is the law regulations with respect to electronic transferable documents. Among the three jurisdictions, only the US has written down regulations to recognize electronic transferable documents. The EU and China have not yet explicitly addressed the problem in their jurisdictions.

In conclusion, the US has adopted a highly liberal path with its policy “let the market lead”

to deal with electronic data and electronic signature, whereas the EU regulatory authority has proactively intervened in the electronic commerce market to reach its policy goals. Unlike the two jurisdictions, China has taken a wait-and-see attitude, which is similar to the EU in regulations and is similar to the US in adjudication. Clearly, the divergences of the three approaches have caused hurdles to the free application and movement of electronic data across national borders and resulted in possible regulatory competition among different jurisdictions. The seemingly more reliable EU approach with qualified trust service can drive out the US's liberal approach because electronic information generated and transmitted in accordance with the EU standard can be recognized in the US, but not inevitably vice versa. This phenomena will consequently affect the liberal approach of the US. That the US will accept the EU standards without any objections is wishful thinking. Saying that the development of electronic law is on the brink of fragmentation is not an exaggeration. If the US decides to establish its own standards, then the early efforts to unify the electronic law would be in vain. A coexistence of multiple competing standards is also likely to emerge. To avoid this problematic situation, the UNCITRAL has basically two instruments at hand, namely, soft and hard law instrument. The next section examines the feasibility of these two instruments.

C. Evaluation of Possible Future Steps of Public Regime

The summary of the differences between the observed legal systems adverting to electronic B/Ls indicates that the contradictions are centered on authentication methods and transferability. After the promulgation of the two UNICTRAL Model Laws on electronic commerce and electronic signature, voices advocate legal instruments that are binding and precise to obviate the divergence on the authentication methods. For transferability, given that no international laws regulating this issue is currently available, starting the exploratory work with soft law instruments is applicable. This section examines the feasibility of applying hard law instruments to obviate the disparities on authentication and soft law instruments to enable transferability.

I. Eclecticism of Hard Law Instruments on Authentication

Hard law is different from soft law in three dimensions, namely, precision, legally binding obligations, and delegation of authority for interpreting and implementing the law.²⁵⁶ Faced with the divergence between different legal systems, particularly the divergence in electronic authentication methods, many countries have suggested that only the compelling hard law instruments can effectively remove the obstacles derived from the current incoherent situation. For instance, the US government has proposed to the UNCITRAL to consider an International Convention on Electronic Transactions that allows transactions using different kinds of authentication methods to be recognized and enforced worldwide.²⁵⁷ However, the idea of using hard law instrument to preclude the legal divergence is most likely unrealistic. The reason is simple. An international legal body, namely, the UNCITRAL is incapable of designing a treaty or other binding instruments, which every sovereign state will be willing to sign and enforce while the treaty imposes precision and binding obligations on electronic authentication. This fact is due to the eclectic nature of hard law instruments. Even the generally admitted successful United Nations Convention on Contracts for the International Sales of Goods has to allow certain extent of vagueness inside its provisions.²⁵⁸

The dilemma with a hard law instrument can be vividly explained by introducing a classic two-party game theory model using the US and the EU as subjects. Leaving aside the political or individual factors inside the regimes, the situation of the EU and the US dealing with the electronic authentication issue can be portrayed as follows:

²⁵⁶ Abbott, Kenneth W., and Duncan Snidal, *Hard and soft law in international governance*, International organization 54.3 (2000), on p. 421.

²⁵⁷ See supra note 184.

²⁵⁸ For example, the CISG excluded several important but controversial issues such as the validity of contracts (Article 4) from its scope or used vague terms, including “fundamental breach” and “reasonable length,” to regulate sensitive issues (Arts. 25, 47 and 63). See more at De Ly, Filip. “Sources of international sales law: an eclectic model.” *JL & Com.* 25 (2005), on p.1.

		EU	
		Liberal	Conservative
US	Liberal	3 5	4 3
	Conservative	2 4	2 2

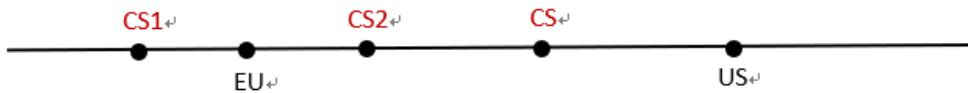
Figure 3: The Gains of the US and the EU

This diagram indicates that the US and the EU have two alternatives regarding electronic authentication: liberal or conservative. Liberal means to treat all types of authentication methods equally, and conservative means to provide domestic authentication methods with certain advantages. The figures on the bottom left corner of the cell represent the gain of the US, and the figures on the top right corner represent the gain of the EU. If both parties adopt the liberal path, then the US(5) will earn a little more than the EU(3) because of its certain advantage in authentication technologies, but the gain in total will outstrip any other combinations. If one party chooses the conservative path and the other chooses liberal, the one who chooses conservative (4) will gain more than the one who chooses liberal (2/3) because the authentication methods correspondent to the conservative requirements are recognized in the liberal world, but not vice versa. In the circumstance where both parties choose conservative, the cross-border authentication will be difficult and both parties will only gain poorly (2).

Assuming that both parties are rational in a single stage game where both parties are unaware of the choice of their counterpart and the choice can only be made once, the US would choose the liberal path given that no matter what the EU chooses, the US cannot benefit solely by changing its strategy. Based on the same logic, the EU would choose the conservative path.²⁵⁹ Therefore, the US and the EU would eventually reach an equilibrium where the US gains 3 and the EU gains 4. This method is clearly not the premium solution compared with other options, but it reaches a state named “Pareto optimality,” which means that making one

²⁵⁹ This solution is also known as the Nash equilibrium, see, Nash, John, *Non-cooperative games*, Annals of mathematics (1951), on pp. 286-295.

party better off without making the other party worse off is impossible. This strategy also explains why the laws in the EU and the US are partially incompatible despite the constant expression of coordinating the drafting of domestic laws from both sides.²⁶⁰ If a hard law instrument is applied in this circumstance, then it would look like this in an axis:



In this diagram, the axis represents the interest of parties to electronic authentication. The point EU and the point US represent the place where their best interest would be served. The abbreviation CS stands for current status. The point CS is currently located in the middle of the line segment from point EU to point US. If point CS moves to either direction, the interest of the other party will be hurt, and this party has no reason to agree to the relocation of the point CS. Therefore, no binding treaties can be reached.

Nevertheless, this dilemma can be solved. Obviously, under a certain circumstance, a hard law instrument can be acceptable for both parties. The axis shows that when the CS point is located outside the line segment, both parties can realistically reach to a consensus. For instance, when the current status is in the position of the point CS1, both parties can benefit from the movement of the point CS1 as long as it does not exceed point CS2 (assuming that the distance between CS1 and EU is the same as the distance between EU and CS2). To apply this strategy in real world, the US should also adopt a conservative approach. By vastly reducing the gain of its opponent, the US and the EU gain the incentive to negotiate a good agreement. In real world, this process will usually take decades and through countless conferences and negotiations until compromises can be reached, not to mention the great economic loss due to the artifactual barrier. Moreover, that the final arrangement will always be honored is not

²⁶⁰ See, for example, *the Joint Statement on Electronic Commerce of the European Union and the United States of December 5, 1997*. Through this statement, the US and the EU expressed their willingness to cooperate together to establish a coherent legal framework and law principles to support electronic commerce. About the incompatible parts, see Christopher T Poggi, *Electronic Commerce Legislation: An Analysis of European and American Approaches to Contract Formation*, (2000) 41 *Virginia Journal of International Law*, on p. 224.

guaranteed because all parties are tempted to benefit themselves by occasionally derogating such a compromised arrangement.²⁶¹

As this model is much simplified, many other variables may partake in the real lawmaking process. For instance, unexpected technological innovation can rewrite the whole model along with current legal institution. Transaction costs can also distort the gains of the players and provide completely different results. One thing that can be drawn from this model is that hard law instruments are not elixir for current international legal incoherence, particularly, when the participants have very distinct interests.

II. Hollowness of Soft Law Instruments on Transferability

Soft law instruments are those without legally binding force but can be incorporated in private agreements. In most cases, the soft law instruments merely provide normative guidelines, which are not directly enforceable in domestic courts or international tribunals. Nonetheless, the guidelines can affect the conduct of international participants and shape the normative expectations of states. Occasionally, soft law eventually leads to the development of new international hard law.²⁶² Given that soft law instruments are principally more resilient and cost-efficient than hard law instruments, they become an essential component of modern harmonization movement. For international lawmaking body, including the UNCITRAL, soft law instruments are preferable tools. The UNCITRAL has been using model laws, legislative guides and recommendations, and explanatory texts to address the issues that occur in electronic commerce. A model law has also been published by the UNCITRAL in 2017 to govern the use of electronic transferable documents. However, this doctoral thesis suggests that the use of soft law instruments by the UNCITRAL to address the transferability issue is insufficient and can cause further fragmentation of laws.

This argument can be supported from three aspects, namely, legislation, adjudication and

²⁶¹ Even the “hardest” international law cannot force states to enforce their commitments. In fact, international regimes do not even attempt to establish legal obligations centrally enforceable against states. See ROBERT O. KEOHANE, *After Hegemony: Cooperation and Discord in the World Political Economy*, Princeton University Press, 1984, on pp. 88–89.

²⁶² One example is the UNCITRAL Model Law on International Commercial Arbitration, which has been adopted voluntarily by many states.

enforcement. With respect to legislation, the UNCITRAL aims to assist states in enabling and facilitating electronic commerce in international trade.²⁶³ The UNCITRAL legislation prioritizes convincing national governments to adopt its works. Thus, the interest of the nations must outweigh the interest of private actors in these legislations to attract national government to adopt the soft law. This unfairness can also be witnessed in the lawmaking process of the UNCITRAL. In the sessions held by the working groups of the UNCITRAL, only government delegations can provide suggestions and hold discussions. Given that government delegations typically include government officials, academicians, experts, or private sector lawyers, the interest of industries as major international actors remain normally underrepresented.²⁶⁴ Furthermore, in the specific case of the UNCITRAL Model Law on Electronic Transferable Records, only over 30 member states have sent delegates to the working group sessions; among them, only the US, Spain, and Columbia have provided a few suggestions to the working group. This phenomenon shows a lack of interest from nation states. Therefore, the model law can hardly claim that it represents the common requests of nation states. With respect to adjudication, the UNCITRAL does not have a tribunal to implement its law as it relies on the domestic courts or arbitration courts to make judicial decisions invoking its laws. Assuming that courts that are willing to apply the model law exist and that these institutions have not usually attended the legislative process, they may misinterpret the law and cause more confusion than precision. The UNCITRAL proposes a solution to this issue through improving the uniform interpretation of its legal texts by establishing a data bank known as the Case Law on UNCITRAL Texts or the CLOUT. By publishing digest of arbitral and court decisions, the UNCITRAL intends to identify trends in the interpretation of its laws and guide the development of the interpretation. However, this method is hardly an elixir for electronic authentication and transferability of title documents given that extremely few legal decisions are made according to the UNCITRAL laws.²⁶⁵ This limitation is consistent with enforcement.

²⁶³ UNCITRAL Model Law on Electronic Transferable Records, see preamble.

²⁶⁴ See *The UNCITRAL Guide Basic facts about the United Nations Commission on International Trade Law*, available at: https://www.uncitral.org/pdf/english/texts/general/06-50941_Ebook.pdf

²⁶⁵ According to the CLOUT, there is only one case with reference to the Model Law on Electronic Signature, and zero case with reference to the Model Law on Electronic Transferable Records.

The enforcement of the UNCITRAL laws falls out of the UNCITRAL authority, so it can barely do anything to improve the efficiency of enforcement.

In summary, the soft law instruments adopted by international legal bodies, including the UNCITRAL, are viewed as a way station to hard law. This legislative approach depends on the enactment of nation States to gain effect and can hardly be seen as an autopoietic system itself when only a few states are willing to enact them. In the domain of electronic transferable documents, most countries hold the idea that passing legislations are premature.²⁶⁶ Therefore, the real effect generated by the UNCITRAL is hollow despite the demonstration effect of the soft law.

III. Summary on Future Steps

Upon examining the electronic law in the selected legal systems, the conclusion reached is that the legislative approach of the UNCITRAL has unquestionably promoted legal harmonization. This approach has helped narrow down the gap between electronic and paper documents and provided a benchmark for legislatures worldwide by providing useful guidance and law principles to states. However, the state-oriented approach has also hindered the establishment of a satisfactory normative expectation for international actors. The laws are usually unprecise or non-binding to make them acceptable to most countries, and the face of laws depends greatly on the multilateral negotiation mechanism applied in this legislative approach. That is, experts, scholars, and state delegates are all critical factors in the lawmaking process. They play roles as either drafters or negotiators, whereas the people who have direct connection to this activity have only very little discourse power. This centralized way of integrating information and issuing laws is known as unsatisfactory and inefficient.²⁶⁷ Moreover, the aforementioned subsections proves that the effect of the UNCITRAL laws is very limited in the circumstance where consensus between states is not achievable or where

²⁶⁶ China, for instance, has rejected the proposition of drafting legal regulations with respect to electronic B/Ls on 2008, stating that the technology and systems of electronic B/Ls should be further studied. No propositions alike are raised afterwards. However, the Ministry of Transport did conduct a research on the usage of electronic B/Ls on 2018 and intended to include this topic in the revision of the Chinese maritime law.

²⁶⁷ For more information, see Hayek, F. A., *The use of knowledge in society*, (1945), *The American economic review*, 35(4), on pp.519–530.

incentives for states to adopt new laws are not sufficient. The reason is that laws passed by the UNCITRAL can only be tested in practice if the states adopt them. Lastly, the authority of one international legal body is constantly confined. For the long transaction chain of maritime transport that involves parties from finance, transport, business, and other sectors, one international legal body will not have the competence to pass laws, which have authority over all the areas. Furthermore, the international legislature cannot master all the knowledge to pass such a law even if competence is not an issue. Cooperation can be a solution. However, despite the cooperative attitude between these legal bodies, conflicts between their laws are somehow inevitable.

This doctoral thesis intends to introduce the private regulatory system into the scheme to cope with the deficiencies of this current legislative approach in the domain of electronic law. By testifying the private regime in the maritime transport branch from the aspects of rulemaking, adjudication, and enforcement, this work hopes to prove that the private regime can create effective uniform rules among the business actors and thereby facilitate the harmonization of laws governing digitalization of maritime transport documents.

Chapter 3: Using Private Regulatory System to Create Order

Particular intelligent beings may have laws of their own making, but they have some likewise which they never made.

—Charles de Montesquieu²⁶⁸

Instead of referring to the natural human rights and laws of the sovereignty, the words of Baron Montesquieu played the same tune when regarding to the discussion of the interrelationship between mandatory state laws and private norms. The previous chapter has presented the current legal status of electronic B/Ls in different jurisdictions and revealed the risks of boosting legal harmonization by implementing either hard or soft law instruments. The current public legislative approach which mainly depends on national states to empower the laws drafted by international public legal bodies is facing great resistance when trying to contribute detailed standards to the generalization of electronic documents. A few of the latest legislative works done by the UNCITRAL which aim to create a workable mechanism for electronic documents have been proven less satisfactory than expected.²⁶⁹ Nevertheless, these setbacks should not be attributed to its legislation techniques or negotiation skills but to the idea of creating a black-letter-law for every legal community on the global sphere. The comparative analysis in the second chapter has demonstrated that each legal community, associated with a certain political system, wants to reflect its interest in the global law, thus making compromises difficult in many cases. In national states or super-national organizations like the EU, sovereign power and the likes can intermediate conflicting interests, and a law can either be passed and honored or be denied and postponed. More importantly, after a law is passed, a hierarchical court system will guarantee the coherence of the interpretation and further development of the law. On the global sphere, the vacuum of an international sovereign and a hierarchical court system often results in either fragmented laws or no law at all. One of

²⁶⁸ de Secondat Montesquieu, Charles, Joseph Vila Prichard, and Jean Le Rond d'Alembert, *The Spirit of Laws*, Vol. 1. G. Bell, 1906, Book I, p. i.

²⁶⁹ See the Rotterdam Rules, the United Nations Convention on the Use of Electronic Communications in International Contracts and the recent model laws of the UNICITRAL, none of these laws have received universal acceptance from the sovereign states.

the reasons is that a public international body that publishes a law does not have the power to persuade national states to adapt and exactly interpret the law.²⁷⁰ Consequently, each legal system will be inclined to adopt the draft with variations in favor of its interest. Even if the law clearly stated that certain clauses cannot be varied, usually in the form of a convention, the legal system can still enforce this clause according to its own interpretations, and neither an authoritative court system nor the legislator can effectively adjust such deviations. Nevertheless, this condition does not necessarily mean that a uniform global order is impossible without a world state. Many jurists, economists, sociologists, and historians presented the feasibility and past-trails for the creation of a self-validating, self-maintaining and self-evolving legal order beyond national borders, and the pushing hand behind this will be the civil society itself.²⁷¹

The same conclusion can be deduced upon comparing some of the most successful Conventions with the latest works of the UNCITRAL. The United Nations Convention on Contracts for the International Sale of Goods (CISG)²⁷² is generally recognized as one of the most successful works of the UNCITRAL. Although some see the CISG as an imperfect product, or even a failure, the supporters of uniform law perceive it successful simply because it achieved the uniformity it seeks. Most of the major trading countries in the world have accepted, and roughly interpreted the CISG in a uniform way even after nearly 40 years of development and commercial environmental change. However, giving all the credit to the legislative techniques or negotiation mechanism that are applied in the drafting process of the Convention is unfair because these skills involve an independent legal language. Feature transparent structures are also applied in the 2005 United Nations Convention on the Use of Electronic Communications in International Contracts,²⁷³ but this Convention is less popular than the CISG. When the two conventions are compared, only two critical factors stand out.

²⁷⁰ See Leo Gross, *States as Organs of International Law and the Problem of Autointerpretation* (1953), reprinted in *ESSAYS ON INTERNATIONAL LAW AND ORGANIZATION* 386 (1984).

²⁷¹ See Teubner, Gunther, ed. *Global law without a state*. Vol. 18. Aldershot: Dartmouth, 1997. Teubner believes that a global law will emerge from the globalization processes independently and it will take a different form than national law.

²⁷² United Nations Convention on Contracts for the International Sales of Goods, Apr. 11, 1980, S. TREATY DOC. NO. 98-9 (1983), 19 I.L.M. 668 (1980) [hereinafter Convention] (entered into force on Jan. 1, 1998). There are 89 parties to this Convention, last checked on 29.04.2019. Available at:

http://www.uncitral.org/uncitral/en/uncitral_texts/sale_goods/1980CISG_status.html.

²⁷³ Schwenzer, Ingeborg, and Pascal Hachem, *The CISG-A Story of Worldwide Success*, (2009), on pp.119-140.

First, the century-long “unwritten customary rules of the trade,” which is used by CISG for reference has genuinely codified into written law.²⁷⁴ Second, legal materials of CISG that arise from judgments and arbitral awards are available to everyone.²⁷⁵ The first factor allows the CISG to receive a relatively large consensus and guide the courts on how to apply the law. The second factor ensures that the interpretation of the CISG is roughly coherent even when no supreme court is available to re-examine the cases. Given that the use of electronic communication in international contracts is still at its initial stage, technologies, business models and other impact factors are all in a transient phase. The absence of uniform custom and usage around this method, as well as incapability of becoming the constant source for public legislations is expected.

The abovementioned drawbacks do not mean that a harmonized order regarding the use of electronic documents cannot be achievable in the foreseeable future or that public legislatures should sit idle. The first part of this chapter introduces the private regulatory system, which may serve as an alternative to creating uniform global order. An empirical study regarding the regulations governing the use of electronic documents in the shipping and related branches is conducted in the second part. The final part of this chapter illustrates the interrelationship between the private regulatory system public law.

A. Private Regulatory System

As previously mentioned, when considering the laws regarding digitalization in the maritime transport sector, the answer should be analyzed at the international level. However, for all kinds of reasons, public powers cannot easily go beyond national borders. Public authorities, such as national states or super-national organizations, are not ready to implement their own logic in a global context. Whether an order can be established by sovereign states depends more on international relations than on legitimate procedures.²⁷⁶ Among other things,

²⁷⁴ See Berman, Paul Schiff, *The inevitable legal pluralism within universal harmonization regimes: the case of the CISG*, *Uniform Law Review* 21.1 (2016), on p.24.

²⁷⁵ While writing this doctoral thesis, there are over 3000 cases available at the databank of the CISG, see at <https://www.cisg.law.pace.edu/cisg/text/caselit.html>.

²⁷⁶ Neves, Marcelo, *Grenzen der Autonomie des Rechts in einer asymmetrischen Weltgesellschaft: Von Luhmann zu Kelsen*, *Archiv für Rechts-und Sozialphilosophie* 93.3 (2007), on p.375.

laws passed by the international legal community are difficult to renew. In the case of maritime transport law, the most popular international law is still the Hague Rules, which was published almost a century ago. The later inventions of container transport and electronic communications are not addressed in this law. In many occasions, this kind of legal vacuum will result in chaos rather than order. Chapter 2 has also reflected this phenomenon by examining the example of the UNCITRAL legislations.

By contrast, private power has long become a global power. Private actors have been actively engaging in all kinds of activities beyond borders since the development of commerce. The constant engagement of private actors provides fertile soil for orders to be built. The process usually starts from customs which are broad and ambiguous. The customs are then gradually be compiled and systemized to become a private regulation parallel to the public legal system or be incorporated into formal law. This process can be most obviously observed in *lex mercatoria*, *lex maritima* and other guild laws. In today's society, private actors continue to create regulatory systems in many areas, especially in commerce and communication. The rule-making, adjudication, and enforcement are sometimes more efficient and have higher legitimacy than publicly-created regulations. The following paragraphs explain in detail the reasons for selecting private regulatory systems.

I. Definition

The concept of private regulatory systems has many analogues, including self-regulation systems, private governance, transnational private regulation, and private regulatory regimes. Despite the slight difference in connotation, all these terms refer to a regulatory system where rule-making, adjudication, and enforcement are mostly performed by non-state actors. These different utterances are not necessarily mutually exclusive, but all lean toward a reflection of distinct foci. Self-regulation focuses on the fact that all elements of regulation are generated by those who are bound by them.²⁷⁷ In a strict sense, any kind of co-regulatory mechanism with

²⁷⁷ A. Overmars, 'Effecten van Gedragcodes: Twee Recente Cases', (2011) Bestuurswetenschappen, no. 4, on pp. 14 and 16

a state should not be categorized as self-regulation.²⁷⁸ In some occasions, having a third party to review and oversee the regulation is a misnomer. By contrast, private governance and regulatory regime, which have a self-binding effect, can affect third parties.²⁷⁹ The foci of both lies with the “private” character, which is equivalent to independence from public involvements. Transnational private regulation emphasizes its regulatory capacities between and across jurisdictions.²⁸⁰ The problem is that the content of these terms is not constant, usually differs from industry to industry and from circumstance to circumstance, and adjusts according to environmental changes. American jurist Alan Page observed that some of the self-regulation authorities are not as closed as they were 15 years ago. Renowned self-regulation branches (e.g., Council of Stock Exchange in the US) invite lay members into the board to demonstrate “fairness and effectiveness” to the public.²⁸¹ This sort of combination is named “regulated self-regulation” by Hoffmann-Riem, judge at the German Constitutional Court.²⁸² Given the breadth of this concept, a “definitional throat clearing” of private regulatory systems is indispensable to avoid misunderstanding.

In this doctoral thesis, the term “private regulatory system” is defined as a regulatory complex that encompasses a regulatory network in which private regulators from relevant branches collaborate with each other in consistent and predictable patterns of interacting behaviors. By considering the behaviors and reactions of other regulators, private regulators build connections among themselves and coherently evolve their rules. In this manner, private regulators function as a system and can form an effective and stable institution. The major roles of public interferences, which are still present in private regulatory systems, should include improving transparency, preventing (potential) risks, and eliminating negative externality.

A private regulatory system has four features: 1) an equal relationship with each other (i.e.,

²⁷⁸ Black, Julia. “*Legitimacy and the competition for regulatory share.*” (2009).

²⁷⁹ Ogus, Anthony, *Self-regulation*, Encyclopedia of law and economics 5 (2000), on pp. 587-602; also, Pies, Ingo. *Introduction: Corporate citizenship and new governance—The political role of corporations*, Corporate citizenship and new governance. Springer, Dordrecht, 2011, on pp. 1–6.

²⁸⁰ See Braithwaite, John, and Peter Drahos. *Global business regulation*, Cambridge university press, 2000; and Büthe, Tim, and Walter Mattli, *The new global rulers: The privatization of regulation in the world economy*, Princeton University Press, 2011.

²⁸¹ Page, Alan C. “*Self-regulation: The constitutional Dimension.*” Mod. L. Rev. 49 (1986), on p. 141.

²⁸² See Hoffmann-Riem, Wolfgang, *Regulating Media: The licensing and Supervision of Broadcasting in Six Countries*, Guilford Press, 1996, on p. 326

none of them can command the other), 2) legitimacy that is either built upon procedural democracy or functional superiority so that they can function parallel to the public law, 3) regulations that are created with reference to regulations in related branches, and are thus compatible with each other and can function as a system, and 4) the strong influencing factor of public law without coercive effect. The illustration below shows the pattern of private regulatory systems.

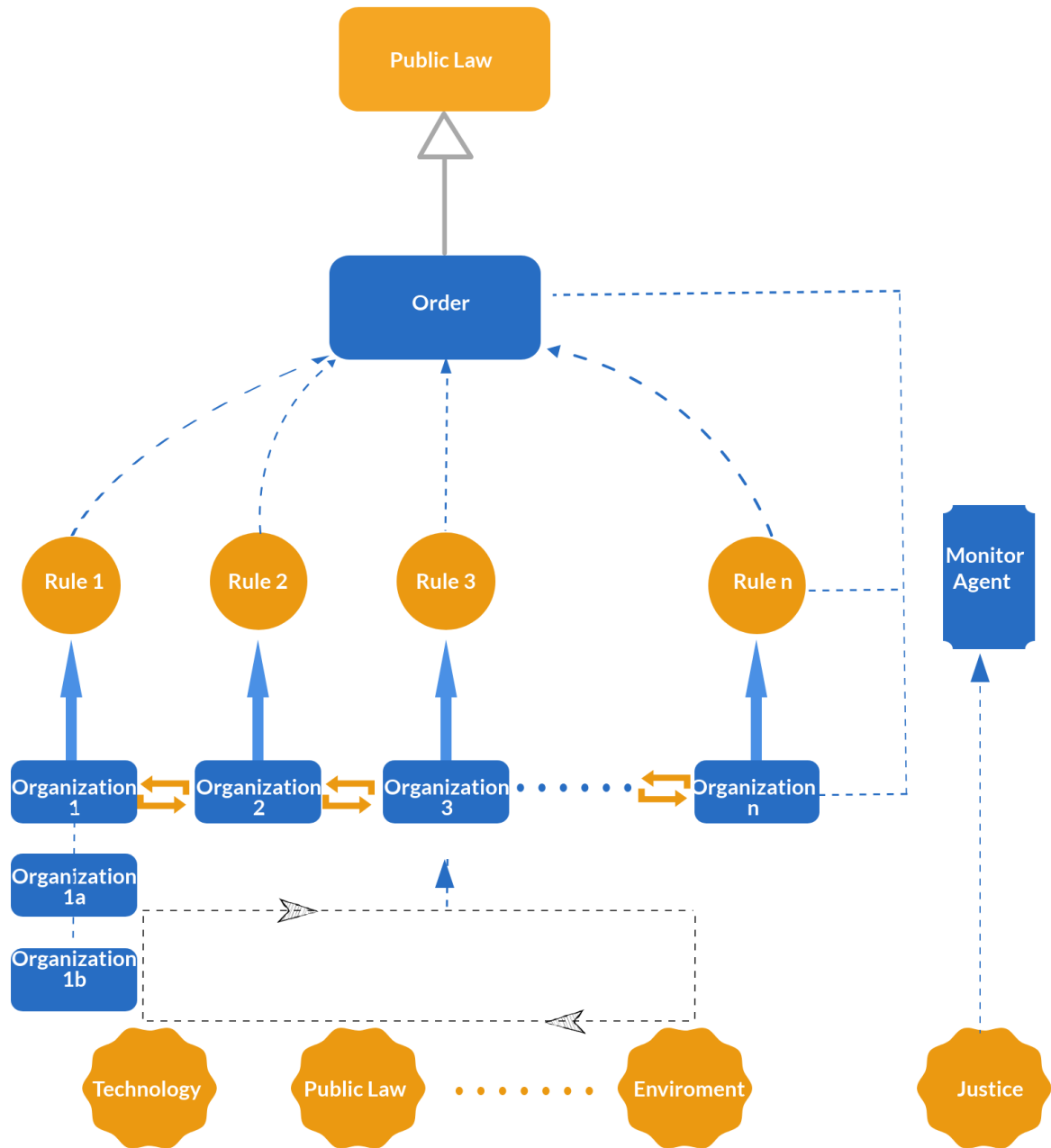


Figure 4: The Model of Private Regulatory System

II. The Legitimacy of Private Regulatory Models

The legitimacy of private regulatory models has been questioned by scholars in social science fields. Many assert that the private regulatory system is wrong because the regulator is

not “legitimate”.²⁸³ However, this doctoral thesis infers that “legitimacy may be an objective fact, but it is socially constructed.”²⁸⁴ The following discussions intends to prove that the private regulatory system can establish legitimacy based on three claims: cognitive, democratic, and functional claims.

1. Tradition: The Legitimacy Gene

Maritime transport and cyber space as major playgrounds of digitalization have a tradition of self-management. The general maritime law, at the beginning and throughout most of its history of development, partially involves compilations of mercantile customs. The universal application of this law is built upon voluntary consents rather than coercive force. Tetley described the maritime law as an “*ius commune* from earliest time to present” due to this voluntary nature.²⁸⁵ This statement corresponds with the discoveries of archaeologists. The Rhodian Sea Law, which is dated from 500 B.C to 300 B.C and is recognized as the earliest known maritime law,²⁸⁶ is law that was not deliberately designed or drafted by legal professionals but was established through customs and usages.²⁸⁷ Although the Rhodian Sea Law has codified rules with regard to the navigation of vessels and dispute resolutions between merchants, which were published in the form of a written code, legal historians speculate that the Rhodians merely committed the practical customs and common usage of the sea established by their ancestors and fellow Greeks to writing instead of designing the law from scratch. In addition, the superior position of the Rhodian Sea Law in the Mediterranean vested not by the Rhodian State but by the excellency of this rule as compared to other contemporary sea laws. The self-management phenomenon is obvious in middle-age Europe. Three local laws govern the maritime affairs in the Atlantic coasts, the Mediterranean, and the Baltic, namely, the Rôles

²⁸³ Scott, Colin, Fabrizio Cafaggi, and Linda Senden, *The conceptual and constitutional challenge of transnational private regulation*, Journal of Law and Society 38.1 (2011), pp 2-3.

²⁸⁴ Scott, W. R. *Institutions and or*, pp 2-3usand Oaks)." (2001).

²⁸⁵ Tetley, William. “*The General Maritime Law-The Lex Maritima.*”, Syracuse J. Int’l L. & Com. 20 (1994), p.105. Tetley claimed that “the general maritime law is a *ius commune*, is part of the *lex mercatoria* and is composed of the maritime customs, codes, conventions and practices from earliest times to the present, which have had no international boundaries and which exist in any particular jurisdiction unless limited or excluded by a particular statute.”

²⁸⁶ Healy, Nicholas J., and David J. Sharpe, *Admiralty, Cases and Materials*, West Publishing Company, 1979, on p. 3.

²⁸⁷ Reddie, James. *An historical view of the law of maritime commerce*, 1841, on p. 67.

d'Oléron, the *Consolato del Mare*, and the Laws of Wisbuy. These laws greatly differ from modern laws because they are formed through the judgements made by merchant judges on classic cases and are based on general law principles that were considered relevant to future incidents of the same kind.²⁸⁸ During this period, despite the lack of strong central governments to unify and implement the laws in Europe, maritime laws developed and grew through the spread of maritime commerce and naturally expanded from one port town to another. The Rôles d'Oléron, for example, was first created in the island of Oleron, west of Rochefort, France. Before the kings and queens in France and England formalized them, the laws were already adopted by the seaport towns of Normandy and Brittany and transplanted to Damme, Bruges, and later in London.²⁸⁹ Molloy commented that like the Rhodian Sea Law, “they (The Rôles d'Oléron) were esteemed for the reason and equity found in them, and were applied to the case emergent.”²⁹⁰ The private aspects of maritime laws declined for a few centuries with the growth of nationalism but was revived again in the nineteenth century because all kinds of private organizations and associations were founded by lawyers and commercial men. Today, private institutions, such as the Baltic and International Maritime Council (BIMCO), the CMI, and the International Chamber of Shipping, play a vital role in the lawmaking. Arbitration courts and tribunals, including the London Maritime Arbitrator’s Association and the Society of Maritime Arbitrators, are processing more cases than state courts.²⁹¹

The Internet, which was a creation of the US government project ARPANET in the 1960s, went out of governmental control since it was opened to general citizens. The word cyberspace becomes popular in the 1990s and describe the largest uncontrolled domain that is distinct from the regulated “outer-space.” John Perry Barlow, who was a so-called “cyberlibertarian,” published “A Declaration of the Independence of Cyberspace” when the US Congress enacted

²⁸⁸ Tetley, William. “*The General Maritime Law-The Lex Maritima.*” Syracuse J. Int’l L. & Com. 20 (1994), on p.111.

²⁸⁹ Paulsen, Gordon W. “*Historical Overview of the Development of Uniformity in International Maritime Law.*” Tul. L. Rev. 57 (1982), on p.1070.

²⁹⁰ Molloy, Charles, *De Jure Maritimo Et Navali: Or, A Treatise of Affairs Maritime, and of Commerce.* John Walthoe, 1744.

²⁹¹ Maurer, Andreas, *The Creation of Transnational Law-Participatory Legitimacy of Privately Created Norms*, (2012), at 3. Maurer compared the maritime caseload between the British state courts and the LMAA, and the result shows an obvious preference for the arbitration courts.

the Communications Decency Act²⁹² in 1996 to clean illegal and harmful materials on the Internet. In this writing, he wrote:

Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone...

You claim there are problems among us that you need to solve. You use this claim as an excuse to invade our precincts. Many of these problems don't exist. Where there are real conflicts, where there are wrongs, we will identify them and address them by our means. We are forming our own Social Contract. This governance will arise according to the conditions of our world, not yours. Our world is different.²⁹³

The libertarians won, and the act was struck down in the landmark case of the *American Civil Liberties Association v. Reno*.²⁹⁴ The court decides that the act violated the US Constitution's First Amendment. Nevertheless, this decision did not make the cyberspace in the wild west. Without the intervention of the state, the Internet solved the problem on its own. The World Wide Web Consortium, a quasi-autonomous and non-governmental organization, developed a standard where browser software can be voluntarily incorporated to filter harmful contents on the Internet.²⁹⁵ For many scholars, this event opens a new era of regulation in the cyberspace: "code as law."²⁹⁶ This credo recognizes that codes can function as law in the cyberspace but are not strictly the only "law." Lessig stated the regulations on the Internet developed from four modalities: law, social norms and values, market incentives, and Internet architecture, including software code.²⁹⁷ This taxonomy was adopted by legal scholars in developing the regulations on the Internet. Later research also focuses on elaborating the

²⁹² Title 47 USCA, 223(a) and (d), The Communications Decency Act 1996 was introduced on January 30, 1995, passed by Congress in December 1995, and signed into law by President Clinton in January 1996.

²⁹³ BARLOW'S, JOHN PERRY, *DECLARATION OF INDEPENDENCE FOR CYBERSPACE*, (1996), at <https://xabuxe.ga/ytg.pdf>.

²⁹⁴ *American Civil Liberties Association v. Reno*, 929 F. Supp. 824, 837 (E.D. Pa. 1996).

²⁹⁵ Tambini, Damian, Danilo Leonardi, and Chris Marsden, *Codifying cyberspace: Communications self-regulation in the age of Internet convergence*, Routledge, 2007, on p.3.

²⁹⁶ See Mitchell, William J. *City of bits: space, place, and the infobahn*, MIT press, 1996; also, Lessig, Lawrence. Code: And other laws of cyberspace. ReadHowYouWant. com, 2009. Lessig asserted that code is law for code shapes behaviors but certainly not the sole regulator on the Internet.

²⁹⁷ Lessig, Lawrence. *Code: And other laws of cyberspace*. ReadHowYouWant. com, 2009.

interactions of the vectors that Lessig specified.²⁹⁸ Looking closer into Lessig's regulatory model, three out of the four modalities are rooted in non-state factors. Social norms and values, market incentives and economics, and software codes are results of private interactions. Therefore, although a pure self-regulation on the Internet may not been realized, the Internet is a place where private regulation is holding a dominant position.

This doctoral thesis believes that the past history of private regulation in the maritime transport and the Internet grants private regulation in these areas, if not full, a certain degree of legitimacy. The regulation of private actors helped with the establishment of the normative criteria in these specific areas, and therefore collected a normative base to provide itself with legitimacy. For instance, standard form contracts were seen as reusable contracts for daily business. However, when new variations occur, the providers of these contracts are naturally vested with the exception to create and explain new terms. The private regulator can exist long enough that its legitimacy is regarded as a natural thing. Naturally, the prerequisite for this opinion is that legitimacy is not perceived like in the eyes of positivists. Suchman interpreted legitimacy as social credibility and acceptability. He further asserted that legitimacy is “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions.”²⁹⁹ Based on this conception, the tradition of private regulation in both branches resulted to a legitimacy gene.

2. Democratic Characteristic

The privately created norms do not have national force to guarantee compliance, so the creation of these norms usually contains the democratic element to increase legitimacy. This democratic element will be articulated in different guises according to occasions. Whether through direct voting or agencies, the purpose is to allow everyone to partake in the creation process and express opinions. By opening participation stage for all relevant parties, the norms

²⁹⁸ Cohen, Julie E., *Configuring the networked self: Law, code, and the play of everyday practice*, Yale University Press, 2012, on pp.155–156.

²⁹⁹ Suchman, Mark C., *Managing legitimacy: Strategic and institutional approaches*, *Academy of management review*20.3 (1995): on p.574.

will be produced in a “negotiated” manner, thereby increasing acceptability and credibility. According to the above definition of legitimacy, the norms created in this way will obtain a certain degree of legitimacy. Although the participants do not see eye to eye in every norm, a “rough consensus” can always be reached,³⁰⁰ and the participants will honor the norms because the negotiated result is the better result.³⁰¹ If non-compliance or opportunistic behaviors occur, then measures (e.g., boycotting) will be taken by the community as a whole, which will drive the “convict” out of the market. Another notable matter is that multiple private regulations can co-exist with public laws. This phenomenon may cause confusion for the participants but also bring benefits from the competition of these regulations. In cases where the regulatory environment is engaging rapid changes, such a competition pushes the regulation authority to evolve and draw merits from their counterparts.

III. Functional Advantages

1. Information Advantage

Information or knowledge is essential for regulators to decide when and how to make rules. Information does not only include professional knowledge but “inside information” that is unique to the branch as well. Given that information is unevenly dispersed throughout the network, information asymmetry is a commonly observed phenomenon between the regulator and the regulatee. This disadvantage is one of the leading factors of unpractical regulations. Outside regulator possesses less information (i.e., professional and inside knowledge) than the inside one. Such a limitation causes difficulty for the regulator to understand what is going on inside the regulatory environment. In appearance, this can be the consequence of the stasis in the information flow from inside to outside or the increasing complexity of the regulatory environment. At least two major problems can occur from the shortage of necessary information. The first notable problem is that the regulator will not always determine whether

³⁰⁰ See Calliess, Graf-Peter and Zumbansen, Peer. *Rough Consensus and Running Code. A Theory of Transnational Private Law*. Oxford: Hart Publishing, 2010.

³⁰¹ Dutta, Anatol, *The Hamburg Lectures on Maritime Affairs 2011–2013*, Vol. 28. Springer, 2014, on p.140.

regulation is necessary. In other words, the regulator may notice a regulatory loophole but be unable to precisely assess the size of this loophole to decide whether measures should be taken immediately or wait for the dust to settle. The rule-making process has other drawbacks. In some cases, the rule-making process is an “insider game.”³⁰² The information required for rule-making is mostly supplied by committee members, staff, and specialists who are close to the regulator. During this process, the information can be easily distorted, and filtered information will reach the regulator. A capable outside regulator can narrow the information gap by entrusting a committee of independent specialists to translate the information. However, this step will require certain inside information to select the specialists in the first place. Moreover, as the complexity of the regulatory environment increases and the differentiation of the systems deepens, the effect of “translation” will inevitably decline.

By contrast, the private regulatory system slight information loss and distortion because regulators are partly regulated. According to Hayek, these regulators are the ones “who know directly of the relevant changes and of the resources immediately available to meet them.”³⁰³ Hence, private regulators have no trouble accessing inside information, and the regulatory environment is more transparent for them. In addition, private regulators will automatically keep up with the new technological developments and organizational changes in the regulated area. Otherwise, they will be cast out of the market. In some cases, the regulator itself can be the leader and major investor for technological advancements. Therefore, private regulators command a high level of expertise and technical knowledge. Agile and innovations will only take place when the market is a competitive one. This aspect is covered in the next section, where the public and private interplay is discussed. In summary, private regulators possess an information advantage over public ones.

2. Lower Costs

Regulation is expensive and costs are incurred in every process. The costs incurred by

³⁰² See, Burns, John. 1971. *The Sometimes Government*, New York: Bantam Books, on pp.103–119.

³⁰³ Hayek, Friedrich August. “*The use of knowledge in society.*” *The American Economic Review* 35.4 (1945), on p. 524.

private regulation is lower than public regulation and will be internalized by the industry. Information can be costly. Assuming that a public regulator wants to acquire information about the regulatory environment, as the previous part of this doctoral thesis suggested. The regulator will have to pay for experts and investigations. In many circumstances, the cost for this service is not trivial.³⁰⁴ In the case of the Antitrust Modernization Commission, which is an advisory agency formed by the US Congress to examine the needs to modernize the antitrust law and solicit the views of all concerned parties, the Congress must pay \$4 million for the commission to perform this task.³⁰⁵ This money comes from the US tax payers. In comparison, the same task is unnecessary for the private regulators because they do not have to investigate the needs for modernization or write reports to persuade the Congress to revise the current laws.

Moreover, the compliance costs will be lower if regulations are performed by private regulators. As suggested by the informational advantages in the previous section, as well as several organizational advantages, private regulators can produce rules that are better tailored to local circumstances. The mutual trust and bond between regulators and regulatees fosters incentives to comply with the rules and receive supervision, which is less costly than information. In addition, one important characteristic of public regulators is the responsibility for public interests, which pushes the public regulators to avoid potential risks by promulgating conservative rules. This step imposes opportunity costs for the regulatees and monitoring costs for the regulator. One excellent example is the standards set by the US Water Pollution Prevention and Control Law on effluent limitation.³⁰⁶ To maximize the pollution reduction, this statute require the “best practicable technology currently available” or the “best available technology” to be installed in the polluting companies before a statutory deadline.³⁰⁷ This demand undoubtedly imposes a large amount of work to monitor the target companies and determine which technology is the “best practicable” and “best available” for each company.³⁰⁸

³⁰⁴ See McGarity, Thomas O. “*Some thoughts on deossifying the rulemaking process.*” Duke Lj 41 (1991), on p. 1385; Magill, Elizabeth. “*Agency Self-Regulation.*” Geo. Wash. L. Rev. 77 (2008), on p. 875.

³⁰⁵ Garza, Deborah A., Jonathan R. Yarowsky, and Bobby R. Burchfield. “*Antitrust Modernization Commission Report and Recommendations.*” (2007), on p. 6, available at https://govinfo.library.unt.edu/amc/report_recommendation/amc_final_report.pdf. Last visited 05.21.2019.

³⁰⁶ 33 U.S.C. § 1311(b).

³⁰⁷ See 33 U.S.C. § 1311(b)(1)(A)(i) and (b)(2)(A)(i).

³⁰⁸ See McGarity, Thomas O. “*Some thoughts on deossifying the rulemaking process.*” Duke Lj 41 (1991), on pp. 1414-1417.

In some cases, the companies that were told to apply certain technologies refuse to obey this order and choose to fight in court, which further increased the costs.³⁰⁹ Enforcement will be relatively more expensive and difficult under public regulation than private one due to jurisdiction and enforcement of foreign judgements. Enforcement by private regulation is cheap and easy because maintaining reputation is crucial for the member in certain communities, and refusing to honor judgements will rise suspicions about the credibility of the defendant. In conclusion, private regulatory systems are less costly than public ones in terms of administrative, investigation, and compliance costs. Moreover, the latter demonstrates the capability to internalize the cost instead of imposing them on taxpayers.

3. Higher Flexibility

Flexibility is essential for regulation in fast-changing environments. Technological growth, for instance, is a common factor of regulatory environmental transformation in modern age. New discoveries in psychology and science can also switch attitude toward certain phenomenon and stretch the corresponding influences upon regulation. Given that these new discoveries and technologies always emerge in great scale after scientific breakthroughs, anticipating the exact timing of an impact is nearly impossible. In addition, the impact of new technologies or discoveries is difficult to foresee. The combination of one technology with the other can lead to unexpected changes, and the effect of these changes on the conducts of people and business models are normally unpredictable. Maxwell published a set of equations that describe all electromagnetic phenomena in 1865 and opened a new field of science. Who would believe at that time that radio, television, Wi-Fi, and smart phones will be invented based on this theory within one and a half centuries and completely change the human society. In today's modern world, new technologies and discoveries will spread at a faster pace and trigger greater repercussions. Consequently, neither the regulator nor the market can evaluate the outcome of

³⁰⁹ For example, in *Corrosion Proof Fittings v. EPA*, EPA attempted for the first time to regulate a toxic substance under section 6(a) of the Toxic Substance Control Act. However, the court held that EPA did not adequately consider less burdensome options short of doing nothing. The court noted that “[w]hile the EPA may have shown that a world with a complete ban of asbestos might be preferable to one in which there is only the current amount of regulation, the EPA has failed to show that there is not some intermediate state of regulation that would be superior to both the currently-regulated and the completely-banned world.” 947 F.2d 1201 (5th Cir. 1991).

a new technology and both cannot control this growth. A recent empirical example is the character and value of private data. Private data in relation to when an individual eat, how does an individual watch a TV show, or where does an individual drink beer are worthless and fully disposable. However, new software and smarter algorithms enable corporates and governments to collect such data in great scale and analyze the respective data producers. By knowing when a person eat, retail shops can adjust their stock plan. By learning how an individual watch a TV show, film producers can generate efficient ways to attract the viewers. By determining where people drink beer, the brewery can cooperate with different snack companies to bring better experience for customers. However, despite vesting data with substantial value, this feature infringes the privacy of people. At this point, flexibility is crucial because the market and the regulator do not know how far the infringement affects human rights. Flexible regulation means that regulators must quickly react and understand the nature of the subject and create an effective mechanism to prevent further damage and possible means to realize remedies. At the same time, the regulation should maximize the added value and possibility of this innovation by leaving enough room for the industries to apply and develop the regulations.

This task is quite difficult for public regulators. The EU spent almost seven years to enforce a new law that will supersede the European Data Protection Directive, which was adopted in 1995 to better protect the privacy of the people.³¹⁰ The real effect of the new data protection regulation is yet to be seen because judgements from the perspective of the EU or the world are not yet reflective. However, one attempt from the Article 29 Working Party,³¹¹ which was an advisory committee to the European Commission on data protection, is worth mentioning. Before launching new revision of data law was launched, the Article 29 Working Party discovered that the data protection authorities in various EU member states lacked the enforcement tools and resources to monitor and enforce the compliance of multinational

³¹⁰ If regarding June 22, 2011 when the European Data Protection Supervisor published an Opinion on the European Commission's Communication as the beginning of the General Data Protection Regulation, it took the EU almost seven years for the law to finally be enforced on May 25, 2018.

³¹¹ The Article 29 Working Party (Art. 29 WP) was an advisory body made up of a representative from the data protection authority of each EU Member State, the European Data Protection Supervisor, and the European Commission. It has been replaced by the European Data Protection Board (EDPB) under the EU General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) on May 25, 2018. For additional details about this organization, see https://edpb.europa.eu/our-work-tools/article-29-working-party_en.

companies.³¹² During that time, multinationals have created own privacy policies to safely process personal data throughout their groups of companies. The committee then proposed a regulatory regime based on these private corporate policies to establish a hybrid system of regulation that will enable governance beyond national borders. This doctoral thesis cites this example merely to indicate that private actors are more agile to regulatory environment changes compared with public ones.

B. Private regulatory system in Digitalization of Shipping

Private regulatory system has already exerted power on maritime transport for centuries. As the industry moves into the electronic era, this regulation approach has demonstrated an even greater force on creating order and standards for implementing digitalization in relevant branches. Contrary to the public legislative approach illustrated in the previous chapter, which is arduous to execute in a global scale and leans to the interest of the national state, the private regulatory system in the shipping industry transcends national boundaries and impose an overall influence upon all relevant branches. This section presents the functioning mechanism of private regulatory system in the digitalization of maritime documents by analyzing the nexus of four regulation areas: electronic documents procession, payment arrangement, insurance, and maritime transport sectors.

I. Electronic Documents Processing

Maritime transport is the major component for the regulations in digitalization of maritime transport documents. Currently, multiple private entities function as regulation providers and produce standards. Among them, Bills of Lading Electronic Registry Organization (Bolero), essDOCS and e-Title TM are three companies that received the recognition of the International Group of P&I Club. Considering this acceptance as a clear signal of wide acceptance across the branches, this thesis focuses on the structure and working mechanism of these three

³¹² Moerel, Lokke. *Binding corporate rules: corporate self-regulation of global data transfers*. OUP Oxford, 2012, on p. 22.

companies. The main paragraph details the first organization (i.e., Bolero). Only the uniqueness of the remaining two are highlighted because these organizations resemble each other in many aspects.

1. Bolero

Bolero is a company that offers buyers, sellers, banks, carriers, and insurance agents to freely exchange trade and transport-related documents over a common digital network. However, Bolero is not only a company that provides services for the utilization of electronic documents but also an ecosystem that combines regulation, technology, and commerce. By understanding the structure and working mechanism of the Bolero, a more vivid view about the private regulatory system can be achieved.

Bolero originated from a research initiative of the European Community in 1995. The aim of this initiative is to find a solution to dematerialize cross-border trade process. The Bolero Association Ltd. (BAL), which is the first entity of the Bolero Project, was founded on July 27, 1995 with enrolled members not only from Europe but also from America and Asia.³¹³ BAL is a non-profit entity that acts as a club for its members.³¹⁴ The leap to the business world was taken by BAL a few years later. In cooperation with the Society for Worldwide Interbank Financial Transactions (SWIFT) and the Through Transport Mutual Insurance Association Limited (TT-Club), the Bolero Project was commercialized in 1998. The result of this cooperation is the Bolero International Ltd. (BIL), which was linked to BAL through the registrar contract that states that the latter should perform the tasks of a registrar for the former. Users willing to employ the Bolero electronic documents must sign service contracts with BAL and the BIL to outline the rights and obligations. In addition, all current and future participants are bound by the so-called “Bolero Rulebook,”³¹⁵ in which the legal structures of transactions undertaken via the Bolero are manifested (Structure of the Bolero see Figure 4 below). Through this rulebook, the users of the Bolero are governed by a common set of rules. BIL is in charge

³¹³ See DiMatteo, Larry A., *International business law and the legal environment: a transactional approach*, Routledge, 2016.

³¹⁴ See BAL Memorandum of Association para 3(4) and para 4.

³¹⁵ Bolero Rulebook (1st ed., September 1999) Available: <<http://www.bolero.net>> (Bolero Rulebook).

of providing users with access to the Core Message Platform and the Title Registry, wherein the users can exchange messages and transfer ownership with each other. The messages exchanged via the Core Message Platform are equipped with digital signatures,³¹⁶ which will guarantee the authenticity of all messages and enable the messages to be traced back to the sender.

The most notable features of the Bolero are not the intricate corporate structure but the regulatory structures built to realize its legal purpose. The Bolero has created its own regulations parallel to the International Conventions and domestic laws to skirt the legal uncertainty and used a democratic method to vest the regulations with higher legitimacy. The first issue is embodied in the transfer of rights through a B/L. As mentioned in chapter 1, the B/Ls represent the ownership of the goods and the rights under the contract of carriage. By endorsement or transfer of the physical possession of the tangible B/Ls, the attached rights are transferred as well.³¹⁷ This condition has been a problem for electronic B/Ls because the laws in most countries are still unsettled about the legal effect of transferring the electronic B/Ls. The Bolero Rulebook deals with this problem by using novation. The rulebook stipulates that if the Bolero B/L is transferred to a new party, then a new contract of carriage based on the old one will exist between the new party and the carrier, and the new party shall have the same rights and obligations contained in the Bolero B/Ls.³¹⁸ The appendant problems of the legal effect of electronic documents and digital signature, as well as the admissibility as evidence before courts, are solved using no-challenge clauses. Article 2.2.2 of the Rulebook stipulates that “No User shall contest the validity of any transaction, statement or communication made by means of a Signed Message, or a portion drawn from a Signed Message, on the grounds that it was made in electronic form instead of by paper and/or signed or sealed.”³¹⁹ To prepare for the possibility that a court denies the effect of electronic evidence produced by the Bolero system, the Rulebook reads: “Each User agrees that a Signed Message or a portion drawn from a Signed Message will be admissible before any court or tribunal as evidence of the Message

³¹⁶ Operating Procedures, Operational Rule 5.

³¹⁷ See Chapter 1, Section A, II (1).

³¹⁸ See the Bolero Rulebook, 3.5.1.(1) and (2).

³¹⁹ See the Bolero Rulebook, 2.2.2(3).

or portion thereof.”³²⁰

The abovementioned regulations can serve as because these regulations do not conform to every national law regarding transfer of rights under carriage of goods contract and electronic evidence. For example, using novation as a means to transfer rights under carriage of goods contract maybe acceptable under English law but not under German law.³²¹ The electronic evidence provided via Bolero Core Message Platform may fulfill the requirements of the eIDAS Regulation but will be deemed to be invalid under Chinese law because digital verification service is not permitted by Chinese authorities.³²² Ultimately, the legal authority of the Bolero Rulebook derives from contract, not the statute.³²³ If the rules set out by the Bolero are presented before a court, then the rules may be invalidated according to national laws. Bolero is fully aware of this risk even before publishing the Rulebook. In 1997, Bolero entrusted the international law firm Allen & Overy to conduct a legal feasibility study concerning the use of electronic B/Ls. The 18 jurisdictions that were examined proved that the situation in some countries were uncertain, that is, “It is not possible to predict whether German courts, faced with Bolero, would be prepared to accept computer evidence and, in any event, it is believed that the highest standard of proof of the accuracy of the data and the authenticity of a document’s origin would be required.”³²⁴ The question is why does Bolero still published the Rulebook with terms that may be invalidated by state laws?

This doctoral thesis holds that the confidence behind this lies with the fact that the Rulebook has never been challenged by the users before courts. In terms of corporate organization, BAL is responsible for revising the Rulebook, which is owned by all users. This has clearly provided an unsatisfactory user, if any, with an alternative to variate the rules he does not like. At the same time, members of the rulemakers should respect the rules.

³²⁰ Ibid, 2.2.3(1).

³²¹ See Eckardt, Tobias, *The Bolero Bill of Lading under German and English Law*, Sellier, European Law Publ., 2004, on pp. 114–140.

³²² See Article 17 of the People’s Republic of China on Electronic Signature.

³²³ Gaskell, Nicholas, *Bills of Lading 2e: Law and Contracts*, Routledge, 2017, on p. 26.

³²⁴ Legal Feasibility Study, at 56.

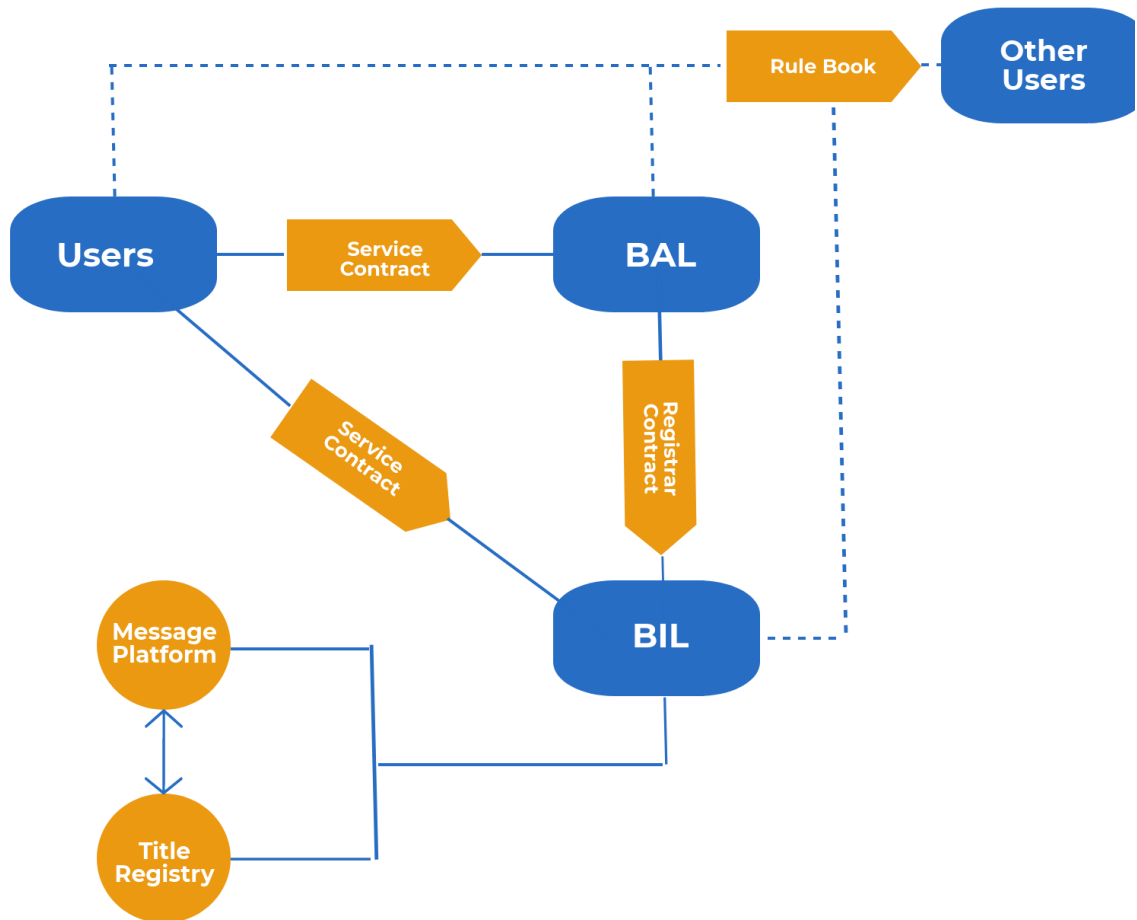


Figure 5: Structure of the Bolero

2. essDOCS

The essDOCS provides the same electronic documentation services as the Bolero and is similar to the latter in many aspects. For instance, essDOCS users must first join a member association named the essDOCS Databridge Development Group and agree to the Databridge Services & Users Agreement (DSUA), which is a multilateral agreement that binds the service provider to all users. Moreover, like the Bolero, the essDOCS is a closed system where only registered members can exchange information and title via the system. To facilitate financial services with electronic documentation, the essDOCS partnered with the SWIFT to automate the presentation of relevant transport documents. The differences of the essDOCS from Bolero

is that the transfer of title under the DSUA is governed by the law of the state of New York and, thus, allows the essDOCS to function as a token system for granting exclusive control to the holder of electronic B/L instead of using novation.³²⁵ Albeit the same problem of the DSUA acceptance, no litigation over the use of the DSUA has been brought up to date.³²⁶

DSUA must be designed differently from the Bolero Rulebook due to the distinct way of operation. Therefore, although essDOCS keeps the DSUA confidential from non-users, essDOCS is a different but equally effective legal framework compared with Bolero.

3. e-title TM

The e-Title TM is the latest system that has been approved by the P&I Club and symbolizes a new method for the production and processing of electronic B/Ls. This system is significantly different from the two previously mentioned frameworks in terms of working mechanism. The e-Title TM does not have a central system or database to deliver all kinds of documents from one user to another but rather functions as an authorization agency. Parties who want to employ the e-Title can use the system's patented software either through the installation of a secured device from the e-Title named the "black box" or the Singapore Trade Xchange Portal.³²⁷ The software will relay the data to the e-title platform, and the platform will verify the digital signature, originality, and other related information on the electronic documents. The data will be sent back to the software after the verification and then forwarded to the receiver. In terms of legal structure, the e-Title TM does not rely on novation and attornment to transfer the rights embodied in the B/Ls but incorporates the English COGSA 1992 into the user agreement so that all users that will sign agree that COGSA 1992 applies also to all electronic B/Ls generated under the system.³²⁸ The e-Title also provides a private

³²⁵ Möllmann, Anders, *Delivery of goods under bills of lading*, Routledge, 2016, on p. 179.

³²⁶ Bury, David A., *Electronic bills of lading: a never-ending story*, Tul. Mar. LJ 41 (2016), at 229. The author carried out a telephone interview with the COO of the essDOCS in March 2016 and inquired about the legal status of the DSUA. When the researcher checked the records related to the essDOCS in June 2019, no legal disputes have been brought up against the DSUA.

³²⁷ The Singapore TradeXchange portal is a trade platform led by the Singapore Custom to allow different parties in the shipping industry to exchange information on it.

³²⁸ See the Legal Briefing from the UK P&I Club regarding electronic B/Ls, available at <https://www.ukpandi.com/knowledge-publications/publications/article/legal-briefing-electronic-bills-of-lading-138374/>.

dispute resolution procedure among the users so that court proceedings can be avoided.

II. Payment Arrangement

Payment arrangement is the foundation of many international trades and is associated closely with maritime transport and other related activities. The first chapter has introduced five methods of payment, wherein each method involves the usage of different types of documents. Accordingly, these payment methods have their own set of rules regarding format, presentation, and examination of related documents in the electronic environment. This subsection highlights the method of L/C and the Uniform Customs and Practice for Documentary Credits (UCP), which is the rules governing the use thereof.

The UCP is a product of the Interstate Commerce Commission (ICC), in which the customs of bankers dealing with exporters and importers, as well as the shipping and insurance companies are embodied. This framework is a successful attempt to unify the rules governing the usage of L/Cs. Today, UCP has gained worldwide application, and banks around the world will subject their L/C to the UCP in most cases. The ICC revises the UCP according to the changes in the industry. The UCP 500 is the first version of UCP, which mentioned the use of teletransmission to advise or amend a credit.³²⁹ More comprehensive rules regarding the application of electronic equivalents were made in 2002 to supplement the UCP 500, which is known as the eUCP (Version 1.0). The eUCP exerts greater effect on electronic documents than UCP. A credit subject to the eUCP is also subject to the UCP, but the provisions of the former prevails that of the latter if the former produces a different result from the application of the latter.³³⁰ The eUCP has also undergone a few updates since 2002, and the latest (version 2.0) was implemented in July 2019. Compared with the former version, the new version has adapted several sizeable changes,³³¹ but the structure regarding electronic presentation remains unaltered.

In all versions of the eUCP, the electronic documents presented and examined by the banks

³²⁹ See UCP 500, Article 11.

³³⁰ See eUCP (1.0), Article e2(b).

³³¹ See eUCP version 2.0 changes, available at <https://www.tradefinance.training/blog/articles/eucp-version-20-changes/>

does not require a high level of authenticity and originality. The electronic messages sent to the banks are required to determine: (a) the apparent identity of the data's sender, (b) the data's apparent source, and (c) whether the data has remained complete and unaltered.³³² However, banks are not taking responsibility for the identity of the sender, source of the information or the complete and unaltered character other than what is apparent in the electronic document.³³³ The eUCP 2.0 has included a new article to exempt banks from the loss due to *Force Majeure*, in which cyberattack and system failure belongs.³³⁴ The formats of the electronic data must be specified in the eUCP credit. Otherwise, the electronic data can be presented in any format with good faith and is readable by the bank system.³³⁵ An unreadable format does not constitute a basis for refusal.³³⁶

III. Cargo Insurance

Maritime cargo insurance is a very specialized area with own traditions and a unique business model. The insurance industry has been introducing additional electronic communication technologies in recent years. As a consequence, bylaws, guidelines, and standard terms have been developed to govern the relevant activities. The bylaws of the Lloyd's of London, which is an insurance body that operates as a partially-mutualized marketplace, stipulates that cargo certificates can be electronically issued by the service provider.³³⁷ The users' guidelines have also been promulgated and upgraded by the Lloyd's several times to address some issues, such as the use of Lloyd's online system and the issuance of a Lloyd's electronic cargo certificate.³³⁸ However, the matter of endorsement is not mentioned in the private regulations. The commonly applied method in the industry is to print out the electronic certificate and endorse it like a regular paper certificate.³³⁹ Fonterra, a New Zealand company,

³³² See *ibid.*, Article e3(b)

³³³ See *ibid.*, Article e12.

³³⁴ See eUCP version 2.0, Article e14.

³³⁵ Byrne, James E., and Dan Taylor, *ICC Guide to the eUCP: Understanding the Electronic Supplement to the UCP 500*, ICC Publ., 2002, on p. 81.

³³⁶ See eUCP version 1.1, Article e6.

³³⁷ Insurance Certificates Byelaw (No. 1 of 2006), para. 3.

³³⁸ Lloyd's, Lloyd's electronic cargo certificate (lecc) – client side user guide JULY 2017 edition, available at <https://lloyds.genoainsurance.net/Main/LECC%20Client%20Side%20User%20Guide.pdf>.

³³⁹ See Goldby, Miriam. *Electronic Documents in Maritime Trade: Law and Practice*, Oxford University Press, 2013, on p. 240.

claimed to have been issued with numerous insurance certificates for more than a decade and used a blank endorsement with facsimile signature for electronic endorsement.³⁴⁰ The legal effect of such action remains unrecognized because of the absence of the corresponding litigation.

Comparing the endorsements of the electronic B/Ls and electronic insurance certificate, the requirements for the latter are much less rigid than the former in terms of authenticity and reliability. This condition poses a hidden danger for fraud and legal uncertainty. However, the industry has clearly accepted this method of electronic communication because the possibility of fraud is low even if forgery is easy. To seek recovery from the insurance provider, a set of accompanying documents is required, therefore, forging the certificate is useless. Moreover, the person who has insurable interest does not have to be named to claim under the certificate,³⁴¹ so the need for endorsement is reduced. Finally, the law provides a relatively broad leeway for the market to decide the appropriate way of assignment. If a certain manner of assignment is “accepted in the market,” then this method of assignment can be accepted before the court.³⁴²

Albeit the resemblance of insurance certificate and B/Ls in many aspects, the two documents are facing different requirements from the industry due to their distinct features. The legal framework governing cargo insurance documents can be further developed, most likely along the direction of electronic assignment and the lead of private organizations. Moreover, due to the different regulatory environment of the electronic certificate from electronic B/Ls, the rules governing cargo insurance differ.

³⁴⁰ Ibid., on p. 254.

³⁴¹ See Law Commission, Insurance Contract Law: Post Contract Duties and Other Issues (CP No 201, 20 December 2011), available at https://s3-eu-west-2.amazonaws.com/lawcom-prod-storage-11jxou24uy7q/uploads/2015/03/cp201_ICL_post_contract_duties.pdf, para 16.40: “More recently, there has been a move away from paper documents altogether. We were told by a leading cargo insurer that under their contractual terms of insurance the assured includes not only the name stated in the schedule but also ‘any party to whom insurable interest in the subject matter insured hereunder passes under a contract of sale.’ This means that the insurance is assigned automatically as soon as insurable interest in the goods passes. All that is required is that the assignor provides the assignee with details of the cover.”

³⁴² See *Strathlorne Steamship Co v. Baird & Sons* 1916 SC (HL). on pp. 134, 136.

IV. Maritime Transport

One of the biggest step forward in the shipping industry regarding the use of electronic documents in recent years is the addition of an electronic B/L clause in BIMCO's New York Produce Exchange form time charter party in 2015. This default clause not only symbolize a wider acceptance of e-commerce in the shipping industry but also reflects the attitude of the shipping industry to the new developments in relevant branches.

The new clause consists of three subclauses. The first subclause grants charterers the right to ask for an electronic bill. The second subclause ensures that ship owners will sign up to the relevant system under which charterers may request for the issuance of electronic B/Ls. However, the charterer must bear the expenses from the necessary operations. This subclause further regulates that the trading systems must be approved by the International Group of P&I Clubs. BIMCO designed this to avoid jeopardizing the P&I cover,³⁴³ but this rule will also grant the standards of the P&I Clubs to "secure" system a more important status. The last subclause is an exemption clause, which indemnifies the owner from additional liabilities arising from the use of the systems.

V. Summary

The regulations in the four areas have been actively and negatively influenced by the public law. For example, the definition of electronic record,³⁴⁴ electronic signature,³⁴⁵ and other concepts in the eUCP, share a strong resemblance to the definitions set out in the UNCITRAL Model Law on Electronic Commerce. Bolero employed the method of novation, which is allowed under many jurisdictions, to solve the problem of negotiable electronic B/Ls. However, these regulations do not always conform to public laws. In some cases, complying

³⁴³ See <https://www.incegd.com/en/knowledge-bank/bimcos-new-charterparty-clause-for-electronic-bills-of-lading>

³⁴⁴ "Electronic record" in the eUCP is defined as "data created, generated, sent, communicated, received or stored by electronic means that is capable of being authenticated as to the apparent identity of a sender the apparent source of the data contained in it, and as to whether it has remained complete and unaltered, and is capable of being examined for compliance with the terms and conditions of the eUCP credit."

³⁴⁵ "Electronic signature" in the eUCP means "a data process attached to or logically associated an electronic record and executed or adopted by a person in order to identify person and to indicate that person's authentication of the electronic record."

with the distinct statutes in different jurisdictions is impossible, so the regulators have to create their own rules to provide certainty. The obvious evidence is the “message as evidence” clause in the Bolero Rulebook. This clause requires users not to challenge the admissibility of the electronic evidence before both state and private courts. In some cases, the private regulations have been deliberately omitted to regulate certain issues to avoid the unnecessary hurdles for the regulatees. The bylaws in the cargo insurance branch and the eUCP created by the ICC have decided not to lay down requirements for electronic signature despite some public laws that set stringent rules governing trust service and electronic identification.³⁴⁶ Private regulators made these decisions based on the factual status of the regulatory environment and believed that this step will be beneficial to the regulatees. To avoid conflict with public laws, the regulations in the mentioned areas include the element of democracy or alternative dispute resolution so that regulatees will have an opportunity to raise their voice. Consequently, a set of rules of conduct that is inconsistent with the public laws gained wide acceptance throughout the industry and functioned parallel to the public laws.

In addition, the regulations in different areas showed a certain degree of interplay with each other. Although the rules in respective branches are produced independently, these rules have also drawn reference from the related branches and considered the possibility of compatibility. Some of the references are quite obvious. The BIMCO electronic B/L clause, for example, is clearly devised based on the trading system of Bolero and essDOCS and has considered the standards of the P&I Clubs regarding trading systems.³⁴⁷ The requirements in the second subclause, which requires ship owners to subscribe and use the charterers’ chosen electronic B/L “platform” and stipulates that these “platforms” should be approved by the P&I Clubs, is the straightforward proof of this reference.³⁴⁸ The eUCP Regulation drafted by the ICC has also based the rules of document presentation on the functioning mechanism of the Bolero system. When explaining the beginning of the time for examination of the presented

³⁴⁶ In the ICC Guide to the eUCP, a warning is given, saying that some interpretations of the European Electronic Signatures Directive can result in the imposition of a greater degree of security with regard to signatures than imposed by the eUCP. See Byrne, James E., and Dan Taylor. ICC Guide to the eUCP: Understanding the Electronic Supplement to the UCP 500. ICC Publ., 2002, on pp. 45–46.

³⁴⁷ See subsection 4.

³⁴⁸ See BIMCO electronic B/L clause, subclause (b), available at <https://www.bimco.org/contracts-and-clauses/bimco-clauses/electronic-bills-of-lading-clause>.

documents, the ICC Guide to eUCP provides the example of how the Bolero system operates to create and send notices of completeness.³⁴⁹ The presentation of documents of the world's first L/C subject to the eUCP is completed by Bolero. The other kind of interplays between the relevant regulation areas is inconspicuous. The drafting committee of one regulatory branch can include the delegates from other branches to directly gather opinions or the regulators from different branches can share a common business partner to become connected. Identifying solid evidence for these subtle connections is difficult because the private regulators protect their privacies. Nonetheless, traces can support the existence of this kind of interplay. One of the traces can be found in the cooperate structure of the Bolero. As mentioned in the above section, BIL was co-founded by the SWIFT and the TT-Club. Both companies are important players in the banking and insurance branches. The former is a bank-owned cooperative that provides secure financial messaging service for over 11,000 banking and security organizations, whereas the former provides insurance services for ship operators, ports, and transport firms across the world.³⁵⁰ The establishment of Bolero is basically the cooperation of banks and insurance providers. During the time when the two companies held the BIL, the Bolero was linked with their respective business partners and the Bolero's Core Messaging Platform and Title Registry were designed.³⁵¹ Until today, SWIFT has maintained a close relationship with the ICC and both jointly set standards for important practices in the banking area.³⁵² The interplay of regulations in related areas created a high degree of compatibility among each other, thereby enabling the electronic documents used in the related branches to circuit freely across branches and national borders. The insurance certificates issued by the Fonterra will be accepted by banks that issue electronic L/Cs subject to the eUCP without imposing EU's strict electronic identification rules on the presented documents.

Aside from the mutual reference as a means of cooperation, competition is a common

³⁴⁹ See Byrne, James E., and Dan Taylor. *ICC Guide to the eUCP: Understanding the Electronic Supplement to the UCP 500*, ICC Publ., 2002, on p.92.

³⁵⁰ See from their websites, available at <https://www.swift.com/about-us/discover-swift> and <https://www.ttclub.com/about-us/>.

³⁵¹ Eckardt, Tobias. *The Bolero Bill of Lading under German and English Law*, Sellier, European Law Publ., 2004, on p. 21.

³⁵² The SWIFT and the ICC have jointly designed the new rules for Bank Payment Obligation (BPO) in international trade. Available at: <https://iccwbo.org/media-wall/news-speeches/swift-and-icc-collaborate-on-enhanced-rules-and-tools-for-trade-finance/>

element in the private regulatory system. The empirical study indicates that the rules produced by each electronic data processing platform competes with each other to an extent. The three data processing companies analyzed in this doctoral thesis have produced their own rules to address several issues, such as working mechanism, allocation of responsibility, and governing laws. Given the overlap among their businesses, the users of these platforms will have the opportunity to choose between the regulations. This provision typically motivates companies to introduce convenient and practical regulations and dedicate additional efforts to satisfy the needs of the regulatees.

VI.

Year	Event	Impact
1994	UCP 500	Teletransmission can be used in L/C
1995	Bolero Project	Launching of the EC
1998	BIL	Joining of SWIFT and TT Clubs
1999	Bolero Rulebook	The Bolero Rulebook 1999 was created
2002	eUCP Version 1.0	Establishment of rules for electronic L/C
2005	essDOCS	Second company for paperless trade
2006	Lloyd's bylaw	Lloyd's rule for electronic certificate
2007	eUCP Version 1.1	Slight variations
2010	First electronic L/C	Completed by the Bolero
2010	P&I Clubs approval	P&I Clubs approved Bolero and essDOCS
2014	Bimco e-B/L clause	Acknowledge Bolero, essDOCS and e-Title
2015	e-Title TM	Third company for paperless trade
2015	P&I Clubs approval	P&I Clubs approved e-Title TM

2017	Lloyd's e-Certificate	The guidelines for e-Certificate was developer
2019	eUCP Version 2.0	Addition of two new articles

(Memorabilia to reveal the connections between different regulations)

C. Public and Private Interplay

The last section has pointed out the advantages and benefits of the private regulatory system. However, these provisions do not mean that public power should sit idle. Instead, the private regime simultaneously takes over the tasks of public authority swallows a “poisoned pill.”³⁵³ The market mechanism alone cannot resolve the problems associated with the private regulatory system. To avoid the possible risks incurred by the private regulatory system, public power should play the role of a monitoring agent. This section initially focuses on the role of public authority as a monitoring agent in the private regulatory system. The tasks of the monitoring agent includes improving transparency, eliminating externality, encouraging competition, and providing guidance to the private regime. Then, the future of the privately created norms is discussed. The conditions under which the private norms will be converted to public goods are explained as well.

I. Why Public Interference still Matters

If privately created norms can build their own legitimacy and function parallel to public laws, then how should public authorities position themselves? This question has been frequently asked by legal scholars as the regulating power shifts from the sovereign states to private actors.³⁵⁴ To provide an answer to this question, some scholars support the idea of completely abandoning public interference.³⁵⁵ This small group of scholars believed that

³⁵³ Teubner, Gunther. “*Contracting worlds: the many autonomies of private law.*” *Social & legal studies* 9.3 (2000), on pp. 399–417.

³⁵⁴ Bruner, Christopher M. “*States, Markets, and Gatekeepers: Public-Private Regulatory Regimes in an Area of Economic Globalization.*” *Mich. J. Int’l L.* 30 (2008), on p. 132.

³⁵⁵ See for example Hall, Rodney Bruce, and Thomas J. Biersteker. “*The emergence of private authority in the international*

private actors can craft detailed norms under the market mechanism and gain acceptability through general consensus instead of through government sanction.³⁵⁶ These scholars built their arguments on the empirical results that laws can be spontaneously developed³⁵⁷ and instead of using the state's coercive power to guarantee enforcement, other external powers (e.g., programmed code or reputation mechanism) can be used to implement legal decisions and deter non-compliance behaviors.³⁵⁸ Private actors are assumed to create more effective and legitimate rules that operate at a lower cost than publicly created laws.³⁵⁹ In addition, due to the advantages and self-sufficient characteristic of the private regulatory regime, intervention from the public area is dispensable. Given that public law will always try to crowd out or undermine the private norms, the interference from the public side can even be deleterious for the private ordering.

Opposite to this complete opt-out of public interference approach, more members of the legal community suggest a public-private partnership. This group of people trusts public participation not only because involving the expertise and interest of the public into the rule-making can improve the effectiveness and the legitimacy of the rules³⁶⁰ but also because the privately created norms have corresponding restrictions, which can be observed from three aspects.

First, creating and enforcing norms only by private actors are not easily achievable goals because the successful creation and enforcement of private norms requires strict preconditions. According to the Nobel Prize winner Elinor Ostrom, the essential preconditions for a collective

system, CAMBRIDGE STUDIES IN INTERNATIONAL RELATIONS 85 (2002): 3–22 or Peters, B. Guy, and John Pierre. *Governance without government? Rethinking public administration*, Journal of Public Administration Research and Theory 8.2 (1998): 223–243; Lessig, Lawrence, *Code is law*, The Industry Standard 18 (1999).

³⁵⁶ See Williamson, Oliver E. *The mechanisms of governance*. Oxford University Press, 1996. Williamson believed that the power of competition in a free market can coordinate the actors' behaviors; also Macey, Jonathan R. "Public and private ordering and the production of legitimate and illegitimate legal rules." *Cornell L. Rev.* 82 (1996): 1123.

³⁵⁷ See for example Robert, Ellickson. "*Order without Law—How Neighbors Settle Disputes.*" (1991). The author observed that the community of cattlemen had generated a set of private norms without any government intervention. This sort of phenomenon can be observed even more frequently on the international sphere, see Cutler, A. Claire, Virginia Haufler, and Tony Porter, eds. *Private authority and international affairs*. Suny Press, 1999.

³⁵⁸ See Stringham, Edward. *Private governance: Creating order in economic and social life*. Oxford University Press, USA, 2015, 39–60. In this book, private actors will not risk their reputation for opportunistic behavior such as challenge the private norms or defy the decision of a private committee.

³⁵⁹ See Lisa Bernstein, *Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms, and Institutions*, 99 MICH. L. REV. 1724 (2001) and Eric A. Posner, *Law, Economics & Inefficient Norms*, 144 U. PA. L. REV. 1697, 1711–25 (1996).

³⁶⁰ Reinicke, Wolfgang H., and Daryl Copeland. "*Global public policy: governing without government?*" *International Journal* 53.3 (1998), at 597.

to act for common solutions include four building blocks.³⁶¹ These blocks include the characteristics of the problem, types of private actors, attributes of group structure, and the multiple rules that affect collective action situation. In other words, the objective, homogeneous level of the actors, size of the community, and regulatory environment will influence the possibility of a common private solution. If any of the four blocks is undesirable or if any incompatibility exists, then the collective action for a solution is unlikely to occur. These burdensome prerequisites demonstrates the lack of empirical examples of purely private regulatory regimes.³⁶² Therefore, the applicability of private regulatory regime under some circumstances does not prove universality under all circumstances.

The second concern about the absolute private regulation is the market failure. The advocates of absolute private regulation build their arguments on the market mechanism and healthy competition. However, occasional market failure should be faced at the same time. Francis Bator first defined market failure in the late 1950s as the “failure of a more or less idealized system of price-market institutions to ‘sustain’ desirable activities or to estop ‘undesirable’ activities.”³⁶³ This statement provides two information. First, the theoretical market model is different than the real market. The latter is influenced by many factors other than price, which makes the market less competitive. Monopoly, for instance, is a common phenomenon that distorts the ideal price mechanism and hinders competition. Although competition laws exist to prevent monopoly and encourage competition, the limitation lies when facing state monopoly or international corporations. In the case of utilizing private regulatory systems in digitalization of shipping, the P&I Clubs and the BIMCO have used their dominant market power to endorse electronic document processing systems. This endorsement will improve the acceptability of the endorsed system but will also be a disaster for the

³⁶¹ Ostrom, Elinor. “*Context and collective action: Four interactive building blocks for a family of explanatory theories.*” Unpublished manuscript (1999).

³⁶² Pure or absolute private regulation regimes are understood as regulation regimes without state involvement. Many private regulation regimes exist in which no governmental actors are represented, but most of them still include a different level of governmental involvement. The Basel Committee, for example, is a global standard setter for the prudential regulation of banks. It is known as a non-state organization, but it also comprises banking supervisors from the G10 countries.

³⁶³ Bator, Francis M., *The anatomy of market failure*, *The Quarterly Journal of Economics* 72.3 (1958), on p. 351. Bator further explained that “the desirability of an activity, in turn, is evaluated relative to the solution values of some explicit or implied maximum welfare problem.”

unendorsed ones. Without doubt, such behavior will reduce competition to an extent, but the conduct of the P&I Clubs and the BIMCO hardly falls within the jurisdiction of competition law. The full-competitive market wherein private regulation was built can be an ideal non-existent model. Second, if the market fails and undesirable activities occur, then the market cannot correct these undesirable activities. Taking again the monopoly as an example, once a monopoly is built, the market alone cannot dissolve it. In this regard, to build a competitive market will inevitably requires public interference to maintain a healthy and competitive environment.

Some scholars argue that the providence of competitions should not be counted as public interference but as a necessary commercial environment that should be maintained by the government.³⁶⁴ Even if this argument is true, the fact that private norms fail to take necessary social responsibilities cannot be justified. The concept of market failure today is interpreted by economists in a simpler way, that is, “the failure of the market to bring about results that are in the best interests of society as a whole.”³⁶⁵ This new understanding alludes that the market will not care much about common goods. The basic logic of the market is that the pursuit of self-interest can promote general welfare.³⁶⁶ When an individual is concentrated on his own interest and tries to maximize only his gain, the tragedy of the commons will inevitably arise.³⁶⁷ Later studies show that users can self-organize and devise institutions to avert the overexploitation of open-access resources. However, scholars also admitted that extensive free-riding is predicted in most efforts to self-organize and govern a resource as a community of users.³⁶⁸ In short, under-regulation is a frequent phenomenon when private actors are to take actions for public goods. This critique of private governance is not a justification for a purely

³⁶⁴ See Lemke, Thomas, *The birth of bio-politics’: Michel Foucault’s lecture at the Collège de France on neo-liberal governmentality*, *Economy and society* 30.2 (2001), on pp. 190–207. In this article, government “becomes a sort of enterprise whose task is to universalize competition and invent market shaped systems of action for individuals, groups and institutions.”

³⁶⁵ Marciano, Alain, and Steven G. Medema. “Market failure in context: introduction.” (2015), on p. 1.

³⁶⁶ See Smith, Adam, *The Wealth of Nations*, Courier Dover Publications, 2019.

³⁶⁷ Hardin, Garrett, *The tragedy of the commons*, science162.3859 (1968), at 1244. Hardin used the example of herdsman and public pasture. If the pasture is open to all, then a rational herdsman will exploit the pasture to the most by putting out as many cattle to the pasture as possible without worrying about overgrazing. The reason is that the cost of overgrazing is shared by all herdsman, but the utility of rising the additional animals belongs to the herdsman alone.

³⁶⁸ See Olson, M., *The Logic of Collective Action: Public Goods and the Theory of Groups*, Cambridge, MA: Harvard University Press, 1965.

centralized public control of the common resources. In fact, in-depth analyses have shown that centralized public administration has accelerated the overuse of common goods.³⁶⁹

The third concern is about justice. When identifying the criteria for legal validity, different schools of thought have given different answers. According to natural law theory, the idea of justice has always occupied a central position. As the old legal maxim says, “*Ius est ars boni et aequi*,” which means that the law is the art of goodness and equity. The natural law theory assumes that law possesses some general characteristics that will guide human to do good rather than simply tell people what to do and what not to do. On addition, given that all legal problems are problems of distribution, justice is the demand for equal distribution.³⁷⁰ Legal theorist Ronald Dworkin stated that “According to law as integrity, propositions of law are true if they figure in or follow from the principles of justice, fairness, and procedural due process that provide the best constructive interpretation of the community’s legal practice.”³⁷¹ The sociology of law sees justice as the provider of contingency for the legal system. Justice is a norm directed to all of the law’s programs that can represent the unity of the legal system.³⁷² Positivists refuse to accept the *a priori* principle of justice as a guide for legislation because they do not believe that justice can be a yardstick to judge a law and is merely an expression of emotion. Hans Kelsen’s Pure Theory of Law asserts that the science of law is neither moral philosophy nor social theory but a specific dogmatic theory in normative terms. Kelsen’s theory frees the science of law from any moral or political ideology.³⁷³ Nonetheless, legal positivists agreed that human actions can be interpreted as a coherent whole of meaning and motivation as they reckon the presence of a “legal order.” To that extent, “justice, in the sense of rationality or regularity, can be said to be ‘constitutive’ of the concept of law.”³⁷⁴ Despite the different views toward the conception of justice, the legal community believe that an intricate connection exists between justice and law. However, when private regulators are developing rules, they

³⁶⁹ See National Research Council. 1986. Proceedings of the Conference on Common Property Resource Management. Washington, DC: National Academy Press; and Ascher, W. 1995. Communities and Sustainable Forestry in Developing Countries. San Francisco: ICS Press.

³⁷⁰ Ross, Alf. *On Law and Justice*, University of California Press, 1959, on p. 268.

³⁷¹ Dworkin, Ronald. *Law’s Empire*. Harvard University Press, 1986, on p.225.

³⁷² Luhmann, Niklas, Fatima Kastner, and David Schiff, *Law as a social system*, Oxford University Press on Demand, 2004, p.23.

³⁷³ See Kelsen, Hans, *General Theory of Law and State*, Routledge, 2017.

³⁷⁴ Ross, Alf. *On Law and Justice*, University of California Press, 1959, on p.280.

usually focus on increasing the efficiency of business and lowering transaction costs. The idea of justice always stays on the sideline. The commonly observed phenomenon in the private adjudication is the lack of transparency, appealing process, judicial review, and media supervision (i.e., things that the constitutional states obtain to guarantee the justice of law). The private regulators often claim that they have enrolled other participants in the regulatory regime and produced regulation for voluntary adaptation, so the interest of every participant is balanced and, hence, just. However, the initial regulation can become unjust one after the regulator obtained the default legitimacy. Moreover, the privately made rules in real life is commonly associated with market opportunities, and rejecting these rules means being crowded-out of the market. In this sense, the participants, or at least the late-comers, have no choice but to comply with the already accepted rules, even when these rules are unjust. In light of this deficiency, an external monitoring power can effectively constraint the abuse of regulatory power and rebalance the interest of participants when set up correctly.³⁷⁵

To sum up, a private regulatory regime cannot be formed under all circumstances. Whether the private regulatory regime can be established depends on the subject, homogeneous level of the regulators, size of the regulation community, and regulatory environment. Observing a community fail to reach consensus on a solution is not surprising, even if the solution will improve the situation of every member in the community. In such a case, public interference is necessary to either guide the private actors or take over the responsibility. When the regulation has a social characteristic, public interference still matters because private regulatory regimes are unfit to provide public goods in most cases. Lastly, justice inside the regulation regime should not be left unattended, and public monitoring can enhance the justice system inside a private regulatory regime.

II. The Extent of Public Interference

After demonstrating the necessity of public interference, this section aims to determine

³⁷⁵ See Resnik, David B., *Setting Biomedical Research Priorities: Justice, Science, and Public Participation*, Kennedy Institute of Ethics Journal, vol. 11 no. 2, 2001, pp. 181–204. This article confirms that public input, not only governmental interference, can effectively adjust the priority setting of biomedical R & D priorities, allowing much attention to public interests.

the adequate extent of public interference in the regulation of digitalization of shipping documents. Typically, the public–private cooperation model, regardless if created through cooptation, delegation, or co-regulation, can be classified into three types according to the amount of public interference involved: management-based,³⁷⁶ outcome-oriented,³⁷⁷ and process-oriented regulations³⁷⁸. The public involvement in the three types of regulation is arranged in descending order. The subsequent discussions introduce the three types of regulations. This doctoral thesis intends to determine the adequate level and mode of public interference for regulating the digitalization of maritime transport documents.

1. Management-Based Regulation

Management-based regulation is the type of regulation that involves the most public attention among the three. This regulation has been widely implemented in many areas, such as food safety, industrial security, pollution prevention, and so on. This type of regulation normally engages the regulatees in the regulation-making process after the framework and regulatory goals are set up by the public regulatory authorities. The regulatee is responsible for making the detailed plans to achieve the goals within the framework. Specific guides or technologies can be provided by the public regulator,³⁷⁹ but the regulatee is free to devise an own regulatory plan. After making the regulatory plan, the public authority will check the feasibility of the plan and decide whether to pass it or not. If the plan is approved, then a public agency will inspect the implementation of the plan. In the food industry, the administration will set the goal of producing qualified and safe food. To help achieve this goal, the administration will draft a framework requiring food processors to report all steps of their processes, as well as the potential hazards that are likely to occur in each step. Then, the food processors are

³⁷⁶ Coglianese, Cary, and David Lazer, *Management-based regulation: Prescribing private management to achieve public goals*, *Law & Society Review* 37.4 (2003), on pp. 691–730.

³⁷⁷ See for example Gunningham, Neil, *Integrating management systems and occupational health and safety regulation*, *Journal of Law and Society* 26.2 (1999), on pp. 192–214; Coglianese, Cary, and David Lazer, *Management-based regulation: Prescribing private management to achieve public goals*, *Law & Society Review* 37.4 (2003), pp. 691–730.; Kaplow, Louis, *Rules versus standards: An economic analysis*, *Duke Lj* 42 (1992), 557–629.

³⁷⁸ See Braithwaite, John, and Ian Ayres, *Responsive Regulation: Transcending the Deregulation Debate*, Oxford Socio-Legal Studies. Oxford University Press –February 16, 1995, p.216.

³⁷⁹ See Lewin, Helen, *Australian Law Reform Commission's Report on Australian Privacy Law for Your Information: Australian Privacy Law and Practice*, Keeping Good Companies (2008).

responsible for crafting a detailed plan to monitor, evaluate, and eliminate the hazards. The plan will then be forwarded to a public agency that has the necessary professional knowledge for review. Once passed, the plan officially becomes the regulation in this food processing branch, and the administration will only keep watch on the compliance on an irregular basis.

The management-based regulation approach invites public intervention in the planning and the implementation stage of the regulation-making process. By making the general criteria for each plan and specifying the elements that each plan should possess, the regulatee is compelled to craft the details of the regulation in a confined manner. After the regulation enters into effect, the public authority will also surveil the implementation of the regulation. In some cases, the auditor will require the regulatee to routinely produce documentation to secure compliance. In other cases, documentation is not mandatory, but unannounced inspections or other surveillance methods will be conducted. The approval or ratification by the government is a common practice but not a necessity. Sub-state authorities and the likes can also provide the regulation with sufficient acknowledgement as long as they have the credibility to examine the plans made by the regulatee. In summary, this regulation approach grants the regulatee a certain level of flexibility to craft its own control or prevention strategy, and thus utilizes the advantage of the regulatee's understanding of the production process. This approach is advisable for regulations in intricate production branches where the production is complicated and the products have a massive impact on the society. The challenges for this type of regulation lie with the design and monitoring capacity of the public regulator. The regulator must be aware of a "good" result of the regulation. If the public regulator is unable to devise a "good" framework or monitor the compliance of the regulatee, then this approach will produce unsatisfactory results.

2. Outcome-Oriented Regulation

The outcome-oriented regulation is similar to the management-based regulation in terms of setting regulatory goals and monitoring the compliance of the regulation. However, the two approaches are different in terms of the rule-making process. Contrary to the

management-based regulation, the outcome-oriented regulation approach does not enumerate specific steps and methods that the regulatee must adapt. Instead, this approach only focuses on the problem identification, objective description, and compliance evaluation.³⁸⁰ This setup imposes the objective setter with less informational burden and regulatory costs. As long as the objective setter can identify what constitutes a good outcome, it can delegate the rule-making to the regulatees or even to independent third parties. This approach is suitable for situation with increasing complexity and constantly changing standards. Take the animal welfare regulations for example, organic operators in Europe are facing numerous regulations with detailed and prescriptive standards.³⁸¹ Although these operators are striving to meet these standards, other indicators are being created by animal scientists and ethologists to diagnose the physical and emotional state of animals. The constantly emerging prescriptive regulations are confusing for the operators and sometimes too resource-demanding for practical implementation.³⁸² To simplify the rules and the implementation, another attempt was made by the German Bioland Animal Health Management Handbook.³⁸³ This work developed several checkpoints for common livestock (e.g., health, feeding, and living), all of which were attached with lively pictures. The farmers can measure their animals against the handbook and do whatever they see fit to achieve the goals. If the farmer fails to maintain the animal in a good state, then the inspector will issue a warning to the farmer. Sanctions will follow if the farmer shows no signs of improvement. Similar approach can be applied in other areas, including aviation security, off-shore drilling, and pharmacy.

The advantage of this regulation approach is that it leaves broad space for private actors to construct solutions that can be tailored to their individual circumstance. This advantage is practical for areas where complexity and new technologies are continuously developing. New technologies and innovations will not be disturbed because the public regulator will not set hard delineations for the regulatee with this regulation approach. The industry can accordingly

³⁸⁰ Parker C, *Reducing the risk to policy failure: challenges for regulatory compliance*, OECD, 2000, on p. 55.

³⁸¹ See Schmida, O, and S. Knüttib. *Outcome-oriented approaches for regulating animal welfare in organic farming*, 2012.

³⁸² See B. Forkman and L. Keeling, *Assessment of Animal Welfare Measures for Layers and Broilers*, Welfare Quality Reports No. 9, Cardiff University, 2009, available at <http://www.welfarequality.net/en-us/reports/>.

³⁸³ Bioland, *Bioland Animal Health Management Handbook* (in German). 3rd edition, 2011, available at www.bioland.de.

apply the suitable technologies. However, this approach still has shortcomings. First, this approach requires a thorough understanding of the regulated issue and aims to reveal who among the regulatees complies with what while stressing out the possibilities of improving the existing regulatory elements.³⁸⁴ To meet this end, the regulator must have the proper tools and avenues to discover what is an adequate regulatory outcome and if the private actors can accomplish it. For both targets, the regulator should be familiar with the problem and the industrial branch. If the regulator does not have the required data or tools to analyze the branches, then the status will be problematic. Second, the regulator must have the capacity to collect the outcomes to check compliance. The regulator must be capable of “determining whether the regulatory design is having its desired effect on the targeted population.”³⁸⁵ This limitation can be demanding for the regulator because the practice of social activities in many networks are becoming increasingly difficult to evaluate and new technologies are being introduced. In the case of the *Deepwater Horizon* oil spill, the governmental actor failed to examine the compliance of the offshore industry due to its lack of expertise to do so. These governmental employees were experts in oil drilling when they were hired, but the depth of the drilling field tremendously increased and moved from land to sea after decades of development. Consequently, the governmental agent became no longer capable of monitoring the activities of the industry and led to the worst ecological disaster in the history of the US.³⁸⁶

3. Process-Oriented Regulation

The process-oriented regulation is a broad concept. This regulation is a quick fix when the law fails to respond to the social feature of organizations to avoid accountability in the contemporary society.³⁸⁷ The process-oriented regulation usually comes with different shapes and colors. Gilad summarized that system-based, enforced self-regulation, principle-based and

³⁸⁴ Tawhid, Rasha et al. “Towards outcome-based regulatory compliance in aviation security.” Requirements Engineering Conference IEEE, 2012.

³⁸⁵ C Parker, ‘Reinventing Regulation within the Corporation: Compliance Oriented Regulatory Innovation’ (2000) 32 Administration and Society, on p. 537.

³⁸⁶ See for example Mills, Russell W., and Christopher J. Koliba. *The challenge of accountability in complex regulatory networks: The case of the Deepwater Horizon oil spill*, Regulation & Governance 9.1 (2015), on pp. 77–91.

³⁸⁷ Dan-Cohen, Meir. *Rights, persons, and organizations: A legal theory for bureaucratic society*. Vol. 26. Quid Pro Books, 2016, on pp. 14–15.

meta-regulations are derived from the prime idea of process-oriented regulation.³⁸⁸ Parker stated the process-oriented regulation is a dynamic regulatory institution where laws, policies, and other regulatory tools aim to catalyze solutions and foster compliance.³⁸⁹ In this study, the specific type of process-oriented regulation thoroughly investigated is the meta-regulation.

The concept of meta-regulation is first introduced by Grabosky,³⁹⁰ who asserted that the public regulator in the new century should no longer focus on implementing rules and monitoring impact but on oversighting and managing contracts. He named this new approach “meta-monitoring.” After posing this concept the content of meta-monitoring has expanded over time,³⁹¹ but the core remains that regulators and rulemakers will evolve through experience and evaluation of private industry self-regulation. Today, meta-monitoring has been replaced by meta-regulation, which regulates not only contracts but also corporates’ internal mechanisms. This type of process-oriented regulation is the regulation of self-regulation responsibility.³⁹² The attention of the regulator should neither be put on the regulation design, nor on the compliance of the regulatees. Instead, the regulator should only monitor the capacity of the regulatee’s internal responsibility process to determine if the regulatee has implemented a mechanism to take over social responsibility and if this mechanism is a well-functioning one. This approach is suitable for circumstances where the regulators have no idea of what constitutes the right processes and results. A typical feature of meta-regulation is to require factories to perform environmental impact assessments or local community consultation before manufacturing. This kind of preprocedural approach is commonly used in the US and the UK if one wants to apply for a manufacturing license. Another way to encourage private actors to establish mechanisms and deal with relevant social issues is by giving incentives and not forcing them to be responsible. In the stock market, numerous companies voluntarily disclose

³⁸⁸ See Gilad, Sharon, *It runs in the family: Meta-regulation and its siblings*, Regulation & Governance 4.4 (2010), on pp. 485–506.

³⁸⁹ See Parker, Christine. *The open corporation: Effective self-regulation and democracy*, Cambridge University Press, 2002.

³⁹⁰ Grabosky, Peter N., *Using non-governmental resources to foster regulatory compliance*, Governance 8.4 (1995), on pp. 527–550.

³⁹¹ See for example J. Braithwaite, ‘*Meta-risk management and responsive regulation for tax system integrity*’, Law and Policy 25 (2003), on p. 1; J. Black, ‘*The emergence of risk-based regulation and the new public risk management in the United Kingdom*’, Public Law Autumn (2005), on pp. 512, 543–5; M. Power, *The Risk Management of Everything: Re-thinking the Politics of Uncertainty* (London: Demos, 2004), p. 21.

³⁹² *Ibid.*, on p. 255.

information to the public beyond governmental requirements. Such information may include social responsible practices, information on new products, trend analyses, and company strategies. For instance, the US Securities and Exchange Commission has set detailed standards for this kind of information disclosure.³⁹³ The standards clearly states that no sanction will be imposed for failure to provide all or any part of the requested information.³⁹⁴ However, many corporations still disclose information in accordance with the statute to send signals to the stakeholders and relevant parties that the company is in good condition.³⁹⁵ As a reverse impact, the companies that choose not to disclose information is perceived as having latent risk and the company's value on the market decreases. In this way, the regulatee will voluntarily reveal information regarding the fulfillment of social responsibilities, corporate strategies, future plans, and so on. The regulator can acquire additional information without promulgating prescriptive rules to force the regulatees to disclose information and verify the integrity thereof.

In summary, the meta-regulation of process-oriented regulation is a superior alternative when the regulator has a limited understanding of the right process and results or when non-compliance is prevalent and institutionalized. However, the major disadvantages to the success of this regulatory model are the lack of a stable regulatory agenda, long-term support, or a supportive political environment.³⁹⁶

III. Appropriate Regulation Approach for Digitalization of Shipping Documents

1. Analysis of the Three Regulation Approaches

After introducing the three regulation approaches with different levels of public interference, this doctoral thesis shall determine if any of these three regulation approaches is suitable for the field of digitalization of shipping documents. Before jumping to the conclusion,

³⁹³ See Rodríguez, Linda C., and Jane LeMaster. "Voluntary corporate social responsibility disclosure: SEC "CSR Seal of Approval"." *Business & Society* 46.3 (2007), pp. 370–384.

³⁹⁴ See Part B of the SECURITIES AND EXCHANGE COMMISSION Washington, D.C. 20549.

³⁹⁵ Scott, T. W. (1994). *Incentives and disincentives for financial disclosure: Voluntary disclosure of defined benefit pension plan information by Canadian firms*, *The Accounting Review*, 94(1), on pp. 26–43

³⁹⁶ *Supra* note 119, on p. 502.

knowledge on the apt domains and regulatory environments for the respective regulation approach should be acquired.

As presented in the diagram below, the management-based regulation is advisable for the type of domain where high externality exists. Food industry, pollution prevention, and industrial security are the common fields where the management-based regulation approach is employed. In these domains, a minor failure or mistake can influence the life of millions. Therefore, inviting the highest level of public intervention and monitoring at the planning and implementation stages is reasonable. At the same time, putting the regulated area under stringent surveillance will bring about high information burden and monitoring costs for the regulator, hence, the regulation will only be worthwhile if the latent damage is tremendous. Despite the complicity of the production or processing procedures, the technologies applied in these industries will not be altered daily. Changes in these industries are always step by step, replacing one production line by another. This condition leaves time and space for the regulator to learn about the environment and acquire necessary tools to collect information. As long as the regulator obtains the ability of continuous learning and the techniques to keep track of the regulatees' compliance level, the management-based regulation can handle the regulated area.

For industries with low externality and few complicated procedures, the outcome-oriented regulation approach is suitable. The typical fields where the outcome-oriented approach is employed includes animal welfare, agriculture, entertaining, environmental protection, poverty elimination, and so on. These fields share the common ground that various methods are necessary to reach the final objective, and the standards to decide whether these methods are efficient or not are subjective rather than objective. Hence, setting up goals with measurable results for the regulatee is more practical than regulating the behaviors. In exchange, the regulatee can adopt whichever method he sees fit to achieve the result. The information burden and monitoring costs for the regulator in this approach are lower than the management-based approach. However, the real challenge for the regulator is to set up achievable goals for the regulatee. This task requires the regulator to be familiar not only with the problem but also with the industry. An inadequate goal can distort the market and bring bad influences. One recent

example is the Chinese environmental protection policy. As the air condition in China worsens, the Chinese government has set the goal of reducing the emission of contaminator by certain percentage.³⁹⁷ Subsequently, the local government must be responsible for cutting down the emission of sulfur dioxide and ammonia by 10% to 20%, depending on the air quality. However, this goal is too ambitious to realize. As a result, when the local governments spare no effort to achieve the goal, they have to shut down tens of thousands of local factories.³⁹⁸ Otherwise, the task cannot be fulfilled. This case demonstrates that knowing the problem is not enough. The regulator must also be acquainted with the industry to be able to set up an achievable objective based on full-scale data and careful evaluation. Accountability is also essential in this approach. The responsibility must be coupled with the corresponding regulatee so that the incentive will encourage the regulatee to take action and bear the responsibility for failures. In short, this outcome-oriented approach is suited for areas with low externality and numerous processing methods.

As discussed in the previous section, the last regulation approach is a special type of process-oriented regulation called meta-regulation. This type of regulation neither takes notice of the process nor the outcome of the regulation. Instead, regulatees are held accountable for the incremental improvement of their internal systems. The reason this regulation approach is getting increasingly popular is that no one can be certain about the development of the industry anymore, especially in a fast-changing environment. Nowadays, predicting the human behavior model and technological development in the next three years will be difficult, almost impossible. Many traditional fields and disciplines start to cooperate and converge to generate new theories each day. Innovations in irrelevant fields can now be combined and to cause a revolutionary transformation in the industry. Imagine being a manager of a local supermarket in Seattle or Osaka. Three years ago, the first concern would be how to make efficient workplans for the cashiers and other employees, how to motivate them, how to set appropriate incentives, how to prevent theft and robbery, and how to pay tax. Today, the manager will be

³⁹⁷ See the “12th Five-Year Plan of the Guideline for Control of Major Contaminators”(十二五主要污染物总量控制规范编制技术指南), available at <https://wenku.baidu.com/view/006818d184254b35eefd3463.html?re=view&pn=50>

³⁹⁸ See the news at <https://www.forbes.com/sites/trevornace/2017/10/24/china-shuts-down-tens-of-thousands-of-factories-in-widespread-pollution-crackdown/>.

sitting in front of a computer screen to manage his shop via programs and codes.³⁹⁹ The rules for employees and the management skill that used to be the core factor of business success are now insignificant. Nonetheless, the unpredictable future should not constitute the reason for nonintervention because innovations always come hand in hand with risks.⁴⁰⁰ Given the fundamental uncertainty about the future, evaluating the risk while maintaining the various possibility of technological advancements is crucial. Monitoring every business or scientific decision and evaluating the associated risks is beyond the regulator's capacity. The more realistic way of regulation is to encourage the decision maker to establish a capable mechanism for risk assessment. The meta-regulation approach is commonly applied in the high-tech capital market and communication areas.

Despite the advantages of meta-regulation, this approach cannot provide the same level of security as the management-based or outcome-oriented regulations. This regulation approach should not be applied in fields with high externality.

³⁹⁹ See the article *Amazon's Most Ambitious Research Project is a Convenience Store*, available at <https://www.bloomberg.com/news/features/2019-07-18/amazon-s-most-ambitious-research-project-is-a-convenience-store>. Amazon has opened up to 14 convenience stores that require no cashiers, and the same thing is happening in Sweden, China, Japan, and other countries.

⁴⁰⁰ See Irwin, Alan. *Risk and the control of technology: Public policies for road traffic safety in Britain and the United States*. Manchester University Press, 1985, at 10–12. “A product or process considered innocuous at its inception may later prove to have a devastating environmental impact, as has been the case with asbestos production or the drug thalidomide.”

Regulation Model			
	Management-based	Outcome-oriented	Process-oriented
Feature	Regulatee should plan regulation within given framework	Regulatee should achieve goals set by the regulator and produce desirable results	Regulatee should implement functioning internal responsibility process
Regulatory Foci	Regulatee's action in different stages must pass different checkpoints set by the regulator	Regulator must identify the problem and the acceptable outcome	Regulator encourages preprocedural action and internal information disclosure
Suited Domain	Food industry, industrial security, pollution prevention	Animal welfare, Agriculture, Entertaining	High-tech, Finance, animal ethics
Requirements for the regulator	Know the problem and the solution well	Know what are the good results, and the capability of the industry	Know the industry
Stage of Public Interference	Planning and Implementing stage	Planning and ex-post Implementing stage	A priori planning
Level of Externality	High	Medium	Low
Information Burden	High	Low	Medium
Monitoring costs	High	Medium	Low

Figure 6: Regulation Models

2. The Regulation Approach for Digitalization of Shipping Documents

The former subsection has demonstrated that the regulatory environment and the externality of this regulatory field are decisive for determining the suitable regulation approach for a specific regulatory field. The interrelationship of these factors and the regulation approach is illustrated in the matrix below.

Externality ↙ Environment	High	→	Low
Stable ↓	Prescriptive Regulation		Outcome-oriented Regulation
Unstable	Management-based Regulation		Process-oriented Regulation

Figure 7: The Influence of Externality and Environment on Regulation Models

If the regulatory environment is stable and the externality is high, then the most suitable regulation approach should be the prescriptive regulation because this approach provides the highest security by providing detailed specifications of rules and standards for explicit actions. Although this regulation can be rigid and can strangle some creativity, it will be worthy for the massive interests that it protects. If the regulatory environment remains stable but the externality of one field is low, then the more flexible outcome-oriented regulation will be the right choice. In circumstances where the regulatory environment is unstable, employing the management-based regulation should be applied if the externality is high and the process-oriented regulation if the externality is low.

In digitalization of shipping documents, the proper regulation approach can be determined by delineating the regulatory environment and the externality thereof. As explained in the first chapter, the digitalization of shipping documents is not simply substituting papers with electronic data. This process involves the complete change of shipping industry, in which the vastly reduced costs and tremendously improved efficiency will open up many new

opportunities for the transportation sector.⁴⁰¹ Finance, insurance, vessel operation, and custom clearance will be facing revolutionary changes after the shipping documents are digitalized. Predict the process of digitalization is a difficult task because the technological advancements and the sequent business model alterations will impact the direction of digitalization and the regulatory environment.

In the 1980s, the SEADOCS project, which is known to be the first serious effort to facilitate the processing of electronic shipping documents, used telefax to communicate between the users and banks.⁴⁰² The half-automated input–output method dramatically increased the costs. Each operation of the SEADOCS system requires an additional \$500 on top of the paper processing fees.⁴⁰³ Moreover, the SEADOCS project did not entirely eliminate the paper because paper is necessary for other services in the payment and delivery fields. Therefore, the efficiency and security level did not reach a satisfactory level. The practical hurdles led to the cancellation of the SEADOCS project after the expiration of the one-year trail period. Then, the advent of the Internet opened up new opportunities and gave rise to the Bolero Project. The speed of the Internet and the electronic data interchange technology allowed the users of the Bolero system to make real-time communication with each other and exchange encrypted messages. This improvement also greatly enhanced the negotiability of the B/Ls, and thus conferred this document with more financial value. The 1996 launched project survived until today and is still gaining momentum. However, as the 5G era is on the horizon, information will be transmitted at a much higher speed than it is today. Similar to how the Internet facilitated the Bolero Project, the 5G may also catalyze other projects. The improvement of information flow will unlock technologies, such as autonomous ships,⁴⁰⁴ smart port,⁴⁰⁵ and smart containers.⁴⁰⁶ When that day comes, the processing of electronic documents

⁴⁰¹ See Chapter 1, section B, part 1 of this doctoral thesis.

⁴⁰² Kozolchyk, Boris, *Evolution and present state of the Ocean Bill of Lading from a Banking Law Perspective*. J. Mar. L. & Com. 23 (1992), on p. 161.

⁴⁰³ Delmedico, Amedeo, *EDI Bills of Lading: Beyond Negotiability*, Hertfordshire Law Journal [Online] 1.1 (2003), on p. 96.

⁴⁰⁴ See Luci Carey, 'All hands off deck? The legal barriers to autonomous ships' (2017) 23(3) JIML 202.

⁴⁰⁵ See Jacqueline Woo, 'PSA Singapore unveils advanced port technologies in new exhibition' The Business Times (Singapore, January 9, 2018) for examples of the next generation port technologies that will be introduced in the Tuas mega-port, earmarked as the centerpiece of Singapore's next generation port vision.

⁴⁰⁶ See Abnous, Razmik et al. "Smart containers." U.S. Patent No. 7,512,578. March 31, 2009.

will entirely change. Moreover, compared with the digitalization attempts in the last century, more projects are co-existing in this millennium, which means more competition and more incentives to adopt innovations.⁴⁰⁷

Aside from new technological advancements, the reform of business models can cause fundamental changes in the regulatory environment. The aforementioned SEADOCS project, the Bolero Project, and the subsequent essDOCS have applied centralized system to record, encrypt, and transmit information. However, the users, shippers, carriers, and banks are naturally resistant to store business information in a third party. With this commercial demand, the e-Title TM developed a non-centralized system for users to communicate with each other without having to send information to a central registry. Users who applied the e-Title TM solution will only need to install an e-Title TM software, which facilitates the secure transfer of electronic B/Ls by providing a peer-to-peer system. Only the logs of every transfer will be kept by the software to manage the state of every B/L and prevent double trading and illegal transfer.⁴⁰⁸ This new idea can contest many regimes concerning the processing of electronic documents if these regimes created rules based on the centralized business model and impose major liability on the system operator. As the electronic solution providers begin to distance itself from the operation system, impose such great liability upon the operator is unreasonable.

The e-Title TM solution remains a few steps away from a complete decentralized system, but the breakthroughs in the blockchain technology has brought people to the doorway of absolute decentralization. Elson Ong, a research associate at the Singapore National University, analyzed the use of blockchain technology in B/Ls and supported the idea of blockchain B/Ls as he believed that this method superior to the normal method in terms of security and transferability.⁴⁰⁹ He further argued that the UNCITRAL Model Law on Electronic

⁴⁰⁷ The relationship between market competition and innovation rate has long been the focus of economists and jurists. Many articles confirm that the two variables have a positive correlation under certain premises. See for example Aghion, Philippe et al. "Competition and innovation: An inverted-U relationship." *The Quarterly Journal of Economics*, 120.2 (2005): 701–728 and Aghion, Philippe, et al. The causal effects of competition on innovation: Experimental evidence. No. w19987. National Bureau of Economic Research, 2014.

⁴⁰⁸ Jacqueline Tan, *Electronic bills of lading: Sharing expertise*, available at https://www.ukpandi.com/fileadmin/uploads/uk-pi/Documents/2017/Legal_Briefing_e_bill_of_Lading_WEB.pdf.

⁴⁰⁹ Elson Ong, *Blockchain Bills of Lading*, NUS Law Working Paper 2018/020 NUS Centre for Maritime Law Working Paper 18/07. See also Takahashi, Koji. "Blockchain technology and electronic bills of lading." *The Journal of International Maritime Law* Published by Lawtext Publishing Limited 22 (2016), on pp. 202–211.

Transferable Records is suitable for the blockchain B/Ls with minor amendments.⁴¹⁰ The blueprint of Ong's work is not a fantasy of some scholar. In practice, the blockchain B/Ls is already a reality. The first trail has been completed by a Slovenian-based company named CargoX in a voyage from Shanghai (China) to Koper (Slovenia) on August 19, 2018. The blockchain B/L is transmitted through a public blockchain network and the transaction is completed in just minutes. According to the words of the CargoX, "the chances of loss, theft or damage of the bills of lading have been dramatically reduced to near-zero."⁴¹¹

By illustrating the relentless technological movements and the accompanying evolution of business model, the regulatory environment of digitalization of maritime transport documents is still developing amidst turbulence. Breakthroughs in ledger technologies empower innovations in the shipping industry, and these innovations can be combined with each other to generate more possibilities. New business models are inspired by such combinations and will be employed by adventurous business actors who are enthusiastic to gain competitive edge. This, in turn, forces the conservatives not to sit idle but to seriously consider transformation, urging the whole industry to move forward. In the meantime, the shipping industry is rather closed. The circulation of maritime documents is confined to a small community consisting of shipping experts who are familiar with the transportation process. The change in business models or application of new technologies may enhance the transferability of B/Ls or warehouse receipts, but the added financial feature also fall under the governance of the exchange platform. Moreover, the odds of an ignorant third party becoming the victim of the digitalization of shipping documents is low.

In summary, the digitalization of shipping documents is already in a fast-changing environment and hardly gives rise to a massive negative influence upon third parties. According to Diagram 1, the most proper regulation approach for this type of area should be the process-oriented regulation. The industry itself should enjoy a high level of autonomy while the public authority guides the emergence of an internal liability mechanism.

⁴¹⁰ Ibid., on p. 6.

⁴¹¹ See the news titled "CargoX Completes Trial Shipment with 1st Ever Smart Bill of Lading," available at <https://worldmaritimenews.com/archives/259379/cargox-completes-trial-shipment-with-1st-ever-smart-bill-of-lading/>.

IV. Co-existence and Competition: The New Normal

The previous section has investigated the social field of digitalization of shipping documents to determine the best rule-making mechanism in an ideal environment. However, rules have numerous sources in reality. Among these sources, some can be categorized as formal sources, and some as informal sources. The formal sources primarily comprises of constitutions, treaties, statutes, regulations and judgments promulgated by States, whereas the informal sources arise mostly from the interactions of societal members. Given that no hierarchy exists, these sources keep interact and communicate with each other. During this process, the competition between and inside formal rules and informal rules becomes the order of the day. Three forms of competition are prominent: the competition among formal sources, the competition among formal and informal sources, and the competition among informal sources. The competition between the formal sources has drawn the most attention from the legal community. Efforts to mediate these conflicted laws have been undertaken since the end of the 19th century. The two most influential approaches are the harmonization and the unification attempts. However, both approaches have lost their former glory after reaching at its peak during the middle of last century because the prospect of both paths is fading.⁴¹² Confronted with the long-standing fragmentation of laws at the international level, actors who engage in transnational trades are motivated to create their own norms to promote certainty. This, in turn, triggers the other two forms of competition, both of which attracts increasing attention from the legal community and are also the emphases of this thesis.

Eugen Ehrlich wrote: “The center of gravity of legal development therefore from time immemorial has not lain in the activity of the state, but in society itself, and must be sought there at the present time.”⁴¹³ As today’s society is changing at an ever-fast speed, the gravity in the society seems to be augmenting every day. Public legislatures and jurists must face questions like “should (formal) law resist current social changes or should it plays along,” “how soon should (formal) law respond to social changes,” “how far should (formal) law engage in social changes.”⁴¹⁴ After decades of discussion, the legal community comes to a common understanding that the values of particular communities should be respected, and additional

⁴¹² This point of view has been demonstrated in chapter 2, section A. Similar idea can also be found in Berman, Paul Schiff. "Global legal pluralism." s. Cal. I. Rev. 80 (2006), at 1236. Berman asserts that universal harmonization is unlikely to be fully achievable even if it is normatively desirable, because multiple communities seek to apply their norms to a single act or actor.

⁴¹³ See, Eugen, Ehrlich. *Fundamental Principles of the Sociology of Law*. New York (1936).

⁴¹⁴ See, for example, Friedmann, Wolfgang. *Law in a changing society*. Univ of California Press, 1959; Lloyd, Dennis. *The Idea of Law*, MacGibbon & Kee, 1964.

discretionary power should be imparted to industries and courts.⁴¹⁵ Under the influence of this idea, the aforementioned three regulatory approaches can be inoculated.

However, drawing a clear line between the public and the private regulation is difficult. The above matrix consists of two factors that may guide the selection of the regulatory approach,⁴¹⁶ but the adequate scale of autonomy given to the industry still depends on the unquantifiable state of society, economy, culture, and individual preference. This dilemma led to sharp conflicts in the global sphere and competitions between public and private rules. The two sets of norms are not entirely compatible, but they also do not directly confront each other because that the informal rules always have an internal mechanism to avoid conflicts with formal laws. In the case of digitalization of shipping documents, the electronic document processors insert no-challenge clause to forbid users to contest the validity of the transaction in front of a state court. They also draw support from other branches to boost the user's confidence, typically insurance. In the case of digitalization of maritime transport documents, organizations, such as the BIMCO and the CMI, also have the same function. No substantial punishment exists if the user breaches the clause, but a tacit understanding somehow averts this breach from happening. Therefore, this two set of norms can function in parallel. Similar phenomenon has been observed by law professors and social scientists when they studied the colonized society in Africa, Asia, and the Pacific. Similar to the European law imposed by the colonial power, the locals are applying traditional laws.⁴¹⁷ In the corporate law field, capturing the corporate governance regulations through references to national or international contexts or to public or private contexts is insufficient.⁴¹⁸ The rules of contemporary corporate governance regulation are evolving in a framework constituted by the interactions of local and transnational actors and norms.⁴¹⁹ This phenomenon is termed by the legal community as legal or normative pluralism and has become a central theme in the reconceptualization of the law/society relationship.

Despite the massive questions and contests arising from the study of legal or normative

⁴¹⁵ See, Grogan, Vincent. "Law and Modern Society." *Quis Custodiet* 7 (1965), on p. 39.

⁴¹⁶ See the matrix in Section C, subsection 3, part b of this chapter.

⁴¹⁷ See for example Carroll, John M. A concise history of Hong Kong. Rowman & Littlefield Publishers, 2007. In this book, Carroll described a way of dispute settlement much different from what is seen today. The Chinese who lived under the British colonial government would go to the Man Mo Temple to resolve their problems instead of going to the British courts. In front of the public, both parties would cut off a chicken's head and swear to god that they are telling the truth. In one case from 1918, the plaintiff refused to kneel before the ceremony, so the British court that heard the case ruled against the plaintiff. For other examples of legal pluralism, see Merry, Sally Engle. "Legal pluralism." *Law & Soc'y Rev.* 22 (1988), at 869–892.

⁴¹⁸ See Zumbansen, Peer, *Neither 'public' nor 'private', 'national' nor 'international': Transnational corporate governance from a legal pluralist perspective*, *Journal of Law and Society* 38.1 (2011) on p. 50–75.

⁴¹⁹ Zumbansen, Peer, *Defining the space of transnational law: Legal theory, global governance, and legal pluralism*, *Transnat'l L. & Contemp. Probs.* 21 (2012), on p. at 330.

pluralism,⁴²⁰ what actually triggers the interest of this doctoral thesis is the paradigm in the next stage of this pluralistic reality. Most scholars, including the advocates of legal pluralism, concede that the legal pluralism is an in-between state and will eventually become harmonization.⁴²¹ This belief has been understood regardless of the basis (e.g., on past experience,⁴²² pursuit of a universally harmonized global order, or on economic analysis of network effect⁴²³). However, today's world has the most complicated networks and the fastest data transmission rate, which constitutes a perfect environment for innovations in different fields to converge and achieve new breakthroughs. The historical inertia has taught people that a long stable period will occur after a short-changing period so that the fluxionary regulatory environment will stabilize and allow the best regulation to grow into a dominant regulation. In fact, this stable period is actually getting shorter since the industrial revolution, and the demarcation line between these two periods are also blurring. In a conversation between the Polish mathematician Stanislaw Ulam and the famous scientist John von Neumann, they mentioned the accelerating progress of technology and the changes in the mode of human life can lead to the approaching of a technological singularity.⁴²⁴ Although this theory is under dispute for all time, the acceleration of technological progress is beyond all doubt. Ray Kurzweil, who is currently a director of engineering at Google, claimed that technology grows exponentially and whenever technology approaches a barrier, new technology will surmount it. He further asserted that paradigm shifts will become increasingly common. He stated that "the growth rates will still be finite but so extreme that the changes they bring about will appear to rupture the fabric of human history."⁴²⁵ Sooner or later, the stable regulatory environment will become the transient phase and the normal regulatory environment is, and will always be, dynamic and changing. If that day arrives, then coexistence and competition of regulations and regulatory regimes will become the new normal.

Viewing this as a tendency that impairs people's way of living, victimizes public good, and substitutes order with chaos is extremely pessimistic. A more productive way to view this tendency is to know that open, non-linear regulatory systems, which are tied to the

⁴²⁰ See Twining, William, *Normative and legal pluralism: a global perspective*, Duke J. Comp. & Int'l L. 20 (2009) on p. 473. This article indicates that legal pluralism is a species of normative pluralism and essentially distinct from "global legal pluralism."

⁴²¹ Legal pluralists proposed tools ranging from world court, world constitution to soft law instruments like self-binding norms, codes of conduct, and best practices to harmonize the laws.

⁴²² The re-nationalization of *lex mercatoria* is one example, which is the same case with *lex maritima*.

⁴²³ See Druzin, Bryan H, *Anarchy, Order, and Trade: A structuralist Account of why a global Commercial Legal Order is emerging*, Vand. J. Transnat'l L. 47 (2014), on p.1049.

⁴²⁴ Ulam, Stanislaw. "John von Neumann 1903-1957." *Bulletin of the American Mathematical Society* 64.3 (1958), on p.5.

⁴²⁵ Kurzweil, Ray, *The singularity is near: When humans transcend biology*, Penguin, 2005.

environments, will perform better in such a situation.⁴²⁶ This kind of regulatory system will read the “genetic code” of the regulatory environment and establish a responding mechanism to catch the patterns of complex but repetitive behavior in the regulatory environment. By this means, the new regulatory system can utilize information, know the power and limits of new technologies, and manage the pressure from other systems. Eventually, order and balance from a seemingly chaotic environment will be established in a very short period. However, the new system is not flawless. In fact, the system is open and flat and consists of numerous networks, hence, risking without external push is obtuse. Going back to the theme of digitalization of maritime transport documents and legal harmonization, to prepare for the risks accompanying the digitalization process, the shipping industry urgently should develop risk management and performance reporting systems. Monitoring the risks and evaluating the performance of digitalization of maritime transport documents will be more important than describing and regulating specific behaviors in the industry. By knowing the risks and the performance, the public authority can intertwine at the right moment and reach out the proper scale of interference. The other equally important measure is transparency and unimpeded information flow, which will ensure that any actor in the field can acquire all available knowledge and technology at disposal to help determine the best practice.

⁴²⁶ Wirick, D., *The creation of dynamic regulatory institutions*, The National Regulatory Research Institute, Ohio State University, Columbus, OH (2001), on p.4.

Conclusion

The digitalization of maritime transport documents is the first of many steps towards shipping digitalization. The examination of the international seaborne trade and digitalization in the first chapter has shown that legal uncertainty in this field is one of the most insurmountable obstacles that hinders the industry from embracing digitalization. The calls for legal harmonization in this field are numerous. However, the comparison between the international and national laws suggests that the current public legislative approach is losing its edges in promoting legal harmonization. The international laws promulgated by international legal bodies commonly presume sovereign states to be the adopter and enforcer, so they must meet the interests of most sovereign states to acquire universal effect. However, when the States have very divergent interests, the international law can hardly get passed. In the case of digitalization of maritime transport documents, the interests and standards of States diverge significantly on the issue of digital authentication and electronic transferable documents. Consequently, the final law texts governing these issues must resort to universal principles and law to avoid oppositions. This leaves ample room for the adopting State to make variations to the law according to its interests and thus impairs the effect of harmonization. The analysis in the second chapter concludes that both soft law and hard law instruments are not promising to solve this dilemma of the more laws the less order.

Bear in mind that the shipping industry has a long history of self-regulation, this doctoral thesis hypothesizes that in the third chapter, suggesting that the shipping industry could have created a set of norms that are widely accepted among the actors. In the search for this type of privately-created norms, it is discovered that private rules have existed in many branches which relate closely to the international seaborne trade and these rules are exerting greater influence on the practice than public laws. In addition, the doctoral thesis observes a systematic relationship among the rules of relevant branches. By considering the reactions of other private regulators, a coordination mechanism is built among all relevant regulators to allow their rules to evolve coherently. The rules regarding electronic document procession, payment

arrangement, cargo insurance, and maritime transport are thereby developed compatible with each other. It has also been found out that the privately-created laws usually disguise themselves as agreements and use no-challenge clause, arbitration clause and governing law clause to avoid conflicts with State laws. While this method helps private ordering to develop without engaging interventions from the public laws directly, it also helps the private norms to evade public responsibility. As the private regulation keeps developing out of public sight, risks could accumulate and eventually cause harm to the society. Acknowledging the advantages of the private regulatory system and the diversity it brings to the law market, the best way is not to forbid the private regulatory system, but to lay certain level of restraints on its development to optimize its potentials while bringing the risk under control. For this purpose, other than the traditional prescriptive regulation, the doctoral thesis brings forward three other regulatory models to manage the public-private relationship. The adequate level of public interference should allow private organizations to operate without jeopardizing the organization's necessary freedom. The determination of suitable regulatory approach must depend on the externality and the stability of the regulatory environment. Since the maritime transport documents circles in a somewhat closed community and the digitalization has a changing content, the thesis recommends public authority to employ the process-oriented regulation model to guide the industry to establish an internal liability mechanism.

In the end, the doctoral thesis questioned the idea of inevitable formalization of private norms and proposed that accelerating technological advancement would shorten the reaction phase of the public legislature and pose more challenges for the current legislative approach to promote legal harmonization. As suggestion, public authorities should encourage the private regulatory system to play a more significant role in the future to facilitate public laws with regulating substantial issues coming along with social changes. It is also noted that transparency and unimpeded information flow are the two most important aids to pick out the best practice.

Due to the limitation of paragraph, the doctoral thesis has not looked into every aspect of the international private law, neither has the thesis investigated the details of the proposed

process-oriented regulation approach. Upon the introduction of the private regulatory system, the interrelation of correlated private norms has not been satisfactory explained by reason of commercial in confidence. Since it is out of reach for a dissertation from the School of Law, little work has been performed on the design of a learning mechanism which helps the public authority to keep up with social and technical changes.. At last, owing to the short development of the blockchain technology, the impact of the blockchain B/Ls has not been investigated thoroughly. Thus, it is favorable to carry out future studies in the broader governance level and apply an inter-disciplinary methodology to study the impact of social changes on law.

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