Chapter 1
Introduction

In a developed society, most individuals and corporations purchase insurance against any possible liability they might incur in a host of activities they engage themselves in. Ship owners are no exception in this regard. In fact, ship owners’ liability insurance is one of the most extensive liability insurance in the world. There is hardly any aspect of maritime liability which is not covered by the corresponding liability insurance. Yet, there is little discussion on various questions related to the effect of insurance’s absence or its presence on maritime liability law. What benefits insurance in general and liability insurance in particular have in our commercial activities including shipping? If insurance is a beneficial risk-management strategy, what are the other alternative risk-management measures ship owners and policymakers devised in the pre-insurance era? Should those measures continue to exist today when commercial insurance is available? What should be the goal of liability law when both liability claimants and liable parties are usually insured against their respective losses and liabilities? Does the presence of liability insurance reduce the deterrent effect of liability law? Or can we say that the presence of liability insurance actually improves deterrence? These are the questions we will attempt to answer in this book and we will do so in the context of maritime law and from the perspective of law and economics.

Few areas of liability law are as influenced as that of maritime liability law both by the absence of insurance in the past and by its widespread presence today. While the evolution of maritime liability law in its many aspects is closely connected to that of marine insurance, some aspects of maritime liability law may appear quite

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2 Ship owners usually purchase liability insurance from their own mutual insurance companies, known as Protection and Indemnity (P&I) clubs. Thirteen of the P&I clubs jointed together to form the International Group of P&I Clubs. Through a pooling agreement among the clubs, the group can provide coverage up to US$7.5 billion per liability incident. See http://www.igpandi.org/Group+Agreements/The+Pooling+Agreement. Accessed 01 September 2013.
3 Gilmore and Black (1975), pp. 17–18, 53.
unreasonable without the realization of their historical link to insurance. Two such aspects examined in the book are the limitation of ship owners’ liability and ‘general average’.

As apparent from the name, limitation of liability reduces ship owners’ legal liability to a pre-determined limit based today on the tonnage of a ship but historically on the value of the ship after a liability-causing incident. General average, on the other hand, is the sharing by ship owners and cargo owners of the losses and the expenses necessitated by their attempts to extricate a ship in distress and the cargo on it from an actual or imminent peril of the sea. The origin of these two principles of maritime liability law predates commercial marine insurance. We argue in the book that the absence of commercial marine insurance was the most plausible cause of their adoption as they functioned like insurance during the pre-insurance era in reducing the burden on ship owners from the losses and/or liabilities arising from maritime transportation.

In the absence of commercial insurance, the insurance function served by these two principles of maritime law was of great social benefit because their presence reduced the fear of loss or liability in the minds of prospective ship owners and thus encouraged them to invest into shipping and maritime commerce. Today, however, marine insurance market is well-developed and has enormous capacity to cover almost any imaginable maritime loss or liability. As a result, there is no need for the above two maritime principles to function as insurance. Instead of producing any social benefit, these two principles may now cause social loss by reducing the incentives for ship owners to exercise proper care and precaution in the transportation of goods and passengers.

The origin of these two principles, their past justifications and their possible detrimental social effects today will be discussed in the first three chapters of the book. Chapter 2 in its first part will trace the historical need and the consequent development of these two principles together with some other alternative risk-management strategies in the pre-insurance era. The second part of the chapter will discuss the mutual influence of marine liability law and liability insurance on each other in the context of their historical development with particular emphasis on the cargo and the oil pollution liability laws. Chapters 3 and 4 will take up detailed analysis of the principles of limited liability and general average respectively.

Although marine insurance market is now well-developed, participation in the market is not similar across the wide spectrum of shipping activities. Not all the

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4 See Donovan (1979), p. 999.


6 See infra Sect. 3.4.3.1.

7 The simple reason why these principles may lead to increased social loss is that they may reduce the liability of negligent ship owners. Reduced liability may in turn fail to deter such ship owners from future negligence. Chapters 2 and 3 will have detailed analysis of this point.
parties to a maritime liability dispute are equally insured against their possible losses or liabilities. Different insurance practices by the parties have influenced at least partially the design of liability laws for different activities. For example, in the context of cargo transportation it is invariably the case that both ship owners and cargo owners (i.e., potential liability claimants) are fully insured against their respective liabilities and losses. On the other hand, in the case of transportation of oil via sea potential victims of oil pollution damage are unlikely to be insured against their losses. As a result, the need for compensation is stronger in the oil pollution liability law than in the cargo liability regime. The difference in the need for compensation may provide the partial explanation why liability for oil pollution is strict, while negligence is the basis for maritime cargo liability laws.

Despite the above difference in the need for compensation, the importance of liability law to deter ship owners from negligence is equally present both in the oil pollution and in the cargo liability laws. Thus, the main difference in the design of these two liability regimes is that while the oil pollution liability law has to cater both for deterrence and compensation, the sole purpose of the cargo liability law should be deterrence. This is because both parties to a cargo liability dispute will already have insurance to cover their respective losses and liabilities. In Chap. 5, we will examine the success of the cargo liability regime in achieving its sole goal of deterrence. It will be shown that the cargo liability laws are generally aligned with its goal of deterrence. However, the presence of limited liability and general average in cargo liability laws reduces the deterrent effect of liability law. Also, the exoneration of ship owners from liability for cargo damage caused either by negligent fire or the negligent navigation and management of ships by crew.

8 See Gilmore and Black (1975), p. 17. For empirical evidence on insurance against cargo loss or liability, see infra Sect. 5.5.
9 See International Maritime Organization’s (IMO) legal document, LEG/CONF.5/C.1/SR.8 (5 Nov. 1976); reproduced in IMO (1983), p. 266. However, sometimes the only claimant would be the government of a state which incurs expenses for cleanup after an incident of oil pollution.
10 See article III.1 of International Convention on Civil Liability for Oil Pollution Damage, 1969, 973 U.N.T.S.3, (1970) 9 I.L.M. 45, as amended by its 1992 Protocol, LEG/CONF.9/15 [hereinafter the CLC]. Another reason for this difference is that the victims of oil pollution are third parties and thus cannot negotiate mutually satisfactory arrangements with tanker owners before pollution incidents, while cargo owners as liability claimants have contractual relationship with ship owners and can decide their respective share of loss or liability beforehand.
12 Compensation and deterrence are the two main goals of liability law under traditional analysis of liability law. See Brown (1978–1979), p. 111.
13 See articles IV.5(a) and V of the Hague-Visby Rules; articles 6.1(a) and 24 of the Hamburg Rules.
members is an obstacle to the achievement of optimal deterrence under the *Hague-Visby Rules*,\(^{14}\) the most-commonly used cargo liability regime.

The discussion in Chap. \(6\) will be focused on the success of the oil pollution liability regime in providing both adequate compensation and proper deterrence through its various insurance and non-insurance mechanisms. Although adequate compensation of the oil pollution victims is the declared goal of oil pollution liability regime,\(^{15}\) it also creates strong deterrence in ship owners from negligent navigation by imposing higher liability on them for oil pollution, by requiring compulsory insurance up to the liability limit, and, finally, by allowing direct action against insurers by victims. The proof of strong deterrence in oil pollution liability law is evidenced by the dramatic reduction of oil pollution incidents throughout the world.\(^{16}\) It is worth mentioning that in addition to liability law there are also other factors which equally contributed to the reduction of oil pollution incidents. These factors will be briefly discussed in the chapter.

While deterrence from negligence is the common goal of both the cargo and the oil pollution liability laws, the purchase of insurance by a potentially liable party may be thought to reduce the deterrent effect of liability law. This is because people with liability insurance may tend to be less afraid and, consequently, less careful against the possible effect of their negligent acts or omissions especially if their insurers have no means to check this tendency.\(^{17}\) Insurers, however, have various means to control this tendency and to keep their insured motivated towards proper care. These means include premium rate variance, deductibles, policy limits and policy exceptions. Therefore, we will maintain in Chap. \(7\) that the presence of liability insurance does *not* necessarily lead to the reduction of deterrent effect of liability law.\(^{18}\) In fact, we would attempt to establish that the presence of liability insurance actually leads to better care than the care induced by the presence of liability law alone (i.e., without liability insurance).

We will analyze the connection between maritime liability law and marine insurance from the perspective of *law and economics*. To avoid repetition and to have a smoother analysis in later chapters, some of the frequently discussed concepts from *economic analysis of law* will be briefly discussed here.

Like any legal analysis, economic analysis of law aims at finding appropriate legal rules and policies which would maximize social welfare or utility.\(^{19}\) However, a characteristic element of an economic analysis is that it assigns tentative

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\(^{14}\) See article IV.2(a) and (b).

\(^{15}\) See the preamble to the CLC which reads, “The State Parties to the present Convention . . . convinced of the need to ensure that adequate compensation is available . . .” (emphasis added).

\(^{16}\) See infra Sect. 6.5.


\(^{18}\) For a somewhat similar observation, see James (1948), p. 549.

\(^{19}\) Shavell (2004), p. 4.
numerical value for every action needed to implement a legal rule and for every consequence flowing from such implementation. In other words, it uses a numeric cost-benefit equation to determine the desirability of legal rules. While the tentative values are mostly assumptions, they are based on common sense. Similar assumptions are also used regularly in other legal analyses, albeit without the use of any numbers. For example, under a traditional legal analysis, liability for vessel-source oil pollution may be justified on the ground that liability reduces the number of oil pollution incidents. Implied in this analysis are the assumptions that most incidents of oil pollution are preventable and that the cost of oil pollution to society is more than the cost ship owners would bear to prevent possible pollution incidents. Under an economic analysis, the same conclusion may be reached by assuming that the damage from an oil pollution incident is $1,000 and the cost of prevention is only $500. Therefore, prevention or taking care is cost-efficient and imposition of liability to motivate ship owners to take such care is justified. Not taking care in such situations amounts to negligence.

In determining negligence, economic analysis uses the concept of expected loss or liability. Expected loss or liability is the product of magnitude of liability multiplied by its probability. An act of negligence does not always give rise to a loss or liability. For example, the failure to install smoke detector may cause $1,000 worth of loss only in one out of ten incidents of fire i.e., in 10% of the time. Even though the actual loss, when incurred, is $1,000, the expected loss is only $100 [the magnitude of loss ($1,000) multiplied by the probability of loss (10%)]. Under an economic analysis, negligence is the failure to take care when the cost of care is less than the expected loss. If the cost to install a smoke detector is less than $100, not installing it would amount to negligence. This definition of negligence was taken from the decision of Judge Learned Hand in *U. S. v. Carroll Towing Co.* Judge Hand, coincidently an admiralty judge, held that a person would be negligent if $B$ is less than $PL$ where $B$ stands for the cost of precaution, $P$ for the probability and $L$ for the magnitude of loss. This is known as ‘Hand Formula’ in the economic analysis of law.

It is noteworthy to mention here an important distinction between expected loss and expected liability. They are not always the same amount. Despite the expected loss of $100 due to the absence of smoke detector in the above example, a negligent homeowner’s expected liability may be less than $100. Only in a sure case of liability following a loss the expected liability and the expected loss will be the same amount. For example, if a homeowner is held liable in one out of two actual fire losses caused by the absence of smoke detector, the probability of his or her

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20 Some figures are also based on statistical data and empirical evidence.
21 It does not really matter whether we use the figure $1,000 or 100,000 for the loss and $500 or 50,000 for the cost of care. The purpose of using these figures is to show more clearly that the cost of care is less than the loss.
22 See Posner (1972), pp. 32–33.
23 159 F.2d 169 at 173 (2d Cir. 1947); see Posner (2003), p. 168.
being liable is only 50 % and the expected liability would be only $50 ($100 × 50 % or $100/2) for the failure to install the smoke detector. Expected liability which is lower than expected loss may reduce the deterrent effect of liability law. Although the installation of a smoke detector may cost less, say $90, than the expected loss, a rational homeowner\(^{24}\) may not install it because his or her expected liability is only $50.

In the above example, the expected liability was less than the expected loss due to the reduction in the probability of being held liable. Reduction in the magnitude of liability would also lower the expected liability. For example, if due to the limitation of liability (i.e., a cap on maximum liability) a homeowner has to pay only $800 instead of $1,000 in damages for not installing a smoke detector, the homeowner’s expected liability would be reduced further to $40 [($800 × 10 %) × 50 %]. With further reduction in the expected liability, the homeowner will have even less incentives to install the smoke detector at a cost of $90. In our discussion on the limitation of ship owners’ liability and general average we will show that the expected liability of negligent ship owners is less their expected loss due to the reduction in the magnitude of their liability.

The concept of expected loss or liability is simple but crucial for the proper understanding of economic analysis of any liability law. The concept will be repeated throughout the book. The importance of this concept lies in the fact that most of our actions are based on a rough calculation of the costs of and benefits from those actions. While the costs of a precautionary measure such as the installation of a smoke detector are certain in each case, the benefits of the precaution in preventing the fire damage or in not being held liable for fire damage are probabilistic. Generally, people would be willing to incur the sure cost of care only when their expected liability is more than their cost for taking care. As the expected liability ($50 or 40) in our example is less than the cost of care ($90), a potentially liable homeowner may not exercise care.

One way to make the expected liability more than the cost of care is to multiply the amount of damage by the inverse of probability.\(^{25}\) As the probability in our example was 50 % or 1/2 of the time, its inverse is 2. In other words, when caught, a liable party must pay $2,000 [i.e., the actual damage of $1,000 multiplied by the inverse (2) of probability] in order for the liable party to be motivated to spend $90 on the installation of the smoke detector. By ensuring that the expected liability remains higher than the cost of care, liability law can deter potentially liable parties from negligence.

For most individuals the above measure to increase the expected liability in order to have stronger deterrence may not be necessary because they are risk averse. The concept of risk aversion is a frequently-used concept in the economic

\(^{24}\) Under economic analysis, people are assumed to be rational profit-maximizing individuals. See Shavell (2004), pp. 1–2.

\(^{25}\) Shavell (2004), p. 244.
analysis of insurance. Risk aversion is the tendency of people to fear more a large loss even with low probability than a small loss with high probability even though the expected loss in both situations is exactly the same. For example, a loss of cargo worth $1,000 with 10% probability may not be as big a concern to the cargo owner as the loss of $10,000 worth of goods with 1% probability even though in both cases the expected loss is $100 [($1,000 \times 10\%) \text{ or } ($10,000 \times 1\%)]. The fear would be even greater if the magnitude of loss is $100,000 even though, say, the odds of such loss are only one-tenth of 1% (i.e., 0.1%). Here again the expected loss is only $100. Risk-neutrality is the opposite concept of risk aversion. To a risk-neutral party, all of the above losses will be of equal concern.

Risk aversion is a source of social disutility as it either causes risk-averse people to take excessive care or discourages them from engaging in socially-beneficial activities. For instance, as the expected loss in all the above examples is only $100, to take precaution against such loss at a cost more than $100 would be excessive precaution. Yet, risk-averse people will tend to spend more than $100 to avoid 1% chance of losing $10,000 or to prevent 0.1% risk of suffering $100,000 loss. Alternatively, they may decide not to engage in such an activity at all even though their expected gain might be higher than their expected loss if they engage in the activity. For example, cargo owners may decide not take their goods via ships to distant ports despite a sure profit of $200 because of their fear of losing $10,000 even though the odds of such loss are only 1%. Both the cost of excessive care and the forgone profit from not engaging in a profitable activity are social loss.

Insurance is the best solution to the problem of risk aversion. Utilizing the available data on loss history, insurance companies can roughly determine the expected losses from an activity in the future. By charging a premium roughly equivalent to the expected losses, insurance removes exaggerated fear from the mind of risk-averse insured and thus facilitates investment into risky but socially beneficial activities such as shipping and other businesses. In the pre-insurance era, limitation of liability and general average served the function of insurance to a limited extent by transferring part of loss or liability from one party to another in the marine transportation contracts.

Liability insurance, however, may be thought to dilute the deterrent effect of liability law. Before we discuss the effect of liability insurance on liability law, we will briefly discuss the goal/s of liability law. Deterrence from negligence is the primary goal of liability law under the economic analysis of law. There is no societal gain in imposing liability on ship owners or anyone else instead of letting losses remain where they fall if the fear of liability or its actual imposition does not deter ship owners from negligent navigation and consequently does not lead to the reduction of maritime losses in the future.

The imposition of liability in the absence of deterrence may only shift a loss from one party to another and will not reduce social loss. Although such shift may serve the traditional goal of liability i.e., compensation, the relative importance of this goal has significantly decreased today as people (both liable parties and liability claimants) can easily buy insurance.\(^{30}\) This is not to say that compensation has no role to play in the liability law today. Compensation can be a necessary means to achieve the deterrence goal of liability. Compensation, however, should not be the primary goal of liability law. In other words, in designing and implementing liability rules both policymakers and courts should focus more on the effects of liability rules on the behavior of a potentially liable party than on their effect on restoring liability claimants to their pre-accident positions.\(^{31}\)

Of course, in most cases the compensation of liability claimants and the deterrence of liable parties will occur simultaneously. For instance, when ship owners are held liable for the cargo losses arising from their negligent handling of cargo without the benefit of limitation of liability,\(^{32}\) cargo owners receive their full compensation and at the same time ship owners are also deterred from similar conducts in the future. There can, however, be cases where full compensation would occur without proper deterrence when the compensation or part of it comes from a party other than the liable party. For example, in liability law for vessel-source oil pollution claimants receive compensation from various oil pollution funds when the amount of losses exceeds the liability limit of ship owners.\(^{33}\) In such cases, it is possible that victims receive full compensation for oil pollution damage without ship owners being properly deterred from negligent handling of cargo.

Conversely, it is also not always true that imposing full liability creates deterrence. If some losses are inevitable in the sense that no amount of precaution could have prevented them, imposing liability for such losses would not create any deterrence. An example of this would be the imposition of liability on ship owner for cargo loss arising from an unpredictable storm on the sea.

\(^{30}\) Shavell (2004), p. 266.

\(^{31}\) Traditionally, the goal of liability both under torts and contract laws has been to restore the claimants to their pre-incident level as far as money can do. It is expressed retrospectively in tort (to put the victim back where he would have been had the tort not occurred) and prospectively in contract (to put the promisee in a position where he would have been had the contract been performed). See Rose (2004), p. 487.

\(^{32}\) Although it would be very difficult to deprive ship owners of the benefit of limited liability under the present law, a court may be lenient in construing the relevant provision of the law i.e., Article 4 of the Convention on Limitation of Liability for Maritime Claims, 1976, (1977) 16 I.L.M. 606 [hereinafter LLMC 1976]. “A person shall not be entitled to limit his liability if it is proved that the loss resulted from his personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result.” (emphasis added).

Finally, the availability of liability insurance may be thought to reduce the deterrent effect of liability. An insured may not use proper precaution against loss or liability simply because such loss or liability would be covered by insurance. This tendency is known as **moral hazard** in insurance literature. As mentioned earlier, there are various means such as variation of premium, deductibles, policy limits and exceptions that insurers can use to check this tendency of the insured. In the final chapter of the book it would be proven that because of insurers’ superior knowledge about the causes of loss and about the preventive measures, insurers can induce their insured through the above means to take proper care, if not better care, than the level of care in the absence of liability insurance.

To recapitulate, using the economic analysis of law the book would maintain that insurance is the most valuable tool against risk aversion. The availability of insurance removes the fear of loss from the minds of investors and thus facilitates the growth of shipping and commercial activities. With this in mind, the importance of both limitation of liability and general average as mechanisms to provide some form of insurance could be appreciated for a pre-insurance era or when insurance market was not well-developed. With well-established insurance market today, however, these two aspects of maritime liability law have lost their importance and justifications. In addition, they may even reduce the deterrent effect of liability law by reducing the liability of a negligent ship owner. Deterrence should be the only goal of liability law especially when both liable parties and liability claimants have access to market insurance. Although the deterrent effect of liability law may seem to be affected by the presence of liability insurance, insurers have various insurance mechanisms to keep the insured motivated towards proper care. In fact, the presence of liability insurance may lead to even stronger deterrence than would be the case otherwise.

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