



Risky Narratives: Framing General Average into Risk-Management Strategies (Thirteenth–Sixteenth Centuries)

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Over the last few years, historians have extensively investigated on the role of risk in the history of finance, and the development of risk-management techniques in the United States since the late nineteenth century. Well-established approaches that considered such innovations

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beneficial in themselves have been questioned, by pointing out the consequences of the pervasive spread of financial tools designed to mitigate risks. It appears, rather, that a socially uneven distribution of risk went along with the financial efficiency brought by these novelties, whose legitimacy rested on narratives identifying individual freedom with the taking of risks.¹

This essay explores the possibility that something similar might have occurred in early modern Europe, when marine insurance provided an alternative to contracts previously used to mitigate the risks connected to sea trade. It also aims at discussing whether the spread of specialized insurance markets, beginning in the sixteenth century, brought to a substantial shift in the distribution of these types of risks from a restricted trading group to a broader social base.

Premium-based marine insurance was crucial in supporting long-distance commerce in the early modern period, since it allowed merchants to carry out business with less capital than the risks of their trade demanded. Initially developed in Italy in the fourteenth century, it later spread to Spain reaching the Atlantic ports of Antwerp, Amsterdam and London during the sixteenth century.² This timing and geographic origin favoured a mainstream interpretation that ‘romantically’ considered insurance as an iconic expression of late medieval merchant capitalism. In a narrative dominated by inventive financial techniques, and efficient systems of commercial letters, it was described as the new tool actors were in need of to reduce the risks of doing business.³

A major flaw in this interpretation is to take premium insurance as something that appeared ‘out of the blue’, as if previously there were no other instruments to support maritime trade. However, marine insurance developed alongside a set of different and pre-existing mechanisms

¹ L. Hyman, *Debtor Nation: The History of America in Red Ink* (Princeton 2011); J. C. Ott, *When Wall Street Met Main Street: The Quest for an Investors’ Democracy* (Cambridge, MA 2011); J. Levy, *Freaks of Fortune: The Emerging World of Capitalism and Risk in America* (Cambridge MA 2012). For a theoretical framework see J. Beckert, *Imagined Futures: Fictional Expectations and Capitalist Dynamics* (Cambridge, MA 2016).

² F. Edler de Roover, ‘Early Examples of Marine Insurance’, *The Journal of Economic History*, 5 (1945): 172–200.

³ Two typical examples of this approach are: L. A. Boiteux, *La fortune de mer: le besoin de sécurité et les débuts de l’assurance maritime* (Paris 1968); F. Melis, *Origini e sviluppi delle assicurazioni in Italia (secoli XIV–XVI), Volume 1: Le fonti* (Rome 1975).

to mitigate risks.⁴ Yet, scholars preferred to focus on what seemed to be the ‘modern’ solution to the problem, given that with this contract ‘sea risks’ became the specific object of the agreement.⁵

In carrying out everyday business insurance was not the only existing option. Merchants and ship-owners willing to manage the risks of navigation could turn to a broad array of alternatives, including sea loan, Averages, sea exchange and various types of partnerships.⁶ In addition to contracts and business agreements, other strategies could be used, like employing armed vessels, dividing the cargo among multiple carriers and sailing in convoy. Considering the resilience proven by several of these possible responses to sea risks—for example, sea loans/bottomry and General Average—the traditional historical reconstruction in which backward techniques are replaced by more developed ones appears oversimplified. A good way to look at their interplay is, on the contrary, to think about an ecosystem where competition goes along with coexistence and cooperation, like a forest made of trees and bushes of different species each adapting to their ecological niche.⁷

Clearly, these responses to navigation risks are not equivalent. A first divide is between strategies aiming at preventing the probability of a mishap, and those designed to minimize the consequences of it. Sailing in convoy or shipping goods on armed vessels is—adopting a terminology coming from decision theory—a form of self-protection to prevent a loss, not to reduce its negative effects. For example, well into the eighteenth century, coral fishers in Southern Italy tackled the threats coming from Barbary pirates by recruiting armed protection.⁸ Quite the opposite is what occurs with General Average, sea loans or insurance. These do

⁴ Some insights on these issues in are in Ron Harris essay in this volume.

⁵ For a recent summary, see L. Piccinno, ‘Genoa, 1340–1620: Early Development of Marine Insurance’, in A. B. Leonard ed., *Marine Insurance: Origins and Institutions, 1300–1850* (Basingstoke 2015).

⁶ R. S. Lopez and I. W. Raymond, *Medieval Trade in the Mediterranean World: Illustrative Documents Translated with Introductions and Notes* (London 1955), 162–211; Melis, *Origini e sviluppi delle assicurazioni*, 12–13, 56–57, 87, 93.

⁷ The comparison of market institutions and ecosystem has been widely adopted by business historians, see L. Hannah, ‘Marshall’s “Trees” and the Global “Forest”: Were “Giant Redwoods” Different?’, in N. R. Lamoreaux, D. M. G. Raff, P. Temin eds., *Learning by Doing in Markets, Firms, and Countries* (Chicago 1999), 253–293.

⁸ V. Ferrandino, *Il Monte pio dei marinai di Torre del Greco. Tre secoli di attività al servizio dei corallari (secc. XVII-XX)* (Milan 2008), 49.

nothing to diminish the probability of an accident, whereas they have a great role in minimizing its economic consequences.⁹

The way in which they do it is, however, different. Here a second distinction needs to be stressed, the one between risk-spreading and risk-shifting. For example, General Average redistributed damages and expenses that could occur to ships and cargoes by allocating them to all interested parties, according to a principle of joint liability. General Average essentially was a risk-spreading technique, a mutual form of protection designed for actors who were routinely engaged in sea trade, including merchants, ship-owners and shipmasters. By contrast, in premium insurance, the risk is not shared but shifted (or hedged) from one party to another. Protection is granted by individual underwriters, each responsible just for the coverage they agreed to subscribe for. Limited liability is the tool that allows this to go beyond a restricted circle of actors, replacing risk-sharing with risk-shifting.¹⁰

Nevertheless, when adapting modern classifications to the framework of the period from the thirteenth to the sixteenth century, distinctions are not so clear-cut; if one considers other tools that could be adopted as a response to sea risks, sharing and shifting were often combined. Clear examples are bottomry and sea exchange, where loan and insurance are mingled together.¹¹ Moreover, in day-to-day business actors unlikely chose just one option but tended to adopt a multifaceted strategy. For instance, one could use insurance in combination with armed vessels, spending less money for premium and more for freight, since in this case insurance costs halved.¹² Likewise, an underwriter could enter into the contract not in a personal capacity but on behalf of a firm, sharing thus

⁹ I. Ehrlich and G. S. Becker, 'Market Insurance, Self-Insurance, and Self-Protection', *The Journal of Political Economy*, 80/4 (1972): 623–648.

¹⁰ N. A. Doherty, 'Some Fundamental Theorems of Risk Management', *The Journal of Risk and Insurance*, 42/3 (1975): 447–460; R. Holzmann and S. Jørgensen, 'Social Risk Management: A New Conceptual Framework for Social Protection, and Beyond', *International Tax and Public Finance*, 8/4 (2001): 529–556, esp. 541–542.

¹¹ R. de Roover, 'The Organization of Trade', in M. M. Postan ed., *The Cambridge Economic History of Europe*, vol. 3: *Economic Organization and Policies in the Middle Ages* (Cambridge 1965), 42–118, 53–57; see also Andrea Zanini's contribution in this volume.

¹² G. Ceccarelli, 'The Price for Risk-Taking: Marine Insurance and Probability Calculus in the Late Middle Ages', *Journ@l électronique d'Histoire des Probabilités et de la Statistique/Electronic Journ@l for History of Probability and Statistics*, 3/1 (2007): 6–7, 16. <http://eudml.org/doc/130865> (last accessed 29 December 2021).

the risk with multiple partners.¹³ Even the choice of using saints and other religious terms to name a ship is revealing of a manifold approach.

Recent scholarship has provided further complexity to this framework. By putting the emphasis on transaction costs and stressing the role of institutions in managing this business, it appears that contract innovation is only one side of the story. Moving from some influential insights by Douglass North and Avner Greif, the focus has thus shifted from financial novelties to insurance governance.¹⁴

This allowed scholars to develop a new narrative in which premium insurance, notwithstanding its innovative potential, for a long time continued to mimic previous forms of solidarity adopted by those involved in maritime trade. For a long time, insurance was an activity parallel to commerce, a risk-spreading technique envisaged to share rather than transfer risk. Merchants acted alternatively as underwriters and insurance buyers, specialization was very limited, and no complex organization emerged. Given this prevailing mutualism, customary mechanisms of contract enforcement were at work; well suited for small groups, they increased the level of confidence reducing in turn the cost of transacting. Insurance markets were efficient, since they functioned as a ‘club’ providing services a small number of ‘members’.¹⁵

Empirical evidence of this framework is widespread, but we can briefly turn to a specific example to have a case in point. During the Renaissance, Florence was a major insurance market, yet the number of those operating in it was surprisingly small. If in the late fourteenth century it involved no more than two hundred individuals, at the beginning of the sixteenth century, the number rose to four or five hundred. In a city of 40/50,000 inhabitants, just a narrow circle—roughly corresponding to 1% of the population—was involved in insurance, whereas the remaining 99% had nothing to do with it. Actors not only were few, but also tended to be extremely similar, fundamentally matching to a single profile. They were

¹³ G. Ceccarelli, *Risky Markets: Insurance in Renaissance Florence* (Leiden 2020), 178–180.

¹⁴ D. C. North, *Institutions, Institutional Change, and Economic Performance* (Cambridge 1990), in particular 126–127; A. Greif, ‘On the Interrelations and Economic Implications of Economic, Social, Political and Normative Factors: Reflections from two Late Medieval Societies’, Working paper, Stanford University, 1997, in particular 33.

¹⁵ A. B. Leonard, ‘Introduction: The Nature and Study of Marine Insurance’, in A. B. Leonard ed., *Marine Insurance*.

male Florentine citizens, coming from families involved in long-distance trade and banking, members of the wealthiest households, enjoying a highly visible political status.¹⁶ Two informal mechanisms—exchange of roles and barriers to entry—were also at work, reinforcing this selection process. Underwriters and insurance buyers regularly exchanged their role on the market. Only a fraction of coverage from marine risks, corresponding to just about 6% of the total insured value, was offered to subjects who did not also act as insurers (see Table 1, at p. 88). If a merchant wanted to be relieved from the risks of sea trade, the same merchant had to be willing to run them on behalf of someone else. A similar outcome resulted from high barriers to entry, customarily applied to those willing to underwrite a contract. The minimum amount insurers were expected to cover, excluding some few exceptional cases, roughly corresponded to the yearly wage of the manager of a medium-sized commercial firm (see Table 2, at p. 88).¹⁷

The Florentine example shows that the spread of premium insurance did not imply per se that club-like markets were rapidly abandoned. What new studies suggest is that the transition was slower than previously thought, beginning only when contract innovation resonated with institutions supportive of impersonal transactions. External pressures, essentially ascribable to the rise of the Atlantic economy and the increasing demand for insurance, gradually altered this static framework by broadening the number of subjects who are engaged in the transactions.¹⁸ It is only during the sixteenth century, with a timing that differs from one market

¹⁶ R. Goldthwaite, *The Economy of Renaissance Florence* (Baltimore 2009), in particular 98–103; A. Addobbati, ‘Italy 1500–1800: Cooperation and Competition’, in Leonard ed., *Marine Insurance*, 47–77.

¹⁷ Exchange of roles and barriers to entry are common in most other insurance markets. See, for example, R. Doehaerd, ‘Chiffres d’assurance à Gênes en 1427–1428’, *Revue belge de Philologie et d’Histoire*, 27 (1949): 736–756; M. del Treppo, ‘Assicurazioni e commercio internazionale a Barcellona 1428–1429’, *Rivista storica italiana*, 69 (1957): 508–541.

¹⁸ C. Kingston, ‘Marine Insurance in Britain and America, 1720–1844: A Comparative Institutional Analysis’, *The Journal of Economic History*, 67/2 (2007): 379–409; and the following essays, all in Leonard ed., *Marine Insurance*: S. Go, ‘Amsterdam 1585–1790: Emergence, Dominance, and Decline’, 107–129; A. Bogatyreva, ‘England 1660–1720: Corporate or Private?’, 179–203; G. Chet, ‘Britain and America 1650–1850: Harmonising Government and Commerce’, 249–268.

to another, that risk-shifting starts working alongside risk-spreading. Individuals previously excluded then entered the business; these newcomers could be foreigners arriving on the market like it happened in Genoa or Livorno, or locals taking over commerce until then carried out by alien merchants, as in the case of Antwerp or London.¹⁹ An indirect clue of their presence comes from the spread of legal interventions aiming (at least in part) at building an infrastructure capable of safeguarding these outsiders. Examples can be found in Florence (1524), Burgos (1538), Ragusa (present-day Dubrovnik) (1568), Antwerp (1563, 1570), Bilbao (1568), Amsterdam (1598) and London (1601). Whereas until then normative interventions always occurred in the broader framework of maritime regulation, now laws specifically designed for marine insurance become the standard. Typically, these would include: a procedure regulating insurance claims, a standard contract that needed to be followed, a specialized court having jurisdiction on insurance litigations and mandatory registration of contracts.²⁰ By designing an institutional infrastructure suited to handle markets larger in scale, and more stratified in their structure, the passage from risk-spreading to risk-shifting was possible, and profit seeking could slowly work its way over protection

¹⁹ L. Piccinno, 'Genoa, 1340–1620: Early Development of Marine Insurance', 25–45, 42–43; Addobbati, 'Italy 1500–1800: Cooperation and Competition', 63; D. De ruysscher, 'Antwerp 1490–1590: Insurance and Speculation', 79–105; G. Rossi, 'England 1523–1601: The Beginnings of Marine Insurance', 131–148; all in Leonard ed., *Marine Insurance*.

²⁰ V. Barbour, 'Marine Risks and Insurance in Seventeenth Century', *Journal of Economic and Business History*, 1 (1928–29): 561–596, 572–573; L. A. Boiteux, *L'assurance maritime à Paris sous le règne de Louis XIV* (Paris 1945), 13; Boiteux, *La fortune de mer*, 110–123, 142; G. S. Pene Vidari, 'Il contratto d'assicurazione nell'età moderna', in *L'assicurazione in Italia fino all'Unità* (Milan 1975), 232–234, 271–285, 295; F. C. Spooner, *Risk at Sea: Amsterdam Insurance and Maritime Europe, 1776–1780* (Cambridge 1983), 18; A. Tenenti and B. Tenenti, *Il prezzo del rischio: l'assicurazione mediterranea vista da Ragusa (1563–1591)* (Rome 1985), 92–97, 286; H. Casado Alonso, 'Los seguros marítimos de Burgos. Observatorio del comercio internacional portugués en el siglo XVI', *Historia. Revista de Faculdade de Letras do Porto*, s. 3, 4 (2003): 213–242, 215–216; G. Rossi, *Insurance in Elizabethan England: The London Code* (Cambridge 2016), 75–88; H. Casado Alonso, *El seguro marítimo en Castilla en los siglos XV y XVI* (Valladolid 2021), 45–47.

seeking. In sum, contract and governance innovation opened transacting to competition, raising the overall performance of the insurance industry.²¹

An interpretation as such, though largely convincing, can be further expanded to encompass a broader set of circumstances under which previous forms of risk mitigation have been sided by new ones. For example, should we consider premium insurance and markets specialized in this type of transactions as socially neutral? Likewise, have some groups benefited from the spreading of these innovations to the disadvantage of others? As studies on nineteenth- and twentieth-century capitalism stress, larger attention should be given to the relation between risk allocation and financial innovation, as well as to the cultural background in which the latter emerges.

Empirical investigations suggest that in the early modern insurance business a limited group of players guided the transactions, whereas a large share of those who took sea risks on behalf of affluent merchants were ‘followers’, lacking of information and adapting to decisions made by someone else.²²

If one focuses on the way coverage was provided in day-to-day operations, the consequences of contract innovation are easier to detect. Before insurance joint-stock companies developed in the eighteenth century, the most commonly used technique was co-insurance. Derived from other areas of maritime economy, in which pooling was routinely used, it allowed to spread the risks of sea trade among a broad number of actors. Descriptions of how co-insurance was carried out reveal how in everyday business two actors were crucial: the specialized broker and the ‘leading insurer’. Those wanting to be insured, after having established the main features of the contract, needed to find people interested in underwriting it. A broker was in charge of this task, making insurers sign the contract,

²¹ S. Go, *Marine Insurance in the Netherlands 1600–1870, a Comparative Institutional Approach* (Amsterdam 2009); C. Kingston, ‘Governance and Institutional Change in Marine Insurance, 1350–1850’, *European Review of Economic History*, 18/1 (2014): 1–18.

²² C. Kingston, ‘Intermediación y confianza’, *Ekonomiaz*, 77/2 (2011): 64–85; Ceccarelli, *Risky Markets*, Chapter 11.

one after another. Being each liable only for the amount they accepted to cover, it was necessary to pool together large numbers of underwriters.²³

Data show how the number of co-insurers has increased over time; in the late sixteenth century, it is possible to find single contracts in which coverage is divided among more than 150 underwriters.²⁴ This system had, however, the flaw of requiring long negotiations between the insurance buyer and each insurer. Intermediaries were able to circumscribe this problem by adopting a specific marketing strategy; they limited the negotiations to one single individual considered experienced by the others. Having seen the signature of this ‘leader’, they would accept more easily the terms envisaged in the contract and quickly underwrote it at the same premium.²⁵

Differences concerning scale and continuity of those engaged in transacting are visible in almost all early modern markets, but we can rely once more on sixteenth-century Florence for a detailed example. For sake of simplicity, let us consider only the supply side of the market. At one end of the spectrum, one finds occasional actors who carry out their business for few months and underwrite a total of 1–5 contracts at most, though numerically large—about 65% of the total—this group is not relevant in terms of insured values, accounting roughly for 10% of the total. At the opposite end of the spectrum, we find recurrent insurers, underwriting with a frequency of two or more contracts per week without significant interruptions over a rather long period of time (two, three years). Although in terms of insured values this group counts for almost 50% of the total, it is numerically very narrow, coinciding roughly with less than 10% of the total. In between these two opposites typologies, there are at

²³ K. Nehlsen-von Stryk, *L'assicurazione marittima a Venezia nel XV secolo* (Rome 1988), 84; G. Ceccarelli, ‘Courtiers et assurances maritimes: les raisons d’une liaison profonde (XIV^e-XVI^e siècles)’, in M. Scherman, A. Wegener Sleeswijk, V. Demont eds., *Le pouvoir des courtiers. Intermédiation marchande et évolution des pratiques commerciales, XIV^e-XVIII^e siècles* (Paris 2018), 75–86.

²⁴ For example, in late sixteenth century Ragusa, see Tenenti and Tenenti, *Il prezzo del rischio*, 181–183.

²⁵ A clear example comes from the testimony given by the London broker John Julius Angerstein during a House of Commons enquiry in 1810, *Select Committee of the House of Commons ... on Marine Insurance* (London: W. Hughes 1810), 121: “If I have a cross risk to make, if it is from America, I go to a box where there are Americans to give me information; and so it is from the Baltic or any other part [...] they are the people who can begin the policy for me better than the others, and I can by that means get it done”.

least two other classes of investors, making the picture even more complex (see Tables 3 and 4, at p. 89). This multilayered framework tended to replicate a fundamental mismatch among those who bought insurance and those who sold it, since only a fraction of the underwriters was interested in being insured: in sixteenth-century Florence, for example, this ratio was of about one in five (see Table 1, at p. 88). To match the demand coming from insurance buyers, a flexible participation of people only irregularly engaged in the transactions was therefore necessary. Since these latter were not demanding protection from marine risks, other ways to drive them in the business had to be at work.

Specialized brokers and leading insurers had this role, granting this complex ensemble of actors the coordination required to properly function. Intermediation was a distinctive trait of insurance since its beginning in fourteenth-century Mediterranean ports, yet this quickly underwent a process of selection ending up in the hand of few professionals. This was furthermore favoured by regulations often limiting the number of brokers through a licence system. Whether it was Genoa or Venice, Antwerp or Ragusa, Burgos or Florence, by the late sixteenth century the largest share of the transactions was in control of an extremely narrow number of intermediaries, normally just two or three in each location.²⁶

A further push to concentration came from leading insurers. Mentions to this group of experts can easily be found in seventeenth- and eighteenth-century sources, revealing that in Amsterdam and London, their reputation was crucial in convincing many *occasional* underwriters to engage in a business they knew little about.²⁷ Once more, quantitative evidence coming from sixteenth-century Florence is highly illustrative, showing a polarized situation. On the one side, a small group, made of less than 40 underwriters, acted in this role in more than 70% of the total contracts; on the other, almost 70% of those who subscribed a contract

²⁶ Concerning Genoa, see G. Giacchero, *Storia delle assicurazioni marittime. L'esperienza genovese dal Medioevo all'età contemporanea* (Genoa 1984), 117–136; and Melis, *Origini e sviluppi delle assicurazioni*, 156; on Venice see “Table 2” in Nehlsen-von Stryk, *L'assicurazione marittima a Venezia*, 502–524; on Florence: C. L. Daveggia, ‘L’intermediazione assicurativa nel Medioevo’, *Assicurazioni*, 52 (1985): 326–372.

²⁷ For references concerning the Amsterdam and London insurance markets, see Boiteux, *L'assurance maritime à Paris*, 15; Spooner, *Risk at Sea*, 19 and 25; A. H. John, ‘The London Assurance Company and Marine Insurance Market of the Eighteenth Century’, *Economica*, n. s., 25 (1958): 126–141, 127.

never acted as ‘leading insurer’ (Table 5, at p. 90). This uneven distribution is further confirmed if one considers the restricted circle of the top 1%, which is made of just five underwriters, who held this position in almost one third of the overall transactions (Table 6, at p. 91). Looking at their identities, one finds that these individuals were not at all ordinary people, essentially coinciding with those in charge of managing the most affluent Florentine merchant-firms. For these firms insurance coverage was vital, as their fortunes were largely dependent from long-distance maritime trade.

Specialized brokers and leading insurers were in the right position to appear reliable to most of the ordinary underwriters, who could follow their lead in subscribing a contract. Likewise, they probably had the positive effect of reducing information costs and risk aversion for actors who were not routinely operating in the market. Conversely, intermediaries and leading insurers reveal that the number of those really having bargaining power was extremely narrow, and that many ended up being just ‘followers’ of decisions taken by someone else. Their combined action, if considered under this light, clearly had an impact on risk allocation, perpetuating a divide between insiders and outsiders.²⁸

However, this passage likely was not just the result of market forces and institutional infrastructure; part of the explanation can also refer to the framework in which it takes place. Marine insurance did not emerge in a vacuum, but intersected a dense rhetoric about risk-taking and its social and economic meaning. To explore this narrative, one can rely on sources coming from business culture, as well as from moral theology. Though apparently distant, these realms shared a common interest for sea trade and the risks deriving from it.

For example, several arguments supportive of insurance are ascribable to discussions carried out by canon lawyers and theologians in the light of religious and legal principles. Among these: that buying and selling risks does not undermine God’s absolute power; that a distinctive trait of business rests on the individual assumption of risk; that insurance is socially useful. Commerce and navigation had little to do in setting the premises of this narrative, the breakthrough came from a seemingly peripheral realm, namely that of ‘wagering’. Risk forecasting emerged as a viable

²⁸ G. Ceccarelli, ‘Coping with Unknown Risks in Renaissance Florence: Insurers, Friars and Abacus Teachers’, in C. Zwiernin ed., *The Dark Side of Knowledge: Histories of Ignorance, 1400 to 1800* (Leiden 2016), 115–138.

option discussing someone rolling a dice or playing head or tails. Already by the late thirteenth century, in discussions about gambling, theologians had introduced the idea that risk could be evaluated and traded for money. A formal analysis of wagering allowed to state that property could be transferred on condition, without undermining God's prerogatives. Gambling served as a model that was later expanded to include several types of agreements and risk-management tools into a specific class—that of the aleatory contract—which were deemed lawful. Concerns about the reasons behind individuals making bets or rolling dices did remain, as well as the link with superstition, drunkenness and other sinful activities. But the point made was that 'moral' issues had no impact on the 'legal' nature of these agreements, which was considered lawful by a large share of scholastic thinkers.²⁹ Having connected the forecasting of future events to economic value, theologians went in search of a suitable criterion to assess it, thus developing the notion of *par periculi causa* (equal exposition to risk). This is a further step in a process representing risk as an object that can be bought and sold for a given price.³⁰

Not surprisingly, scholastic thinkers will transfer this conception from wagering to insurance as soon as the latter started to spread. Marine risk could be depicted as an object that could be actively dealt with, something actors may forecast in economic terms and express through a number, a percentage. This can clearly be seen in arguments developed to remove any suspect of usury from insurance.³¹ A first set of thinkers, mainly Dominican friars that followed a thesis developed by Thomas Aquinas,

²⁹ See, for example, Petrus Johannis Olivi, *Tractatus de contractibus*, in Pierre de Jean Olivi, *Traité de contrats*, ed. S. Piron (Paris 2012), 258–260 (p. III, q. 1); Alexander Lombardus (de Alexandria), *Tractatus de usuris*, in A. M. Hamelin ed., *Un traité de morale économique au XIV^e siècle. Le Tractatus de usuris de maître Alexandre d'Alexandrie* (Louvain 1962), 204–205. See also G. Ceccarelli, 'Gambling and Economic Thought in the Late Middle Ages', *Ludica, annali di storia e civiltà del gioco*, 12 (2006): 54–63; C.-O. Doron, 'The Experience of Risk: Genealogy and Transformations', in A. Burgess, A. Alemanni, J. O. Zinn eds., *Routledge Handbook of Risk Studies* (London 2016), 17–26.

³⁰ Petrus de Trabibus, *Quaestiones de quodlibeta* (Qd. I, q. 40 "Utrum lucrum acquisito in ludo aliarum teneatur ipse vincens perienti sive alii restituere"), Florence, Biblioteca Nazionale, ms. *Conventi Soppressi* D.6.359, fol. 112va; Baldus de Ubaldis, *In quartum et quintum Codicis libros commentaria* (Venice: Iuntas 1599), fols. 16v–17r (lib. 4, rub., §. 4).

³¹ G. Ceccarelli, 'Risky Business. Theological and Canonical Thought on Insurance from the Thirteenth to the Seventeenth Century', *The Journal of Medieval and Early Modern Studies*, 31 (2001): 602–652.

argued that risk assumption has different legal meanings depending on the contract considered. This allowed to interpret insurance in terms of a lease contract, through which risks are transferred, until the merchandise safely arrives to destination, to a third party that lawfully deserves a payment, namely the premium.³²

A more complex approach was supported by Franciscan theologians, that rested essentially on the idea that risk, when suffered by a businessman, was substantially different from risks undertaken by other persons. For many friars, including Peter Olivi, Monaldus of Capodistria, Francisc Eixemenis and Francesco of Empoli, maritime trade was the perfect example of commercial activity whose high risk justified profits. In their view, investments in this type of businesses have a potential value that merchants are able to estimate in advance. This way of reasoning allowed them to support premium insurance and also favoured a vision in which ‘navigation’ and ‘investment risk’ practically overlapped. Bernardino of Siena and Giovanni of Prato solved the problem by integrating the Dominican and Franciscans views: like in a lease contract, sea risk can be shifted from one individual to another, but its cost is a matter that specialists experienced in insurance should assess.³³

It seems no coincidence that, strikingly similar arguments emerged within business culture and its multifaceted literary output, ranging from commerce handbooks, to memoirs for the instruction of youths, or more

³² Bartholomaeus de Sancto Concordio, *Summa de casibus conscientiae cum supplemento Nicolai de Ausimo* (Venice: [s.n.], 1474), fol. 299v (“Usura 1”, §. 24); Petrus Strozzi, *Opusculum de Monte*, in J. Kirshner, ‘Storm Over the “Monte commune”: Genesis of the Moral Controversy Over the Public Debt of Florence’, *Archivum Fratrum Praedicatorum*, 53 (1983): 219–276, 268; Laurentius de Rodulphis, *De usuris*, in *Tractatus universi iuris*, t. 7, “De contractibus, et aliis illicitis” (Venice: Ziletti 1584), fol. 38r.

³³ Petrus Johannes Olivi, *Quodlibet I, quaestio XVII*, ed. by A. Spicciari, ‘Gli scritti sul capitale e sull’interesse di fra Pietro di Giovanni Olivi. Fonti per la storia del pensiero economico medievale’, *Studi Francescani*, 73 (1976): 317–321; Monaldus Iustinopolitanus, *Summa* (Lyon: Petrum Baleti 1516), fol. 285ra-rb; Francisc Eixemenis, *Tractat d’usura*, ed. J. Hernando I. Delgado (Barcelona 1985), 65–66; Franciscus de Empulis, *Questio de monte*, ed. L. Armstrong, ‘The Politics of Usury in Trecento Florence: The *Questio de monte* of Francesco da Empoli’, *Medieval Studies*, 61 (1999): 1–44, 34; Bernardinus Senensis, *Quadragesimale de evangelio aeterno*, in Bernardinus Senensis, *Opera Omnia*, 4 vols (Florence 1956), IV: 272–273; Ioannis de Prato, *Contractus*, Padua, Biblioteca Universitaria, ms. 694, fol. 145r. See also G. Ceccarelli, ‘Quando rischiare è lecito. Il credito finalizzato al commercio marittimo nella riflessione scolastica tardomedievale’, in S. Cavaciocchi ed., *Ricchezza del mare. Ricchezza dal mare. Secc. XIII-XVIII* (Florence 2006), 1187–1199.

structured treatises on household management. As I shall discuss in the rest of the essay, in the writings of merchants maritime risks experienced a semantic change, exemplifying a cultural climate that developed a set of themes supportive of insurance and risk-shifting. Whereas in the fourteenth century the approach was rather narrow, the later narrative discussed navigation risks and premium insurance side by side, with praiseworthy depictions of individuals taking responsibilities for decisions they make, embodied by the expert merchant capable of thwarting (if not foreseeing) potential mishaps.

In the fourteenth century, references to navigation risks, and the business tools to confront them, were confined to technical trade literature (merchant manuals) with a rather narrow meaning. A good example is provided by Francesco Balducci Pegolotti who essentially restates the formulae customarily present in contracts envisaging a clause about the cargo's safe arrival. His *Pratica di mercatura*, compiled precisely when and where premium insurance started being used, does not mention it, making, however, several references to bottomry and maritime exchange. Contrary to what occurs in theological writings, mentions to "risk of sea, men, fire, or pirates", "risk and peril" suffered either by the carrier or the shipper, and commodities "safely discharged on land" did not originate any discussion about the economic value of sea risks. At most, they are considered for their cost function with reference to specific merchandise, bought in one market and transported to another where it will be sold.³⁴

This tendency continues when premium insurance is eventually mentioned in this type of writings. For instance, in the notebook compiled by Ambrogio de Rocchi at the end of the fourteenth century 'insurance' appears, along with freight, land transport and duties in the list of items to take into consideration when assessing what he names as the *prime cost* (*primo costo*) of doing business between Valencia and Flanders. These lists include at times references to premium rates, which are, however, specified only in the light of the broader category of ancillary

³⁴ P. Spufford, 'Late Medieval Merchant's Notebooks: A Project. Their Potential for the History of Banking', in M. A. Denzel, J.-Cl. Hocquet, H. Wittho eds., *Kaufmannsbücher und Handelspraktiken vom Spätmittelalter bis zum beginnenden 20. Jahrhundert/Merchant's books and mercantile Pratiche from the Late Middle Ages to the Beginning of the Twentieth Century* (Stuttgart 2002), 47–62; Francesco Balducci Pegolotti, *La Pratica della Mercatura*, ed. A. Evans (Cambridge, MA 1936), 45, 75, 196, 242, 321, respectively.

costs, being this latter the main point a merchant should assess.³⁵ As it has been suggested by Bruno Dini, these rates reflect nothing more than a customary evaluation of sea risks, in which no distinction among the various factors involved is pointed out. Ambrogio de Rocchi appears to imply that expertise in insurance can be acquired only through practice, not by reading a handbook written by someone else.³⁶

A few decades later, a slight change can be perceived in Giovanni da Uzzano's *Pratica di mercatura*. His writing is among the first attempts to assemble a proper instruction manual for merchants, and this could explain the reason why sea risks are no longer mentioned only as contractual formulas or in terms of ancillary costs. Clearly, the well-established approach was still prevailing with a number of indications about standard prices required to cover shipments to Tuscan ports from several parts of Europe, including Southampton, Collioure and Aigues-Mortes.³⁷ The *Pratica* continued to frame marine insurance as one cost item among others, but also suggested that readers should be aware of some basic elements influencing premium rates. When discussing business between England and Tuscany, these two approaches are combined: "And concerning marine insurance from London to Pisa, it is always between 12 and 15 florins percent, and at times more depending to threats that are known of, whether of pirates, or of others".³⁸ It was no longer just a matter of providing customary prices, da Uzzano now warned about contingent risks. In doing that, he admits that, along with commercial practice, written texts may also help to train merchants in risk forecasting and decision-making. For instance, in deciding whether to take insurance or not, to save the money of premiums: "there is the risk as well, which

³⁵ B. Dini, *Una pratica di mercatura in formazione (1394–1395)* (Florence 1980), 138 and 187; Spufford, 'Late Medieval Merchant's Notebooks', 49 and 59.

³⁶ Dini, *Una pratica di mercatura*, 61.

³⁷ Giovanni di Antonio da Uzzano, *La pratica della mercatura*, in Gian Francesco Pagnini del Ventura, *Della decima e di varie altre gravetze imposte dal comune di Firenze*, 4 vols (Lisbon-Lucca [Florence: Bouchard] 1766) IV: 122, 131, 174; Spufford, 'Late Medieval Merchant's Notebooks', 50, 53, 55.

³⁸ Giovanni di Antonio da Uzzano, *La pratica della mercatura*, 119: "E per scurtà di mare da Londra a Pisa sempre è da fior. 12 in 15 per 100 di valuta, e quando più secondo i pericoli che sentono, o di corsali, o d'altro".

has to be assessed in the calculation, that if you do not buy insurance you can spare it if you safely arrive”.³⁹

Yet, for a further shift to occur, a slightly different literary framework was needed, as well as writers at ease with both humanistic and business culture. Navigation became a typical metaphor adopted in merchants’ autobiographies to depict how one should manage its own life and wealth, in a storytelling in which the skilled shipmaster acquires the role of main character.⁴⁰ A clear example is offered by the dialogue *On the Family* by Leon Battista Alberti, a sophisticated version of merchant notebooks and memoirs. The metaphorical use of sea risks likely derived from late medieval medical literature—an area which Alberti touched in his work *Momus*—where the image of the expert navigator exemplified how a physician should act in making a diagnosis and developing a cure.⁴¹

This image is restated to fit in the context of good household management that an idealized *pater familias* should follow. According to Alberti, protecting one’s own household is like sailing and requires knowing “how to steer according to the wind’s favour [...] toward the harbor [...], how to strike and furl the sails [...] in storms and in such misfortunes”. It is not simply a matter of knowledge, but rather of applying it to a given framework, therefore, “when fortune is tranquil and good-natured, but still more when the times are stormy, the good father never departs from the pilot of reason”. This allows him to confront the risks coming from

³⁹ Giovanni di Antonio da Uzzano, *La pratica della mercatura*, 159: “[...] e più e’ rischio che si dee stimare quello è ragione, che se non pigli sicurezza, te l’avanzi andando a salvamento, [...]”.

⁴⁰ An in depth analysis of how economic and social historians—including Federigo Melis, Christian Bec, David Herlihy and Christiane Klapisch-Zuber—have used this kind of sources can be found in A. Cicchetti and R. Mordenti eds., *I libri di famiglia in Italia*, Vol. 1: *Filologia e storiografia letteraria* (Rome 1985), 29–33. For an overview on this type of literature, see also A. Cicchetti, *I libri di famiglia in Italia*, Vol. 2: *Geografia e storia* (Rome 2001).

⁴¹ Arnaldus de Villa Nova, *Repetitio Super Canonem Vita Brevis*, in M. R. McVaugh and L. Garcia Ballester, ‘Therapeutic Method in the Later Middle Ages: Arnau de Vilanova on Medical Contingency’, *Caduceus: A Humanities Journal for Medicine and the Health Sciences*, 11/2 (1995): 73–86, 76. See also F. Wallis ed., *Medieval Medicine, A Reader* (Toronto 2010), 211; and M. Solomon, ‘Breaking Non Natural Bread: Alimentary Hygiene and Radical Individualism in Juan de Aviñón’s *Medicina sevillana*’, in M. Piera ed., *Forging Communities: Food and Representation in Medieval and Early Modern Southwestern Europe* (Fayetteville 2018), 147–158, 149; L. Boschetto, ‘Democrito e la fisiologia della follia. La parodia della filosofia e della medicina nel “Momus” di Leon Battista Alberti’, *Rinascimento*, II s., 35 (1995): 3–29.

the sea or life. The expert navigator—continues Alberti—“remains alert, foresees from a good distance every mist of envy, every storm cloud of hate, every lightning stroke of enmity”, and “encountering any contrary wind, any shoal and danger [...] he acts the part of the experienced expert sailor”. But when it comes to skills, judgements are guided by information individuals can acquire, and choices should also be a matter of recalling “with what winds others have sailed, how they rigged their ships and how they sighted and avoided every danger”.⁴²

The theme that *On the Family* puts forward is further developed in a number of later writings as a mean to tackle the unstable condition of human life. The image of a calm sea suddenly turning into a storm becomes for instance a recurring one, even Nicolò Machiavelli will exploit it to blame those princes who are not anticipating a political turnaround.⁴³ In the *Zibaldone* written by Giovanni di Paolo Rucellai, it is stated in three different versions.⁴⁴ Rucellai was an important Florentine merchant in close relations with Alberti, to whom he commissioned several architectural works.⁴⁵ His approach to the topic clearly moves from the dialogue *On the Family*, arguing in favour of an active role, grounded on observation and expertise, when dealing with sea risks, as well as with the contingency of life. “We must not be subjected to anything – Rucellai argues – on the contrary we need to prepare to any event, not only what ordinarily happens but whatever might

⁴² R. Neu Watkins, *The Family in Renaissance Florence: A Translation of I Libri Della Famiglia* (Columbia, SC 1969), 36–37; Leon Battista Alberti, *I Libri della Famiglia*, eds. R. Romano, A. Tenenti, F. Furlan (Bari 1960), 17–18: “Non è solo officio del padre della famiglia, come si dice, riempire il granaio in casa e la culla, ma molto più debbono e’ capi d’una famiglia veggiare e riguardare per tutto [...] sapere con l’aura [...] condursi in porto [...], ritrarre e ritendere le vele a’ tempi, e nelle tempestati, in simili fortune e naufragii [...]; e nella tranquillità e bonaccia della fortuna e molto più ne’ tempestosi tempi, mai partirsi dal timone della ragione e regola del vivere, stare desto, provvedere da lungi ogni nebbia d’invidia, ogni nugolo d’odio, ogni fulgore di nimistà in le fronti de’ cittadini, e ogni traverso vento, ogni scoglio e pericolo in che la famiglia in parte alcuna possa percuotere, essere ivi come pratico ed esercitatissimo navichero, avere a mente con che venti gli altri abbiano navigato, e con che vele, e in che modo abbiano scorto e schifato ciascuno pericolo [...]”.

⁴³ Nicolò Machiavelli, *The Prince*, translated by J. B. Atkinson (Indianapolis 1976), 357–358, Chapter 24.

⁴⁴ Giovanni di Pagolo Rucellai, *Zibaldone*, G. Battista ed. (Florence 2013), 365, 384, 420.

⁴⁵ Rucellai, *Zibaldone*, xxxviii.

occur”.⁴⁶ Not surprisingly this optimistic approach about the possibility of preventing mishaps (if not even forecasting them) comes from an individual who built his fortunes on maritime trade, proudly recalled on his coat of arms in shape of a sail blowing in the wind.⁴⁷

In the second half of the fifteenth century, the model of the capable navigator is rooted in business culture to the point that it can be transferred to other specialists of sea risks, like the expert underwriter. Managing risks the proper way, i.e. by shifting them to someone else after a careful economic evaluation, comes to be a typical trait of how merchants self-represented themselves.⁴⁸

Rucellai’s *Zibaldone* is a good example of this transition, given that its literary vein is intertwined with the traditional one of business instructions. The connection between risk and expertise is restated from the point of view of a merchant providing guidance to his sons about how markets work—including marine insurance ones. Information flows, accurately recorded to build solid experience, are depicted by Rucellai as the key for a successful business strategy.⁴⁹ This memoir is written exactly in the same years when another merchant, Benedetto Cotrugli, offers in his handbook the clearest representation of this trend. At the crossroad of the two genres of merchant manuals and treatises on the family, the *Book of the Art of Trade* combines elements already visible in Giovanni da Uzzano with those of Leon Battista Alberti.⁵⁰ Sea risks appear to emerge as a

⁴⁶ Rucellai, *Zibaldone*, 384: “niuna cosa ci dè essere subita, anzi dobbiamo tutte le cose provvedere, non solamente quello che suole avvenire ma tutto ciò che fare si può”.

⁴⁷ N. Scott Baker, *In Fortune’s Theater. Financial Risk and the Future in Renaissance Italy* (Cambridge 2021), 136–149.

⁴⁸ G. Maifreda, *From Oikonomia to Political Economy: Constructing Economic Knowledge from the Renaissance to the Scientific Revolution* (Farnham 2012), 43–72; G. Todeschini, ‘Theological Roots of the Medieval/Modern Merchants’ Self-Representation’, in M. C. Jacob, C. Secretan eds., *The Self-Perception of Early Modern “Capitalists”* (New York 2008), 17–46.

⁴⁹ Rucellai, *Zibaldone*, 26–27.

⁵⁰ G. Favero, ‘A New Edition of Benedetto’s Cotrugli The Book of the Art of Trade’, in Benedetto Cotrugli, *The Book of the Art of Trade*, C. Carraro and G. Favero eds. (London 2017), 9–19. On the relationship between Alberti’s *On the Family* and Cotrugli’s *Book of the Art of Trade* see Ugo Tucci’s ‘Introduction’ to Benedetto Cotrugli, *Il libro dell’arte di mercatura*, U. Tucci ed. (Venice 1990), 63.

realm of knowledge in which instructions can be given well beyond practical training, by engaging in some kind of analysis regarding the factors affecting them.

Cotrugli is the first to provide a detailed list of the elements considered by businessmen in evaluating insurance premiums.⁵¹ He argues that “they must be constantly enquiring and asking about pirates or other ill-intentioned people, about wars, truces and reprisals, and all the things that can threaten a sea voyage”. In doing that, he even appears to trace a distinction between types of risks, beginning with contingent ones, like piracy and military clashes. He then focuses on structural risks, namely those that are stable over a period of time. First of all, the route to follow, which should be considered with great care; he advises that insurers “must keep navigation charts on their desks and be familiar with the ports and the beaches, the distances between one place and another”. Other important elements to take into account were also the type of vessel and the reputation of those who own it, as well as the type of merchandise insured and its possibly perishable nature. Therefore, Cotrugli warned to “also consider the status of the ship-owners and the merchants who are seeking insurance, and the ships, as well as their cargo”. In line with Alberti and Rucellai, however, experience and power of observation are essential features of this description. The ability of individuals to gather any piece of information and process it, their skills in keeping “their eyes open for all news from the seas”, became the precondition for any correct evaluation of sea risks.⁵²

Cotrugli’s words reveal that premium insurance is the perfect setting where ideas about risk and its economic value can be explored. It was not the only one, however, as the discussions about gambling show. Within merchants’ culture and beyond, as early as the thirteenth century, business partnerships, General Average and other risk-sharing tools need also to be

⁵¹ The risk factors provided by the *Book of the Art of Trade* essentially match those emerging by taking into analysis insurance contracts of the fourteenth-sixteenth centuries, see: Ceccarelli, ‘The Price for Risk-Taking’, 5–6.

⁵² Cotrugli, *The Book of the Art of Trade*, 75; Cotrugli, *Il libro dell’arte di mercatura*, 176: “E per dire delli sicuratori, li ricordiamo che gli è di bisogno d’aver e aprire molto l’occhio alle novelle del mare, et al. continuo domandare et inquirere de corsali et male genti, et guerra, triegue, ripresaglie et tucte quelle cose che possono perturbare lo mare. Debbono tenere nello scriptoio loro la carta del navigare et sapere porti et spiagge, distantie di luogho et considerare la conditione de padroni et delli mercanti che assicurare si fanno, et delli navili, et considerare le mercantie”.

considered. Compared to insurance their treatment is less systematic, so a broad spectrum of writings by jurists, theologians and even teachers of commercial mathematics must be addressed if we are to arrive at a clearer image of how marine risks are discussed in this specific framework.

Writings on commercial mathematics offer precious information on how merchants were expected to cope with the damages suffered by ships and cargos during navigation. At the end of the fifteenth century, Luca Pacioli summarized a two hundred years long tradition of business cases related to sea trade. Some of these clearly echo General Average, referring to the recovering of wine barrels that lost part of their content in a storm, or the expenses made for damaged ship equipment. As one would expect, the *Summa de arithmetica* describes in detail the type of calculations to be made in case of mishaps.⁵³ However, these examples are not confined to this literary genre, since similar discussions can also be found in legal writings such as Paolo di Castro's readings on the *Digest* (1429). For instance, in commenting the *Lex Rhodia*, quite surprisingly mathematics is used to address issues like the damages suffered by shipped goods during a jettison.⁵⁴

In all these cases, a basic principle that merchants learnt at school was routinely applied, the so-called rule of three. It allowed, when knowing three elements of a proportion, to calculate the fourth unknown datum, without having to use equations. In practical terms, this implied to proportionally distribute costs among all the actors involved. As a result, sea risks are essentially treated from the perspective of mutual support, as noted by Olivia Remie Constable, "equalization of risks" is a

⁵³ Lucas de Burgo S. Sepulchri, *Somma di arithmetica, geometria, proporzioni e proporzionalità* (Venice: Paganinus de Paganinis 1494), fols. 153r–154v; in particular fol. 153r, n. 43, fol. 153v, n. 48. Another fifteenth-century mathematician discussing many problems connected to maritime trade is Filippo Calandri, author of the first printed book of commercial arithmetic: F. Calandri, *De Aritmetica opusculum* (Florence: Lorenzo Morgiani and Johann Petri 1492), fols. 63v–65r; elsewhere, in a handwritten collection of problems now available in critical edition, Calandri tackles a case of jettison in form of a brainteaser: Idem, *Aritmetica: secondo la lezione del Codice 2669 (sec. 15.) della Biblioteca Riccardiana di Firenze*, G. Arrighi ed. (Florence 1969), 193, 205–207. Cp. W. Van Egmond, *Practical Mathematics in the Italian Renaissance: A Catalog of Italian Abacus Manuscripts and Printed Books to 1600* (Florence 1980).

⁵⁴ Paulus de Castro, *Super secunda parte Digesti veteris* (Venice: Andreas Calabrensis Papiensis, 1492) [unnumbered folios] in D.14.2.4.2 *Cum autem*. On the calculative dimension of General Average see the contribution of Sabine Go in this volume.

“common denominator” in these discussions.⁵⁵ Not by chance, commercial arithmetic includes most cases concerned with navigation risks within a broader discussion centred on partnerships (*ragioni di compagnia*).

The same line of argument emerges from legal texts, in starting with the risk-sharing point of view, explicitly linking the concept of common good to General Average. This connection appears already by mid-fourteenth century in the commentary to the *Lex Rhodia* by Bartolus of Saxoferrato. He does so by establishing an analogy between a fire threatening to destroy a group of houses and the jettison of a cargo: “when someone’s house is demolished by the neighbors to avoid the fire to spread, the neighbors must make reparation to the house owner, since the demolition was done for the common good”. These neighbours, Bartolo claims, have a shared responsibility, just like the owners of the jettisoned goods, the shipmaster and all the subjects involved in General Average do.⁵⁶ This analogy, as well as the reference to common good, will later become a recurring argument. For example, Baldus de Ubaldis discussing the same passage will closely follow Bartolo’s words, while Paolo di Castro will connect the argument of common good to other parts of the *Lex Rhodia*.⁵⁷ More in general, the language through which jettison is addressed hints at mutual aid, with a dominance of nouns and verbs referring to the act of ‘bringing together’, such as *contributio*, *contribuere*, *collatio*, *conferre*.⁵⁸

⁵⁵ O. Remie Constable ‘The Problem of Jettison in Medieval Mediterranean Maritime Law’, *Journal of Medieval History*, 20 (1994): 207–220, 208–209.

⁵⁶ Bartolus de Saxoferrato, *Lectura super prima et secunda parte Digesti veteris* (Venice: Baptista de Tortis 1493), fol. 97rb, in D.14.2.2.pr. *Si laborante*: “Domini iactarum mercium habent actionem cum magistro, et magister cum ceteris non solum habet actionem: sed etiam retentionem mercium: ut fiat contributio. Item ... quando domus alicuius destruitur a vicinis: ne ignis ulterius transeat quod debeat ei emendari a vicinis: quia pro communi utilitate factum est”.

⁵⁷ Baldus de Ubaldis, *Tomus secundus in Digestum vetus* (Lyon: Joannes Thierris Lingonensis 1541), fol. 79va, in D.14.2.2.pr. *Si laborante*; Paulus de Castro, *Super secunda parte Digesti veteris*, in D.14.2.4.2 *Cum autem*: “damnum ... passus est propter communem utilitatem omnium”.

⁵⁸ For example, Bartholomaeus a Saliceto, *In Secundam Digesti veteris partem* (Frankfurt: Lazarus Zetznerus 1615), col. 340 in D.14.2.4pr. *Navis* and D.14.2.1 *Sed si navis*; also, Baldus de Ubaldis, *Tomus secundus in Digestum vetus*, fol. 79vb in D.14.2.2.4 *Portio autem* and Paulus de Castro, *Super secunda parte Digesti veteris*, [unnumbered folios] in D.14.2.4pr. *Navis*.

And this was precisely how canon lawyers and theologians also framed their discussions about long-distance maritime trade. By mid-thirteenth century, beginning with Geoffrey of Trani, scholasticism stood in favour of contractual tools allowing merchants to jointly take care of the risks and damages of navigation (*communicare pericula et damna*).⁵⁹ The emphasis on ‘sharing’ made it easy to draw a clear watershed between these mutual arrangements and usury, thus distancing the discussion from the controversies related to canon law. By embracing this line of reasoning, Thomas Aquinas will make it extremely influential in the following centuries, to the point that even civil lawyers will often refer to the *communicare pericula et damna* formula.⁶⁰

The resulting narrative, by linking risks to damages, made sea risks as something difficult to evaluate in advance and thus unworthy of being discussed in detail. As a consequence, these discussions do not provide a suitable framework for risk quantification. In the texts addressing General Average not only the word *periculum* is seldom mentioned, but it is never attached to terms that could hint at an economic potential, like price (*pretium*) or estimate (*extimare*).⁶¹ As seen above, these sources reveal that a calculative approach to risk takes shape only ex-post, when the potential threat has materialized and actually become a ‘loss’; only in these situations, a vocabulary suited to express the value of objects is used. Exceptionally *periculum* is framed in a hypothetical scenario, treated as an event that might occur in the future, as Baldus de Ubaldis comment on *Lex Rhodia* exemplifies. However, even in these cases no effort is made to numerically estimate maritime risk (*periculum maris*), being this latter

⁵⁹ Goffredus de Trano, *Summa super tituli decretalium* (Venice: Bernardinus Stagninus 1491), fol. 80rb-va in X. 5.19.19 *Naviganti*.

⁶⁰ Thomas Aquinas, *Summa Theologiae*, II, II, in *Opera omnia*, 3 vols (Parma: Fiacadori 1853), 281a–282ab. A crucial role in spreading Aquinas’ view is played by manual for confessors compiled by canon law experts in the fourteenth and fifteenth centuries, such as that by John of Freiburg: see Johannis de Friburgo, *Summa confessorum* (Lyons: Henricus Vortoma, 1518), fol. 87rb. Pier Filippo della Cornia provides a good example of how the theological approach spreads among civil lawyers: Petrus Philippus Corneus Posinus, *In primam Codis partem* (Lyon: Eredi Giunta 1553), fol. 118vb, in C. 2.3.9 *Si pascenda*.

⁶¹ Any reference to risk (*periculum*) is missing from Bartolus of Saxoferrato’s comment on *Lex Rhodia*, as well as from that of Bartholomew of Saliceto, another relevant jurist of the late thirteenth, early fourteenth century. At best the term is generically linked to the risk of shipwreck, cp. Paulus de Castro, *Super secunda parte Digesti veteris*, [unnumbered folios] in D.14.2.6 *Navis adversa*: “quando navis non fuit in periculo perditionis”.

only considered in the light of prevention, depicted as a threat to avoid (*evitare*) rather than an event to evaluate and forecast.⁶²

As argued earlier, similar dynamics emerge if one looks at commercial mathematics. While most risk-sharing agreements simply needed an ex-post assessment of profit and losses, some also required the forecasting of potential risks and returns.⁶³ When a partnership was abruptly terminated by an unexpected event, for example, how should shares be calculated? This implied a change of perspective in the direction of probability calculus that, apart from few exceptional cases, did not yet occur.⁶⁴ The ‘rule of three’ was so rooted in merchants’ culture that it was also applied to predict future events, falsely assuming that the future

⁶² Baldus de Ubaldis, *Tomus secundum in Digestum vetus*, fol. 79vb, in Dig.14.2.5pr. *Amissae navis*: “Pro nave amissa non habet locum collatio, sed pro arbore cesa ut evitetur periculum maris et mercium collatio locum habetur.” Cp. also Paulus de Castro, *Super secunda parte Digesti veteris*, [unnumbered folios] in D.14.2.2.1 *Si conservatis*: “quando mercatores vident tempestatem si non dubitant periclitari non debent magistro dicere quid habet agree [...] puta quod navem exarmet [...] idem si fecit ne perclitaretur”.

⁶³ Examples can be traced since the early fourteenth century. Paolo Gherardi, *Opera matematica. Libro di ragioni - Liber habaci. Codici magliabechiani classe XI, nn. 87 e 88 (sec. XIV) della Biblioteca Nazionale di Firenze*, ed. G. Arrighi (Lucca 1987), 145–146; Gratia de’ Castellani, *Chasi sopra chonpagnie. Dal codice Palatino 573 della Biblioteca nazionale di Firenze*, ed. M. Pancanti (Siena 1984), 32–39; *Libro d’abaco. Dal Codice 1754 (sec. XIV) della Statute di Lucca*, ed. G. Arrighi (Lucca 1973), 75–79; Filippo Calandri, *Una raccolta di ragioni. Dal Codice L. VI. 45 della Biblioteca comunale di Siena*, ed. D. Santini (Siena 1982), 5–7, 26–27; Lucas de Burgo S. Sepulchri, *Somma di arithmetica*, fol. 152r, n. 31.

⁶⁴ It is important to stress that the few hinting at the solution later provided by Pascal, did not so in referring to risk-sharing partnership and sea trade, but to wagering; for example, Filippo Maria Calandri who discusses how to divide a stake between two ball players, in one case, and two crossbowers, in the other: Filippo Calandri, *Una raccolta di ragioni. Dal Codice L. VI. 45 della Biblioteca comunale di Siena*, 13–14, 39–40. Also I. Schneider, ‘The Solution of the Two Main Problems Concerning Games of Chance in the Late European Middle Ages and the Possibility of Islamic Sources’, *Bollettino di Storia delle Scienze Matematiche*, 23/2 (2003): 99–108. Other two examples, found both in anonymous handwritten collections of commercial mathematic problems, are edited and discussed by R. Franci, ‘Una soluzione esatta del problema delle parti in un manoscritto della prima metà del Quattrocento’, *Bollettino di Storia delle Scienze Matematiche*, 22/2 (2002): 260–265; L. Toti Rigatelli, ‘Il “Problema delle Parti” in Manoscritti del XIV e XV Secolo’, in M. Folkerts, U. Lindgren eds., *Mathemata. Festschrift für Helmut Gericke* (Wiesbaden-Stuttgart 1985), 229–236, 232–234.

would develop following the same pattern of the past.⁶⁵ Only by mid-seventeenth century mathematicians will be able to design a theory suited to go beyond this traditional approach.⁶⁶

Alternatives to premium insurance persisted over a long period not just in business practice, but also in the narrative describing them. As a result, sea risks continued to be framed in ways that varied according to the context in which they were discussed. Considering them as something that could be evaluated in advance, and therefore transferred in exchange for money, made little sense in the perspective of partnerships, General Average and similar risk-sharing tools. What mattered was the existence of well-functioning mitigation systems to mutualize losses. Commercial mathematics offered practical means to achieve this, while the concept of common good provided the moral rationale for a rhetoric emphasizing collective responses to marine risks.

This double-pronged approach goes side by side with the line of reasoning developed at the same time about premium insurance, suggesting a long-term coexistence of these views. As seen for gambling, these discussions were never totally self-confined, revealing unexpected points of contacts and combinations. The image of the expert ship master introduced by Alberti provides a good case in point. While the individual decision-maker is clearly at the centre of the stage, the choices he takes impact the larger dimension of household and lineage. Not by chance the equivalent of the skilled ship master is the exemplary *pater familias*, who is in charge of safely delivering his wealth to the next generations, thus making it clear that is not simply a matter of ‘personal’ liability.⁶⁷

⁶⁵ N. Meusnier, ‘Le Problème des partis peut-il être d’origine arabo-musulmane?’, *Journ@l électronique d’Histoire des Probabilités et de la Statistique/Electronic Journ@l for History of Probability and Statistics*, 3/1 (2007): 1–14.

⁶⁶ I. Hacking, *The Emergence of Probability: A Philosophical Study of Early Ideas about Probability, Induction and Statistical Inference* (Cambridge 1975), 12, 57–62; P. Bernstein, *Against the Gods: The Remarkable Story of Risk* (New York 1996), 60–72.

⁶⁷ Neu Watkins, *The Family in Renaissance Florence*, 36–39; Leon Battista Alberti, *I Libri della Famiglia*, 17–19. Not by chance, this whole passage revolves around the words of Benedetto Alberto, Leon Battista’s grandfather, who connects the material duties of the exemplary “*padre della famiglia*” (36, 17) to moral ones. This combination is presented as the key to avoid a household from ruin (“*ruinare*”, 38, 18) and pass a family’s fortune from one generation to another. This intergenerational bond is pushed even forward when Benedetto Alberto claims that “the old, then, should be common fathers to all the young” (39, 19).

Cotrugli provides a further example of how the two levels can combine. As seen above, making judgements on the basis of personal expertise is a distinctive feature of the ideal insurer, but the emphasis on individual skills is only part of the picture. The *Book of the Art of Trade* devotes a full chapter to marine insurance, granting full recognition to a contract that until then had been given little space in merchant handbooks. The opening lines of this chapter are revealing of a converging narrative where the quantification and shifting of maritime risks go along with a broader collective effort to manage them. Premium insurance is defined as “convenient and useful not only to the merchants that insure and take out insurance, but also most beneficial to cities and republics”.⁶⁸

Cotrugli’s words are not a novelty. Since the beginnings of the thirteenth century, scholasticism had developed a literary cliché made of long-distance trade and brave merchants supplying cities in need of provisions. The risk merchants took going by sea was seen as crucial in legitimizing their profits, as well as in granting them a public recognition for their role. The key-concept used, like in Bartolus of Saxoferrato discussion on General Average, is ‘common good’, but it was only in the following century that Bernardino of Siena explicitly linked this line of reasoning to insurance. The usefulness of insurance is directly connected with its support to the spreading of maritime trade, which is among the primary sources of wealth for a city (or a state). Since they take risks on behalf of the community, thus carrying out some form of civic duty, underwriters have the right to earn premiums.⁶⁹

Not only this theme will inspire Cotrugli, but later will become popular to the point of spilling over from the realm of theology to political discourses and economic ideas, countering the spread of less positive narratives depicting insurers as selfish profiteers. Examples of this can be found in the speech Queen Elizabeth I delivered when the London Chamber of Assurance was reformed in 1601, as well as in the seventeenth-century French bestseller on maritime trade, Estienne

⁶⁸ Cotrugli, *The Book of the Art of Trade*, 74; Cotrugli, *Il libro dell’arte di mercatura*, 175: “Lo sicurare è uno commune utile et comodo non solamente a mercanti che assicurano e si fanno asichurare, ma etiamdio egli è commodissimo ale ciptà e le republiche”.

⁶⁹ Bernardinus Senensis, *Quadragesimale de evangelio aeterno*, IV: 273; Ceccarelli, ‘Risky Business’, 616, 629–630.

Cleirac's *Us et coutumes de la mer*.⁷⁰ The long-lasting success of this line of reasoning takes us back to our departure point. Depicting underwriting in terms of a collective effort carried out by a community of citizens shows how the relation between risk-shifting and risk-sharing continued to be multifaceted. At the same time, emphasizing extremely familiar arguments made contractual innovation not only more comprehensible, but also fully compliant with civic values. It was essentially a matter of extending to the expanding business of insurance, those well-established narratives about lending money to the city, or investing in local charitable institutions that were—as noted by Anthony Molho—presented as the standard way for citizens of “drawing profit from the state”.⁷¹ The connection was strong to the point it worked the other way around as well. When new forms of charitable pawnbroking (*monte di pietà*) did emerge, it seemed obvious to equal them to insurance. Under this light it could be easily claimed that, confronting the risks of sea trade, was evidence of public commitment that signalled social rise and civic inclusion.⁷²

This rich imagery—jointly developed by merchants, mathematicians, jurists and theologians—was something more than a rhetorical exercise. Such ideas clearly mirrored (and resonated with) the functioning of markets run by small groups in need of investors granting coverage even if not involved in maritime trade. Seen from this perspective, the expansion of the insurance business taking place between the thirteenth and the sixteenth centuries acquires a richer meaning. It suggests that an

⁷⁰ L. Lobo-Guerrero, *Insuring War: Sovereignty, Security* (New York 2012), 27; Estienne Cleirac, *Us et coutumes de la mer, divisées en trois parties* (Bordeaux: Jacques Mongiron Millanges 1661), 215; on this F. Trivellato, *The Promise and Peril of Credit. What a Forgotten Legend About Jews and Finance Tells Us About the Making of European Commercial Society* (Princeton 2019), 51–52.

⁷¹ A. Molho, ‘The State and Public Finance: A Hypothesis Based on the History of Late Medieval Florence’, *The Journal of Modern History*, 67 (1995): Supplement 124.

⁷² See, for example, *Consilium almi collegii doctorum utriusque inclite civitatis Perusii super montem pietatis* in *Pro Monte Pietatis* (Venice: Johannes Tacuinus 1494–1498), [unnumbered pages, but fol. 31r]. It is no coincidence to find the above-mentioned Pier Filippo della Cornia among the lawyers who wrote this legal text in 1469.

interaction between narratives about risk, and the development of risk-management tools, was at work far earlier than recently argued by Jens Beckert and Richard Bronk.⁷³

If we look at the way markets actually worked, it was not just a matter of contract and institutional innovation, which proves to be efficient by being able to match an increasing demand for insurance and to include a larger number of underwriters. The expansion in scale did not overturn previously existing asymmetries but rather tended to reproduce them. On the one hand, there are groups needing protection for their maritime business, who control the market thanks to their bargaining power. On the other, there are ‘followers’ who can provide this protection thanks to risk-shifting innovations designed for this purpose, and supported by narratives promoting their adoption.

This latter is, however, slower than claimed by earlier scholarship. The customary risk-sharing approach—whether it concerned tools or ideas—was not all of a sudden erased by the creation of premium insurance. As this paper shows, the rise of this latter can no longer be explored, without taking into account the resilience of the former.

APPENDIX

See Tables 1, 2, 3, 4, 5, and 6.

⁷³ J. Beckert, R. Bronk, ‘An Introduction to Uncertain Futures’, in J. Beckert, R. Bronk eds., *Uncertain Futures: Imaginaries, Narratives, and Calculation in the Economy* (Oxford 2018), 1–38.

Table 1 Subscriptions in the role of insurance buyer and underwriter in Florence (1524–1526)

<i>Type of subscriber</i>	<i>In the role of insurance buyer</i>			<i>In the role of underwriter</i>		
	<i>No. of subscribers</i>	<i>No. of contracts</i>	<i>Value insured (in florins)</i>	<i>No. of subscribers</i>	<i>No. of shares</i>	<i>Value insured (in florins)</i>
Subjects subscribing both as underwriter and insurance buyer	75	797	621,300.5	72	3282	278,853.3
Subjects subscribing only as underwriter or insurance buyer	39	82	36,495.0	248	5210	380,792.2
“Ufficiali alle sicurtà”	1	2	3600.0	–	–	–
Unspecified/Non-identifiable subscriber	–	–	–	–	24	1750.0
Total	115	881	661,395.5	320	8516	661,395.5

Source Pisa, Archive of the *Scuola Normale Superiore*, *Salviati I*, “Libri di Commercio”, 70, cc. 3r–144r

Table 2 Insured values by amount underwritten in Florence in a selected trimester (March–May 1526)

<i>Value insured in florins (by amount underwritten)</i>	<i>Subscribed shares</i>		<i>Value insured</i>	
	<i>No.</i>	<i>%</i>	<i>Florins</i>	<i>%</i>
<49	31	4.1	793.3	1.3
≥ 50 < 100	389	51.1	19,655.0	32.3
≥ 100 < 200	297	39.0	30,700.0	50.6
≥200	44	5.8	9,625.0	15.8
Total	761	100.0	60,773.3	100.0

Source Pisa, Archive of the *Scuola Normale Superiore*, *Salviati I*, “Libri di Commercio”, 70, cc. 3r–144r

Table 3 Contracts subscribed, by frequency and temporal extension of underwriters, in Florence (1524–1526)

		<i>No. of underwriters by subscription frequency (on monthly basis)</i>				<i>Total</i>
		<i><0.25</i>	<i>≥ 0.25 < 0.50</i>	<i>≥ 0.5 < 1.00</i>	<i>≥1.00</i>	
No. of underwriters by length of their activity in the interval 1524–1526 (in months)	≤ 9	174	3	1	0	178
	> 9 ≤ 18	39	17	3	1	60
	> 18 ≤ 24	4	11	17	1	33
	>27	0	6	17	27	50
	Total	217	37	38	29	321

Source Pisa, Archive of the *Scuola Normale Superiore, Salvati I*, “Libri di Commercio”, 70, cc. 3r–144r

Table 4 Value insured, by frequency and temporal extension of underwriters, in Florence (1524–1526)

		<i>Value insured (as a % of the total) by subscription frequency (on monthly basis)</i>				<i>Total</i>
		<i><0.25 (%)</i>	<i>≥ 0.25 < 0.50 (%)</i>	<i>≥ 0.5 < 1.00 (%)</i>	<i>≥1.00 (%)</i>	
Value insured (as a % of the total) by length of business in the interval 1524–1526 (in months)	≤9	5.9	1.0	0.6	–	7.5
	> 9 ≤ 18	4.9	6.9	2.2	1.2	15.2
	> 18 ≤ 24	0.6	4.4	13.8	2.8	21.6
	>27	–	2.2	11.3	42.2	55.7
	Total	11.4	14.5	27.9	46.2	100.0

Source Pisa, Archive of the *Scuola Normale Superiore, Salvati I*, “Libri di Commercio”, 70, cc. 3r–144r

Table 5 Main “leading insurers” in Florence (1524–1526)

<i>Underwriter</i>	<i>No. of subscribed shares (as “leading insurer”)</i>	<i>No. of subscribed shares (total)</i>	<i>Shares subscribed as “leading insurer” (as a % of the total subscribed shares)</i>
Salviati, Averardo & c	145	230	63.0
Bartolini, Gherardo e Lanfredini, Bartolomeo & c	48	131	36.6
Bartolini, Gherardo (individually)	8	23	34.8
del Rosso, Agnolo di Pierozzo	63	209	30.1
Capponi, Ludovico	8	29	27.6
Dini, Agostino di Francesco & c	36	143	25.2
Venturi, Neri	34	137	24.8
Segni, Mariotto di Piero	8	33	24.2
del Nero, Marco di Simone & c	14	64	21.9
Antinori, Alessandro (individually)	13	76	17.1
Saliti, Zanobi (individually)	13	77	16.9
Ginori, Leonardo e Pitti, Giovanbattista & c	8	48	16.7
del Palagio, Mariano (individually)	11	71	15.5
del Benino, Stefano di Filippo & c	6	39	15.4
da Filicaia, Leonardo	7	46	15.2
Gondi, Bernardo e Antonio & c	12	81	14.8
Total (“leading insurers”)	434	1437	30.2
Other underwriters	399	6839	5.8
Total	833	8276	10.1

Source Pisa, Archive of the *Scuola Normale Superiore*, *Salviati I*, “Libri di Commercio”, 70, cc. 3r–144r

Table 6 Distribution of underwriters in the role of “leading insurer” in Florence (1524–1526)

<i>Class of “leading insurers” (in centiles)</i>	<i>% of contracts underwritten as “leading insurer”</i>
Top 1%	31.3
Top 5%	55.3
Top 10%	71.5
Top 20%	88.7
Top 40%	99.6

Source Pisa, Archive of the *Scuola Normale Superiore*, *Salviati I*, “Libri di Commercio”, 70, cc. 3r–144r

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