3 CONTRACT ENFORCEMENT

Introduction

An active market will develop only if traders can be sure that their trades will be executed by the market.[1] A trader will be hesitant to enter into a transaction if his counterparty can renege on his obligations without suffering adverse effects. So, for the development of the secondary market for VOC shares, some kind of mechanism for contract enforcement had to be in effect. Fortunately, the Low Countries already had a long history of commercial contracting when share trading started in 1602, so merchants and legal institutions were experienced in enforcing commercial transactions.[2] Moreover, the legal system acknowledged its important role in the development of trade. In Antwerp, the commercial metropolis of the sixteenth-century, the legal institutions interacted with the merchant community and promoted the merchants' interests.[3]

Share trading did thus not emerge in a legal void. On the contrary, the legal principles that applied to the transactions on the share market were already in existence and hence the share transactions fitted into existing categories of commercial law. The laws that applied to the transfer of title of a share, for example, were the same as those that applied to the transfer of ownership of real estate – both were considered immovable goods under Dutch law.[4] However, not everything was clear from the start, as the large number of conflicts between share traders that ended up in lengthy court cases in the period before 1630 shows. For period 1610-30, I have found thirty lawsuits dealing with share-trade-related court cases in the archives of the Court of Holland in The Hague.[5] This provincial court pronounced judgment in about 150

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[1] O'Hara, 'Optimal microstructures', 831-2.

[2] See, e.g., Herman van der Wee, *The growth of the Antwerp market and the European economy (fourteenth-sixteenth centuries)* II (The Hague 1963). Oscar Gelderblom, *Confronting violence and opportunism. The organization of long-distance trade in Bruges, Antwerp and Amsterdam, 1250-1650* (manuscript 2009).

[3] Dave de Ruysscher, *Handel en recht in de Antwerpse rechtbank (1585-1713)*, unpublished PhD thesis (K.U. Leuven 2009).

[4] See footnote 28 on page 98.

[5] Heleen Kole generously shared the notes she made for Oscar Gelderblom in the Court of Holland archives with me. She used a sample of court cases over the period 1585-1630 in which litigants appeared whose last names started with B, M or P. In addition to her sample, I used the name index (NA, Court of Holland, inv. nr. 1077) to look up all cases whose litigants are known to also have been share traders. There are no share-trade-related court cases available prior to 1610; which can be explained by the facts that it took several years before the court pronounced judgment, that there were relatively few trades in the first years after 1602 and that share traders started using more advanced financial techniques (forward trading, short selling) only from 1607 onwards.

cases per year, which means that one percent of the cases concerned share transactions.

After 1640, however, the ratio decreased to about one in every five-hundred lawsuits.[6] I will show in the first section of this chapter that in the earliest decades of the development of the secondary market for VOC shares, traders started litigation to test the bounds of the existing legal concepts. These litigants were convinced that there existed some space to maneuver within the rule of law. They were willing to enter into costly litigation – lawsuits before the appeal courts of Holland became especially costly if litigants kept adducing new evidence and appealing judgments[7] – that took up a great amount of effort; lawsuits that were ultimately brought before the Court of Holland could take anywhere between three-and-a-half and twelve years.[8]

From around 1640 onwards, however, traders no longer brought their share-trade-related conflicts before the higher courts. By then, the Court of Holland had pronounced judgment on all legal concepts that applied to the share trade. Henceforth, share traders could predict how the courts would decide in share-trade-related conflicts. Traders were no doubt abreast of the jurisprudence concerning the share trade and they regarded the Court of Holland as the authoritative institution regarding new interpretations of the law; they explicitly referred to earlier judgments of the

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[6] There are twenty so-called extended sentences of lawsuits dealing with share-trade-related conflicts available for the period 1640-1700. I have used the name index (NA, Court of Holland, inv. nr. 1078) to look up all cases for which I knew that the litigants (or their close relatives) traded shares. Additionally, I have checked all lawsuits listing names of Portuguese Jews.

[7] In the case between the directors of the VOC and Abraham de Ligne c.s., for example, the costs for the report made by one of the councilors of the High Council already amounted to *f* 126; each party had to pay half. This sum does not include the costs of lower courts, the process server, the solicitors' fee and taxes. NA, High Council, inv. nr. 642, 7 December 1621. These reports usually constituted half of the court's total costs; a bill in the Cardoso family's estate shows that the report constituted about 60 percent of the court's costs: *f* 36 on a total of *f* 59.20. Rachel Cardoso had to pay half of this amount (*f* 28.40), to which a total of *f* 12.90 taxes were added: bill Parnassim of the Jewish community of Amsterdam *vs.* Rachel Cardoso, 2 November 1712, estate David Abraham Cardoso, SAA, PIG, inv. nr. 654. The reports of the Court of Holland's *commissarissen* (e.g. NA, Court of Holland, inv. nr. 1355, for the year 1672) sometimes also include the bill of the court's process server. He charged *f* 3.75 for every summons. The clerk of the court's office charged *f* 6.20 per document. The bill could become steep if a lawsuit involved several litigants who all had to be served summons individually.

[8] The main factor of influence on the variation in duration was the amount of time litigants let go by before they submitted a request for appeal. The Court of Holland of course employed a maximum term to request an appeal, but the court could make exceptions for special cases. Moreover, a lower court's judgment could be suspended for the duration of the appeal (*mandement in cas van appel*) only if the appeal had been requested within a short period: M.-Ch. le Bailly, *Hof van Holland, Zeeland en West-Friesland: de hoofdlijnen van het procederen in civiele zaken voor het Hof van Holland, Zeeland en West-Friesland zowel in eerste instantie als in hoger beroep* (Hilversum 2008) 26. Le Bailly does not mention the maximum periods before lodging an appeal.

Court of Holland if a new conflict arose.[9] The courts' jurisprudence can thus be regarded as securities law.

The legal certainty that emanated from the judgments of the Court of Holland reduced investors' hesitancy – smaller merchants and, most prominently, Portuguese Jews – to participate in the share trade. As a result of the establishment of a clear legal framework, the market grew considerably in size.[10] Focusing on transaction costs can help to understand how legal certainty can persuade people to invest: the formation of a clear legal framework reduced the costs of protecting contractors' rights and also of costly enforcement of agreements by a third party, i.e. the court.[11]

However, the legal certainty applied only to part of the market: shareholders were allowed to trade only shares they legally owned on the spot and forward markets. The possibilities for growth were thus limited by the size of the VOC capital stock – the amount of legal shares available on the market. The sources clearly show that a number of traders performed far more transactions than their shareholdings would legally allow. Jacob Athias and Manuel Levy Duarte, for example, had monthly share turnovers on the forward market during the period 1683-4 of between *f*200,000 and *f*2,000,000.[12] At the same time, however, there were only very few mutations registered on their account in the capital book of the Amsterdam chamber and their nominal position never exceeded *f*3,000. In June 1684, they liquidated their position.[13] Their forward trades generally netted out, so they did not take large short positions in the VOC, but their official ownership of shares was nevertheless insufficient to legally justify their forward sales. These were, in other words, short sales and would not be enforced by the courts.[14] I will argue in the second section that the participants of the forward market were aware of this. They therefore established a private enforcement mechanism that replaced the rule of law. This mechanism, which was in force in the

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[9] Diego d'Aguirre, Duarte Rodrigues Mendes, Antonio do Porto and Isaack Gomes Silvera, for example, referred to a judgment of the Court of Holland in a claim they submitted to the Court of Aldermen (18 September 1672): SAA, Notaries, inv. nr. 4075, pp. 186-9.
[10] Cf. Chapter 2; particularly Figure 2.1 (p. 76) and Figure 2.2 (p. 77).
[11] North, *Institutions*, 27.
[12] SAA, PIG, inv. nrs. 687-8. The values given are market values.
[13] Interestingly, their nominal position in the VOC fluctuated between *f*9,000 and *f*27,000 in the years 1680 and 1681: NA, VOC, inv. nr. 7072, fo. 235, 383. Unfortunately, their forward trading activity during these years is unknown.
[14] For the ban on short selling, see chapter 1, section 1609-10 – Isaac le Maire on page 24 ff. The ban of 1610 was reissued in 1623, 1624, 1630, 1636 and 1677. Placard 3 June 1623: Cau, *Groot placaet-boeck* I, 555-9. Placard 20 May 1624: Ibidem, 665-7. Placard 1 October 1630: Ibidem, 667. Placard 27 May 1636: Ibidem, 667. Placard 16 September 1677: Cau, *Groot placaet-boeck* III, 1307.

trading clubs[15], was based on the traders' reputations and the condition that each participant benefited from subordinating to it.

The line of argument is thus as follows: court judgments in the first decades of the seventeenth century created a level of legal certainty that induced the entry to the market of new groups of traders. The subsequent growth could no longer fit within the legally approved boundaries of the market and created the need for a sub-market where a private enforcement mechanism was in force and where access restrictions made sure that only trustworthy traders could participate.

The two parts of this chapter build on two different fields of historiography. The first deals with the development of commercial law in Northwestern Europe and third-party enforcement of trade-related conflicts. In the province of Holland, the law consisted of a combination of Roman law and customary law, compiled by the famous jurist Hugo de Groot (Grotius).[16] Gelderblom has argued that this was not a static law. The *Hollandsche Consultatiën*, a seventeenth-century collection of legal advices compiled by jurists working for the provincial Court of Holland show that this court based its judgments 'on a combination of Roman law, local and foreign customs, Habsburg ordinances, and Italian and Spanish mercantile law'.[17] It is therefore interesting to study the sentences of the Court of Holland in detail – in pronouncing judgments on share-trade-related court cases this court's judges drafted the world's first securities law. Banner has traced the origins of Anglo-American securities regulation from the eighteenth century onwards. He analyzed attitudes towards the trade in securities and studied how these influenced the regulation of the trade. Banner found that although the societies and the authorities in England and the United States were often ill-disposed towards the trade in financial securities, leading to bans on the trade of specific derivatives, the courts kept enforcing the contracts. They based their judgments on general legal concepts rather than on the attitudes of the general public, thus giving legal protection to the trade.[18]

The second focuses on private enforcement mechanisms. The most influential works on this topic have focused on international trade. The difficulty of monitoring business partners abroad required a high level of commitment by all partners in-

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[15] See, for a general introduction on trading clubs, chapter 1, section 1660s – Trading clubs on page 45 ff.
[16] R.C. van Caenegem, *Geschiedkundige inleiding tot het privaatrecht* (Ghent 1981) 51.
[17] Gelderblom, *Confronting violence and opportunism*, 366.
[18] Banner, *Anglo-American securities regulation*.

volved. Greif has shown for the eleventh-century trade between North Africa and Italy that traders organized themselves in coalitions. This coalition-forming created a situation in which even traders who did not know each other personally were willing to trade with one another. The system worked so well because all participants benefited from it.[19] The share market cannot be seen as an example of international trade, though. While foreign traders occasionally participated, the majority of the traders came from Amsterdam. But the trading community did not consist of a homogeneous group of traders either – particularly after the Sephardic community of Amsterdam started participating in the market from the 1640s onwards. Hence the forward market was characterized by a large heterogeneous group of traders who put very large amounts of money at stake. How did they make sure that all members of the trading community lived up to their agreements?

Court cases form the most important source for this chapter's analysis. A short review of the procedure of civil litigation in the Dutch Republic is therefore indispensable. Conflicts concerning share transactions on the Amsterdam market would usually first come up before the local court of Amsterdam. The archives of this court have been lost, however, so my argument is based on the extended sentences that are available in the archives of the Court of Holland and – to a lesser extent – the High Council. The Court of Holland was the court of appeal for cases that had come up before one of the local courts in Holland. After this court had pronounced judgment, litigants could appeal to the High Council, but this court was neither more authoritative, nor more influential; the only difference was that the High Council also had jurisdiction over the province of Zeeland.[20]

The near total loss of the archives of the local court of Amsterdam is a pity, but these sources are not indispensable for my argument, since my main interest concerns the development of jurisprudence on share trade. It is to be expected that the local court of Amsterdam could very well deal with most of the share-trade-related conflicts. There are indications that share traders went to the Amsterdam court to exact payment or delivery of a share from their counterparties[21], but these were probably not

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[19] Avner Greif, 'Reputation and coalitions in medieval trade: Evidence on the Maghribi traders', *The journal of economic history* 49 (1989) 857-882.

[20] M.-Ch. le Bailly and Chr. M.O. Verhas, *Hoge Raad van Holland, Zeeland en West-Friesland (1582-1795): de hoofdlijnen van het procederen in civiele zaken voor de Hoge Raad zowel in eerste instantie als in hoger beroep* (Hilversum 2006) 7.

[21] This is based on the *insinuaties* in the protocols of Amsterdam's notaries. An *insinuatie*, or notarial summons, was usually the first step in legal action. The protocols of 1672 and 1688, two years with

the most interesting cases. However, if one of the parties was convinced that there were several possible interpretations of a lawsuit, he would appeal the judgment of the lower court to the Court of Holland. Hence, those cases are particularly important for a reconstruction of the development of a legal framework.

The procedure of litigation before the Court of Holland was as follows. The plaintiff first submitted a petition to the court, listing a short summary of the case and his principal arguments. The court then, provided that it had approved the petition, entered the case onto the scroll (*rol*), the list of cases to be dealt with by the court. Thereafter, the plaintiff could summon the defendant to appear in court. The plaintiff's solicitor then submitted his claim to the court, to which the defendant could respond within two weeks' time. Thereafter, both parties could submit a rejoinder, which could take another four weeks in total. Both parties had now set forth their positions, but the court could ask the parties to submit more information or to prove a certain argument.

Naturally, both the plaintiff and the defendant adduced evidence, for example attestations before a notary, questionings of witnesses and other forms of written evidence such as brokers' records.[22] Conflicting parties often asked other merchants or brokers – people, in sum, who were demonstrably well informed about the share trade – to attest before a notary public.[23] They attested, for instance, the customary way of trading shares or the share price at a certain date. They could also give a report as a witness.[24] Case files that contain all written evidence are available for some lawsuits.[25]

When the court had collected all the necessary information, it pronounced judgment. A report of the court procedure was included in the collection of extended sentences of the Court of Holland. This collection, as well as the collection of extended sentences of the High Council, contains reports of all cases in which the judges took some sort of action. These collections thus also contain lawsuits in which, for instance, the judges referred the litigants to mediators. This means that my sources are

large price fluctuations and consequently many conflicts between share traders, contain high numbers of *insinuaties*. It is very well possible that these conflicts were also brought before the local court. Only one conflict stemming from a transaction in 1672 and one from a transaction in 1688 reached the Court of Holland, however.

[22] See for the types of evidence accepted by the courts: Gelderblom, *Confronting violence*, 272-3.

[23] Cf. Van Meeteren, *Op hoop van akkoord*, 172-3. According to Van Meeteren, for an attestation to be credible, it had to be attested to a notary public as soon after the event had happened as possible: Van Meeteren, *Op hoop van akkoord*, 181.

[24] E.g. NA, Case files, inv. nr. IIT39.

[25] NA, Case files. Normally, litigants received the contents of the case file back when the court procedure was finished. However, some litigants did not collect the case files.

not biased by the selection procedure of the clerk of the court. It is true, however, that my method of research excludes those cases that reached amicable settlement before the courts' mediators. Again, this is not problematic: I have checked the reports of mediators in the years after 1672 – when the price crash led to a high number of conflicts – but the share-trade-related cases in these reports deal with relatively minor issues. The litigants whom the lower courts had ruled against simply appealed to the Court of Holland to postpone the execution of the lower court's judgment. Subsequently, the Court of Holland realized that it was no use to start a full court procedure again and referred the litigants to mediation.[26] So, to conclude, the extended sentences of the provincial courts of Holland are the right sources to use for an analysis of the development of jurisprudence on share-trade-related issues.

The legal framework

Conflicts about share transactions could involve three legal concepts: ownership and the transfer of ownership, endorsement* and the terms of settlement of a transaction. The courts of the province of Holland refined jurisprudence on these concepts by judging on a number of court cases. All three legal concepts will subsequently be addressed in the following subsections.

OWNERSHIP AND TRANSFER OF OWNERSHIP

Clear rules for share ownership and the transfer of share ownership were crucial for the development of the secondary market. Under Roman-Dutch law, the general rule for transfer of title was that ownership passed on the basis of delivery. Since VOC shares were not payable to the bearer, however, they could not be physically delivered, so a special rule for the conveyance of ownership was needed. The directors of the VOC were aware of this and therefore they included a rule that regulated how investors could ascertain and convey share ownership in the subscription book of 1602. Shareholders owned those shares registered under their account in the capital books that were kept by the company bookkeeper. Title to a share could be transferred by means of official registration.[27] This procedure was similar to the procedure for trans-

[26] NA, Court of Holland, inv. nrs. 1552, 1559.
[27] The first page of the Amsterdam chamber's subscription book stated this rule. Transcript of this page (followed by the entire book): Van Dillen, *Aandeelhoudersregister*, 105-6. See also chapter 1 section 1602 – The subscription on page 17 ff.

ferring unmovable goods such as real estate. Hence, the law also classified shares as unmovable goods.[28]

Van Balck *vs.* Rotgans (1622) marks an important step in clarifying the rules for ownership of a share. This case made clear that a shareholder could be certain that the shares listed on his account in the capital book of the VOC were his full property and that previous holders of the ownership of the share could not lay claims on it. The judges thus confirmed the legal force of the capital books. The plaintiff in this lawsuit, Allert van Balck, believed that he had right of vindication on the share he had transferred to Jan Hendricksz. Rotgans. Right of vindication means that the transferor of a good could reclaim ownership if the good had not been fully paid for or if he could prove that the purchaser had practiced fraud at the time of the transaction – for example by hiding his impending insolvency or fleeing from town without paying.[29] Van Balck had transferred a share, but he never received full payment and therefore claimed the ownership of the share.

Van Balck had sold this particular share to Hans Bouwer on April 5, 1610. Bouwer, for his part, sold a similar share to Rotgans on the next day. Rotgans approached Van Balck on the exchange, saying that he wanted to receive his share, but Van Balck replied that he did not know Rotgans and that he had traded with Bouwer. Rotgans then explained the situation and told Van Balck that he should transfer the share to him; he would pay him *f* 1,000 and Bouwer would see to the payment of the remaining sum. Van Balck agreed to transfer the share, but he never received full payment: Bouwer left Amsterdam in the following days to flee from his creditors. Van Balck went to court, where he requested seizure of the share, but the Court of Aldermen refused to adjudicate this; the judges reasoned that Van Balck no longer had title to the share after he had transferred it to Rotgans. Van Balck argued that he still had the right of mortgage of the share, because he had never received full payment. In his view, he still had a claim on Bouwer's share and hence on Rotgans' payment to Bou-

[28] The *Consultatien*, a famous compilation of early-modern Dutch jurisprudence, confirms that the courts treated shares as immovables in the winding up of estates: *Consultatien, advysen en advertissementen, gegeven ende geschreven by verscheyden treffelijcke rechts-geleerden in Hollandt* I (Rotterdam 1645) 77, 139-40. In England, it had been unclear after the foundation of the first joint-stock companies whether common law treated shares as real or personal property. This had implications for the transferability of shares. Subsequent incorporation acts added a clause that declared shares to be personal property: Harris, *Industrializing English law*, 117-8. In the Dutch Republic, there were no impediments to the transfer of unmovable goods other than the obligation to officially register a transfer.
[29] De Groot, *Inleidinge* II *Aantekeningen*, 236.

wer. Van Balck appealed the Aldermen's decision before two higher courts, but both the Court of Holland and the High Council also ruled against him.[30]

The fact that Van Balck and his lawyer appealed the courts' decisions twice indicates that this was not a clear-cut case. This lawsuit was not just about the right of vindication; Bouwer had practiced fraud, so there was little doubt that Van Balck had right of vindication. However, the courts had to balance Van Balck's right of vindication and the rights of Rotgans, who gave the impression that he was a sincere buyer who had paid for the transfer, against each other. Rotgans was not as sincere as he had the court believe, in fact, he was in league with Rotgans, but Van Balck did not succeed in convincing the court of Rotgans' insincerity.[31] In the end, the courts favored the interests of the buyer who had purportedly done nothing wrong.

This judgment had far-reaching consequences; with it, the courts safeguarded the interests of commerce. Share trading could have been severely hampered had Van Balck won this lawsuit, because in that case a buyer of a share would always have to fear that there was still a claim on the share he had bought, which would give the seller the right to claim it back.[32] This particular lawsuit, in other words, took away legal doubts that could have restrained investors from buying shares on the secondary market for VOC shares.

Interestingly, a few years before the High Court pronounced final judgment in this case, the VOC had also recognized the potential problems of transfers of shares that had claims attached to them. The VOC feared that buyers would not only lay a claim on the seller, but also on the company. It therefore changed the share transfer regulation. From 1616 onwards, the buyer of a share had to sign a statement when the bookkeeper added the share to his account that indemnified the company against any future claims. The buyer signed that he had accepted a 'good' share – a real share, in other words, a share that had formed part of the capital stock since 1602 – and that he was satisfied with it.[33]

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[30] Allert van Balck *vs.* Jan Hendricksz. Rotgans, 22 December 1622, NA, High Council, inv. nr. 715. The *insinuatie* that preceded the court case has been published by Van Dillen: Van Dillen, 'Isaac le Maire', 101 (doc. nr. 46). Pieter Symonsz. van der Schelling ended up in a similar situation after transferring shares to Hans Bouwer: Van Dillen, 'Isaac le Maire', 108 (doc. nr. 57).
[31] Van Dillen, 'Isaac le Maire', 121.
[32] D.L. Carey Miller, 'Transfer of ownership', in: Robert Feenstra and Reinhard Zimmerman (eds.), *Das römisch-holländische Recht. Fortschritte des Zivilrechts im 17. und 18. Jahrhundert* (Berlin 1997), 521-40, there 527, 532-4.
[33] Van Dam, *Beschryvinge* 1A, 144-5.

By extension, the same legal principle that the court applied in Van Balck *vs.* Rotgans was in force in the forward trade. In a series of judgments, the courts ruled that forward buyers could also expect the underlying asset of their forward contract to be a real share. There was no need to explicitly state in the contract that the share had to be free of any claims; the judges held the opinion that that was a matter of course. The Court of Holland thus clarified the procedure of transfer of ownership in a forward transaction.

The lawsuits that dealt with these matters were to a large extent similar to Van Balck *vs.* Rotgans, although they look much more complicated at first sight. These court cases all started with Pieter Overlander who found out that the share he had received in settling a forward contract was fraudulent. The seller had transferred a non-existent share to his account, which the company bookkeeper had knowingly executed. The complication of this case lies in the fact that many more traders were involved in this transaction; the transfer of a share to Overlander had settled the contracts of a chain of forward traders. The following description of the lawsuit shows that these chains of traders could prove problematic if conflicts arose between one pair of traders within the chain.

Pieter Overlander had bought a forward with a *f* 3,000 VOC share as underlying asset from Abraham Abelijn on 13 March 1609, but the share was eventually transferred to him by Hans Bouwer. Abelijn had a similar transaction (a forward with the same nominal value and settlement date) with Dirck Semeij, who for his part had bought a similar forward from Maerten de Meijere. When the contract was due for delivery, Semeij asked De Meijere to transfer the share directly to Abelijn. De Meijere, however, was to receive a share from Jacques van de Geer and Hans Pellicorne and therefore he asked Abelijn if he would be satisfied if they delivered the share to him. Abelijn referred the question to Overlander. But Overlander had just heard a rumor that Van de Geer and Pellicorne were on the verge of going bankrupt, so he refused to accept this deal, unless De Meijere would explicitly indemnify him against any trouble. De Meijere then proposed to let Hans Bouwer, who also owed a share to him, deliver the share instead. Overlander accepted this deal and Abelijn also trusted that this transfer would successfully settle all the abovementioned transactions: he traded with Bouwer on a daily basis. Overlander had the share transferred to Frans van Cruijsbergen, his brother-in-law, and each pair of traders in the chain came together once more to tear up the contracts and pay possible price differences.

A little later, however, the transferred share was found to be fraudulent, so Overlander started litigation. He summoned Abelijn – the only trader he had a rightful claim on – to appear in court and demanded that Abelijn replace the share with a good one. What makes this lawsuit so interesting is that the Amsterdam Court of Aldermen requested Overlander to give evidence under oath that he had been promised a 'sincere and sound' share on contracting this transaction. His claim would be dismissed if he did not take the oath, which reveals that the lower court did not acknowledge the legal principle that the buyer of a good can always expect this good to be delivered according to the conditions in the contract.

Abelijn's lawyer had made this particular point an important part of the defense, arguing that Overlander had requested to be indemnified against any troubles if Van de Geer and Pellicorne would have transferred the share, but he had not made any such requests when Abelijn proposed to let Bouwer transfer the share. Overlander had thus, according to the defense, accepted the share without reservations.

Overlander did not hesitate to make his declaration under oath and the court consequently sentenced Abelijn to replace the share. Abelijn then summoned his original counterparty Semeij, and the Aldermen pronounced the same judgment. Hence, the chain of share transactions became mirrored in a chain of court cases before the Court of Aldermen. Furthermore, every one of the defendants appealed the Aldermen's sentences to the Court of Holland, resulting in another chain of court cases (this time the other way around: Abelijn *vs.* Overlander, Semeij *vs.* Abelijn, etc.), but the appeals were disallowed. The judges of the Court of Holland did not require the litigants to make declarations under oath. It was clear for them that the forward traders could expect to be delivered a real share.[34] The Court of Holland thus clarified the procedure of transfer of ownership for forward transactions.

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[34] Abraham Abelijn *vs.* Pieter Overlander, NA, Court of Holland, inv. nr. 632, nr. 1614-50 and NA, High Council, inv. nr. 708, 30 July 1616. Dirck Semeij *vs.* Abraham Abelijn, NA, Court of Holland, inv. nr. 632, nr. 1614-73 and NA, High Council, inv. nr. 708, 30 July 1616. Maerten de Meijere *vs.* Dirck Semeij, NA, Court of Holland, inv. nr. 632, nr. 1614-76 and NA, High Council, inv. nr. 708, 30 July 1616. The traders also appealed the judgments of the Court of Holland to the High Council, but the trial before the High Council did not reveal any new information. The motivations behind these appeals were of a more pragmatic nature: since Bouwer had fled from Amsterdam, the last person in the chain – Semeij – had no one to lay a claim on. He therefore tried once more to be released from De Meijere's claim.
The cases concerning the chain of transactions starting with Pieter Overlander are almost identical; the Court of Aldermen pronounced judgment around late November or early December 1611, the appeals came up before the Court of Holland in 1614 and before the High Council in July 1616.
There was a similar lawsuit between Maerten de Meijere and Pieter van Duynen. Van Duynen had traded with Maerten de Meijere, who had an unsettled transaction with Bouwer. The share transfer

ENDORSEMENT

The lawsuits about the fraudulent share also show that the clearing of multiple forward contracts worked inefficiently in 1609. These pairs of traders first negotiated their transactions individually and then tried to arrange settlement of multiple contracts with a single share transfer. However, to accomplish that, they constantly had to consult their initial counterparty about whether he agreed that a third party would deliver the share to him. These traders could have spared themselves this trouble had they chosen to resell their original contracts rather than to draft new contracts for each transaction.

It is not surprising, however, that traders were hesitant to assign their forward contract to third parties before maturity; simple assignment of a financial claim to a third party meant that the trader would once again have to make an assessment of counterparty risk. He would have to consider, in other words, whether the new counterparty would live up to his agreements. The risk that the assignor did not inform the assignee about all the conditions of the contract further complicated assignation – there was always a chance that there was something wrong with the contract. Moreover, the assignee did not get in personal contact with the counterparty of the contract if he bought the claim from someone else and this might hide important information about the counterparty's reputation and creditworthiness. In sum, the assignee might be hesitant to take over the contract under these conditions.

Contract negotiability was the solution to these problems. This concept was introduced in the Netherlands under the reign of Emperor Charles V in 1541 with the intention of enabling merchants to assign letters obligatory more easily. The legal title to a contract could now be assigned to the assignee by way of endorsement, which literally means that the assignee puts his name on the back (*en dos*) of the original contract. If a debtor defaulted, his creditor not only had recourse to the debtor, but also to previous assignor. This implied that the legal status of the contract improved with every endorsement: the longer the list of endorsers, the more people the ultimate trader in line would have recourse to.[35]

from Bouwer to Van Duynen settled both transactions. Maerten de Meijere *vs.* Pieter van Duynen, 27 January 1612, NA, Court of Holland, inv. nr. 626, nr. 1612-6.

[35] John H. Munro, 'The medieval origins of the financial revolution: Usury, rentes, and negotiability', *The international history review* 25 (2003) 505-562, there 553. Van der Wee, *The growth of the Antwerp market*

Endorsement also worked in derivatives transactions. The endorser wrote on the contract that he assigned his rights to the endorsee and both men signed the endorsement.[36] The lawsuit Adriaen van der Heijden and Daniel van Genegen *vs.* Abraham Abelijn (1614) shows the legal force of endorsements and the advantages of endorsements over the chains of traders that figured in the previous example. The conflict between Van der Heijden and Van Genegen and the defendant emerged after the plaintiffs refused to deliver a share. In the original contract, Van der Heijden sold a forward to Van Genegen. Less than a month after the contract date, on 3 April 1610, Van Genegen resold this claim to Abelijn. The resulting transaction was thus as follows: Abelijn would receive a share from Van der Heijden on 17 March 1611, the settlement date of the contract, and pay 150% for it. On the settlement date, Abelijn and Van der Heijden disagreed over how to settle the contract: Van der Heijden preferred a monetary settlement, whereas Abelijn requested that the share be delivered. They were unable to come to an amicable settlement and Abelijn started litigation. He summoned both Van der Heijden and Van Genegen to appear in court, arguing that they were both contractually obliged to deliver the share. Van Genegen replied that there was no ground to summon him, because Van der Heijden was sufficiently solvent to comply with the contractual obligations. The judges disagreed with him, however; they ruled that both Van der Heijden and Van Genegen were individually responsible to deliver the share.[37]

To summarize, Abelijn had a legal claim on the holder of the contract, but also on the original counterparty who had resold his claim. It made no difference to the judges that there were no bankruptcies or insolvencies involved in this case. The Amsterdam merchants were probably already familiar with the advantages of endorsements before the Court of Holland pronounced this judgment, but it would nonetheless have made potential share traders aware of the advantages of endorsements. Abe-

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II, 340-3, 348. Veronica Aoki Santarosa is preparing a PhD thesis in which she argues that the incentive to monitor the counterparty becomes smaller as the number of endorsers increases. The maximum number of endorsers in share transactions is two, so in my opinion, the negative effects of endorsements on monitoring would not have played a significant part on the seventeenth-century share market.

[36] For an example of an endorsed contract, see the options contract in the case file of the lawsuit between Willem Hendrick Tammas *vs.* Antonio Alvares Machado, 1689, NA, Case files, IIT39. The earliest endorsements I have found date from 1609. In the chaotic aftermath of Le Maire's bear raid, many forward traders wanted to be sure who their counterparty was. Several notarial deeds show that forward contracts had been resold, e.g. *insinuatie* 10 August 1610, SAA, Notaries, inv. nr. 120, fo. 99v; *insinuatie* 16 August 1610, SAA, Notaries, inv. nr. 209, fo. 181v; *insinuatie* 21 August 1610, SAA, Notaries, inv. nr. 120, fo. 99v-100r.

[37] Adriaen van der Heijden and Daniel van Genegen *vs.* Abraham Abelijn, NA, inv. nr. 633, nr. 1614-118.

lijn's position was similar to that of Overlander and other unwary buyers on the share market, but his legal position was much better. Furthermore, Abelijn did not have to make an assessment of the reputation and creditworthiness of his contractual counterparty Van der Heijden, because he also had recourse to Van Genegen. This judgment spread knowledge about the benefits of endorsements on the share market and might very well have persuaded traders to participate in the forward market rather than in the spot market, because endorsed forward contracts were stronger than spot contracts; it was a significant advantage to have recourse to several counterparties.

With this legal concept clearly defined, the legal framework was in place. From the 1630s onwards, traders knew the legal force of the various transactions that they could choose among. Also, property rights were now clearly defined. Finally, and most importantly, participants in the secondary market for VOC shares could predict how the courts would judge in certain types of conflict. This legal certainty reduced the chance of becoming involved in a court case and thus reduced transaction costs.

Terms of settlement

The outcome of share-trade-related court cases was not always to the benefit of the development of trade. Court judgments of the early seventeenth century confirmed that it was possible to delay the settlement of a forward contract for a seemingly indefinite period of time. Buyers simply delayed requesting delivery of the share until it became profitable for them to so. Until that moment, they had postponed settlement, for instance under the pretext that they needed some more time to gather the money needed for the settlement. The seller, meanwhile, could urge the buyer to accept the share, but he could not legally force him to do so. When the buyer finally requested delivery of the share, the seller could try to object to this claim by arguing that it was unreasonable to suddenly request delivery months after the original settlement date, but the buyer's case stood stronger in court: the judges would decide on the basis of the original forward contract, which stated that a share should be delivered at a certain price after a certain term, without a limitation to the contract's validity. Hence, they would enforce the contract.[38]

[38] E.g. Isaac le Maire *vs.* Louis del Beecke, NA, Court of Holland, inv. nr. 633, 1614-134 and Isaac le Maire *vs.* Louis del Beecke, NA, Court of Holland, inv. nr. 664, 1624-64. (In spite of the fact that the same litigants appear in both cases, these are different lawsuits.)

It is not hard to see how this hampered the development of trade: it was a rather uninviting prospect for forward sellers that their counterparties could simply linger over settlement until the deal would become profitable to them. The market itself found a solution for this problem. From the 1630s onwards, it became customary to settle a forward contract within three weeks after the original settlement date. Forward buyers could use this period to gather the money needed for the share transfer or to try to find a counterparty willing to roll over the contract. This market custom did not have the status of a legal rule, however. In the early 1640s, for instance, traders already referred to it in their plea before court, but the judges took no notice of it.[39] The market itself, however, did regard it as an official rule; stockbrokers Sebastiaen da Cunha and Hendrick van Meijert attested before a notary in 1659 that a buyer lost title to the forward contract after the customary settlement term had expired.[40] This was thus an example of self-regulation: the trading community expected its members to settle their contracts within three weeks' time after expiry of the contract. The absence of conflicts over contract settlement that came before a higher court after 1641 suggests that the traders complied to a large extent with this informal rule.

In the mid-1680s, share trader Samuel Cotinho decided to test this rule's legal status once again. His lawsuit against Vincent van Bronckhorst is especially interesting, because its case file, containing various attestations, survived. This case thus shows how the judges in the Dutch Republic took statements of market practitioners into consideration. The case went as follows: on 25 June 1683, Van Bronckhorst sold a forward with a *f* 12,000 VOC share as underlying asset to Cotinho. Three days after the settlement date (1 September 1683), Van Bronckhorst notified Cotinho that he wanted to deliver the share, but Cotinho answered that he was unable to receive it. Van Bronckhorst then asked a notary to serve an *insinuatie* containing a request to deliver the share to Cotinho. Cotinho was not at home, though, but his maid listened to the *insinuatie*. Since no subsequent action was taken on the side of Cotinho, Van Bronckhorst asked permission of the Court of Aldermen to sell the share on the market instead, which the Aldermen granted. A little later, however, Cotinho started litigation; he argued that it was unreasonable that Van Bronckhorst had sold the share to

[39] E.g. Philips de Bacher *vs.* Frederick van Schuijlenburch (20 December 1641), NA, Court of Holland, inv. nr. 739, nr. 1641-166. This lawsuit shows that the market custom had already become established, but the court did not yet rule accordingly: the buyer had waited a month before he requested delivery of the share, but the court still ruled in favor of his claim to get the share delivered.
[40] Attestation (11 July 1659), SAA, Notaries, inv. nr. 2207, p. 95.

a third party before the customary term for settling forwards had expired. Cotinho held a strict view of the market custom. In his opinion, forward buyers held title to an unsettled contract until the customary term had expired whatever happened in the meantime. He thus regarded it as an extension to the contract's term and wanted to see whether the court would approve of this view.

Both litigants adduced attestations to support their case. A group of regular traders attested on 4 October 1683, only days after the *insinuatie*, that it was customary to settle contracts after two or three weeks, but traders should immediately settle once the counterparty had requested settlement through an *insinuatie*. The attestation used by Cotinho's solicitor was dated 27 October 1684: a number of brokers stated before a notary that the customary settlement term was three or four weeks. In the end, the court ruled in favor of Van Bronckhorst: it had not been unreasonable that he had sold the share before the customary term for delivery had expired.[41]

The market custom regarding the term for contract settlement did thus not have legal status. A contract neither lost its validity after the term had expired[42], nor were traders able to claim title to a contract on the basis of the market custom. But the courts' judgments did not stop the market from using its customary practices for the settlement of contracts. To be sure, from the end of the 1680s onwards, the market custom was explicitly mentioned on the printed forward contracts used in the forward trade. And, what is more, this extra clause imposed a fine on non-compliance with the market custom. A trader who settled his contract with a *f*3,000 share as underlying asset too late was fined *f*7.50 per day. I have found no evidence of traders actually paying this fine, but the fact that this stipulation was included on the printed contracts suggests that it was widely accepted by the trading community. Interestingly, moreover, the clause also stipulated that a contract would lose its validity should its holders refrain from settling it within three months.[43] The trading community thus imposed its own rules where legal enforcement proved to be inadequate. In the case of terms of settlement, self-regulation facilitated the settlement procedure. Without it, however, the market would still have functioned. The next section will address a self-regulatory

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[41] Samuel Cotinho *vs.* Vincent van Bronckhorst, 1689, NA, Case files, IIK98.
[42] See footnote 39.
[43] Forward contract 14 June 1688, SAA, PIG, inv. nr. 654. The bottom lines of this contract stipulated that it should be settled within 20 days after the original settlement date. If the seller did not comply, the price would thereafter be reduced by a quarter of a percentage point a day. If the buyer did not comply, the price would be increased by a quarter of a percentage point a day. In any case, the contract would lose its legal validity three months after the original settlement date.

mechanism that was a sine qua non for the scale of forward trading of the second half of the seventeenth century.

Private enforcement mechanism

The ban on short-selling of February 1610[44] severely constrained forward trading. Traders were allowed to sell forward contracts only with shares they legally owned as underlying asset, but share traders continued short-selling and the authorities felt compelled to repeat the ban several times. In these reissues, the first of which appeared in 1621, they explicitly stated that brokers were not allowed to negotiate contracts that contained a renunciation clause. Moreover, any contract containing such a clause would be declared null and void. Apparently traders negotiated contracts in which they explicitly renounced the ban on short-selling.[45]

The use of contracts containing a renunciation clause was nevertheless widespread. All examples of printed contracts that I have found, dating from different periods throughout the seventeenth century, contain such a clause. To be sure, even Vincent van Bronckhorst, himself a councilor of the High Council, did not hesitate to use them.[46] The judges understood that they could not pronounce the entire forward share trade illegal, so they approved the use of the contracts containing a renunciation clause, which shows once more that the courts were disposed to supporting the development of the share trade.

At the same time, however, the Dutch legal system did not enforce short sales. So if a litigant could convincingly prove that his counterparty had not owned the share that was subject of a forward sale at the contract date and during the contract's term, the court would declare the contract null and void. In his case against Andries Polster in 1633, Severijn Haeck convinced the judges of the Court of Holland that Polster had not owned the underlying asset of the forward he had sold him during the contract's term. The court declared the contract null and void, even though Polster had immediately made good tender of the stock after Haeck announced that he was about to start litigation.[47]

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[44] See chapter 1, section 1609-10 – Isaac le Maire on page 24 ff.
[45] Smith, *Tijd-affaires,* 57-60. See, for the bans, footnote 14.
[46] Samuel Cotinho *vs.* Vincent van Bronckhorst, 1689, Court of Holland, Case files, IIK98.
[47] Severijn Haeck *vs.* Andries Polster (28 March 1633), NA, Court of Holland, inv. nr. 703, nr. 1633-36-1. The court pronounced the same judgment in a similar case between Severijn Haeck and Dirck van der Perre, which came up in court on the same day: Severijn Haeck *vs.* Dirck van der Perre (28 March 1633), NA, Court of Holland, inv. nr. 703, nr. 1633-36-2.

A lawsuit that came before court 34 years later indicates that traders were fully aware of the fact that the courts would never enforce short-sale contracts. The defendants in the case started by Sebastiaen da Cunha did not even bother to appear in court. Just like Haeck, Da Cunha wanted to be relieved from his contractual obligations. In 1665, he had bought a number of forward contracts with VOC shares with a nominal value of several thousands of guilders as underlying assets from a total of nine counterparties. During the terms of these contracts the Second Anglo-Dutch War (1665-7) broke out, leading to a relative price decrease of 35% (from around 490%[48] in 1664 to 315%[49] in September/October 1665). Da Cunha realized that he was about to lose a lot of money were he to comply with the contracts and he therefore tried to be relieved from his contractual obligations by taking these contracts to court. The report of the court's session does not state the details of Da Cunha's contracts, but assuming that he traded one forward contract with each of the nine defendants in this lawsuit, that all shares had a nominal value of *f* 3,000 and that the price dropped by 175 percentage points[50] after he bought the forwards, he could have lost up to *f* 50,000 on these forwards. The defendants probably knew that Da Cunha could produce convincing evidence and therefore they realized that they had nothing to win by going to the courtroom in The Hague. They were sentenced by default after the fourth no-show; the court declared the contracts null and void.[51]

Da Cunha's strategy could have posed a big threat to the growth of the forward market: many forward traders owned only a small or zero amount of shares in the capital books of the VOC. Hence, if they sold forwards, these were likely to be short sales, which gave their counterparties the opportunity to legally renege on their purchases. Consequently, forward short sellers would always lose on their transactions: on expiry of the contract, buyers, whose behavior was solely influenced by economic con-

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[48] During the period June-August 1664, the share price fluctuated between 490 and 500%: SAA, Merchants' accounts, inv. nr. 39, fo. 73.
[49] SAA, Deutz, inv. nr. 291, fo. 46.
[50] This would have been the maximum possible loss per share.
[51] Sebastiaen da Cunha *vs.* Michiel Rodrigues Mendes c.s. (27 May 1667), NA, inv. nr. 784, nr. 1667-60. This case was brought before the Court of Holland in first instance, but it is unclear to me why Da Cunha did not take the case to the Court of Aldermen first. Foreign merchants were allowed to litigate directly before the Court of Holland, but a plausible explanation may also be that one of the defendants (Joan Corver) was himself one of the judges in the Court of Aldermen in 1666: Johan E. Elias, *De Vroedschap van Amsterdam, 1578-1795* I (Haarlem 1903) 521. Names of the defendants: Michiel Rodrigues Mendes, Isaack Mendes da Silva, Moses de Silva (also acting on behalf of Moses Machado, Joan Corver, Louis Gonsales d'Andrada, Manuel Lopes Villareal, Gerrit van Beuningen and Cornelis Lock).
Da Cunha could prove that the forward contracts were short sales because the sellers had placed the shares on Da Cunha's 'time account' in the course of the terms of the contracts, thus trying to make the sales appear legal.

siderations, would comply with their contracts only if this would be profitable to them. Such was not the case, however. Very few forward buyers – only two examples can be found in the archives of the Court of Holland – employed this strategy to avert losses. It could be possible that these cases were seldom brought before the provincial court, for this was no complicated juridical matter. Hence there could have been little ground to lodge an appeal against the local court's judgment.[52] The archives of the Court of Aldermen cannot be consulted to check this, but there are no signs whatsoever that these cases ever existed: a logical first step for litigation on the basis of the bans on short-selling was to request *aanwijzinge* in the VOC capital books (a buyer could ask a seller to show his ledger in the capital books to verify whether he was the legal owner* of a share) via a notarial *insinuatie*. Such *insinuaties* appear frequently in the protocols of the notaries of Amsterdam around 1610[53], but they are largely absent thereafter. The conclusion must thus be that forward buyers rarely reneged on their contracts.

The explanation for this observation is that a private enforcement mechanism, based on honor, reputation and peer pressure, was in place on the secondary market for VOC shares. This mechanism prevented forward buyers from reneging. Only in cases where the amount of money at stake was too high (as in Da Cunha's case) did this private enforcement mechanism fail.

The strongest form of the private enforcement mechanism was in place in trading clubs like the *Collegie vande Actionisten* and a somewhat weaker form in the *rescontre* meetings. It should be stressed, moreover, that honor and reputation were very important personal assets in early modern societies in general, so some form of a reputational regulatory mechanism was always in place in early modern trade.[54] The contracts used in the forward trade emphasized the importance of a trader's honor: the names of the parties to the contract were preceded by the word 'honorable' and the traders were called 'luyden met eere' (men of honor) in the penalty clause at the bot-

[52] Please note that Sebastiaen da Cunha *vs.* Michiel Rodrigues Mendes c.s. was not an appeal case either, cf. footnote 51.
[53] These buyers did not ask for *aanwijzinge* because they wanted to be relieved from their contractual obligations – this was before the ban on short-selling – but because they feared that they would miss out on the first dividend distribution if their counterparties did not actually own the shares they had sold.
[54] See, e.g., Goldgar, *Tulipmania.*

tom of the contracts. The personages in Josseph de la Vega's *Confusión de confusiones* also repeatedly stress the importance of honor and reputation in the share trade.[55]

This was all very well, but the participants of the high-risk forward market, where deals were made that were unenforceable by law, wanted to be sure that their counterparties not only said they were honorable men, but that they also acted accordingly. The correspondence between Lord Londonderry (born Thomas Pitt, Jr.) and his cousin George Morton Pitt, dating from 1723, shows that there were indeed a large number of disreputable traders on the Amsterdam exchange who preferably bought forwards and received option premiums. If it turned out that they would suffer a loss on these contracts, they simply reneged. George Morton Pitt added to this that merchants of Amsterdam did not trade with these particular traders; only traders who were unaware of their bad reputations (e.g. foreigners) would enter into a transaction with them.[56] But how could a trader have information about the creditworthiness and reputation of all possible counterparties?

First of all, brokers gathered information about as many traders' reputations as possible[57], but the regular meetings of the *rescontre* and the trading clubs provided an even better solution to the reputation problem. The strength of these meetings was that a large number of traders were regularly present at the same location. Information about the reputations of the participants of the trading sessions spread quickly amongst the traders present and a trader with a bad name would find it hard to find counterparties for his transactions. Moreover, traders learnt to know each other very well during the sessions, all the more so since reciprocal transactions occurred frequently.

The private enforcement mechanism of the trading clubs went one step further. These clubs were private meetings and participants could be expelled.[58] Once a

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[55] When, for example, the shareholder explains the use of options, he says: 'Even if you do not gain through the "opsies" the first time, you do not risk your credit, and do not put your honor in danger.' De la Vega, *Confusión de confusiones*, 77 (p. 24 in the 1688 edition, p. 7 in Kellenbenz' English edition).

[56] George Morton Pitt to Lord Londonderry, 23 April 1720, quoted in: Larry Neal, 'Reflections from the Mirror of Folly: The adventures of Lord Londonderry in the stock markets of Paris, Amsterdam, and London in the bubbles of 1719-1720', *Working paper* (2010) 13-4. George Morton Pitt characterized these disreputable traders as 'Scrub Jews'.

[57] See chapter 1, section 1630s and 1640s – Intermediation and a changing composition of the trading community on page 36 ff.

[58] The organization of the Amsterdam trading clubs bears close resemblance to the London Stock Exchange in the eighteenth century. Both were closed associations of traders characterized by a high degree of self-regulation: Larry Neal, 'The evolution of self- and state-regulation of the London Stock Exchange, 1688-1878', in: Debin Ma and Jan Luiten van Zanden (eds.), *Law and long-Term economic change: a Eurasian perspective* (forthcoming, Stanford 2011) chapter 14.

share trader was allowed in – it is very well possible that new members were admitted only after the intercession of one of the members – he had the possibility to perform a large number of possibly profitable transactions. If a trader failed to live up to the standards of the club, however, he would be excluded from the trading sessions and his chances of participating in the trading sessions were gone.[59] It was thus in the interest of all parties involved to live up to their agreements.[60] An attestation by four frequent participants stresses the force of honor and reputation within the community that traded in the clubs: they attested how the traders in the clubs rarely used written contracts for their transactions. Oral agreements sufficed for transactions between honorable traders.[61]

As mentioned briefly in chapter 1, it is moreover likely that the trading sessions in the clubs were chaired by some kind of committee that could also adjudicate in conflicts that arose from dealings in the meetings. The committee received its authority from the community of participants – a trader who entered the trading clubs also subordinated himself to the adjudicating board. The principal indication for my hypothesis that there such committees were present in the trading clubs is that the main trading club was called *Collegie vande Actionisten*. The word 'collegie' implies that there was some sort of governing body that supervised the meetings. Moreover, the name of this club was similar to that of a typical tulip-trading club that regularly met during the Tulipmania of 1636-7: *Collegie vande Blommisten*. Goldgar has shown that during that winter, most of the trade in tulip bulbs took place in inns, where *collegien* (e.g. *Collegie vande Blommisten*) presided over the trading sessions. The *collegien* acted as committees of tulip experts who made the rules for the trade that took place in the inns, organized continuous auctions and also adjudicated in conflicts between bulb traders. Peer pressure, which weighed heavily in the small community of bulb traders, gave the *collegie* its power.[62]

Interestingly, a known regulation of the eighteenth-century *rescontre* meetings explicitly mentions the presence of a secretary, an official who could impose fines and

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[59] Without the possibility of exclusion, the free-rider problem arises. The possibility of exclusion was therefore key to the functioning of the trading clubs. James M. Buchanan, 'An economic theory of clubs', *Economica* 32 (1965) 1-14.
[60] North, *Institutions*, 33.
[61] Attestation 9 January 1704, SAA, Notaries, inv. nr. 6956, fo. 23. Names of the attestants: Henri Alvares, Jacob Gabay, Moises Coronel and Daniel Dias de Pas. It is unclear why these four men made this attestation before notary Van Velen.
[62] Anne Goldgar, *Tulipmania: money, honor, and knowledge in the Dutch Golden Age* (Chicago 2007) 191-2.

a board of 'deciseurs' that adjudicated in conflicts.[63] Presumably, the *rescontre* participants had recognized the advantages of an adjudicating board for the settlement sessions. So, although direct evidence of regulatory and adjudicating bodies is lacking for the trading clubs of the second half of the seventeenth century, the presence of such bodies in similar trading clubs in the 1630s and the eighteenth century makes a reasonable case for their presence in the share-trading clubs.

The trading club ledgers of the Portuguese Jewish merchants Jacob Athias and Manuel Levy Duarte[64] give proof of the effectiveness of these clubs. They show the immense turnovers of Athias and Levy Duarte during each session, but equally interesting is the fact that they regularly traded forwards with Christian participants of these sessions, whereas I have found few examples of high-risk (i.e. forward) transactions between members of different religious communities on the market outside the trading clubs. The peer pressure and the reputational mechanism in the trading clubs persuaded traders to enter into a transaction with traders they did not know very well. But for reasons mentioned before, the large turnover in the trading clubs did not lead to an increase in traders trying to legally renege by suing their counterparties for short selling. What is more, even insolvent traders rarely tried to become relieved of their forward deals by asking the courts to declare their forward purchases null and void.[65] They chose the lesser of two evils: an honorable bankruptcy was apparently less bad than a dishonorable reneging. And perhaps they hoped to be able to return to the exchange shortly after their bankruptcy had been dealt with.

Sebastiaen da Cunha was probably not indifferent about his reputation either, but the losses he was about to incur on the forward contracts that were subject of the 1667 lawsuit were simply too high. And that was exactly the weakness of the private enforcement mechanism based on traders' reputations: there was a limit to the extent to which the participants of the trading clubs valued their reputations. If the share

[63] Smith, *Tijd-affaires*, 135-8. It is unknown when this regulation was put into effect, but this is likely to have happened before 1 May 1764.

[64] SAA, PIG, inv. nrs. 687-8.

[65] In June 1672, Balthasar da Cunha (not to be confused with Sebastiaen da Cunha – cf. footnote 51), one of the largest stock traders on the Amsterdam exchange, transferred the ownership of two houses and a *f* 6,000 share in the Enkhuizen chamber of the VOC to Miguel Netto de Paiva: deed of conveyance and transfer (28 June 1672), SAA, Notaries, inv. nr. 4074, fo. 485-7. He had obviously financial difficulties, but did not renege on his forward deals.
Frans Pardicque became insolvent in October 1688. He was unable to fulfill his obligations because he did not receive payment on an unsettled transaction with Coenraet van Beuningen. He did not, however, try to let the courts declare his forward purchases null and void, but rather let his counterparties lay claims on his insolvent estate: record containing the unsettled forward deals of Pardicque (22 October 1688), SAA, Notaries, inv. nr. 4135, fo. 712-4.

price fell very steeply, traders had to make a difficult assessment: they could choose to renege and lose their carefully accumulated reputation, or they could comply with their contracts and lose a large amount of money. In Da Cunha's case, the scale tipped toward reneging. And indeed, the price fall during the term of his forwards was clearly exceptional: the years 1664-5 witnessed the largest decline in share price in the history up until that time of the VOC.

Only seven years later, however, the share price experienced an even greater fall. In 1672, the share price fell to 280% in June/July, whereas shares had been sold for 560% in July 1671.[66] For a number of traders, this price fall was so large as to outweigh an unblemished reputation. Unsurprisingly, then, all instances of *insinuaties* explicitly mentioning the intention to renege on the basis of the States of Holland bans date from this year. Antonio Lopes de Castro Gago, alias Jacob Lopes de Castro Gago, for example, answered to two *insinuaties* served upon him that the sellers had sold him nothing but 'air' and that he would obey the official bans. He had bought two forwards in January 1672 with a nominal value of *f* 3,000 each at 485 2/3% and 487%. In early May 1672, the settlement date for both contracts, the share price stood at 325%. He would thus have lost almost *f* 10,000 on these forwards.[67]

The price crash of 1688, when the VOC shares subsequently lost 18% of their market value in late August and another 9.5% in October[68], did not lead to a similar pattern of reneging forward traders. The most plausible explanation is that this price fall was not large enough for the traders to give up their good reputations on the market; the 1688 price decrease was only half as large as its 1672 counterpart. Another, related, explanation is that there was no reneging trader in 1688 who gave the initial impetus for a chain of non-compliances. The participants of the clubs all traded with each other and all tried to keep their portfolios balanced. The individual forwards were risky transactions, but the traders reduced their portfolio risk by netting out their transactions with opposite transactions.[69] This system worked well until one of the traders pulled out. The portfolios of all of his counterparties would then no longer be balanced, which increased their incentive to also renege on one or more of their li-

[66] See, for a more detailed discussion of the 1672 price crash, p. 161 ff.
[67] *Insinuaties* Raphael Duarte (18 May 1672) and Manuel Mendes Flores (19 May 1672): SAA, Notaries, inv. nr. 2239, fo. 183, 199. Gaspar Mendes de Garvoijs gave a similar answer to an *insinuatie* requesting him to receive a share at 530% on 1 July: *insinuatie* Antonio and Miguel Guitieres Martines (1 July 1672): SAA, Notaries, inv. nr. 2239.
[68] The share price decreased from 560 to 460 in August and further to 416 in October. See, for a more detailed discussion of the 1688 price crash, page 60 ff.
[69] See, for a more detailed analysis, chapter 4.

abilities, thus possibly starting a chain of unfulfilled transactions. The 1672 price crash thus highlighted the weak spot of the trading clubs with their private enforcement mechanism: it was founded on the honor and reputation of its participants, but consequently, when one of the participants chose to pull out, the system became unbalanced and there were no formal institutions to fall back on.

Conclusions

Together, the legal framework and the private enforcement system provided a high level of certainty that the market would consummate all transactions. The two systems may seem to have been in place on fully separate markets; one where the rule of law was indispensable for the development of the market and the other where the rule of law was redundant because informal institutions replaced it. Yet they were strongly connected to each other. The private sub-market could never have developed into an effective trading place without a clear legal framework being in place and hence the two parts are inextricably intertwined. I have already mentioned the direct connection between the two: the coming into place of a clear legal framework contributed to the entry of new groups of participants on the share market and thus necessitated the emergence of sub-markets where there were no restrictions as to the amount of shares that could be traded – the market simply grew too large for its legal boundaries. But the sub-markets were in yet another way connected to the principal share market.

It was important that the traders in the trading clubs knew that they participated in a sub-market where other rules applied than on the principal market. This is a marked difference from the trade in tulip bulbs during the Tulipmania. This trade also took place in clubs, the so-called *collegies*, but there did not exist a principal market for bulbs with the same level of development as the market for VOC shares. This became problematic when the bulb price collapsed in early 1637. Many tulip traders went to court to extort payment from their counterparties, but the courts refused to pronounce judgment in tulip-trade-related lawsuits.[70] Thus emerged a situation where

[70] Goldgar, *Tulipmania*, 237-51. E.H. Krelage, *Bloemenspeculatie in Nederland: de Tulpomanie van 1636-'37 en de Hyacintenhandel 1720-'36* (Amsterdam 1942) 96. The reasons why the courts refused to do so remain unclear. Goldgar eagerly uses the courts' refusal to support her argument that civic harmony stood at the basis of the Dutch society: the courts encouraged traders to settle their conflicts in the friendliest way. It is undoubtedly true that arbitration and mediation were important in the Dutch legal system, but why would the courts refuse to attend to these cases? Their number could have clogged the system, as Goldgar put forward, but these cases were all similar: one judgment would have created a precedent. I think the principal motivation for the courts was that the tulip trade had attracted large numbers of new participants only months before the bubble burst. The courts might have argued that the tulip

traders believed that the transactions they had entered into would be enforced, but as it turned out, their trades were not considered to be legally valid. Consequently, traders lost confidence in the institutions of the tulip trade.

In the case of the share trade, however, the participants knew that the courts would not enforce the transactions they performed within the trading clubs. They were aware of this situation because the legal framework of the share trade had been clearly defined in the first decades of the seventeenth century. Hence, traders were well aware that there was a chance that their counterparties in the trading clubs would renege, and they implicitly accepted this as soon as they started participating themselves. They did not lose confidence in the system in the event that one trader reneged. However, the reneging traders of 1672 did make the trading community realize how risky the forward trade was. The next chapter will discuss how traders used different types of transactions to manage and control the risks of their trades.

Appendix – Short summary of court cases

Table 3.1 Court of Holland, Extended sentences

Inv. nr.	Year – nr.	Plaintiff	Defendant	Legal concept	Short summary
626	1612-6	De Meijere	Van Duynen	Transfer of ownership	Buyers may expect shares transferred to them to be genuine and freed from any claims.
632	1614-50	Abelijn	Overlander	Transfer of ownership	Idem Additionally, there is no need to explicitly ask for indemnification against any future troubles.
632	1614-73	Semeij	Abelijn	Transfer of ownership	Idem
632	1614-76	De Meijere	Semeij	Transfer of ownership	Idem
633	1614-118	Van der Heijden and Van Genegen	Abelijn	Endorsement	All endorsers are individually responsible for compliance with a contract, even if the endorsee is solvent.
633	1614-134	Le Maire	Del Beecke	Terms of settlement	A contract does not lose its validity over time.
664	1624-64	Le Maire	Del Beecke	Terms of settlement	A contract does not lose its validity over time.
703	1633-36-1	Haeck	Polster	Upholding of the ban on short-selling	Short-sale contracts are null and void.
703	1633-36-2	Haeck	Van der Perre	Upholding of the ban on short-selling	Idem
784	1667-	Da Cunha	Rodrigues	Upholding of the	Idem

contracts were invalid because the new entrants to the market were unaware of its rules and customs; more experienced traders might have misled them to pay the exorbitantly high prices.

	60		Mendes c.s.	ban on short-selling	

Table 3.2 Court of Holland, Case files

Inv. nr.	Year	Plaintiff	Defendant	Legal concept	Short summary
IIK98	1689	Cotinho	Van Bronckhorst	Terms of settlement	There are limits to a contract's validity: a buyer cannot reverse his decision after the seller has made good tender of stock, but he has refused to receive it.

Table 3.3 High Council, Extended sentences

Inv. nr.	Year	Plaintiff	Defendant	Legal concept	Short summary
708	1616	Abelijn	Overlander	Transfer of ownership	Buyers may expect shares transferred to them to be genuine and freed from any claims. There is no need to explicitly ask for indemnification against any future troubles.
708	1616	Semeij	Abelijn	Transfer of ownership	Idem
708	1616	De Meijere	Semeij	Transfer of ownership	Idem
715	1622	Van Balck	Rotgans	Ownership	Seller has no right of vindication on a share that has been transferred in the capital books, but which had only partly been paid for. Recognition of the legal force of the capital books.

4 RISK SEEKING AND RISK MITIGATION

Introduction

The development of the derivatives market, which already started in the first decade of the seventeenth century[1], enabled traders to participate in the share trade and hence benefit from share price movements without locking up a large amount of money in VOC capital stock. This was not the only advantage the derivatives market provided, however. From the mid-seventeenth century onwards, it also offered sophisticated risk-management possibilities to the traders who were active on the derivatives market. According to Ranald Michie, 'the design of trading methods which permitted investors to buy and sell securities remuneratively, without exposing themselves to undue risk' was even the most important innovation of the Amsterdam securities market.[2] Using data from protocols of Amsterdam notaries and private papers of merchants who were active on the market, this chapter explores which trading methods were available on the market and how traders could use these to manage and control their financial risks. I will show that in the second half of the century, the derivatives market allowed investors to allocate and mitigate risks according to their needs. It thus fulfilled a core function of financial systems as designated by Merton and Bodie.[3]

There were two kinds of risk involved in trading on the secondary market for VOC shares. Firstly, each transaction, and especially those on the forward market, carried a risk that the counterparty would default. The legal framework and the private enforcement mechanism of the trading clubs significantly reduced the chance of reneging, but counterparty risk was not negligible. Secondly, every investor with a position in the VOC faced portfolio risk – the risk of fluctuations in the value of a portfolio.

I will show in this chapter how traders managed counterparty risk by choosing between different derivatives. More specifically, they chose to use derivatives instead of spot transactions to reduce the risk of non-payment. Moreover, they shifted from forwards to repos if they deemed contract nonperformance risk too high. The next section analyzes how traders used derivatives to control portfolio risk. They used both forwards and options to leverage their risk and to protect their portfolios against un-

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[1] See chapter 1, section 1607 – The emergence of a derivatives market on page 20 ff.

[2] Michie, *The global securities market*, 28.

[3] Robert C. Merton and Zvi Bodie, 'A conceptual framework for analyzing the financial environment', in: Dwight B. Crane et al. (eds.), *The global financial system: a functional perspective* (Boston 1995) 3-31, there 5.

wanted price fluctuations. Lastly, contingency claims were added to derivatives contracts in order to specifically allocate price risks that could result from certain events, such as peace negotiations.

The picture that emerges from this chapter is that the high level of sophistication of the derivatives market allowed share traders to allocate and mitigate risks according to their needs. This development completed the transition from an accidental market where corporate equity could be bought and sold to a full-fledged financial market. It is important to note that it became possible to control financial risks on the derivatives market only with the entry of a large pool of short-term speculators on the market that started in the 1640s. These speculators specialized in trading risks. Moreover, they were generally less risk-averse than the long-term horizon investors on the market. The speculators were willing to take on the risks that other investors wanted to mitigate.

The market for VOC share derivatives has been the subject of two previous studies. Smith tried to unravel the workings of the derivatives market by studying the official rules and regulations for forward and option trading in Amsterdam in the seventeenth and eighteenth centuries.[4] Gelderblom and Jonker paid attention to the emergence of repo transactions in the first decade of the seventeenth century[5] and to the beginnings of option and forward trading in Amsterdam from the late sixteenth until the first half of the seventeenth century.[6] I will add to these historical studies by analyzing how investors used the market to manage and control their financial risks. Murphy did something similar for the London option market of the 1690s.[7] She showed that a wide range of speculators used options for both risk-seeking and risk-management purposes. Interestingly, it becomes clear from Murphy's study that the late-seventeenth-century option traders had good knowledge of the factors that determine the size of the option premium. This indicates that they did not use this relatively complex financial instrument for gambling purposes; they were aware of how they could use options to hedge risks.

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[4] Smith, *Tijd-affaires*.

[5] Gelderblom and Jonker, 'Completing'. Gelderblom and Jonker argue that investors used the shares they owned in the VOC to attract extra debt capital to finance their businesses. Extensive research in primary sources has led me to come to a different interpretation of the use of repos: traders solely used this type of transaction to be able to finance their share dealings. I will go deeper into the use of repos in the section Counterparty risk.

[6] Gelderblom and Jonker, 'Amsterdam as the cradle'.

[7] Anne L. Murphy, 'Trading options before Black-Scholes: a study of the market in late seventeenth-century London', *The economic history review* 62 (2009) 8-30.

Counterparty risk

Both parties to a transaction face contract-nonperformance risk, either in the form of non-payment or non-delivery of the underlying asset of the transaction. Chapter 3 has analyzed how formal and informal institutions guaranteed the enforcement of contracts. This chapter, on the other hand, will discuss how different types of transactions and settlement procedures carried different levels of nonperformance risk. It will, in other words, explore how traders could use the diversity of options available on the market to manage their risk.

In the most basic form of a share transaction, a spot transaction, there is no time lag between negotiation and settlement of the transaction. Still, counterparty risk in a VOC share spot transaction was not negligible, because a large amount of money was needed for the purchase of a share – particularly from the 1640s onwards, when shares with a nominal value of *f* 3,000 cost on average more than *f* 12,000. Spot transactions therefore carried a risk that the buyer could not accumulate the money needed on short notice.[8] Traders could use derivatives to reduce non-payment risk, because fewer and smaller payments were needed for the settlement of forwards and options. However, counterparty risk in these transactions is higher because the underlying asset is transacted over time, thus increasing the risk that the counterparty would not live up to his agreement, due to a changing situation during the term of the contract.

Reduction of non-payment risk was effected when derivatives were settled without actually transferring the underlying asset and having to pay for the full value of the asset. The parties to a derivatives contract could also negotiate a monetary settlement, in which case one of the parties would pay the price difference between the contract and the market price. This settlement method is called direct settlement – the contractors negotiate the settlement directly with each other. It was widely used on the Amsterdam market for shares from the first decade of its existence. Hans Thijs († 1611), for example, regularly noted in his ledger that he had settled his forward contracts by paying the price difference.[9]

It was possible to use direct settlement to complete forward transactions throughout the century, but ringing, a more advanced settlement method, soon complemented the choice of settlement procedures. In a ring settlement procedure, not

[8] Merton and Bodie, 'A conceptual framework', 13.
[9] E.g. BT, inv. nr. 119K, fo. 209.

only the original counterparties to a contract can settle or cancel out that particular transaction, but also other traders holding similar contracts. Hence, fungibility of the traded assets is a necessary precondition for this settlement method. Contracts needed to have, in other words, the same underlying asset and settlement date. Then, if trader X held a forward purchase of trader Y, and trader Y held a similar forward purchase of trader Z, these three contracts could be settled by a transaction between X and Z.

Ringing works most efficiently when all possible counterparties for contract settlement are present in the same location. It was therefore not until the *rescontre* meetings, with a high concentration of possible counterparties, reached a high level of development, that traders started to frequently use this settlement method. All traders present at the *rescontre* were willing to settle forward contracts, and, more importantly, all participants owned forward contracts that were due on the same date. The transition from direct to ring settlement went through an intermediate stage: direct settlement of multiple forward contracts. The chain of forward traders, discussed in chapter 3, where the last person in the chain eventually received a fraudulent share, is an example of this settlement method.[10] Each pair of traders in this chain individually negotiated direct settlement. It then turned out that several traders could cancel out their contract with another contract and this made it possible to settle all contracts in a single share transfer.

To sum up, the advantages of ringing over direct settlement were reduction of counterparty risk and transaction costs. Counterparty risk was lower because a trader could settle his contract with a range of other traders; the chance of successful settlement thus became higher, which reduced the risk of non-payment. Ringing also reduced transaction costs because fewer and smaller monetary payments were needed. However, as I have argued in chapter 3, the use of forward contracts also involved a risk that the counterparty would simply walk away. The legal system of the Dutch Republic did not enforce the contracts if they were short sales – which was often the case. By submitting its participants to a private enforcement mechanism, the risk of reneging became lower, but traders remained subject to exogenous risk: in periods when the share price fluctuated heavily, for example, forward buyers could be tempted to renege on their contracts, even though this damaged their reputations. The reputation-based enforcement mechanism was, put differently, not a watertight system.

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[10] See infra, page 101.

Traders therefore always had to assess the risk that a possible counterparty would renege. There could be several reasons why a trader could deem the risk of reneging too high to enter into a forward contract. Firstly, high share-price volatility increased the chance of suffering a large loss on a forward contract and hence also increased the chance of reneging. Forward sellers could then become more hesitant to enter into a forward contract. Secondly, a trader could have information that a possible counterparty possessed other high-risk assets that could contaminate the forward contract. And finally, if a possible counterparty did not participate in any of the trading clubs, it was difficult to assess how he valued his reputation and thus also to assess the risk of his reneging.

For theses situations, another derivative could be used: the repo (short for repurchase agreement), in which a trader temporarily pawned his share with a moneylender. A repo was a loan, but it was disguised as a purchase of a share by the moneylender and the repurchase of the share by the borrower at a certain date in the future for a price fixed. The repurchase price was always higher than the purchase price; the difference being the interest due on the loan. The interest was a compensation for the moneylender who held the legal ownership of the share during the term of the contract without being entitled to its economic benefits.

An example will clarify how repos worked. Trader X considered buying a share with a nominal value of *f* 3,000. This share would cost him *f* 15,000 on the exchange, but he could not afford to have that much money locked up in a share. He could then choose to negotiate a repo with trader Y, a wealthy moneylender. Trader X would then pledge his share as security for a loan with Y, for which Y agreed to give him a loan of, say, *f* 12,000. This was the purchase part of the agreement: Y purchased a share of X and paid him *f* 12,000 for it. They also agreed that X would repurchase the share in one year's time for *f* 12,480. Put differently, X would redeem the loan and pay 4% interest. So, a repo was actually a loan on the security of a share.

The Dutch traders called this kind of transaction *belening*[11], derived from the word *lenen*, meaning 'to borrow' or 'to lend'. The contracts used for these transactions did not mention a loan or an interest rate, however; they only mentioned a purchase and a repurchase price of the share, which equaled the principal of the loan and the

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[11] Joseph Deutz, for example, kept accounts of *beleende actiën*, shares on which he had granted loans: e.g. SAA, Deutz, inv. nr. 294, fo. 117, 168; inv. nr. 295, fo. 22.

principal plus interest, respectively.[12] The traders' reluctance to call these transactions loans had nothing to do with usury regulations. To be sure, moneylenders generally charged interest rates of between 2.5 and 4% on repos[13], well below the usury limit of 6%.[14] The share traders rather made the *beleningen* look like repurchase agreements because this eased the procedure in case of default on part of the borrower. The share was transferred to the lender's account for the term of the contract and hence he unequivocally received the ownership of the collateral. This was important, because it allowed the moneylender (trader Y) to sell the share on the market if trader X failed to live up to his agreement.

The counterparty risk of a repo was considerably lower than the counterparty risk of a forward. If the borrower were to renege, the lender would lose money only if the share price had sunk under the purchase price, but then he would lose only the difference between the market price and the purchase price. So, in the fictitious example of traders X and Y, trader Y would lose money if X reneged only when the shares traded for less than 400%. The benefits of the active secondary market for VOC shares were substantial when the borrower defaulted: it enabled lenders to quickly and cheaply sell the collateral in case of a default. Moreover, the constantly updated market price kept the lenders informed about the value of the collateral – they could anticipate a possible default.

Clearly, then, traders preferred repos if they had doubts whether the borrower/buyer would live up to his agreements. From the perspective of the borrower/buyer, however, the choice between negotiating a forward or a repo depended on other considerations. Repos were, of course, the only option for traders with insufficient cash to buy a spot or too low a reputation to enter into a forward contract, but they could also offer a solution to traders who were stuck with a share they did not want or could not pay for. If, for example, a forward buyer was unable to find a seller to settle his contract with or to contract a rollover with, he would have to actually accept a share and thus pay the full market value of the share. If he was unable or unwilling to do so, however, he could pledge the share as collateral and use the loan to pay for it. The forward buyer – who now became a borrower in a repo – would only

[12] See for examples of the contracts used: NA, Case files, IIM99 (Machado *vs.* Cappadoce). The contracts used for repos were called *renversaals*, a reversal – a contract, in other words, that specified the repurchase of the share on maturity. The earliest evidence of a *belening* in the form of a purchase and a repurchase dates from 1645: NA, Case files, IIH21 (l'Hermite *vs.* Van Hoorn).
[13] SAA, Deutz, inv. nrs. 291-5.
[14] Cloppenburch, *Christelijcke onderwijsinge van woecker*, 21.

have to pay the amount not covered by the loan he received on the collateral.[15] The forward seller was often unable to act as moneylender, but the sources clearly show that there were a number of wealthy merchants in Amsterdam who were willing to facilitate this kind of transactions, for it provided them a low-risk investment opportunity. They thus contributed to the functioning of the forward market.[16]

There were also traders, however, who were offered a choice to enter into either a forward or a repo. These transactions had a similar outcome for the borrower/buyer: both forwards and repos separated the economic and legal ownership of a share for a certain period of time. The economic owner (the forward buyer or the borrower in a repo transaction) ran the risk of any share-price movements during the term of the contract and was entitled to any intermediate dividends. He had not (fully) paid for the share, however, and therefore paid the legal owner a fee in recompense for the economic ownership – the forward premium in a forward transaction and the interest over the loan in a repo. Figure 4.1 presents both transactions from the buyer/borrower's perspective in diagram form. The left sides of these diagrams show the actions taken by the buyer/borrower when he entered into the forward/repo. The right sides show how both kinds of transactions were settled.

An example from the correspondence of Jeronimus Velters, a wealthy Amsterdam merchant, shows that he was well aware of the similarities between these types of transactions. When he wrote his business partner Pierre Macaré in Middelburg, in the

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[15] An *insinuatie* of Luis Gonsales d'Andrada reveals this procedure. He had sold a forward contract to Vincent van Bronckhorst on 20 August 1688. According to this contract, Van Bronckhorst would buy a *f*6,000 share on 1 September at 502%. However, during the eleven-day term of this contract, the VOC share price fell considerably. The contractors did not come to a settlement agreement until 6 November, when Van Bronkhorst pledged the share as collateral. He got a six-month loan (with a yearly interest rate of 3.5%) of 400% of the share's nominal value from Gonsales d'Andrada. This means that he had to pay *f*6,120 (502% - 400% of *f*6,000) immediately; the remaining sum (*f*24,000) was postponed until a later date. Gonsales d'Andrada served an *insinuatie* upon Van Bronckhorst, because he had failed to pay the *f*6,120: *insinuatie* 14 December 1688, SAA, Notaries, inv. nr. 4136, fo. 468.
Jeronimus Velters explained to his correspondent Pierre Macaré that he used this strategy to postpone payment on a forward contract that had resulted in a loss: Velters to Macaré, 25 September 1676, SAA, Velters, inv. nr. 2, fo. 514.

[16] An example may clarify how this worked: on 11 August 1681, Reijnier Lieftingh arranged a repo with Joseph Deutz. Lieftingh borrowed *f*10,000 on a *f*3,000 share; the loan had a three-month term and Deutz charged 3% interest. Lieftingh had bought the share from Willem Kerckrinck and sold it, three months later, to Martinus Alewijn. During this period, Lieftingh held the economic ownership of the share, but it never passed through his account in the ledger of the VOC; put another way, he never legally owned the share. The share was directly transferred from Kerckrinck to Deutz and from Deutz to Alewijn. Furthermore, Deutz paid out the principal (*f*10,000) to Kerckrinck and received it back from Alewijn. Lieftingh, for his part, paid the surplus money to Kerckrink, was liable for the interest payment to Deutz and received surplus money from Alewijn. To sum up, Lieftingh used Deutz' liquidity to bridge the time between his transactions with Kerckrinck and Alewijn. In return for his services, Deutz received the interest payment. NA, VOC, 7072. SAA, Deutz, inv. nr. 295, fo. 22 and 76.

province of Zeeland, that he had bought a forward on his account on 21 October 1676, he explained to him that he had also considered contracting a repo instead. The forward had a share with a nominal value of *f* 6,000 as underlying asset and was to be delivered on December 1 at 456%. If he had contracted the repo, he would have pledged a *f* 6,000 share as collateral, but he had calculated that a forward contract was cheaper than a loan bearing an interest of 4% or even 3.5%, all the more so since lenders would only be willing to grant loans of at most 366 2/3% of the nominal value of the security.[17] Unfortunately, I do not know the price at which spots were traded on October 21, but two weeks earlier, on October 9, the spot price had been 453.75%.[18] Hence, the maximum size of a loan granted on a share pledged as collateral was slightly over 80% of the share's market value. Hereafter, I will assume that the share price was 454% on the contract date; the annualized forward premium in the forward contract would then have been 4%, which is plausible for a wealthy and reputable trader such as Jeronimus Velters.

Table 4.1 adds some figures to Velters' assessment of these transactions.

Forward - 40 day term - underlying asset f6,000			
Spot price	Forward price	Total cost (*f*)	
454	456	120	
Loan - 40 day term - share with nominal value f6,000 as security			
Interest (%)	Principal (*f*)	Principal + interest (*f*)	Total cost (*f*)
3.50	22000.00	22082.87	82.87
4.00	22000.00	22094.50	94.50
Extra loan - 40 day term - market value share minus costs f22,000 loan			
Interest (%)	Principal (*f*)	Interest cost to break even (*f*)	Interest rate (%)
3.50	5240.00	37.13	6.67
4.00	5240.00	25.50	4.54

Table 4.1 Estimated costs of Jeronimus Velters' forward and repo transactions
Please note that for these calculations, I have used a spot price of 454% for October 21.

The total costs of the forward contract amounted to *f* 135 (2.25% · *f* 6,000). If, however, Velters chose to take out a loan and pledge the *f* 6,000 share as security, he would get a loan of at most *f* 22,000 (*f* 6,000 · 3 2/3). The total costs of this loan amounted to either *f* 82.87 or *f* 94.50 – depending on the interest rate. He would

[17] Velters to Macaré, 21 October 1676, SAA, Velters, inv nr 2. Interestingly, only a few months earlier (in June), Velters had been able to contract two loans of 400% of the nominal value of the shares pledges as security with Joseph Deutz: SAA, Deutz, inv. nr. 276, fo. 98. The share price had not dropped in the intervening months, so it remains unclear why Velters now feared that he could only get 366.67%.

[18] Velters to Macaré, 9 October 1676, SAA, Velters, inv nr 2.

come short ƒ5,240 to pay for the share (a ƒ6,000 share cost ƒ27,240 on the market), meaning that he would have had to take out another loan to finance the share purchase. If he could get the additional ƒ5,240 for a yearly interest rate of less than 6.67% or 4.54% (depending on the interest rate of the secured loan), it would be profitable to pledge the share as security for a loan rather than contract a forward transaction.

The same calculation holds if Velters had enough spare money to finance the ƒ5,240 himself. This changes the reasoning behind the calculation, though, for he now had to consider whether it was more profitable to take out a loan on collateral and have less liquid money at his disposal, or to contract the more expensive forward deal. The forward transaction would become the best option if Velters could get a rate of return of at least 6.67% or 4.54% (again depending on the interest rate of the loan on collateral option) on the ƒ5,240 he did not have to lock up in the repo.

Velters preferred the forward. As he was a very wealthy merchant, he probably had sufficient cash at hand to finance the share himself and, therefore, the choice he made was that he could allocate the ƒ5,240 in a more profitable way than to lock it up in the share used as security; i.e. he could invest it at more than 4.54%. So far, however, I have omitted some factors that also came into play. The transaction costs for a loan secured on stock were higher than for a forward contract. The brokerage – which, of course, had to be paid only if the traders used a broker's services – was the same for both transactions, but the share that was pledged as collateral had to be transferred at the East India house twice. Moreover, four bank transfers were needed to take out and eventually redeem the two loans. The fees for these transactions were relatively small, but added together and taking into account that the time to perform all these actions was costly for a busy merchant like Velters, they probably persuaded him to choose for the forward.

Velters was probably always in a position to choose between competitively priced forwards and repos – the chance that he would renege on a forward was relatively small. A small adjustment to the figures in the example shows what happened if a certain trader had a slightly lower reputation. Forward sellers would then charge a higher forward premium as a compensation for the increased risk of reneging. If an extra 0.5 percentage point was added to the forward premium (the forward price in the example would then have gone up to 456.5%), the secured loan would have become the cheaper option as long as the borrower could find the extra financing at maximum interest rate of 12.35% (instead of 6.67% if the forward price was 456%) –

which cannot have been difficult on the Amsterdam money market of the second half of the seventeenth century. A small increase in forward premium thus already tipped the scale towards a repo.

Comparing the Velters example from 1676 to two transactions dating from August 1671 reveals how the markets for forwards and repos reacted during periods of large price fluctuations – more specifically the crash of 1672. On 1 August 1671, Abraham Salvador was granted a six-month loan of 93% of the market value of the *f* 3,000 share he pledged as collateral. The interest rate of this loan was 3%.[19] Clearly, this loan was a better deal than the one in the Velters example: Salvador received more money on his collateral and he paid a lower interest rate. A fortnight later, on 15 August 1671, Sebastiaen Cotinho bought a forward with an underlying asset of *f* 3,000 and a term of 3.5 months. He paid 538%, while the spot price was 532.5%.[20] Hence, the cost of carry on this contract was 3.5% – again a lower rate than in the Velters example.

These transactions were not as competitively priced as those offered to Velters. The total costs of Cotinho's forward amounted to *f* 165, or *f* 282.86 for a term of six months. Salvador's interest due on his loan was *f* 220.36, which means that he had to be able to finance the *f* 1,175, the money he came short to buy the collateral[21], for less than *f* 62.50 for this option to be cheaper. Hence, he had to get a loan with a yearly interest rate of less than 10.1%, which would probably have been no problem on the Amsterdam money market.

The loan secured on stock was seemingly the cheaper option. This is not surprising; it had to be better priced to be competitive with forward contracts – in 1671, there was, as yet, hardly any restraint on contracting forward transactions. The share price fluctuated within its normal boundaries, the *rescontre* system functioned well and there was no reason to fear that forward buyers would not live up to their agreements. Hence, share traders preferred forward contracts to repos; they assessed the risks involved in both transactions to be similar, but the transaction costs of a forward were lower. At the same time, however, there was a lot of money available among the rich inhabitants of Amsterdam. These rich persons were willing to invest in low-risk repo

[19] *Insinuatie* 5 February 1672, SAA, Notaries, inv. nr. 2238.
[20] *Insinuatie* 10 February 1672, SAA, Notaries, inv. nr. 2238.
[21] A spot cost *f* 15,975; Salvador was granted a loan of *f* 14,800.

transactions, but for the repos to be competitive with forward contracts, they had to charge low interest rates.

The price crash of 1672 changed the situation on the derivatives market. As I have shown in chapter 3, the large price drop (from 560 in July 1671 to 290 in July 1672) induced a number of traders to renege on their forward contracts.[22] These traders now considered the losses they were about to suffer on their contracts too large to offset an undamaged reputation. The impact on the derivatives market was large. Since many traders held balanced portfolios[23], a single reneging caused an uncovered position in his counterparty's portfolio, which could force him to also renege on one of his contracts. The price crash thus brought the market to a standstill. Jeronimus Velters wrote on 29 November 1672 that there was hardly any trading activity[24]; he was probably referring to the forward market, for the transfer register of the Amsterdam chamber of the VOC does not show a trough in the number of share transfers around that date (see Figure 2.4 on page 79).

Consequently, traders became hesitant to sell forward contracts unless they had near absolute certainty that the counterparty would live up to his agreements. Repos were, of course, not immune to the price fall either. In June 1672, for example, Bartholomeus Rodrigues Hendriques was not able to redeem his loan of *f* 10,500 secured on a share with a nominal value of *f* 3,000. The Court of Aldermen had permitted the moneylender, Hendrick Staets, who, incidentally, was a sworn broker, to sell the collateral on the market. Staets made a final attempt to persuade Rodrigues Hendriques to repay the loan through a notarial *insinuatie*, but this was to no avail.[25] Staets lost the difference between the loan and the market value of the share (around *f* 1,500), but Staets could lay a claim for this amount against Rodrigues Hendriques' property – this was an important advantage of repos over forward transactions; forwards were simply null and void if they concerned short sales and hence the sellers had no right to lay a claim to the counterparty's property.

Staets was lucky that he had granted Rodrigues Hendriques a loan of only 350% of the nominal value of the collateral. The price fluctuations that started in the autumn of 1671 had probably made him more cautious when he granted a loan. This immediately reveals the main advantage of repos over forward contracts: the lending

[22] See page 113.
[23] See page 138.
[24] Velters to Fletcher, 29 November 1672, SAA, Velters, inv. nr. 1, fo. 292.
[25] *Insinuatie* 20 June 1672, SAA, Notaries, inv. nr. 2239, fo. 503.

party in a repo could adjust the risk of the transaction to the circumstances by adjusting the size of the loan granted to the borrower – a 'haircut' in modern parlance. The smaller the loan granted, the higher became the chance that the lender would be able to fully recover the principal on the market in case the borrower defaulted. Similar risk adjustments were impossible with forward contracts. Forward sellers could ask a higher forward premium to cover higher risk, but this would above all create an extra incentive for the counterparty to default on the contract.

Figure 4.2 shows the size of the loans granted on shares pledged as collateral or the period 1649-88.[26] The size of the loans is expressed as a percentage of the market value of the share on the contract date. The size of the loans varied from 63% (December 1681) to 103% (October 1671) of the market value of the collateral. The graph clearly shows that the average loan was higher in the early 1650s than in the later decades of the seventeenth century. Changing market conditions explain a large part of this variation. The early 1650s were the final years of a period of rising share prices that had lasted for more than two decades. There was as yet no reason to believe that the share price would fall in the near future. In the following decades, however, the First and Second Anglo-Dutch Wars had a large impact on the share price. The increased price volatility led to a higher risk of default and lenders adjusted their loans accordingly. The peak of 1671 depicts that year's sense of optimism: a record high dividend payment and good news from the East Indies boosted the share price and moneylenders were willing to lend almost the full value of the collateral – and on one occasion even slightly more. The price volatility in 1672 brought the size of the loans down to about 70%. In fact, the 1672 price crash disrupted the market even more than this graph shows. Moneylender Jan Witheyn, for example, was willing to roll over a repo with Jeronimo and Manuel Gomes Pessoa in June 1672, but not only did he change the conditions of the loan, he also demanded extra security in the form of a government bond.[27]

Market conditions cannot explain the fluctuations after 1672, however. These must be attributed to circumstances related to the individuals involved in these repos.

[26] Very few data are available for the period before 1649 – the year in which Elisabeth Coymans started facilitating repo transactions. Antoni Thijs was granted a loan of 97% of the market value of his share in 1618: BT, inv. nr. 113, fo. 47.

[27] Rollover, 15 June 1672, SAA, Notaries, inv. nr. 2905, fo. 167. Originally, on 26 November 1671, Witheyn had lent *f* 12,000 on the security of a *f* 3,000 VOC share. The term of this repo was 6 months and Witheyn charged a yearly interest rate of 3.75%. In the renewed contract, Witheyn only granted *f* 10,000 at 4% interest. Furthermore, he demanded a *f* 3,200 bond of the States of Holland as extra security.

The low values for April and October 1679, as well as those for May and December 1681 come from the books of Jacob Athias and Manuel Levy Duarte, who were the borrowers in these transactions.[28] The other data from the 1670s and 1680s stem from the records of Joseph Deutz, a very wealthy merchant who acted as moneylender in all these transactions.[29] The counterparties to the repos of Athias and Levy Duarte apparently had their doubts about the creditworthiness of these merchants.[30] Deutz, on the contrary, was willing to grant his counterparties larger loans. He probably selected his counterparties for their creditworthiness.

It is interesting to note, finally, that there was little variation in interest rates charged on repo contracts. Elisabeth Coymans charged yearly interest rates between 3.75 and 4% in the 1650s[31]; during the following decade, Louis Trip charged 3%[32] and Joseph Deutz lent money secured on stock shortly after the 1672 price crash at 3.5%.[33] Clearly, risk management was carried out through adjusting the size of the loan rather than the interest rate.

The collateral/loan ratio, or size of the haircut, could function as a risk-management technique only if moneylenders could easily and quickly sell the collateral on the market if the borrower defaulted. Moneylenders would be less inclined to participate in this type of transaction if lengthy court proceedings were required to get permission for the conversion of collateral into real money, since this would considerably increase the transaction risk – the time it took to get permission increased the chance of large fluctuations in the value of the collateral. The earliest example I have found of a repo transaction, which dates from June 1618, shows that the share was transferred to the lender's account in the capital books of the VOC for the duration of the loan.[34] An official regulation on repos, first proclaimed in 1623[35], stated that this was not the right procedure; collateralized shares should be transferred to the time account of the moneylender.

[28] SAA, PIG, inv. nr. 858, fo. 89, 214. They contracted some of these repos on the accounts of Salvador de Palacios, Pieter Hunthum, Luis da Costa and Luis Alvares. There does not seem to be a difference between the size of the loans they contracted on their own account and those on the accounts of third parties.
[29] SAA, Deutz, inv. nr. 293-5.
[30] Incidentally, their fears proved to be correct. Attestations dating from 1698 give evidence that Jacob Athias was hiding from his creditors: SAA, Notaries, inv. nr. 6004, fo. 361, 383.
[31] SAA, Deutz, inv. nr. 276, fo. 220.
[32] E.g. SAA, Merchants' accounts, inv. nr. 50, 2 April 1663.
[33] SAA, Deutz, inv. nr. 293, fo. 113.
[34] BT, inv. nr. 113, fo. 47. Anthoni Thijs received a loan of almost 94% of the nominal value of the collateralized share. He paid 5% interest for the four-month loan.
[35] Placard 3 June 1623: Cau, *Groot placaet-boeck* I, 555-9.

These time accounts, however, were hardly ever used[36] – understandably, because in case of default, the moneylender would have had to officially seize the share before he could freely dispose of it. Permission to seize a share that was registered on a time account could be obtained from the Court of Aldermen, but this was a time-consuming process; the moneylender would need to start litigation, claiming the right to legally dispose of the share. If he won the case, he would have to ask the court to execute the sentence by seizing the share.[37] However, if the defendant appealed the court's permission to seize the share, the moneylender would still not be able to sell the share on the market. Hence, moneylenders required their counterparties in repo transactions to transfer the share that was used to secure a loan to their 'normal' accounts in the ledger of the VOC. The bookkeeper of the VOC did not oppose this procedure.[38] Incidentally, he could not easily distinguish repos from other transactions, because the traders disguised repos as standard purchases and repurchases.

When the collateral was stored on a normal account, a moneylender could more easily dispose of the share in case of default. There were two different procedures. Moneylenders could ask official permission from the Court of Aldermen to sell the share by handing in a request. The Aldermen would then approve this request by way of a marginal note; this was a mere formality if the moneylender could prove that the borrower had not redeemed the principal – no court case was started.[39] This also indicates that the Aldermen implicitly approved the way traders customarily traded repos. Finally, contractors of a repo transaction could add a clause to the contract that stated that the moneylender was allowed to sell the collateral on the market after the end of the contract term without further judicial procedure.[40] Before taking any steps,

[36] In the year 1688, for example, the VOC bookkeeper registered only two transfers from/to a time account: NA, VOC, 7072, fo. 181 and 183.
[37] For the procedure of executing sentences: Le Bailly, *Hof van Holland*, 51. The bookkeeper of the VOC made notes of seizures in the margin of shareholders' accounts. He also added a reference to the date of the sentence of the Court of Aldermen and, from 1684 onwards, a reference to the VOC register of seized shares. This register, in which all documents requesting the seizure of a share were collected, allows for a quick count of the number of seizures. The Amsterdam bookkeeper administered two to seven seizures per year between 1684 and the end of the seventeenth century. Most seizures concerned conflicts over estates and the size of the seizures was generally small (seized shares with nominal values of between *f*100 and *f*500), with the exception of two claimants to Van Beuningen's shares (1688), who seized *f*6,000 each: NA, VOC, inv. nr. 7122.
[38] Joseph Deutz distinguished in his private administration between shares that were his own investment and shares he had received as security for loans; these two types of shares were not treated differently on his account in the official VOC ledger.
[39] E.g. *insinuatie* 20 June 1672, SAA, Notaries, inv. nr. 2239, fo. 503. The case file that has survived of the lawsuit Samuel Cotinho *vs.* Vincent van Bronckhorst shows that the local court of Amsterdam responded quickly to such requests: NA, Case files, IIK98.
[40] E.g. *insinuatie* 5 February 1672, SAA, Notaries, inv. nr. 2238, fo. 276.

however, they should always inform their counterparties about the steps they were about to take – preferably through a notarial *insinuatie*.

To summarize, repos mimicked the separation of legal and economic ownership of a share over a certain period of forward transactions. Counterparty risk in a repo was considerably lower, but in exchange for that advantage, traders had to perform at least two share transfers and arrange several payments. The choice between these instruments was thus an assessment of transaction costs and counterparty risk.

It is striking that the traders on the Amsterdam market for corporate equity did not come up with a hybrid transaction – a forward transaction that adapted certain elements of the repo to lower counterparty risk. The most obvious way to lower counterparty risk of a forward transaction would have been through the establishment of margin accounts. The principle of a margin account is that both parties to a contract deposit a certain sum upon concluding the transaction. This sum (the margin) is a form of collateral; it covers a large part of the credit risk of the counterparty. If one of the parties defaults, the other party has recourse to the sum deposited. Dynamic use of a margin account can even provide full coverage of credit risk. An extra clause should then be added to the contract, which states that traders should deposit an extra sum in the event of a certain change in market conditions – e.g. a 10% price change of the underlying security. If, for example, the market price of the underlying security falls 10% during the term of the contract, the buyer – whose incentive to renege becomes larger due to this price change – should deposit an extra sum in the margin account. Similar dynamic margins are always used in modern-day derivatives markets.[41]

This use of margin accounts significantly reduces counterparty risk in forward contracts, but there is no evidence that Amsterdam traders used it in the seventeenth century. I have only found a single example of a forward contract where the seller asked for extra security to reduce the counterparty risk. This contract had a VOC share with a nominal value of *f* 12,000 as underlying asset and was therefore riskier than the more common *f* 3,000 forwards. The parties to the contract were Vincent van Bronckhorst (the seller) and Samuel Cotinho (the buyer). They agreed on 25 June 1683 that the share would be delivered on 1 September of that year at a price of

[41] Today, the exchange organization is often, if not always, the counterparty to derivatives contracts. Each trader holds an account with the exchange and has to update his margin to price changes on a daily basis.

422.625%. The traders added an extra clause to the contract: Cotinho gave Van Bronckhorst a *renversaal* as security for the contract – this *renversaal* was the repurchase part of a repo Continho had entered into. It gave Van Bronckhorst the right to settle Continho's repo in case he defaulted.[42]

This collateral provided some cover for the contract's credit risk. If Cotinho defaulted, which would have been feasible – at least, from an economic point of view – if the VOC shares traded at a price below 422 5/8% on expiry of the forward, Van Bronckhorst could use the *renversaal*. This gave him the right to receive ownership of a *f*6,000 share if he redeemed a loan of *f*22,000 (plus interest), which Susanna de Neufville had granted to Cotinho. This means that Van Bronckhorst would not suffer a loss as long as the share price did not fall below 408 5/8%.[43] It is questionable to what extent this extra security would really reduce credit risk; to be sure, a real incentive for Cotinho to renege would arise only if the share price fell even further. In my opinion, therefore, the strength of the extra clause was merely symbolic; by handing over his repurchase agreement with De Neufville, Cotinho showed that he was committed to complying with the agreement.

Interestingly, there is evidence of the use of margin accounts for the eighteenth century. John Law and Lord Londonderry (born Thomas Pitt, Jr.) used one in 1719 for a one-year forward contract with EIC stock with a nominal value of £100,000 as underlying asset – an incredibly risky contract. Each trader deposited £30,000 and they had to adjust their deposit if a 10% price movement occurred.[44] Data from 1772 indicate that traders from Amsterdam were by that time familiar with the use of margin accounts, although in these instances only the buyer had to deposit a margin.[45]

The seventeenth-century traders might have been wary of using margin accounts because it can lead to moral hazard.[46] A trader could be tempted to enter into a forward transaction with a trader with a bad or unknown reputation because he thinks that the margin account will cover the loss in case of default. This is of course what a margin account is supposed to do, but there is always a possibility that a trader

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[42] NA, Case files, inv. nr. IIK98 (Cotinho *vs.* Van Bronckhorst).

[43] Calculation: Van Bronckhorst would make a profit as long as the proceeds from the sale of the collateral would be higher than the loss incurred in the forward contract. The break-even point lies at a market price halfway between the forward price (422 5/8%) and the size of the loan (366 2/3%). However, the collateral had a nominal value of *f*6000, whereas the forward contract involved a share of *f*12000. Hence, the break-even point lies at 422 5/8 – (422 5/8-366 2/3)/4 = 408 5/8%.

[44] Neal, 'The adventures of Lord Londonderry', 12.

[45] SAA, Notaries, inv. nrs. 10600-5. (Thanks to Peter Koudijs.)

[46] Cf. Angelo Riva and Eugene N. White, 'Danger on the exchange: How counterparty risk was managed on the Paris Bourse in the nineteenth century', *NBER working paper* Nr. 15634 (2010).

with a bad reputation will not update the margin according to the agreement. A margin account might, put differently, provide spurious certainty, enticing traders to enter into transactions they would otherwise have deemed too risky. The legal sphere could provide an additional explanation for the absence of margin accounts in seventeenth-century Amsterdam. The main advantage of the use of shares as collateral (in a regular repo) was that the collateral was registered on the lender's account in the capital books of the VOC. The lender thus held legal ownership of the share and could easily dispose of it in case of default. It might have been problematic to give a party to a forward contract – in many cases an illegal contract – legal ownership of the margin in case his counterparty defaulted.

Moreover, a forward transaction would have lost its dynamic character if traders needed to deposit margins for each transaction. And it was of course the dynamics of the forward market that proved to be so alluring to the traders. The stock-jobbers needed a market where they could negotiate many deals in a short period of time for their trading strategy to be profitable. So, to conclude, counterparty risk was manageable on the Amsterdam market for VOC shares, but traders had to give up on the advantages of the forward market (low transaction costs) in exchange for the lower counterparty risk of a repo. They therefore often preferred to face the higher counterparty risk of a forward. The manageability of counterparty risk contributed to the accessibility of the market. It enabled merchants with reputations that were inadequate for the regular forward market to participate in the share trade without necessarily locking up the full market value of a share by holding a positive position in the capital books of the VOC.

Portfolio risk

Portfolio risk is the risk that the share price, and hence the value of the portfolio makes unwanted movements. Portfolio risk falls into a different category of risk than counterparty risk; whereas every trader tries to minimize counterparty risk, while taking care that transaction costs do not get too steep, the level of portfolio risk an individual trader is willing to take on depends on his risk-averseness. Speculators, for example, trade on short-term price movements and they are therefore willing to take a higher short-term portfolio risk. People who regard their investment as a pension scheme, on the other hand, require a long-term positive return on their investment, and do not want to run the risk that the value of their portfolio will be reduced to zero due to

sudden price movements. There are several ways to mitigate or allocate portfolio risk; I will successively discuss how the seventeenth-century share traders used contingency claims and derivative transactions to this end.

Traders could add a contingency clause to their derivatives contracts.[47] A contingency clause is a clause that comes into effect if a certain described event happens; put another way, the clause is contingent on the event described in the clause. The risk allocating effect that contingency clauses could have becomes clear in the following example. In the fall of 1618, Anthoni Thijs and Abraham Govertsz. van de Graef contracted a forward transaction that was due on 1 January 1619. Earlier that year, five VOC ships had safely returned from the East Indies. However, Thijs and Van de Graef had the impression that there might still be still be more ships bound for the Dutch Republic under way, but they were unsure how many. They therefore stipulated that Van de Graef should pay Thijs 158% if two more ships would arrive from the East Indies before the end of the year, 152% if one more ship would arrive and 144% if none. They settled the contract on 2 January 1619; Van de Graef paid 152%, because one more ship had arrived.[48]

This transaction thus brought about the following risk allocation: Thijs was the seller, so he would not suffer a loss if the share price were to fall during the term of the contract. If the share price were to rise as a result of the safe arrival of one or more VOC ships, he would get a fixed profit. Van de Graef, on the other hand, would suffer a loss if the share price were to fall and he would profit from the arrival of additional ships only to the extent that this did not accrue to Thijs. Moreover, he would suffer a loss if the share price did not react as positively to the arrival as laid down in the contingency clause. So Thijs knew exactly how much he would get paid on January 1; he had covered his risk. Van de Graef, on the other hand, was willing to take on these risks. He might have been rewarded through a low forward premium, but the sources do not allow for a reconstruction of the premium. It is also possible that Van de Graef was willing to take on the risk because he had a more positive expectation on the share price reaction to the arrival of ships.

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[47] There were standard forms available for derivatives contracts (in printed form from about 1630 onwards, but before that time traders already used a standard formulation for their handwritten contracts), but traders could always tweak the transaction by adding extra clauses at the bottom of the contract.

[48] BT, inv. nr 113, fo. 48. The last ship, called Goede Fortuijn, arrived in Zeeland on 15 November 1618: DAS. Incidentally, both traders proved to have been very good at assessing how the market would react to the arrival of ships: on 27 December, Thijs paid the exact same 152% for a spot transaction.

Hubertus Pollius and Anthony Alvares Machado entered into a similar transaction on 8 August 1678. They agreed that Alvares Machado would buy a share (nominal value *f* 3,000, price 405%) if peace were to be concluded in the coming month. Otherwise, the contract would become null and void. So, in this particular transaction, neither party ran a risk if the peace negotiations failed. If, however, they succeeded, Pollius knew for sure that he would get 405%. Alvares Machado would suffer the loss or get the profit if the price were lower or higher in a month's time. Again, this contract is partly a bet (by Alvares Machado) and partly a way to control the impact of political circumstances on the value of a share portfolio. Pollius was willing to forgo the chance of a very high return for the certainty of getting 405% were peace to be concluded.[49]

Traders also used the derivatives market for commodities to hedge the price risk of the VOC shares in their portfolios. For an effective hedge, the price of these commodities should go up if the price of the VOC shares were to go down and vice versa. The goods that were brought to the Dutch Republic by the VOC satisfied this requirement to an extent that made hedging feasible. The share price reacted positively on large return fleets, but large ladings of spices and other goods from the East Indies of course also saturated the markets for these commodities. The general trend was thus that the market price for spices went down when the share price went up. If, however, part of the fleet was lost at sea, the share price decreased whereas spices became scarcer on the European markets and their price increased. A good way to hedge against price risk was thus to invest in pepper or other spices when these were abundantly available. The goods brought over from the East Indies were not perishable, so they could be stored in a warehouse until the price went up.

Jeronimus Velters did so in the fall of 1676 when the pepper price was very low. He bought pepper on the Amsterdam and Hoorn markets for Pierre Macaré and himself and immediately pawned it. He received 4.5% loans secured on the pepper;

[49] The contractors later disagreed on the interpretation of the contingency clause. Peace with France was signed on 11 August – only three days after they had drawn up the contract, but Alvares Machado was not willing to receive the share, stating that the contract was valid only if a general peace was concluded, whereas the Peace of Nijmegen solely concerned France and the Dutch Republic. Pollius then sold the share to another trader. A year later, however, when VOC shares traded at 410-3%, Alvares Machado changed his mind and he started a civil case against Pollius to force him to deliver the share. Both the Amsterdam court and the Court of Holland dismissed Machado's claim. Anthony Alvares Machado *vs.* Engelbert de Geyselaar (guardian to Pollius' heirs), 25 March 1681, HvH, inv. nr. 816, 1681-55.

the storage costs were included in this interest rate.[50] Based solely on the letters to Macaré in which Velters wrote that he was going to buy pepper, it could seem as if Velters had simply speculated on a price rise of pepper – buying low and hoping to sell high. This was not the case, however; Velters was actually hedging the price risk of his shares, since his entire correspondence with Macaré was focused on trading shares and other financial transactions (insurance, bills of exchange). The sole purpose of their correspondence was to make better financial deals by using each other's business networks. This example of buying and storing commodities must thus also be seen in the context of their financial dealings.

The aforementioned examples are chance findings in the sources; it is unclear how often traders used these risk-mitigating strategies. The very frequently traded share derivatives were also fit for risk-reducing trading strategies, however. Both forwards and options could be used to mitigate the risk of unwanted price fluctuations. Below I will discuss how this worked and to what extent the traders used share derivatives to manage and control the risk of their portfolios.

Forward short sales, to begin with, are often used for making a hedge. The possibilities for this trading strategy were rather limited on the seventeenth-century forward market, however, because VOC stock was the only asset that was regularly traded and that could thus be sold short. Traders could therefore not, for example, use forward options to hedge against systematic risk – the class of risk associated with market returns (i.e. of the market as a whole, not of an individual asset). This is a category of risk that cannot be reduced by portfolio diversification. If, for example, the government of a specific country is replaced as a result of a coup d'état, this will affect the return of all stocks traded on the market in that country. Some stocks will react more heavily to this event than others, but the price reactions will be positively correlated. A portfolio that consists of only long positions in different stocks will therefore always be affected by systematic risk. Short-selling, however, can protect against this type of risk. If a long position in stock X is combined with a short position in the market with the same value, the systematic component of the return on stock X is reduced to zero. A positive systematic return will then still result in a positive return on stock X, but this will be fully offset by the negative return on the short position in the market. So, what is left is the unsystematic, or stock-specific, risk and return of stock X. On the

[50] Velters to Macaré, 25 September 1676, SAA, Velters, inv. nr. 2, fo. 514; 6 November 1676, SAA, Velters, inv. nr. 3., fo. 5.

Amsterdam financial market of the seventeenth century, however, it was not possible to take a short position in the market as a whole, so traders could not hedge against this type of risk. A combination of a long VOC position and a short WIC position would have come the closest to cancelling out systematic risk, but the trade in WIC shares was too irregular to make this feasible and I have not found any evidence in the sources that traders used this strategy.

The Amsterdam share traders could also use forward short positions in the VOC to limit the risk of their long position in the same VOC. This technique is very simple. A long position limits downward risk (the value of a long position can go only to zero), but gives unlimited upward potential. A short position, on the other hand, has unlimited downward risk (there is no limit to a rise of the share price, hence there is no limit to the loss on a short position), whereas upward potential is limited to the point where the asset becomes worthless. Hence, a combination of a long and a short position fixes the loss or profit on the portfolio. This is exactly what the forward traders on the market for VOC shares did; they always tried to net out their positions by making opposite contracts. The ledger containing the trades of Jacob Athias and Manuel Levy Duarte in trading clubs during the 1680s clearly shows this; they traded a very high number of forward contracts, but always made sure that their net position in the market was (close to) zero.[51] A flat position not only yielded the best settlement possibilities, it also limited the portfolio's profit or loss to the difference between the average prices of its long and short positions. The portfolio was not exposed to additional share-price risk.

Option contracts provided more sophisticated hedging possibilities. An option is the right to buy (call option*) or sell (put option*) a share with a certain nominal value at a certain price on a certain date in the future. The holder of the option has the right to exercise the option, but he can also choose not to do so – he will exercise it if the option is *in the money*, meaning that the market price makes it profitable to exercise the option. The main difference between forward and option contracts is that the holder of an option has the right to exercise it, whereas the buyer of a forward is obliged to buy the underlying asset on expiry or settle the contract in some other way. Options can therefore be seen as an insurance against a certain share-price movement. A put option, for example, guarantees the buyer that he can sell the underlying asset at a certain price at a future date. He is thus insured against a reduction in value

[51] SAA, PIG, inv. nr. 687-8.

of the underlying asset from the point where the option is *at the money*. Of course, insurance does not come for free; the buyer of an option has to pay an option premium that is similar to an insurance premium.

So, put another way, the holder of a forward contract holds the economic ownership of the underlying asset, postponing payment until the contract's expiry date, whereas the holder of an option contract holds an insurance against certain price movements. This makes an option a more complicated instrument and it is therefore also much more complicated to assess the price of an option. The price of a forward can be assessed by taking the spot price at the contract date, to which a cost-to-carry is added. The size of the cost-to-carry is dependent on the contract's term in relation to the prevailing interest rate and on the risk of default. In the case of an option contract, however, the size of the premium is dependent on more factors. It is, of course, to a large extent determined by the nominal value of the underlying asset, the length of time to expiry and the relationship between the market price and the strike price of the option. Because of the time value of money, the premium increases as the term lengthens. It is harder to price the relationship between the market price and the strike price, however. The option premium increases as the chance that the option will be *in the money* on expiry becomes greater – the seller of the option demands a higher compensation for the greater chance that he will incur a loss if the option is exercised. This component of the option premium is thus dependent on the variation of the share price. The seventeenth-century options traders were definitely aware of this relationship, but they did not have the mathematical knowledge to perform the calculations needed. To be sure, it was not until the 1970s that the Black-Scholes model was developed, presenting a method for option valuation.[52]

However, even the Black-Scholes model does not capture all factors influencing the size of the option premium. Most importantly, it does not take the risk preferences of the options traders into account, but exactly these different risk preferences are the source of all trading activity in options. The buyer of an option always considers whether the coverage for a certain price risk offsets the option premium. The trader who writes the option, on the other hand, receives the premium, but has to consider whether it offsets the extra risk exposure. They can come to an agreement only if they value risk differently.

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[52] Murphy, 'Trading options', 20-1.

The sources give few clues regarding how the seventeenth-century options traders assessed the size of the option premium. The available data on option contracts give the impression that there was something like a market price for options with a similar exercise date – although I have never seen any quotations of option prices in share-traders' correspondence. Two put options, one between Jacob da Costa Athias and Antonio do Porto and the other between Manuel Mendes Flores and Josep Francees, give evidence for this view. The former option was contracted on 22 October 1671 and the latter one day later. Both had the same underlying asset, strike price and exercise date. Da Costa Atias paid a premium of *f* 600 and Mendes Flores *f* 585. This certainly gives the impression that these traders took a market price as a starting point, adjusting it slightly to their personal expectations.[53]

Apart from this observation, it is impossible to find out how the traders priced their option premium. There are simply too many factors at play and, what is more, the traders used several types of option contracts. For example, both what are nowadays called American-style and European-style options were used.[54] The difference between these two styles is that European options can be exercised only upon expiry of the contract, whereas the holder of an American-style option has the right to exercise it on or before the date mentioned in the contract. It makes a big difference for the size of the premium whether it is an American or a European option. On 28 February 1680, for example, Joseph Deutz bought four call options, paying a premium of *f* 510,55. The total underlying asset of these options was *f* 12,000. The strike price in these contracts was 410% and the exercise date 1 May 1680. The original contracts have not survived, but these must have been European options, because the VOC spot price at the contract date was around 420%. If these had been American options, the contracts would have had an intrinsic value of *f* 1,200 on the contract date – Deutz

[53] *Insinuaties* 1 August 1672, SAA, Notaries, inv. nr. 2239, fo. 968, 999.

[54] The exact details of option contracts have survived only in very few instances. The court case Abraham Cappadoce *vs.* Isaack le Boulanger gives evidence of an American-style option: Cappadoce had bought the right to receive a share from Le Boulanger between the contract date (19 October 1689) and 1 January 1690 at 460%. NA, Court of Holland, inv. nr. 853, nr. 1694-31. The option contract between Johannes van Gistelen and Moses Gabay Henriques (1672) that is transcribed in the protocol of notary Lock is also American-style: SAA, Notaries, inv. nr. 2238, fo. 773. The contract (30 August 1688) between Manasse Ababanel and Jacob Poppen, however, reads that Ababanel had the right to sell a *f* 9,000 VOC share to Poppen only upon the contract's exercise date: 1 January 1689 ('op den eersten january 1689 eerstcomende dein dagh alleen'). SAA, Notaries, inv. nr. 4135, fo. 533-4. The options that were traded on the London market in the late seventeenth century were American-style: Murphy, 'Trading options', 12 (in footnote).

could have immediately exercised them and he would then have made a profit of almost *f* 700.[55]

There were more factors that complicated the valuation. The seller could, for instance, insert a penalty clause for non-compliance in the contract. This meant that he could reduce his downward risk stemming from writing the option. On 6 October 1671, for example, Bartholomeus Rodrigues Enriques sold a put option to Michiel Rodrigues Nunes. Rodrigues Nunes paid *f* 78.75 for the right to deliver Rodrigues Enriques a share of *f* 3000 at a price of 530% on or before 1 August 1672. The contractors added a penalty clause that Rodrigues Enriques should pay 10% of the nominal value of the underlying asset (*f* 300) to Rodrigues Nunes if he refused to accept the share.[56] Hence, if the share price dropped to 517 3/8% or lower, the seller would choose not to accept the share, but rather pay the fine. There are also examples of contracts with a 20%-penalty clause. Unsurprisingly, the premium paid for these contracts was higher – these contracts gave the buyers a profit potential of *f* 600 instead of *f* 300.[57]

Option contracts could be used for both risk-mitigating and speculative purposes. The speculative use of options works as follows. A trader who believes that the share price will increase can hold a positive position in the stock, but he can also buy a call option or short a put option.[58] The option transactions allow him to get the profits of a larger number of shares for a relatively small amount of money; he does not have to actually buy the shares, but he can still gain from the expected price increase. A trader who believes that the share price will decrease, however, can short the stock, buy a put option or write a call option.[59] The available data on the use of option contracts shows that this speculative use was by far the one most employed by the share

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[55] SAA, Deutz, inv. nr. 287.

[56] *Insinuatie* 1 August 1672, SAA, Notaries, inv. nr. 2239, fo. 993. This procedure could be compared to the very common early-modern Dutch practice of *rouwkoop* ('grieving money'): a fee to cancel a contract. This was basically a fine for not behaving honorably; by paying it, a trader restored the honorable relations: Goldgar, *Tulipmania*, 210.

[57] E.g. *insinuaties* 1 August 1672, SAA, Notaries, inv. nr. 2239, fo. 995, 997. The net profit of the buyer in case the seller did not live up to his agreements did, of course, not equal the penalty payment. To calculate the net profit, the option premium should be subtracted from the penalty payment.

[58] The difference between buying a call and writing a put is that the buyer of the call has unlimited profit potential, whereas his loss is limited to the option premium. The writer of a put, on the other hand, gains the option premium if the share price is above the strike price on the exercise date, whereas his potential loss amounts to the total value of the underlying asset.

[59] The buyer of a put option gains as soon as the share price falls below the strike price to an extent that it offsets the option premium. The profit potential is limited to the value of the underlying asset; the loss to the option premium paid. The writer of a call gains the option premium if the share price falls below the strike price. He loses – and the potential loss is unlimited – as soon as a share price increase offsets the option premium he received.

traders in Amsterdam. Louis Trip, for example, bought two call options for shares with a total nominal value of *f* 42,000 on 16 January 1660.[60] The strike price of these options was 400% and they expired on 16 April 1660. They were just *out of the money* on the contract date. Trip had a large long position in the VOC at that time: he owned share capital with a nominal value of *f* 53,000.[61] The combination of his long position and the large long call indicates that he was speculating heavily on a share-price increase.

Unfortunately, Trip did not systematically register the details of his option contracts – for the most part, he noted in his journal only the premium he paid or received, without specifying put or a call, strike price or underlying asset – so it is not possible to analyze whether he also used options for risk-hedging purposes.[62] Joseph Deutz, however, kept his accounts more meticulously. He also used options for purely speculative purposes. On 12 March 1675, for example, when Deutz held a long position in the VOC with a nominal value of *f* 36,000, he bought five call options. These options all had a *f* 3,000 VOC share as underlying asset, a strike price of 450% and expiry date May 1[63], while the spot price on the contract date was 447%. Deutz was clearly speculating that the share price would increase in the next few months; he enlarged his long position's exposure to price fluctuations with call options for VOC shares with a nominal value of *f* 15,000.

Deutz also used options for other investment strategies, however. On 4 May 1678, for example, he wrote a call option with a *f* 3,000 VOC share as underlying asset, a strike price of 340% and expiry date August 1. He received a premium of *f* 360 for this call.[64] At this date, his long position in the VOC amounted to a nominal value of *f* 8,090 and the spot price was 319%.[65] This combination of a long position and a short *out of the money* call option, called a covered call, indicates that Deutz was hedging against short-term fluctuations in the value of part of his portfolio. With this covered

[60] Journal entry, 16 January 1660, SAA, Merchants' accounts, inv. nr. 50. The counterparties to these contracts were Aron Gabay Pharo and Nicolaes van Bambeeck. Sworn broker Hendrick van Meyert participated for 50% in the option with Gabay Pharo (underlying asset *f* 30,000).
[61] Journal entry, 24 December 1659, SAA, Merchants' accounts, inv. nr. 50.
[62] The same goes for Jacob Athias and Manuel Levy Duarte; they traded options on the accounts of Salvador de Palacios and Olympe Mancine, the Countess of Soissons, but never registered all details of their options. SAA, PIG, inv. nr. 858, fo. 113, 150, 202, 216 and 298.
[63] SAA, Deutz, inv. nr. 286. The counterparties to these contracts were Rodrigo Dias Henriques, Manuel Mendes Flores, Manuel Anthonio Rodrigues, Samuel Elisa Abrabanel and Joseph Gonsalves de Assevedo. Deutz paid a *f* 180 premium on three contracts and *f* 165 on the remaining two contracts.
[64] SAA, Deutz, inv. nr. 286. The counterparty to this contract was Guilliam Venturyn.
[65] SAA, Deutz, inv. nr. 294, fo. 155.

call, Deutz received an option premium and he still profited from a share-price increase up until the point where the market price equaled the strike price. A further increase in the share price would accrue to the buyer of the option. If the share price were to decrease, however, the option premium would cover part of the loss on the long position in Deutz' portfolio.

Deutz performed a different type of hedge in May/June 1680, when his long position in the VOC amounted to a nominal value of *f* 15,000.[66] On May 8, he bought a call option with a *f* 12,000 VOC share as underlying asset, a strike price of 430% and exercise date of August 1. The premium paid for this option was *f* 840. So far, it seems that Deutz leveraged his portfolio, speculating on a share-price increase. One month later, however, on June 6, he also bought a put option. This option had a *f* 18,000 VOC share as underlying asset, a strike price of 415% and exercise date of August 1. Deutz paid a *f* 495 premium for this put.[67] Combined, these two options formed a straddle*. Deutz obviously expected a big price movement, and he wanted to profit from it, but he was unsure in which direction the price would go. Using these option transactions, he safeguarded his portfolio against too big a price decrease, whilst at the same time enabling him to fully profit from a possible price increase.

Straddles could also be bought in a single transaction. Raphael Duarte, for example, bought one from Josep Francees on 26 October 1671. He paid Francees *f* 1,200 for the right to either receive or deliver a share of *f* 3,000 at a price of 500% from/to Francees on or before 1 August 1672.[68] Duarte could always exercise this option, unless the price were exactly 500%, in which case the option would be worthless. He would make a profit if the share price were to drop under 460 or rise over 540. For any share price in between these values, he would be able to partly recover the option premium he had paid in October. Francees, on the other hand, would make a profit as long as the share price did not change too much. Clearly, straddles were the perfect transaction for traders who did not want to be exposed to large downward risks, but who at the same time wanted to benefit from possible price increases. It is not surprising, then, that the premium that had to be paid for these options was rather high.

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[66] SAA, Deutz, inv. nr. 295, fo. 20.
[67] SAA, Deutz, inv. nr. 287. The counterparty to the call was Jan Haen, for the put Egbert de Vrij.
[68] *Insinuatie* 1 August 1672, SAA, Notaries, inv. nr. 2239, p. 962.

To conclude, all financial techniques needed to take hedged positions on the market were available in the second half of the seventeenth century. The extent to which they were actually used for hedging purposes seems to have been limited, however. Joseph Deutz at times certainly used options to protect his portfolio against short-term price fluctuations, but for the most part he used options in a speculative way; to get a larger exposure to price risk rather than to be insured against unwanted price risk. This does not alter the fact that for each option transaction to be concluded, a certain amount of price risk was traded. Each trader that entered into an option transaction had to consider how much risk was involved in the transaction and how much he was willing to pay to transfer the risk or how much he wanted to be paid to take on the risk.

Consequently, as I have mentioned before, the buyer of each option transaction needed to have a different level of risk-averseness than the seller. The sophisticated options market allowed the traders to get the risk exposure they wanted for their portfolios; they could pay for insurance against a certain amount of risk or be paid to take on extra risks. It is clear, then, that this kind of options market could exist only if there were a large number of traders active on the market who were concerned with short-term market movements. Only these traders were sufficiently well up on the market to be able to put a price on the risk. It is not surprising, therefore, that only the frequent share traders participated in the options trade. The same names that are found in the register of Jacob Athias and Manuel Levy Duarte listing their activities in the trading clubs dominated the options trade. Indeed, options were also traded in the meetings of the trading clubs.[69]

An additional advantage of trading options with participants of trading clubs was of course that they were subject to the private enforcement mechanism in force in the clubs. Stock options were never explicitly mentioned in the bans on short-selling[70], but it is to be expected that the courts would judge similarly traders who wrote options without owning the underlying asset as they did the short-selling of forward contracts. The fact that I have not found court cases of reneging option sellers could be an indi-

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[69] See, e.g., SAA, PIG, inv. nr. 687, fo. 217.

[70] Moreover, option transactions were never forbidden. Smith suggested that the 1693 brokers' ordinance might also have been a ban on the use of stock options, but this concerned only options on commodities (particularly grain): Smith, *Tijd-affaires*, 83-4. The ordinance can be found in: Noordkerk, *Handvesten* II, 1072. The States-General in 1698 also issued a ban on the use of option contracts, but again this concerned only options on commodities: Placard 17 October 1698, Cau, *Groot placaet-boeck* IV, 1371-2.

cation that the private enforcement mechanism also functioned well for the options trade. Option buyers thus had to choose their counterparties carefully – all the more so since it was obviously tempting for exchange dealers to write options; this being an easy way to get ready money. Josep Francees, for example, who sold a straddle to Raphael Duarte (see the example on page 143) received *f* 1,200 by just signing a piece of paper. And this was not the only option he wrote; within a month's time, Francees received *f* 3,285 in his bank account by writing two straddles and a put option.[71] The options market thus not only allowed investors to carefully transfer part of their portfolio risk, it also tempted traders to take on risks they would never be able to bear.

Conclusions

The development of the derivatives market enabled investors to manage and control their financial risks. The evolution of the various types of transactions made the risks involved in trading VOC shares ascertainable and tradable. Furthermore, the active and speculative traders on the market were willing to trade financial risks. The risk-management possibilities provided by the market are the best proof that the secondary market for VOC shares had become a modern securities market.

It is important to note that the traders could never have used the derivatives market to its full potential without both the legal framework and the private enforcement mechanism of the trading clubs and the *rescontre* being in place, for the derivatives market also tempted traders to take unbearable risks. Writing options, for example, resulted in an immediate positive cash flow. Furthermore, entering into a forward contract required no payment up front, but it did yield the prospect of possible profits. The legal framework and the private enforcement mechanism ensured to a high extent that traders could not just enter into derivatives transactions and walk away if they yielded a loss. Hence, a combination of the availability of sophisticated derivative transactions, a sufficiently large pool of active traders and an efficient enforcement mechanism were required for investors to be able to manage and control their risks according to their needs. The secondary market for VOC shares satisfied these conditions in the second half of the seventeenth century and, as a result, became a modern financial market.

[71] SAA, Notaries, inv. nr. 2239, p. 964, 968, 989.

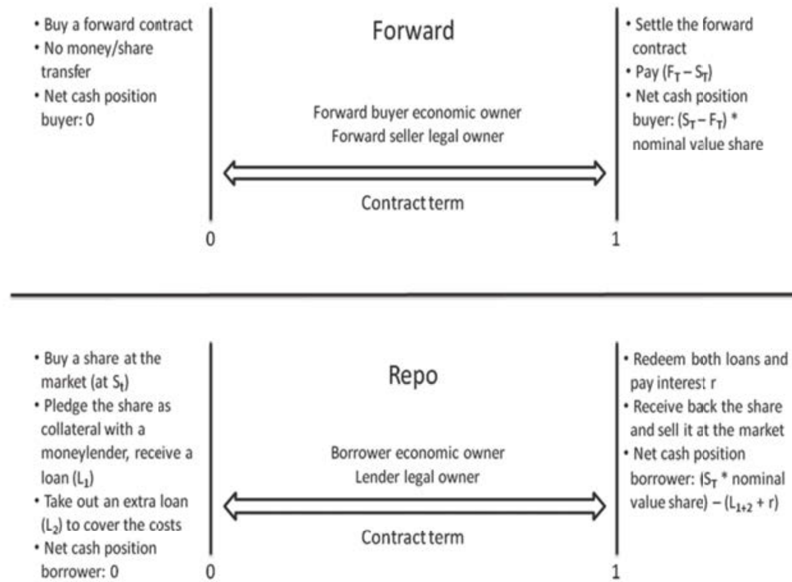

Figure 4.1 Forward and repo transactions represented in diagram form
These diagrams show both transactions from the perspective of the buyer/borrower. On the left side, the steps to be taken to enter into either a forward or a repo are shown. The right side of these diagrams shows the settlement procedures for both transactions and the resulting net cash position of the buyer/borrower. Most importantly, however, the middle part shows that both transactions were similar: they separated the legal and economic ownership of the underlying share during the term of the contract.

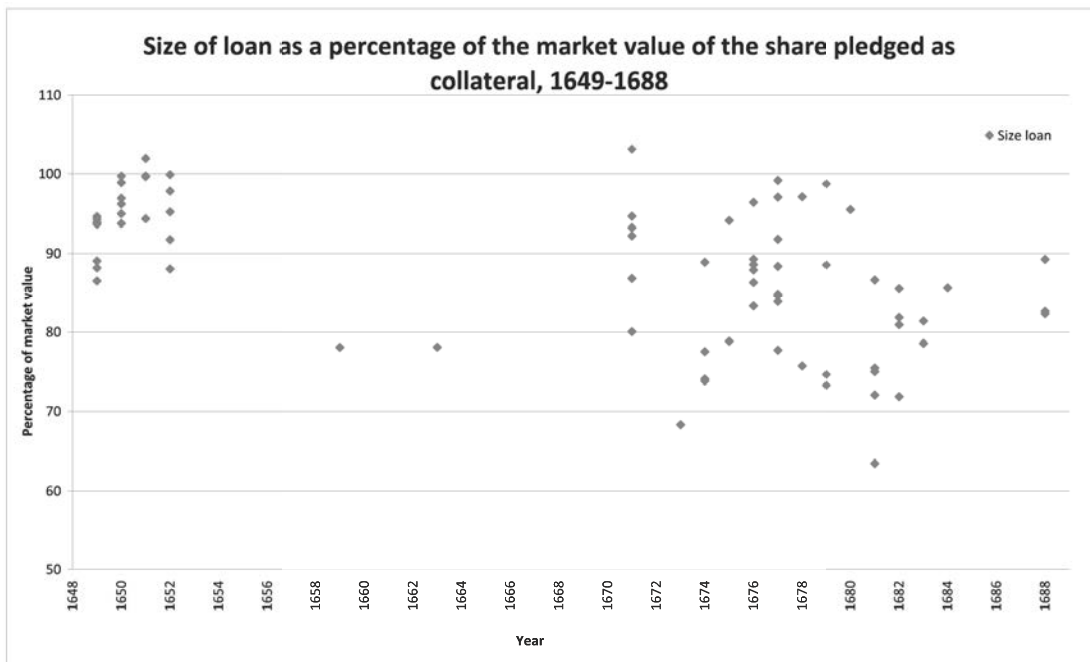

Figure 4.2 Size of loans granted on shares pledged as collateral, 1649-1688
The size of the loans is depicted as a percentage of the market value of the share on the contract date. Sources: SAA, Deutz, inv. nr. 275, 285-8, 293-5. SAA, Merchants' accounts, inv. nr. 50. SAA, PIG, inv. nr. 858. Number of observations: 140.

5 INFORMATION

Introduction

The growth in market activity of the 1630s came at a remarkable moment. In the previous decade, activist shareholders had started a corporate governance debate because they were dissatisfied with the way the company was run. The principal subject of the debate was information. Shareholders wanted to be informed about the financial state of the company.[1] The VOC had skipped its intermediate liquidation in 1612 and again did not make up its books at the end of the first charter. Consequently, investors remained ignorant of the company's financial situation.

The outcome of the corporate governance debate did not alter much in this situation; the chief participants did not share the information they got access to with the other shareholders – they merely acted in the directors' interests.[2] This created a principal-agent problem: the company's shareholders (the principals) were insufficiently able to monitor the performance of the company management (the agents). The shareholders could have made their dissatisfaction with this situation known to the VOC directors by selling their shares in the company. But the opposite happened; the number of shareholders increased and trading activity skyrocketed. This chapter seeks to find an explanation for this seeming incongruity.

The argument is structured in three sections. In the first section, I will discuss on what kind of information the investors of the first decade of the seventeenth century based their investment decisions. This was the time when investors still believed that the company would be liquidated in 1612 or 1623 at the latest. I will subsequently contrast the findings of this section with later periods; first by showing what kinds of information the share price reacted to and then by analyzing how share traders in the

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[1] Investors in equity have higher information requirements than investors in debt. In the case of debt financing, investors know before they enter into a transaction what the rate of return on their investment will be, for the interest rate on the loan is fixed. They also know when they will get the principal back, for the term is fixed as well. So, the main thing moneylenders typically worry about is whether the borrower will live up to his agreements. Investing in equity, however, is different. Investors in a company's equity provide the company with a sum of money whilst there are no arrangements on when the money will be paid back or how the investors will be recompensed for putting their money at the company's disposal. In exchange for this, investors get unlimited upside potential (the chance, in other words, that the return on the investment will be higher than the going interest rate). The level of uncertainty is thus much higher for equity financiers than for moneylenders. Investors therefore need detailed information to make an assessment of the expected risk and return.

[2] See chapter 1, section 1622 – The relation between the company and its shareholders on p. 32 ff.

second half of the seventeenth century obtained the information necessary for their investment decisions.

The theme of this chapter falls into a broader literature on the relation between the availability of information and economic or financial development. According to Shiller, speculative bubbles could occur only after the advent of news media; newspapers enlarged the interest in financial speculation.[3] McCusker and Gravesteijn, on the other hand, argued that developments in the dissemination of information and more specifically the rise of commercial and financial journalism always followed economic developments.[4] Naturally, information is not confined to printed news media. Neal, Neal and Quinn, and Murphy all analyzed the relationship between the development of financial markets in London and the availability of financial information. The general conclusion of their works is that printed information, mainly in the form of price lists, was widely available by the end of the seventeenth century, but that investors relied on their personal networks if they needed information for more complicated investment decisions.[5]

Seventeenth-century Amsterdam, meanwhile, is renowned for its status as an information centre. It became the newspaper centre of Europe, supplying for instance the heavily censored French market with French-language newspapers.[6] Lesger argued that Amsterdam became the commercial centre of the Northern Netherlands after the Dutch Revolt because the city functioned as a crossroads for information flows.[7] Finally, Smith contended that innovations in processing commercial information in seventeenth-century Amsterdam contributed to the modernization of capitalism.[8] An extra research question emerges from this literature: to what extent was the development of Amsterdam's financial market dependent on the city's status as an information centre?

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[3] Robert J. Shiller, *Irrational exuberance* (Princeton 2000) 71. Murphy, *The origins of English financial markets*, 89.

[4] John J. McCusker and Cora Gravesteijn, *The beginnings of commercial and financial journalism: the commodity price currents, exchange rate currents, and money currents of early modern Europe* (Amsterdam 1991) 22-5.

[5] Larry Neal, 'The rise of a financial press: London and Amsterdam, 1681-1810', *Business history* 30 (1988) 163-78. Larry Neal and Stephen Quinn, 'Networks of information, markets, and institutions in the rise of London as a financial centre, 1660-1720', *Financial History Review* 8 (2001) 7-26. Murphy, *The origins of English financial markets*, chapters 4 and 5.

[6] F. Dahl, 'Amsterdam: earliest newspaper centre of Western Europe: new contributions to the history of the first Dutch and French corantos', *Het Boek* 25 (1938/39) 161-197.

[7] Lesger, *Handel in Amsterdam*, particularly chapter 6.

[8] Woodruff D. Smith, 'The function of commercial centers in the modernization of European capitalism: Amsterdam as an information exchange in the seventeenth century', *Journal of economic history* 44 (1984) 985-1005.

Investors' information needs in the first decade of the seventeenth century

In hindsight, it seems odd that anyone would have taken the risk to invest money in the VOC in 1602. The company directors did not state in any way how they would use the money raised by the stock subscription and the shareholders did not get a say in the management. So why would anyone subscribe to the equity stock of this newly founded company?

Four things are of importance in this regard. Firstly, the VOC did not come out of the blue. It was a merger of earlier initiatives in the East India trade: a total of eighty ships had left different ports of the United Provinces between 1595 and 1602, so these ventures were widely known amongst the Dutch. These pioneering ventures had proved that the East-India trade could be very profitable and it had also become clear that in order to really outrun the Portuguese and other competitors, it was necessary to build fortresses, permanent trading posts, refreshment stations along the route, etc. – in sum, more than simply going there, loading the ships and sailing back.[9] Also, the transition from the pioneering voyages to the VOC would not be that big; shareholders would get the opportunity to liquidate their investment every ten years and if they did not want to wait this long, they could also sell their shares to a third party on the secondary market. Hence, from an investors' point of view, the step from investing in one of the *Voorcompagnieën* to investing in the VOC was bridgeable. And that is the second point: shareholders expected their investment to last for only ten years. There can be no doubt about this: the investors called the entity to which they had subscribed their money 'the first ten-year account of the chartered East India Company'.[10] At the same time, however, they knew that the company as a whole would stay in existence for a longer period of time, for the States General had granted the charter for 21 years.

Thirdly, the investors did not subscribe to a faceless company. In Amsterdam, for example, the capital subscription took place at the private house of company director Dirck van Os. Moreover, company directors canvassed for potential investors.[11] All company directors formed part of the local merchant elite: people knew who they were and were also confident that they could entrust these highly reputable merchants

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[9] Gelderblom and Jonker, 'Completing', 649-53. Amsterdam alone had accounted for fifty of these ships.

[10] See, e.g. notarial deeds of share transfers in 1604: SAA, Notaries, inv. nr. 96, fo. 173; inv. nr. 98, fo. 53. Also, *insinuatie* 20 February 1610, SAA, Notaries, inv. nr. 267, fo. 128.

[11] Ibidem, 651. This strategy to attract investors had been more important for the financing of the *voorcompagnieën*.

with their investment.[12] Lastly – and this may seems odd in the particularistic Dutch Republic and given the somewhat strange structure of the VOC with six semi-independent chambers – the subscribers of 1602 thought the company to be directly connected to the Dutch Republic as a state. Since the highest governmental body had granted the company charter, the investors felt that they did not simply invest in a company, but rather in the Dutch cause.

However, the VOC did not become profitable as quickly as the pre-companies. In the final years of the first decade of the seventeenth century, the first signs of discontent amongst the shareholders became apparent. The share price stood at a high in 1607 (167%[13]) when bad news started to arrive from the East Indies. Cornelis Matelieff, the leader of a large operation against the Portuguese in 1606, wrote a critical report on the state of the VOC in the East Indies on his return in 1608. At about the same time, shareholders voiced their doubts about the profitability of the company: its warehouses were packed with spices, while they held the market to be saturated.[14] This was also the period of Isaac le Maire's bear-trading consortium. Le Maire was convinced that the shares were overvalued and there was good reason to believe his information to be correct, for he had been a company director until 1605. Finally, in these years the Dutch Republic and Spain were negotiating a truce. The VOC existed only by grace of the war with Spain, for according to the treaty of Tordesillas (1494), the territories outside Europe belonged to either Spain or Portugal. So the signing of a truce could very well have meant the end of the VOC.[15]

It was during this turmoil that Anthoine l'Empereur corresponded with his nephew Jacques de Velaer Junior about the trade in VOC shares.[16] This correspondence gives insight into the considerations and motivations that were the basis for share-traders' investment decisions in the first decade of the seventeenth century. l'Empereur lived in Leyden, some forty kilometers from Amsterdam, and he therefore

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[12] Frentrop, *Corporate governance*, 50.
[13] This is the highest share price I have found (10 April 1607): SAA, Notaries, inv. nr. 106, fo. 229. However, in a memo dating from August 1609, probably written by Isaac le Maire, a share price of 180-200% for 1607 is mentioned: Van Dillen, 'Isaac le Maire', 43 (doc. nr. 4).
[14] Frentrop, *Corporate governance*, 74. The shareholders were also worried about the fact that the company had become heavily indebted: it had taken out large loans at 8% interest.
[15] Israel, *The Dutch* republic, 401-5.
[16] l'Empereur was married to the aunt of De Velaer's wife; De Velaer called l'Empereur 'uncle'. They corresponded anywhere between one and eight times per month from December 1608 until June 1611. l'Empereur had received irregular letters – also from VOC director Jacques de Velaer Senior – before this period, but the frequency increased after l'Empereur informed his nephew about his intention to buy a VOC share. For unknown reasons, the intervals between two letters increased markedly after June 1611.

asked De Velaer to keep him updated about news concerning the East India trade and to perform his dealings on the Amsterdam exchange.[17] De Velaer lived on Oudezijds Voorburgwal, right in the financial heart of Amsterdam; he went to the exchange on a daily basis and was the son of one of the directors of the Amsterdam chamber of the VOC.[18] De Velaer did not provide his services for free: he charged his uncle a commission of 1% of the nominal value of shares purchased and sold.[19]

The primary service De Velaer provided to his uncle was not buying and selling shares, though, but forwarding information. He forwarded both newsletters and international business correspondence – these letters from abroad first arrived in Amsterdam, so the fastest way to get them in regional cities was via an Amsterdam-based receiver[20] – and informed l'Empereur about news he had heard on the exchange. The newsletters, precursors of newspapers, often contained news about the VOC fleet. They were generally considered to be very well informed; even the Amsterdam Chamber of the VOC subscribed to them.[21]

An example of a handwritten newsletter that has survived in the l'Empereur papers reveals the sort of information that shareholders could get from this source. This particular newsletter contained information only about the company's activities east of the Cape of Good Hope, which suggests that there were other information channels available in Amsterdam for VOC-related information concerning events that had taken place closer to the Netherlands. It mainly informed its readership about recent conquests of the VOC and the fortunes of the VOC fleet. It recounted, for exam-

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[17] De Velaer also forwarded news from Amsterdam to his father-in-law Andries van der Muelen in Utrecht. See the correspondence in RAU, Van der Muelen, inv. nr. 47. Van der Muelen was less interested in information related to the share trade, however.
l'Empereur, De Velaer and Van der Meulen all formed part of a few close-knit families, predominantly originating from Antwerp. These families, tied together by marriages, frequently traded together. Van Dillen, *Aandeelhoudersregister*, 83-4. l'Empereur was born in 1552 in Doornik/Tournai in the province Hainaut. De Velaer was born in 1578 in Antwerp. Other families that formed part of network were the Malapert, De Latfeur and De la Faille families.

[18] His letters do not give evidence of inside information, however. In his letter dated 11 June 1611, for example, he reported to his uncle that the company directors had received a letter from St Helena containing extensive information about the business in East India. He did not know the contents of this letter, however – or chose not to inform his uncle about it. De Velaer to l'Empereur, 11 June 1611, BT, inv. nr. 215, nr. B2/7.

[19] Example of a semi-annual bill (16 June 1609), BT, inv. nr. 215, nr. A3/6.

[20] By an old rule, all letters coming from Hamburg to the Netherlands had to pass through Amsterdam: Milja van Tielhof, *The 'mother of all trades': the Baltic grain trade in Amsterdam from the late 16th to the early 19th century* (Leyden 2002) 165. However, De Velaer forwarded letters from Antwerp and Paris too (e.g. De Velaer to l'Empereur, 8 July 1609, BT, inv. nr. 215, nr. A3/14). De Velaer charged his uncle postal charges for this service: BT, inv. nr. 215, nr. A3/6.

[21] Annie Stolp, *De eerste couranten in Holland: bijdrage tot de geschiedenis der geschreven nieuwstijdingen* (Haarlem 1938) 84.

ple, how six ships had left Bantam on 16 November 1608, of which one, named De Grote Sonne, had had to return shortly thereafter because of leakage and another one, named Erasmus, had had leakage problems too, but it had been able to sail on to Mauritius. It also told about the conquest of the island of Makéan and how bad weather had broken two ships, lying at anchor there, from their moorings. This information was partly correct: this incident had indeed occurred (in July 1608), but in fact both ships were wrecked. The last bit of information dated from yet earlier: July 1606. This news must have reached the Netherlands earlier on, but it concerned such a heroic event that the compiler of the newsletter did not want to hold it back: the ship named d'Eendracht had arrived at Bantam and had burnt four or five Portuguese ships on its way there.[22] This news touched on the future of the company and was therefore undoubtedly of interest to investors.

It is remarkable, however, that the newsletters did not contain information about the cargo of the return fleet, which would have been of primary importance for the short-term profitability of the company. So De Velaer had to rely on other sources for this type of information. De Velaer's reports about the approaching return fleet of 1610 allow for a reconstruction of the way this information reached the Amsterdam exchange. Between May 25, when the first rumors circulated, and July 26, when De Velaer could finally check the correctness of all bits of information, a number of different and sometimes contradictory rumors could be picked up on the exchange. It must thus have been difficult to base investment decisions on these bits of information. The most interesting aspect of De Velaer's reports, however, is the sequence with which the news became available in Amsterdam.

The first rumor, about which De Velaer wrote his uncle on May 25, named the ships that were about to arrive, but did not give any information about their lading. It emphasized the fortunes of two Dutch admirals: Paulus van Caerden had been taken prisoner and Pieter Willemsz. Verhoeff had been treacherously killed together with some of his men after they had built a fortress in Bantam.[23] This news came from the crew of the English ship Hector, under command of William Keeling, which had

[22] Handwritten newsletter, undated, BT, inv. nr. 215, nr. A2/8. The publication date of this newsletter is unknown. It can be found in l'Empereur's correspondence of January 1609, but it was probably compiled on a later date, for it contained news about ships that had left Bantam in November 1608. Another example of a handwritten newsletter in the correspondence of l'Empereur, dated 22 June 1609, was written in French and came from Cologne. It did not contain information on the East Indian trade however: BT, inv. nr. 215, nr. A3/8.

[23] Velaer younger to l'Empereur, 25 May 1610, BT, inv. nr. 215, nr. B1/7. According to this rumor, the ships underway to the Dutch Republic were called 'Gelderlant, Bantam, Seelant, Banda *or* Delft'.

encountered the VOC return fleet at sea on 23 December 1609. Keeling had talked to the commander of the Dutch fleet and informed him about the fate of the two admirals – Keeling's ship was faster than the Dutch return fleet; he had left Bantam on a later date than the Dutch, so he had more recent information.[24] Keeling must have had much more information, however, for example about the cargo of the Dutch fleet. He also knew about two other ships heading for the Netherlands: ten days before the Hector had left Bantam, two Dutch ships (Banda and Patania) had left.

De Velaer sent his uncle an update on June 15, in which he again did not give priority to the fleet's cargo. He reported that due to some illness, many crewmen of the ship Gelderland had died. On its way to the Dutch Republic, this ship had called at Mauritius, where the leaky ship Erasmus was stranded. The Gelderland did not bring the cargo of the Erasmus, though, but it did bring 48 healthy members of its crew – many of the crew had died during the journey. The ship mainly carried coarse quality pepper. De Velaer did not have any new information on the other ships of this same fleet, but he did have extra news about the situation in East India. It was now commonly held to be true at the Amsterdam exchange that Paulus van Caerden was kept in prison in Ternate and that the other admiral, Pieter Willemsz. Verhoeff, had been killed, 'although he had been very friendly to the local population of Banda'. Moreover, De Velaer had now also learned that Keeling's crew had reported about the two Dutch ships (Banda and Patania) that had left Bantam shortly before them as well. These ships were laden with wares from the Moluccas (cloves, mace, nutmeg) and were to arrive soon, too.[25]

De Velaer did not report on the arrival of the first ships of the fleet in June and early July. His next letter was dated July 26, when the last two ships had arrived at Texel. The news these two ships carried was far more recent and therefore more valuable than the news from the ships that had arrived earlier, for the newly arrived ships

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[24] Hendrick Jansz. Craen wrote in the Gelderland's log about the information William Keeling gave them at sea on 23 December 1609: A. de Booy (ed.), *De derde reis van de V.O.C. naar Oost-Indië onder het beleid van admiraal Paulus van Caerden, uitgezeild in 1606* II (The Hague 1970) 94-95. On this date, the ships were still east of Cape of Good Hope. They accompanied each other during their stay at the Cape, at St. Helena, and during their journey all the way to 48.5 degrees north latitude (according to Craen's log). The Gelderland was in great difficulties: the ship was damaged and due to an unknown illness, a large part of its crew died. The fleet did not get updated information at any of the company's refreshment stations along the route.

[25] De Velaer to l'Empereur, 15 June 1610, BT, inv. nr. 215, nr. B1/8. De Velaer did not mention the source of the new information, but it was probably a letter from Craen to the *Heeren XVII*, written in Dartmouth on 20 May, which is published in De Booy, *Derde reis* II, Appendix 24. The information in this letter corresponds to the news De Velaer reported to his uncle.

had left East India more than six months later. The ships reported only good news about East India: the trade was going fine, there was hope of conquering Ternate soon and the Dutch had formed an alliance with Japan, so that they could now trade with Japan as well. Details about the cargo went together with the news: the ships brought pepper, nutmeg, cloves, mace, silk and china.[26]

This excerpt from the De Velaer-l'Empereur correspondence reveals two things. Firstly, the information l'Empereur received was inadequate for a short-term speculative trading strategy. De Velaer reported only news that he had heard on the exchange; therefore, by the time it reached l'Empereur, the share price had already adjusted to the new information.[27] But this did not matter to l'Empereur; he had invested in the VOC for long-term gains.[28] The correspondence moreover suggests that l'Empereur was not after only financial gain. His decision to invest in the VOC was also motivated by his wish to support the Dutch cause in the East Indies. He for example corresponded with De Velaer about Isaac le Maire's attempt at persuading the French king to found an East India Company – a competitor for the VOC – rather than about his bear-trading syndicate. They saw Le Maire as a traitor to his country rather than a cheater who had deceived his fellow shareholders.[29] l'Empereur need not be representative for all shareholders of the VOC, but the bits of information that reached the Amsterdam exchange give evidence that this was a more general feeling amongst the shareholders. The investors talked about heroic deeds of the Dutch in the East Indies: the burning of Portuguese ships and the conquest of several strongholds on islands of great importance to the spice trade. These events obviously directly influenced the future performance of the company. At the same time, however, shareholders thought illness on board of one of the ships a more important subject to talk about than the specifics of the cargo that was about to arrive in the VOC cities. The fact that petition-

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[26] De Velaer to l'Empereur, 26 July 1610, BT, inv. nr. 215, nr. B1/10.

[27] De Velaer himself also often received new information too late to make profitable trades on it. On 4 August 1609, for example, he wrote to his uncle about the first news regarding the return fleet. Four ships had been seen near England and De Velaer had heard that they would bring good news about East India, but did not know any details yet. To his surprise, the share price had already risen in the days before: some people had received the information through a private channel and they had taken advantage of their private information. De Velaer to l'Empereur, 4 August 1609, BT, inv. nr. 215, nr. A4/3.

[28] l'Empereur to De Velaer, between 8 and 12 January 1609, BT, inv. nr. 265. Judging by the fact that he bought his first share with borrowed money on which he had to pay 8% interest, he expected the rate of return on VOC shares to be very high: De Velaer to l'Empereur, 13 January 1609, BT, inv. nr. 215, nr. A2/9.

[29] On Le Maire's bear-trading syndicate: De Velaer to l'Empereur, 19 March 1609, BT, inv. nr. 215, nr. A2/15. On Le Maire's deliberations with the French king: De Velaer to l'Empereur, 8 January 1610, BT, inv. nr. 215, nr. B1/1.