

THE EVOLUTION OF THE MARKET MICROSTRUCTURE OF THE WORLD'S FIRST STOCK EXCHANGE: THE AMSTERDAM MARKET FOR VOC-SHARES 1602-1700

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When talking about financial markets, liquidity is the key word. The credit crunch that has paralyzed the financial markets for the last few months is also liquidity related: banks have become wary to lend money to other banks, firms and individuals, which has significantly slowed down the flow of money, resulting in lower liquidity of the market. Due to the reduced liquidity, the markets can no longer perform their main function – capital allocation – adequately. On a liquid market, by contrast, there are ready and willing buyers and sellers enabling investors to perform the trades they desire at or very close to the price of the last transaction. Hence, investor participation is the central requirement for a liquid market. It is therefore very important for the development of a financial market that investors are persuaded to participate in the market. But this is not as straightforward as it may seem.

History's earliest examples of secondary markets for financial claims were not very liquid. Obligations were certainly resold from time to time in the Middle Ages and the early modern era, but a thriving market never developed. There was also some trade going on in shares of the earliest joint-stock companies, but, again, regular trade did not develop. The secondary market for Dutch East India Company (VOC, founded 1602) shares did become highly active, however.¹ What caused this secondary market's faster development? It is true that the size of the company's stock and the number of investors were unprecedented: the VOC raised a staggering f6,429,588. In Amsterdam, 1143 investors signed up for f3,679,915, or slightly over 57 percent of the company's total stock. It is therefore not surprising that VOC shares were more often traded than shares in companies with only a few shareholders. Moreover, it was relatively easy, compared to the procedure for transfer of shares in for example the Dutch *Voorcompagnieën*, to transfer a share and ascertain share ownership.²

¹ See, e.g., Oscar Gelderblom and Joost Jonker, 'Completing a Financial Revolution: The Finance of the Dutch East India Trade and the Rise of the Amsterdam Capital Market, 1595-1612', *The journal of economic history* 64 (2004) 641-672.

² *Ibidem*, 654.

The liquidity of the secondary market for VOC shares became gradually higher during the seventeenth century, whereas the size of the company stock did not grow larger. Moreover, only part of the company stock was in the hands of active traders. In 1688, a year characterized by frantic trading, only 436 out of a total of 1770 shareholders transferred a share.³ What then caused the increasing liquidity? The largest part of the liquidity increase was achieved in the forward market, where contracting parties agreed to trade a share on a future date at a predetermined price.⁴ This market was not confined by the size of the company stock, because this trade could be conducted without necessarily transferring shares – the forward trade could grow seemingly without limit. This paper therefore concentrates on the forward market. It aims to show the developments that contributed to persuading investors to participate in the forward share trade. I use well-known official regulations and VOC capital books, but also hitherto unexplored sources from merchants' archives and judicial courts as the basis for my argument.

Several fields of economics address the important issue of investor participation. Maureen O'Hara (an authority on market microstructure, a branch of economics that researches the way markets settle transactions) writes that in markets 'where regulatory and legal protection is weak, market microstructure can provide a way, maybe the only way, to induce investors to participate. [...] Well-functioning clearing and settlement procedures can assure buyers and sellers that their trades will be consummated.'⁵ Other economists regard investor protection by a country's legal system as the major determinant for investor participation and thus for financial development.⁶ This paper concludes that market dynamics can replace for the role of legal institutions.

Most – if not all – of the financial history literature considers the emergence of secondary markets for shares as a very important stage in the development of modern finance. Well-functioning secondary markets contribute to bridging the gap between savers and borrowers in an economy by 'reapportioning capital between sectors and regions'.⁷ Therefore, secondary markets are an engine of economic growth. By analyzing the functioning of the Amsterdam market for VOC shares, which happens to be the first active secondary market in history, the development of an important component of the financial infrastructure that en-

³ National Archives (NA, The Hague), VOC archives (1.04.02), inv.no. 7072.

⁴ A forward contract is a personalized contract. A standardized, and hence more easily tradable forward contract is called a futures contract (cf. infra).

⁵ Maureen O'Hara, 'Optimal Microstructures', *European Financial Management* 13 (2007) 825-32, 826.

⁶ Rafael La Porta et al., 'Law and Finance', *The journal of political economy* 106 (1998) 1113-55.

⁷ Ron Harris, *Industrializing English Law: entrepreneurship and business organization, 1720-1844* (New York 2000) 117.

abled the progress to industrialization can be revealed. Oscar Gelderblom and Joost Jonker treated the company foundation in 1602 and the market's early years in which derivatives trading emerged and showed that this market had positive effects on the credit market since shares turned out to be perfect collateral for loans.⁸ Most historians, however, took 1688 as a starting point, using Josseph de la Vega's famous treatise on the stock exchange to describe the market organization that was copied by London after the Glorious Revolution.⁹ Pioneering work on the development of the market has been done by M.F.J. Smith (1919), but his focus was mainly on government regulations – although the bulk of the transactions were conducted informally.¹⁰

Securing the terms of a contract

In 1602, there was just one formal rule that regulated the secondary market: it stated how share ownership could be ascertained and transferred. Traders who had agreed on a share transaction were to go to the East India house to officially transfer the share from the seller's to the buyer's account in the company's capital ledgers. This involved transaction costs (the bookkeeper charged *f*0.60 per transaction and the fee for the deed of transfer was *f*2.20)¹¹ and the traders had to go to the East India house twice to complete a transaction; the first time to check the seller's balance and then, after the buyer had paid for the share, to actually transfer the share. Shares could be transferred every day, but there were times when the East India House was closed because the directors were out of town for a meeting.¹² These inconveniences notwithstanding, already during the year 1605, before the last instalment for the subscription was due, 153 transactions (worth 7 per cent of Amsterdam's total stock) were registered. In 1610 this number had grown to 409 transactions (24 per cent).¹³

But does this mean that the spot market was liquid, meaning that both buyers and sellers could perform the trades they desired at minimum trading costs? No, or so Jacques de Velaer, a merchant from Amsterdam, wrote to his uncle on 29 January 1609: he had great difficulties buying a share.¹⁴ A single share trader's observation may not be entirely convincing, but the company's transactions ledger corroborates De Velaer's view: no share transfers were registered between January 19 and February 2; there were three transactions on the 7th of that

⁸ Gelderblom and Jonker, 'Completing'.

⁹ E.g. Charles Wilson, *Anglo-Dutch commerce and finance in the eighteenth century* (Cambridge 1941).

¹⁰ M.F.J. Smith, *Tijd-affaires in effecten aan de Amsterdamsche beurs* (The Hague 1919).

¹¹ Pieter van Dam, *Beschryvinge van de Oostindische Compagnie 1A* (1701), F.W. Stapel (ed.) (The Hague 1927) 145.

¹² Letter De Velaer to l'Empereur, 3 April 1609, Thysius Archive (TA, Leyden), A2/16.

¹³ NA, 1.04.02, inv. no. 7066.

¹⁴ Letter De Velaer to l'Empereur, 29 January 1609, TA, A2/11.

month and again five on February 11.¹⁵ There was hardly any trade going on in these days, which made it difficult for De Velaer to buy a share.

By the end of the first decade of share trade, however, other possibilities to take part in the share trade emerged. Starting in 1607, forward contracts appear in the protocols of public notaries. There were no formal regulations concerning the forward trade, but the merchant community had gained experience with this trading method from the commodities trade.¹⁶ Therefore, customary law governed the organization of forward trade. The merchants seem to have been a bit wary to utilize forward trading on the market for shares, however, since many of them registered their forward transactions with public notaries. They were willing to pay the public notary's fee, which amounted to at least *f*1,20 (excluding taxes and additional fees for authentic copies)¹⁷, to formally register their contracts. The contracts in the protocol of notary Jan Fransz Bruyningh (25 in the first five months of 1607) show that these traders made sure that every step in the process of a forward transaction was officially noted down; they all came back to the notary's office to register contractual changes and the contract's settlement.¹⁸

Soon, however, records of forward contracts disappear from the notarial protocols, notwithstanding the fact that forward trade grew much larger during the seventeenth century.¹⁹ What caused this change in the contracting of forwards? It may sound paradoxical, but Isaac le Maire's bear raid in 1609 – a syndicate of traders, led by the illustrious merchant Le Maire, went short on a large amount of forward contracts, hoping that the share price would fall and thus make a profit²⁰ – reinforced confidence in the functioning of the market and in institutions to enforce share trade contracts. Precisely this event, which caused so much confusion and uproar on the market and which could have resulted in widespread distrust of financial trade, enabled all participants and institutions that were involved in the market to better define their relation to the share market.

¹⁵ NA, 1.04.02, inv.no. 7066, f.149-50.

¹⁶ Participation in forward share trade was far more widespread than in commodities trade. In early modern Antwerp and Amsterdam, only traders of a specific commodity traded the derivatives of that particular trade. In the case of the forward share trade, also non-specialized merchants participated: Oscar Gelderblom and Joost Jonker, 'Amsterdam as the Cradle of Modern Futures and Options Trading, 1550-1650', in: William N. Goetzmann and K. Geert Rouwenhorst (eds.), *The origins of value: the financial innovations that created modern capital markets* (Oxford 2005) 189-205, there 194.

¹⁷ Throughout the seventeenth century, public notaries charged a fixed fee for standard deeds. A register of fees charged by public notary Dirck Danckerts: Amsterdam city archives (ACA), Archives of public notaries (5075), inv.no. 2856. A bill for a public notary's services (1686-1691): ACA, 334, inv.no. 678, no. 476.

¹⁸ In the early years of the seventeenth century, Bruyningh was the public notary who registered large part of the financial contracts in Amsterdam. ACA, 5075, inv.nrs. 105-8.

¹⁹ ACA, Notarial card index.

²⁰ See for details on Isaac le Maire: J.G. van Dillen, 'Isaac Le Maire en de handel in actiën der Oost-Indische Compagnie', *Economisch Historisch jaarboek* 16 (1930) 1-165.

Right after the first rumours of Le Maire's bear trading consortium had spread over the trading community, many buyers of forward contracts went to a public notary to summon their counterparty to show his share possessions in the capital ledgers of the VOC. They feared that the sellers did not actually own the shares they had sold, which would mean that the buyers would miss out on the first dividend distribution that had recently been announced by the company and that maybe the sellers would not be able to deliver the shares according to the contracts. This would have been very unfavourable for the buyers; the share price had risen considerably in the preceding months, notwithstanding the bear trades. In most cases, no real conflicts arose and the share was delivered according to the conditions of the contract, or the forward contract was settled by paying the difference between the contract price and the market price. But some cases of non-compliance were brought to court. Twelve cases, all of them concerning contracts from before the time that Isaac le Maire's dealings became publicly known, appeared before the *Hof van Holland* (the provincial court) during 1612-4, and they probably only represent a fraction of the total amount of legal cases relating to breaches of forward contracts.²¹ In some of these cases, the seller was not able or willing to deliver the share. In other cases, the parties disagreed on the settlement payment or the ownership of the dividend. The court was very clear in its decisions: the buyers should be provided with shares and dividends (plus interest) as if they had actually owned the share from the moment they bought the contract. Thus the court formalized the rules concerning the forward trade.

The court's rulings are not wholly surprising, however: Dutch merchants wrote thousands of contracts each year and it would have been far more surprising if all these contracts were not legally valid. Customary law had recognized informal contracts for a long time already. However, the fact that the traders were willing to enter into lengthy and costly litigation underlines that enforcement of informal financial contracts was not at all obvious from the start. I do not argue that these decisions of the *Hof van Holland* mark a new era in trade history; they did, however, provide the forward share trade a touch of legality that reassured the traders after the Le Maire debacle. Moreover, they took away all possible doubts with the traders about enforcement of informal contracts. From now on, the spot and forward trades were legally treated as equal. This development significantly lowered transaction costs: there was no longer need to register the contracts at a public notary's office. Moreover, traders no longer bothered to take their conflicts to court: after this episode, the number of cases dealing

²¹ NA, Hof van Holland 3.03.01.01, inv.nos. 626-636. In Amsterdam, commercial conflicts were first brought before the Amsterdam *Schepenkamer*, whose archives unfortunately have been lost. The *Hof van Holland* was the court of appeal for the *Schepenkamer*; I base my argument on the appeal cases.

with contract breaches declined sharply, which indicates that traders simply complied with their contracts, knowing that if they did not comply, their case would not stand much chance in court.

Changing formal rules

Share trade related court cases dating from later years dealt with another matter: the upholding and interpretation of new laws regulating share trade – formal rules this time. Isaac le Maire's bear raid had inspired the States of Holland to issue a ban on short selling both in the spot and forward trade (February 1610). A contract would become null and void if it was revealed that the seller did not own the amount of shares he had sold when the contract was drawn up. It is important to note, however, that the States of Holland did not ban 'regular' forward trade. Instead, they focussed on ending its under-the-counter character: all share transactions – forward transactions included – had to be registered at the company's office within a month's time after the contract had been negotiated. This rule, however, posed a problem to the forward trade. The seller of a forward contract would never allow his share to be deducted from his account before the forward transaction had been settled and he had received his money (forward transactions were paid for at the time of delivery). This would mean that he would lose his legal title to the share. To overcome this problem, the Amsterdam chamber of the VOC changed the rules for share transfers. On 17 June 1613, they resolved that shares that were involved in a forward transaction would be temporarily transferred to the seller's *reekening van tijt*, a 'time account'. On the settlement date, the actual transfer to the buyer's capital account would take place. Or, if the traders cancelled the contract during its term or agreed to a settlement without actual transfer, the share was transferred back to the seller's account.²²

The registration rule, however, was doomed from the start. One of the reasons for traders to participate in the forward market, rather than in the spot market, was that it enabled them to bypass the hassle and accompanying costs of going to the East India house to officially transfer a share. This advantage would be largely undone by the 1613 resolution. The traders simply ignored the rule: time accounts only appear very rarely in the company's ledgers.²³ The States of Holland regulations, too, went unheeded: the authorities felt compelled to repeat the ban on short selling several times; on 3 July 1621 they explicitly mentioned that

²² Smith, *Tijd-affaires*, 46-7.

²³ The capital ledgers (NA, 1.04.02, 7068-7081) are only available from 1628 onwards. It is therefore not possible to trace the immediate effects of this resolution.

brokers were not allowed to negotiate contracts that contained a clause that the buyer ceded any rights he would have on the basis of the 1610 decree. This indicates that share traders knowingly continued short-selling shares.²⁴

A known example of a printed forward contract dating from 1629 does not include any such clauses, but another one dating from 1662 states that both the buyer and the seller agree to forbear from prosecution and to not comply with the company's registration rule.²⁵ This shows that the traders not only ignored the rules, but also waived their rights. The fact that this contract was printed indicates that this was regular practice. There was a danger involved, however, for the courts followed the rule of law. The judges of the *Hof van Holland* sentenced on 27 May 1667 that several forward contracts were null and void because the sellers could not prove that they had owned the shares at the time of the sale in 1665 and, moreover, they had not transferred the shares to the buyer's time account. They had misled the buyer.²⁶ The buyer's legal proceedings were probably considered dishonourable by the trading community, so it is doubtful if he was still able to find counterparty for his trade afterwards.

Increased liquidity through standardization

The traders deliberately chose not to rely on the investor protection of the Dutch legal system. This was feasible because of the existence of a very efficient market clearing mechanism: monthly *rescontre* meetings. Not a lot is known about these meetings in the seventeenth century. A group of traders probably came together in a café or coffeehouse on or around the 25th of each month to mutually settle their contracts, but it is unsure whether these were, for example, private meetings. I think that the meetings had a semi-closed character; all forward traders could participate, but traders could also be excluded – for example because they had a history of non-compliance of share transfers or payments. It is not possible either to put an exact date on the emergence of the *rescontre* system. Gelderblom and Jonker have suggested that this system came up in the 1630s, because in this decade similar trading clubs emerged in the tulip trade: tulip bulb traders met in cafés to trade bulbs amongst themselves.²⁷ The share

²⁴ Smith, *Tijd-affaires*, 57-60.

²⁵ The 1629 example: Gelderblom and Jonker, 'Amsterdam as the Cradle of Modern Futures and Options Trading, 1550-1650', in: William N. Goetzmann and K. Geert Rouwenhorst (eds.), *The origins of value: the financial innovations that created modern capital markets* (Oxford 2005) 189-205, there 199. The 1662 example: ACA, Archive of the Portuguese-Jewish Synagogue (334), inv.no. 678, 926.

²⁶ Sebastiaen da Cunha vs. Michiel Rodrigues Mendes c.s., 27 May 1667, NA, Hof van Holland 3.03.01.01, inv.no. 784, 60. The main reason for the buyer to litigate was probably the considerable fall in the share price during the term of the forward contract due to the Second Anglo-Dutch war. By asking the courts to declare the contract null and void, he managed to wriggle out of a considerable loss.

²⁷ Anne Goldgar, *Tulipmania: money, honor, and knowledge in the Dutch Golden Age* (Chicago 2007).

traders would then have adopted this trading system.²⁸ But there is one important difference between the contracts for future delivery of bulbs and shares: the tulip contracts were all due in the next flowering time, the only time of year when the buyer of a bulb could check whether the bulb really produced the flower the seller had promised. This made mutual clearance of the bulb contracts possible. The forward share trading contracts, however, had different settlement days; the contractors could agree on any settlement day.

From the 1660s onwards, however, the writs drawn up before Amsterdam notaries show that forward contracts became more standardized.²⁹ Almost all of the contracts were now due on the first day of a month. Another example of a printed forward contract, this one dating from 1668, clearly endorses my view of standardization in this decade: on this contract, the date of delivery (*primo*) is pre-printed, followed by an empty space where the contractors could write down the month. The stipulations in the body of this contract are the same as those of the 1662 example mentioned above, but there are some extra conditions at the bottom, once again with all the dates pre-printed. The forward contract had to be settled or the share transferred before the 20th of the same month and if the contract was settled or resold to another trader, the surplus had to be paid by the 25th, enabling the remittee to dispose of the share or the surplus money in the next *rescontre*. It also stipulates penalties in case of non-compliance with these conditions.³⁰ This type of printed forward contracts was obviously aimed at smoothing the *rescontre* meetings: all dealings of the last *rescontre* had to be settled before the start of the next meeting.

Standardization not only enhanced mutual clearing and settlement, it also increased transferability of forward contracts. Public notary Adriaen Lock's protocol of the year 1672 shows several examples of endorsements of contracts for future delivery of a share.³¹ The rights and obligations of these contracts were transferred to a third party whose name was written at the back (*en dos*) of the contract. This means that probably also during the 1660s the personalized forward contracts that first appeared at the start of the century had developed into futures contracts that were tradable on the market. Another advantage of standardized contracts was that it became easier to assess the value of an existing forward contract. All share traders who paid regular visits to the Exchange or to Dam square knew the spot price and the prices that were paid for contracts due on the first day of the next month or the month

²⁸ 'Amsterdam as the Cradle', 202-4.

²⁹ ACA, Notarial card index. Please note that the original contracts were not registered with a public notary. These data stem from so-called *insinuaties*, where one of the contracting parties summons the other party to perform a certain action.

³⁰ This contract can be found in the estate of David Abraham Cardoso, ACA, 334, inv.no. 654.

³¹ E.g. ACA, 5075, inv.no. 2238, p.909.

thereafter. They could then calculate the price for an endorsement by subtracting the price mentioned in the contract from the market price for forwards due on the same date.

These developments led to an enormous expansion of the forward trade; at the same time reducing the role of the spot trade to almost irrelevance. This point can be stressed by analyzing some spot and forward prices. Jeronimus Velters, a wealthy and very active share trader, corresponded about the share trade on a regular basis. He sometimes mentioned both the spot price and forward prices that had been paid on the Exchange that day to his correspondents, which makes it possible to calculate the implicit interest rate charged by the seller.³² Over the period 1675-94, the implicit interest rate on forwards that were due in one or two months' time ranged from 3 to 8 percent. Forwards due within two weeks' time, however, were relatively far more expensive: between 15 and 20 percent.³³

What caused this difference? It seems as if investors were willing to pay a premium to get a 'last-minute ticket' for the upcoming *rescontre* meeting.³⁴ These meetings had become the main venue for financial dealings. The sheer size of the *rescontre* dealings underlines the importance of these meetings: in the meetings of 1683-4 the monthly turnover of Joseph Athias and Manuel Levy Duarte, Jewish jewellery merchants from Amsterdam, ranged from f200,000 to over f2,000,000. In the meeting on 25 August 1683, for example, they bought 57 (total value: f1,013,666) and sold 60 contracts (f1,018,856). The nominal value of both their sales and purchases equalled f249,000, which means that they made a profit of f5,190.³⁵ The *rescontre* system enabled investors to very quickly and efficiently rebalance their portfolios. This service also attracted foreign investors: Athias and Levy performed their dealings on the accounts of Salvador de Palacios from Hamburg and Luis Alvares from Paris.

Obviously, the *rescontre* boosted the share market's liquidity. In these same years, Athias and Levy only transferred nine shares to and from their account³⁶, but they actually performed a many times larger number of transactions. But even more importantly, the sophisticated clearing system of the *rescontre* guaranteed the traders that their trades would be consummated. Moreover, the monthly meetings functioned as a monitoring system. The semi-closed character of the *rescontre* made that traders with a history of non-compliance or litiga-

³² When a trader buys a contract for future delivery of a share, he basically borrows this share for the term of the contract and, consequently, he owes the seller interest.

³³ On 25 July 1687, for example, the spot price was 485.5 and the price for a forward due on August 1st, 6 days later, 487. The implicit 1-year interest rate is 18.8 percent. The data can be found in Velters' letter books: ACA, Velters archive (2), inv.nos. 1-4.

³⁴ It is unlikely that the price would be higher due to traders doing last-minute buying to enter the *rescontre* with equal amounts of purchases and sales since you would then expect last-minute selling as well.

³⁵ ACA, 334, inv.no. 688 f.3-6.

³⁶ NA, 1.04.02, 7072, f.383.

tion could be denied access. Hence, the market microstructure substituted for the legal investor protection the traders had given up on by ignoring the formal rules.

Conclusion

The market for VOC shares was the first secondary market in history where active trade in financial claims took place. The size of the company stock and the rules for share transfers provided the necessities for the start of the market at the beginning of the seventeenth century. However, the development of the forward trade was responsible for the largest part of the growth of the market. Isaac le Maire's dealings could have severely damaged the early development of the market, but instead it caused litigation that enabled the *Hof van Holland* to take away ambiguity that could have restrained merchants from participating in the market. The court rules formalized existing customs and took away uncertainties about enforcement of informal contracts. The legal backing provided a fertile soil for the growth of the market, but the traders nevertheless chose to make the rule of law redundant. With the standardization of forward contracts, a very efficient clearing system came up. This development boosted the forward market to such an extent that the spot market was almost reduced to irrelevance. The biggest leap in the increase of the market's liquidity was thus achieved by improvements of the structure of the market.