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From free-for-all to self-governing monopoly: market organization and price information at the Amsterdam Stock Exchange, 1796–1940

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For most of its history Amsterdam securities trading was entirely unregulated and spread over various venues frequented by different social groups, handicapping price transparency. A public price current emerged only in 1796 and then with wide bid-ask spreads to protect margins. To combat the confusion a curious pricing method, the mid-price system, emerged during the nineteenth century. Tied to a market microstructure centring on *hoekmannen* (market makers), this system transited effortlessly from a public market into a monopoly by 1913, self-governing, still without any government regulation, and offering wide rent-seeking opportunities.

Keywords: financial markets, stock exchanges, price formation, market organization

JEL classification: D4, G1, G2, N2

I

The history of Amsterdam's securities price currents mirrors the evolution of its market organization. Early and precocious to develop, the securities trade lacked formal organization and regulation until the late nineteenth century. As a result the market failed to produce uniform, reliable and public prices for most of that time. At the same time, the stock exchange association formed in 1876 struggled to have its members accept the

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virtues of transparent price quotes and agree on how to produce them. Currently, the most authoritative publication on this topic is the book by De Vries (1976) that celebrates the centennial of the *Vereniging voor de Effectenhandel*, which has been the most prominent organization of the Amsterdam Stock Exchange.

Understanding the development of securities market organization and the publication of prices is an important area in finance and financial history. In textbook finance models, security trading takes place in frictionless markets. Here, all market participants submit their orders to the market, reflecting supply and demand. An efficient auctioneering mechanism balances quantities, resulting in an equilibrium price representing the security's fundamental value (Foucault *et al.* 2013, pp. 1–3). However, reality is very different, due to information differences, limited numbers of traders, inefficient auctioning, etc. As a result, actual quantities and prices will deviate from the frictionless self-equilibrating market. Financial history can help us to understand the consequences of frictions by discussing market microstructure, information environments and price quotation systems. A good understanding of the securities market organization and price publications can help in investigating inefficiencies and the cost of trading by empirically estimating market microstructure models (O'Hara 1995; Madhavan 2000; Hasbrouck 2007; Foucault *et al.* 2013).

In this article we discuss the co-evolution of organization and price currents of the Amsterdam securities trade. How could such an invertebrate structure work, and how did it actually work, seen from the perspective of price formation and price currents? We tackle these questions chronologically. Starting with a sketch of the securities trade's origins up to 1796 (Section II), we then discuss in more depth how it evolved during the nineteenth century until the founding of the stockbrokers' association in 1876 (Section III), with special attention given to the curious system of pricing introduced around 1830 (Section IV). We move on to analyse how the association moulded the securities trade up to 1940 (Section V) before examining in Section VI the stock exchange's evolving procedure for price quotations and the continuing, contemporaneous complaints about the procedure's defects. Section VII concludes and provides suggestions for further research.

II

In Dutch early modern conceptions of commerce, exchanges worked best when they were public, that is, open to all. Consequently, when the Amsterdam city council decided to commission a building dedicated to trading, this was to be city property and accessible to all on payment of a trifle for the poor. When the exchange opened in 1613 the regulatory regime was very light and did little more than specify relatively short opening hours and impose general public order byelaws (Scheltema 1846, pp. 45–7; Petram 2011b, pp. 30–2).[1] The concentration of trade

[1] Building finished in 1611, but further works caused a two-year delay before the exchange opened (Scheltema 1846, p. 25).

under one roof also eased the task of the brokers' guild which, since 1585, collected information for the public, city-sponsored commodity price current published once a week (Sautijn Kluit 1875; McCusker and Gravesteijn 1991, pp. 43–50). Eighteenth-century floorplans show that every trade sector had its own, numbered column or specific floor space, later called *hoek* (corner), while court officials watched the two entrances to prevent bankrupts from entering (Jonker 1996, pp. 145–7, 160–1). Dealers in bonds and other commercial paper gathered at columns 28 and 29 and the plans show share traders on the front terrace before the south entrance, perhaps denied entry as suspicious speculators, or perhaps because their rumbustious business contrasted with the sedate atmosphere inside. However, by 1730 and possibly earlier share trading had definitely moved inside as well. Though contemporary depictions of the exchange floor suggest a calm, indeed sedate atmosphere, actual trading appears to have been rather noisy at times, possibly always (De la Vega 1688; Van Leuve 1730; Leemans 2017).

By the time of the building's opening, trade in Dutch East India Company (VOC) shares had been going on for a decade and merchants' discovery of securities as a highly practical loan collateral was well on the way to linking the securities trade with a call money market, a key feature of the Amsterdam exchange well into the twentieth century (Jonker 1996, pp. 90–104; Gelderblom and Jonker 2004; Gelderblom *et al.* 2016). The launch of the West India Company (WIC) in 1621 added another, more speculative title and Holland's voluminous debt must have been traded on the exchange as well. During this process the traders and investors developed a marked preference for bearer securities, easier to transfer than registered ones (Hecht 1869).[2]

Though the official price current did publish exchange rates and the *Wisselbank* agio, securities were never included, for two reasons: trade was dispersed and run by parties whose interests did not align. Forward and options trading, buoyant from the 1660s onwards, moved from the square in front of the exchange to coffee houses in the vicinity of the exchange building before and after hours. These gatherings grew into trading clubs, which offered their members more comfort than the front terrace of the exchange plus a concentration of trade among vetted and trusted peers, which reduced both information search costs and counterparty risk (De la Vega 1688; Petram 2011b, pp. 45–8). By 1720 and probably much earlier regular securities traders also had haunts along the Kalverstraat, neatly ranked by social stature. The respectable, select top merchants and bankers met in a decent coffee house; the much more numerous middle group of commission traders (*commissionairs*) used a more roomy and rowdy inn; the riffraff of hopeful speculators occupied cafés with a certain reputation, brokers shuttling between the various venues to find counterparties and settle deals (Gelderblom and Jonker 2013; Hell 2017, pp. 218–19).

[2] See on the wider significance of bearer securities for the Dutch financial system: Van Beurden and Jonker (2021) and De Jong *et al.* (2021).

From the early eighteenth century yet another venue opened at the Oudezijds Heerenlogement, a hotel which also hosted public auctions. Brokers began auctioning securities there, intermittently at first but by 1740 about once a month. Auctions were better at pricing assets of uncertain value, such as Caribbean plantation loans, because of the particular technique (Van Bochove *et al.* 2012; De Jong *et al.* forthcoming). Thus three different market types existed side-by-side, a private, a public and an over-the-counter market.

This dispersed trade made investors without access to these clubs dependent on brokers to find a reliable counterparty and fix a price. Though direct dealing did happen, most trade appears to have been done through brokers (Le Long 1763, vol. II, p. 18). Brokers held a public, regulated office. Forbidden to trade in their own name, they earned an income from fixed brokerage fees (*courtage*) (Petram 2011b, pp. 43–5, 175–4). The number of licensed brokers, though officially limited, was quite large, 360 in 1612 and 395 a century later. Moreover, the city council did nothing to stop non-licensed brokers from operating. Called *beunhazen* or *bijlopers*, they numbered more than double the licensed ones (Malsen 1933, pp. 38, 51).

We can thus distinguish four broad groups in the Amsterdam securities trade. The merchants and bankers dealt in bulk for their own account and issued securities; *commissionairs* (commission traders) bought and sold for clients while also trading for their own account; what we would now call daytraders hoping to hit the big time betted one way or the other; and brokers connected buyers and sellers for a commission. The last two groups stood to gain from public and transparent prices, the daytraders because their bets depended on them, the brokers because transparency would likely raise income by attracting more clients. By contrast, merchants, bankers and *commissionairs* preferred a degree of opacity to protect their margins. These circumstances, dispersed trade and divergent interests, prevented the collection and publication of reliable securities prices and increased investors' dependence on brokers' supply of market information which, in the absence of a proper gauge, they had no way to check (Van Nierop 1931).

During the early eighteenth century the growth of trade combined with a sudden slump to effect several overdue changes. Hard on the heels of their introduction in London, shares of the English East India Company, the South Sea Company and the Bank of England, followed by Consols, also found their way to Amsterdam and contributed to the close integration between the two financial centres (Carter 1975; Neal 1990; Koudijs 2016). These securities were both investor favourites and ideal fodder for the burgeoning forwards and options market described in such florid terms by De la Vega (1688). In 1720 traders and promoters planted bubble company share prices, presumably spurious ones, in newspapers to push their projects, but with little effect. The episode remained a damp squib with only three or four companies from a plethora of projects becoming active (Gelderblom and Jonker 2013; *pace* Frehen *et al.* 2013a and 2013b). Yet securities trading and more particular forwards do appear to have taken a hit (Smith 1919, p. 139; De Vries 1968, p. 72). Soon after, in 1722 at the latest, detailed regulations for the periodic settlement of forward contracts (*rescontre*) appeared and in July 1723 the newspaper *Amsterdamsche Courant* began publishing prices of securities in the forward trade (Van Dillen 1931).[3] Though clearly aimed at reviving a slow market, the two initiatives and notably the provisions for conflict resolution in the clearing regulations also suggest that the sudden collapse of September 1720 had caused havoc by people reneging on forward and options deals (Le Long 1763, vol. II, pp. 25–6).[4]

The 1730s and 1740s also saw the public bond market widening from mostly Holland paper to include debt issues from other provinces and from foreign issuers (De Vries 1968, pp. 63–4, 67). A one-off price current published to give investors a gauge for paying the 1747 emergency wealth levy listed a total of just over a hundred securities, of which 73 were Dutch public bonds of one kind or another, 29 foreign public bonds and 16 Dutch and British shares (Van Dillen 1931). During the third quarter of the eighteenth century that market boomed, merchant bankers and *commissionairs* increasingly using the Republic's low interest rates to float debt for Caribbean plantation owners and foreign states, while at the same time targeting small investors with innovations such as mutual funds with small-denomination securities (Diferee 1908, pp. 75–7; Smith 1919, p. 145; De Iongh 1926, pp. 35–6; Berghuis 1967; Slot 2004; Rouwenhorst 2005). By 1780 the number of securities on the market had risen to well over a hundred, swelled by plantation loans and public bonds from Sweden, Denmark, Russia and Austria. The total is likely to have been still higher, since British and French securities and a variety of Dutch public bonds had been left out (*Almanac des négocians* 1782, pp. 5–10; Jonker 1996, p. 149).

This growth combined with a succession of upheavals to give a push for more information and better organization. The 1763 and 1773 crises shook the Amsterdam market and were followed by the Fourth Anglo-Dutch War (1780–4), which, having bankrupted the two colonial companies and the *Wisselbank*, also triggered a brief civil war which ended with public bonds at junk levels. Public order had only just been restored when, in 1795, French revolutionary armies overran the country and installed a puppet regime siding with France during the subsequent serial wars.

Three pushes for better price information may be distinguished during this tumultuous period. The first was probably given by the *Maandelijksche Nederlandsche*

[3] This newspaper had published prices of British shares in London first sporadically in the late seventeenth century and more regularly since 1710 as part of its foreign news. On 8 Jul. 1723, prices of Dutch companies in Amsterdam were first published: 'De actien van onze Oost-Indise Comp. gelden tegenwoordig 660, en de West-Indisce Comp. 91 en 1 half, subscriptien 870 guld. en d' Agio van 't Bankgeld 4 en 7 agtste a 5 pre cento'. Local prices of English shares were added on 31 Jul. 1723: '… De Engelse Bank 118 en 3 vierde, oostindische Comp. 134 en 1 half, en de Zuydzee 103 en 1 half'.

[4] In his 1723 poem, the onetime broker Roeland van Leuve complained about the securities trade being slow that year (Van Dillen 1931, pp. 6–7).

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Mercurius published by the bookseller Jan Augustus Swalm. In 1766 this monthly magazine started printing the outcome of the securities auctions, by now a regular monthly or even fortnightly fixture. The auctions took place on Mondays just after exchange hours and most sales by far were broker-to-broker, so prices there are unlikely to have deviated substantially from the regular trade (Van Bochove *et al.* 2012, pp. 9–10).

The second push came from the first known formal securities trade body, the *Collegie tot Nut des Obligatiehandels*, founded during the late 1780s. Presumably originating as a typical dealers' club trading in the coffeehouse *Beurszigt* (Jonker 1996, pp. 148–9), the *Collegie* evolved into a semi-official trade body for all securities. As such, it provided a rallying point for initiatives to shore up market confidence by publishing regular prices, as the *rescontranten* (clearers) had done earlier. From September 1792 the *Nederlandsche Mercurius* published securities prices from the exchange in addition to the auction prices (Hoes 1986, pp. 5–6).[5] Then on 2 August 1796, following a reorganization of the city printing office and the commodity price current, the printer Nicolaas Cotray launched his *Prijs-Courant der Effecten*, an oblong leaflet with Amsterdam securities prices on the front and on the back a handful of prices from London and New York, Amsterdam interest rates, exchange rates, coin prices and advertisements. Appearing twice a week, the paper could be ordered from booksellers all over the country and was probably financed, like the commodity price current, by the city council.[6]

Cotray's *Prijs-Courant* listed a broad selection of securities at the exchange without specifying criteria or how prices had been collected. Each quote consisted of a pair of prices, the lower price separated from the higher price by the letter *à*, accurate to 0.25 per cent. The difference between the lower and the higher price was always at least 0.5 per cent.[7] The published quotations included the broker's or commission trader's fee, 0.25 per cent at the time (*Almanac des négocians* 1782; Van Beek 1873, pp. 24–7). To obtain the published quotations, the actual lowest and highest prices were first respectively decreased and increased by 0.25 per cent and then, if need be, rounded to the nearest 0.25 per cent (Polak 1924, pp. 201–2, 210).[8] In addition the price current

[5] The *Mercurius* had already started the publication of prices of English securities in April 1792. The September edition for the first time also listed the prices of 24 foreign and 10 domestic bonds. It continued its monthly publication of prices until 1807.

[6] It was published on Tuesday and Friday mornings from 1796 until 1811. The publication of the *Prijs-Courant der Effecten* was temporarily suspended by order of the *Préfet* of the *Zuiderzee* departement during the French annexation of the Netherlands (1810–13). From 1 Dec. 1811 until 16 Nov. 1813, the official price list was published in the newspaper *Affiches, annonces et avis divers d'Amsterdam*. Publication of the *Prijs-Courant der Effecten* resumed on 25 Nov. 1813. It appeared on Monday and Thursday from 1813 until 1842 (Hoes 1986).

[7] This probably reflected standard practice. The *Mercurius* quoted prices the same way, as did *Zeelands chronyk-almanach* (1781) with prices for *Zeeland* province bonds and hand-written quotations for Saxon bonds in 1776 in a copy of *Tablettes pour les négocians et les banquiers* (1772) digitized by Google (https://books.google.be/books?id=FwlpAAAAcAAJ&pg=PP11).

[8] Prices of 41 3/4s and 41 5/8ths would both be quoted as 41 1/2 à 42.

published the prices of Amsterdam securities and real estate auctions, now often a weekly fixture, and occasionally those from other cities like Utrecht.

The third impetus came from the government's need for a tax gauge. Nobody really knew which securities were traded on the Amsterdam exchange. As a first step the new national convention commissioned, in July 1797, a full list of securities traded by eight brokers. Printed by the government printing office in The Hague and republished by Cotray on 31 August as an annex, the list contained far more securities than his *Prijs-Courant*, 230 against 141, and with an exact price, no spread, except for one or two. Having repeated the exercise in 1798, 1800, 1801 and 1803 to serve wealth and income tax levies, the government turned this official price list into a monthly publication in 1805, thereby presenting investors with regular, impartial price information.[9]

III

As trade bodies go, the *Collegie* was a fairly weak one. The London Stock Exchange could blackball, suspend or expel traders from its closed club; elsewhere governments provided and monitored market regulations. By contrast, the Amsterdam exchange remained open to all and free from outside interference, so the *Collegie* lacked the means to enforce rules or regulations. Dissenters and offenders could carry on as before unless peer pressure and, at times, brute physical force prevented them, and that mechanism worked poorly due to the continuing diversity of interests between merchants, bankers, commission traders, brokers and daytraders.

In 1832 the always fragile consensus between them broke over how the *Collegie* published prices, that is to say, over the inherent tension between trade margins and transparency. From the wide spreads in the *Prijs-Courant* it was impossible to know a security's exact price on a given day unless it happened to coincide with the government's list. Considering the *Prijs-Courant*'s information too vague and below standards elsewhere, a group of international arbitrageurs persuaded the newspaper *Algemeen Handelsblad* to start publishing actual transaction prices down to 1/16th per cent below the *Collegie*'s official prices. A couple of months later the group formed a rival organization, the *Nieuwe Handel-Sociëteit*. Primarily a social club for afterhours trading like the *Collegie*, the *Handel-Sociëteit* had a building of its own with a bar, a billiard room and a reading room with parlour games, but its members also wanted more transparent pricing. When proposals to reform the *Prijs-Courant* were turned down by the *Collegie*, they went ahead with a new price list. So-called *guides* appointed by the board collected prices of transactions effected between members during exchange hours (15:00 to 16:30). After the closing of the exchange, the board discussed the quotes and whether or not to dismiss prices

[9] Cotray's *Prijs-Courant*, 31 Aug. 1797, 6 Dec. 1798; *Haagsche Courant*, 23 Apr. 1800; *Binnenlandsche Bataafsche Courant*, 28 Jun. 1801, 13 Sep. 1803; *Notificatie van den Secretaris van Staat* (1805).

considered spurious. The lowest, highest and closing prices, all accurate to 1/16th per cent, were published by the *Algemeen Handelsblad*, replacing the *Collegie*'s prices. Other newspapers soon followed suit, though usually keeping the *Collegie*'s prices as well (Bos 1871, p. 61; Van Beek 1873, p. 78; Polak 1924, pp. 202–5, 211; De Vries 1976, pp. 45–6; Jonker 1996, pp. 150–1, 249–50).

Over time both clubs realized competition was undesirable. Repeated overtures from one side or the other to bring them in line foundered, however, until in 1850 the *Collegie* finally budged and adopted the pricing system of the *Handel-Sociëteit* (Polak 1924, pp. 205–6, 210–18; *Amsterdamsch Effectenblad*, 23 April 1850). By then only provincial bankers and commission traders used the *Collegie*'s wide spreads for handling transactions and to earn a little extra from unsuspecting clients (Broens 1852, p. 19). This step paved the way for a full merger between the two organizations. In October 1856 they jointly formed an umbrella organization, the *Algemeen Beurs-Comité voor Publieke Fondsen*, with the aim of providing the securities trade with firm regulations and investors with better representation of their interests. The following year the *Collegie* and the *Handel-Sociëteit* merged to form the *Effecten Sociëteit*, which adopted the *Handel-Sociëteit*'s way of quoting transaction prices for its price current (Algemeen Beurs-Comité 1856; De Iongh 1926, pp. 46–51; De Vries 1976, pp. 46–7).[10]

IV

The pricing confusion probably inspired two crucial, linked innovations that were to shape Amsterdam securities trading for over a century: the *middenkoers* (mid-price) and *hoekmannen* or market makers. While the price lists published by the *Handel-Sociëteit* were more accurate than the *Prijs-Courant* of the *Collegie*, they prevented principals from checking whether their agents (*commissionairs*) diligently executed their unlimited orders. Because the publication of prices was limited to the lowest and highest prices, an agent could abuse the price list to settle an unlimited order to buy at the highest price and an unlimited order to sell at the lowest price. Limit orders to buy or sell executed below or above the limit price too could be settled at the limit (Van Overeem 1920, p. 23; Hartmann 1937, p. 91). The lack of trust in agents and the absence of adequate price lists to check their dealings resulted in the investing public demanding settlement of unlimited orders at the so-called mid-price (De Kat 1920, p. 464). The *middenkoers*, in effect the arithmetic mean of the day's lowest and highest prices, served as yardstick for settling both unlimited (*bestens*) and limited or *limiet* orders given before the opening of trade. The mid-price offered investors the advantage of knowing that a *bestens* order would be executed

[10] The *Avondbode* did so from its first edition of 2 Oct. 1837, the *Amsterdamsche Courant* from 13 Apr. 1841.

irrespective of the day's price fluctuations. *Limiet* buys were not carried out above the mid-price, while limited sales never settled under the mid-price.

This asymmetry led to the so-called 'mid-price miracle', best illustrated with an example. Assume an investor giving a limit buy order at 159 and a limit sell at 159. The day's prices fluctuate between 150 and 160, yielding a mid-price of 155. The purchase would then be settled at 155, better than the limit of 159, but the sale also obtains the best price, i.e. the seller's limit of 159, not the lower mid-price. Both orders gain 4. Used probably as early as the 1830s, the mid-price system offered investors a check on traders' leeway to abuse the wide spreads in the *Prijs-Courant*, because orders against mid-price could easily be verified (Polak 1924, p. 204; De Vries 1976, p. 112).

Key players in the mid-price system, the *hoekmannen* are likely to have entered the market at around the same time.[11] Bankers and commission traders executing unlimited buy or sell orders were at risk of losing from the mid-price system if prices respectively dropped or increased during the day. They therefore chose to transfer this risk to the *hoekman* (Van Overeem 1920, pp. 22–3; Besier 1925, p. 78). *Hoekmannen* acted as intermediaries similar to the Brussels *teneurs du marché*, that is to say, they ran the exchange trade in a particular security. Using their knowledge of orders received before exchange hours, they set buy and sell prices at the start of trade and offered a ready counterparty to anyone wishing to buy or sell, during the course of trade adjusting bid and offer prices as needed to end the day by supplying high-low and mid quotes. Providing liquidity from their own holdings, *hoekmannen* were thus also pivotal in the price formation process. Moreover, their ability to turn advance information into prices mirroring likely market sentiment removed a degree of uncertainty for traders holding outside investors' orders, because they could now always rely on being able to execute them advantageously.

There was a flipside, however. Market makers earned their income from commissions charged to customers plus gains from trading on differences between mid-prices and whatever happened on the floor (Hartmann 1937, pp. 90–2). While superior information gave *hoekmannen* a clear edge over other participants in floor trading, they could at the same time easily manipulate prices to their advantage, giving rise to constant complaints from the late nineteenth century onwards, as we shall see shortly. The mid-price system also incentivised traders outside Amsterdam to avoid dealing through the exchange by matching orders themselves, thus avoiding brokerage fees (Van der Werf 1988).

V

For 20 years the *Algemeen Beurs-Comité* and the *Effecten Sociëteit* operated side-by-side. The former styled itself as a semi-official trade body giving directives for the conduct of trade and representing investor interests at home and abroad; the latter aimed, like

[11] It is tempting to see several budding *hoekmannen* running a particular trade described in the pamphlet *De effecten-hoek* (1827).

its predecessors, to publish a price current and run a club for conviviality and after-hours trading. In their efforts to beef up the organization of the securities trade both were hampered by recurrent friction between them, for instance the *Sociëteit* voting to list a particular security which the *Comité* would not accept. Moreover, neither could enforce rules on the unruly, diverse and growing crowd of securities traders speaking a jargon that confounded outsiders. The sheer number of people crammed into the securities corner of the exchange building prevented oversight and frequently even the proper collection of transaction prices, so the endemic price manipulation went largely unpunished (Pik 1890, pp. 127–31). At times trading was so unruly that the police had to be called in to restore order, twice in 1874.

At that time Amsterdam increasingly needed to prove its efficiency as a market. Notably the Rotterdam exchange competed successfully for business. In 1873 the Amsterdam-based *Heineken's Brouwerij*, until then privately owned, issued its first shares there (Camijn 1987; Van der Werf 1988; De Gast 1998). The Dutch East Indies saw the rise of a stock market in Batavia (Djakarta) offering an alternative to colonial companies until then exclusively floated in Amsterdam (Van der Eng 2022). There also existed a voluminous unlisted market with a price current of its own and, as often as not, run by private investors selling shares to relatives, friends and business relations. In 1867 Rotterdam gas company shareholders criticized the board for wasting money on official brokers to sell a bond issue, arguing the 1.2 million guilder loan could have easily been placed through their private networks (Jonker 1996, p. 159).

Amsterdam therefore badly needed to up its game if it was not to lose more ground. In 1876 the *Algemeen Beurs-Comité* and the *Effecten Sociëteit* finally merged to form a single organization, the *Vereeniging voor den Effectenhandel*, which assumed the functions of both. Having no fewer than 465 members lent the new association considerable authority, which its board used to issue a series of regulations on all aspects of the securities trade, including a more detailed listings procedure. The *Vereeniging*'s main goal, however, was to obtain a separate building so that it could control access and enforce regulations.

That took another quarter of a century plus sleight of hand. The exchange building was widely accepted as no longer suited to modern business needs but its owner, the Amsterdam city council, was slow to replace it and would not consider a separate stock exchange anyway, arguing that from time immemorial exchanges had been shared by all relevant business sectors and publicly accessible (Van Rooy 1982). Yet when the city finally commissioned a new exchange, shared and public as before, the *Vereeniging* secretly arranged for its allotted floor space to be fenced off by a high wrought-iron railing, causing general uproar at the building's 1903 opening.

Practical access control proved only the first step to a full trade monopoly, established on the back of a fast growing securities trade. The number of securities quoted rose from 238 in 1876 to 1,901 in 1914, pushing membership of the *Vereeniging* up to about 700. The consequent need for more space persuaded the association to build a dedicated stock exchange. This palatial building, an eloquent testimony to the prosperity of the securities trade, opened in 1914. At long last the securities trade had become a closed club like its great example, the London Stock Exchange. With the move one would have expected the *Vereeniging* to have acquired better disciplining powers, but its rules and regulations remained a paper tiger for a lack of zeal to pursue transgressions (De Vries 1976, p. 110).

VI

The outbreak of World War I brought the first formal regulation of the stock exchange in the form of the *Beurswet 1914*, an emergency measure which gave the government full temporary powers over all aspects of the securities trade in case of need. The powers were invoked only once, for a minor issue, but with immediate salutary effect (De Vries 1976, pp. 139–40). However, the government let the law lapse with the return of peace, allowing the *Vereeniging* to resume its position as an officially sanctioned, self-governing monopoly. During the interwar period the trade continued to grow, the number of securities quoted peaking at 2,947 in 1932, at the same time concentrating, membership stagnating at about 750 people. Part of that concentration was the consequence of joint-stock banks seizing an ever larger share of trade, which also gave them a growing influence within the *Vereeniging* (De Vries 1976, pp. 156–7; Hermans 2004; Geljon 2005).

Even so the *hoekmannen* remained the single most powerful group within the *Vereeniging*. United in an association of their own from 1922 (De Vries 1976, p. 109), the *hoekmannen* retained an iron grip on the price formation process and succeeded in defeating repeated efforts at reform. As we have seen above, orders without a price limit given before the opening of trade were customarily settled against the mean of the lowest and highest price, producing two phenomena, both undesirable but for different reasons: the matching and settling of orders out of exchange and price manipulation. The former increased notably through the joint-stock banks' growing market share. The latter phenomenon resisted all attempts to eradicate it until the mid-price system's abolition in 1967.

For securities traders the mid-price system was a miracle in generating such generous revenues that one trader was quoted as joking he would call his future retreat *Villa Middenkoers*. Abuse was easy, widespread, persistent and largely unpunished, and it came in two main forms (Pik 1890, pp. 129–30; De Vries 1976, pp. 107–8, 111–17; *Deli Courant*, 19 September 1902; *De Maasbode*, 1 March 1914; Hartmann 1937, p. 92; De Kat 1920, pp. 458–9). Because the *hoekmannen* knew all orders for the security concerned beforehand and also traded with their own portfolio, they could set opening prices to suit their best interests, thus also affecting the mid-price applying to transactions bypassing the trading floor (Ree and Zuurdeeg 1925, pp. 4–6, 44–6; Westerman 1915, pp. 6–7). This was mostly the case in so-called closed corners (*gesloten hoeken*) for inactive securities where the market maker completely controlled trading. In open corners (*open hoeken*), agents and traders traded more liquid securities directly with each other by shouting out orders aloud (Van

Overeem 1920, p. 23). Moreover, since a single transaction below the current lowest price or above the highest impacted on the mid-price, *hoekmannen* colluded with other traders to create fake prices with very small or fictitious transactions. Called *potloodaffaires* (pencil trades) or various synonyms for theft like *aleichems*, *snaaikoersen* and *gapkoersen*, such transactions aimed to increase or decrease the mid-price, depending on the *hoekman*'s own position (Pik 1890, pp. 127–31).

In 1881 an advertisement in the newspaper *Algemeen Handelsblad*, paid for by a securities trader, first drew investors' attention to systematic price manipulation by brokers (De Vries 1976, p. 107; *Algemeen Handelsblad*, 24 June 1881). To remedy the use of *potlootaffaires*, the *Commissie voor de Notering* could send a member to a corner to investigate if the *guides* who were charged with collecting prices suspected tampering (Van Meeuwen 1919, pp. 248–9). Members who tampered with prices first received a warning. Subsequent transgressions were punished with increasing fines (*Reglement voor de Noteering*, 10 May 1883, art. 10). In 1905 abuse had become sufficiently notorious for members to start pressing the *Vereeniging*'s board for reform, triggering a sorry succession of ineffective commissions, defeated proposals and inconclusive membership surveys.

The one reform proposal that did pass muster was the adoption of time slots for quotations of the most active securities. Designed to render mid-price abuse more difficult, the system envisaged up to seven slots ending with prices of transactions recorded, the last ones functioning as closing prices. From November 1924 Dutch government bonds were quoted in four slots, yielding an opening (13:30–13:40), first (13:40–14:00), second (14:00–14:30), third (14:30–14:45) and closing price. The following month seven such slots were introduced for Royal Dutch Petroleum, and in 1925 more quotations followed. Experiments with time slots resulted in 1929 in new regulations, which came into effect on 1 July and remained in place until 1940. Henceforth, a distinction was made between fixed interest securities, liquid shares (so-called *A-fondsen*) and other shares. Lowest and highest prices for the first group were quoted in one time slot, for the second in seven slots and for the third in two slots. For each group, closing prices were also quoted. The state of the market was further clarified by the inclusion of letters indicating whether the prices were bid or ask prices and if there were outstanding buy or sell orders at the quoted prices (De Vries 1976, pp. 151–2). However, despite high hopes this system failed to scupper the practice of settling against the day's mid-price.

The failure to tackle the mid-price system ties in with similar procrastination over reform of the stock exchange's listings rules to highlight the *Vereeniging*'s inability to stamp out the glaring defects and rent-seeking practices in its business (De Vries 1976, pp. 160–4). As before, the poor alignment of its members' interests was responsible for this inability: typically, the brokers were divided over reform proposals but largely in favour, the bankers indifferent and the *hoekmannen* against (De Vries 1976, pp. 113–14). However, a more fundamental cause lay in the *Vereeniging*'s governance as a self-regulating monopoly free from outside interference. In that respect

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letting the *Beurswet 1914* lapse represented a missed opportunity, which, had the government taken it, would have changed the character of Amsterdam securities trading, from investors' viewpoint for the better. Such actions now had to wait until the 1980s.

VII

During the period under consideration Amsterdam securities trading evolved from an entirely free, open and publicly accessible market to a self-governing monopoly. For most of the time, that market differed markedly from those elsewhere, in being entirely unregulated, socially diverse and spread over various venues, resulting in poor public prices, an ill-disciplined market and rent-seeking opportunities aplenty. The first question is whether that mattered: whether the securities trade served the Dutch economy, society and investors better or worse than counterparts abroad. The second question is how efficient the Amsterdam market was. We have described developments in market organization and publication of prices. Now we can use published prices to test microstructure inefficiencies and price discovery using the economic models mentioned in the introduction. At this point in time the research and the data required to answer the question are unavailable, yet in the process of being generated. A project led jointly by Herman de Jong and Abe de Jong started at the Rijksuniversiteit Groningen in 2021 combining the collection of stock exchange prices and corporate finance data, using the tried and tested relational database system developed by the *Studiecentrum voor Onderneming en Beurs* (University of Antwerp), with research into the importance of the Amsterdam stock exchange for the Dutch economy and society in the 1870–1940 period. The research focuses on three key subjects: corporate finance, investor portfolio choice and market microstructure, with the aim and intention of filling some of the large holes in our knowledge.

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