

1. Introduction

«Audaces fortuna juvat timidisque repellit, vj looten», Fortune favors the bold and repels the timid, six lots. This so-called proze or lottery poem is an allusion to Seneca the Younger's *Medea* (line 159) and translates as: Fortune favours the bold and spurns the fearful. The shorthand versions *Audaces/Audentes fortuna juvat* (Fortune favours the bold), borrowing from Virgil's *Aeneid*, appear in documents of at least four other lotteries organized in the Low Countries between 1555 and 1596. The anonymous ticket buyer from Delft had this poem registered by ticket seller Everart van Lodensteijn for the six lottery tickets that he or she purchased in the lottery organized in 1562-1564 by the city authorities of 's-Hertogenbosch, now in The Netherlands, back then in the Duchy of Brabant, one of the provinces of the Habsburg Low Countries (van Dijck 2003, line 1631). Priced at three and a half stuivers per ticket, our anonymous buyer spent between 3.5 and 5.25 daily wages of a 's-Hertogenbosch master builder or construction labourer respectively (Hanus 2014, 160).

This short poem which, like all other tickets in the lottery, was read out loud at the draw, illustrates several key elements of what I would like to call the risk culture of Low Countries lotteries. I borrow the definition of risk culture from Jeffrey Toner's work on risk in the ancient Roman world: «what constitutes a risk reflects a range of ideological, structural and social-psychological elements in a given social situation. Societies can in these ways be seen as revealing themselves by how they deal with dangers. They have what can be described as specific risk cultures» (Toner 2023, 10). Risks do not necessarily have to be a bad thing: «embracing risk can be a way for the individual to get richer, to improve his or her social status and generally move up in the world» (Toner 2023, 13). In this sense, late medieval and early modern lottery playing fits into what Mary Beard has called an aleatory society: «[ancient] Rome was a culture that looked danger in the eye. It did not attempt to avert or calculate danger, but rather to assert (almost celebrate) the uncertainties, chances and dangers of human existence. [...] They [the Romans] were not simply the dupes of Fate, they 'managed' danger by repeatedly reminding themselves to face it head on» (Beard 2011, 98). The refreshing works of Toner and Beard show that historians of premodern risk can certainly learn from their colleagues in ancient history.

The key elements of the risk culture of Low Countries lotteries are the following. First, lotteries were a very common method to raise money for city authorities,

churches, charitable institutions, the central government and private entrepreneurs from 1441 onwards, the year in which the city government of Bruges organized the first lottery in the Low Countries. Between 1441 and 1696 (my research project ends in 1700) 450 lotteries were organized in the Low Countries. Second, lotteries could bring substantial profit to the organizers but this profit was not guaranteed as it depended on the size of operational costs and the number of tickets sold. Third, a rather trivial amount of money as ticket price could yield the participants a substantial prize in silverware, money or luxury goods. These fairly low ticket prices allowed broad segments of society to participate in the lotteries. Fourth, the corpus of around 27,000 lottery prozen or poems from 17 lotteries reveal at least some of the motivations and strategies of the ticket buyers and the nomenclature of risk used by them. Fifth and last, interesting differences can be seen in the risk-behaviour involved in the lotteries: the players and the organizers.

In earlier work I have shown differences in the discourses of players and organizers, using the lottery poems for the players and various documents of lottery organization and regulation for the organizers (Puttevils 2017). In this paper I make use of a far larger set of lottery poems and I go deeper in the concept of risk and how it was performed by players and organizers. Can the players be described as risk-seekers or risk-lovers and the organizers as risk-avoiders?

2. Risk-lovers: the lottery players

An announcement for the 1480 Bruges city lottery distributed in Mechelen was very explicit in that sense: «one should know that everyone, cleric or laymen, citizen or stranger, old or young, can put in as many lots as they please».¹ Note the absence of a reference to gender here: clearly men and women were equally welcome as ticket buyers. So, who were these lottery ticket buyers? For two sixteenth-century lotteries we can determine the socio-economic profile of the ticket buyers: the Leiden city government lottery of 1504 and that of 's-Hertogenbosch of 1564, from which the opening quote of this paper comes. For the Leiden lottery we have what must have been one of several subscription ledgers, which contains the registered tickets of those ticket buyers whose first name started with an A up to the letter M. 8,960 tickets were purchased by almost 1,400 individuals.² Lottery participants bought 6.5 tickets on average (costing one shilling Flemish per ticket), the median was 2 tickets. Half of the ticket buyers thus bought two or more tickets, with several buying more than 100 tickets (with a maximum of 162). Among the identifiable ticket buyers we find 787 men and 536 women. The group of men accounts for 70% of all tickets sold, leaving the remaining 30% for the women. Women thus purchased a lower numbers of tickets on average in Leiden. This 30% in fact is very close to the share of female investment in annuities (one third of the annuities market), one of the important methods of investment in the premodern Low Countries.

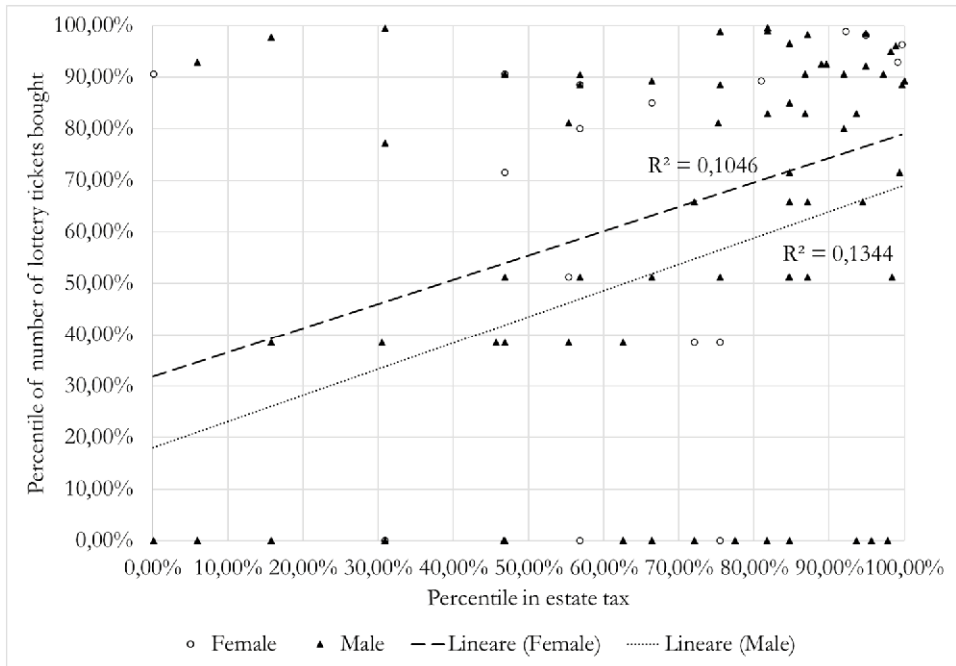
¹ City Archive Mechelen, Oud archief, 6, burgerlijke zaken, IV, nr. 212, 1. This very open invitation to participate in the lottery became a common phrase and found its way into lotteries in the Holy Roman Empire as well (Delle Luche 2018, 564).

² Regional Archive Leiden, Archief der secretarie van de stad Leiden SA I, 986.

In this lottery, intended to sanitize the finances of the Leiden city government, ticket buyers could pay their tickets in cash and in money owed to them by the city government (usually for delayed annuity and loan payments). The majority of the lottery participants went for the second option, with women preferring this option even more than their male counterparts (83% vs. 77%). Apparently, these ticket buyers thought participation in the lottery was a better option than to wait even longer for the uncertain repayment of their investments in Leiden’s city government debt.

The registers of the 1502 estate tax, another method used by the Leiden city government to raise money, can be used to socially benchmark the Leiden lottery ticket buyers. 1,441 heads of family were taxed on their estate. I was able to match almost 100 individuals between the estate tax registration and the preserved A to M lottery tickets buyers ledger.

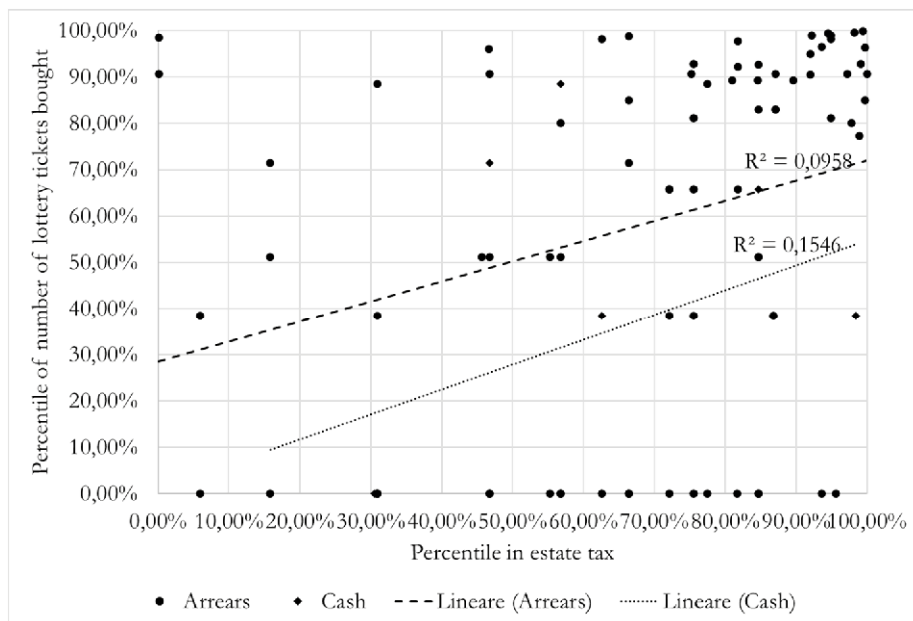
Graph 1. Relation between fiscal position, gender of the ticket buyer and the number of lottery tickets bought, Leiden, beginning of the sixteenth century



Source: database based on Regional Archive Leiden, Archief der secretarie van de stad Leiden SA I, 986 <https://oudleiden.nl/werkgroepen/jan-van-hout-archieffonderzoek/vermogensbelasting-1502-lening-1508>

The above graph shows that those inhabitants of Leiden who were taxed more bought more lottery tickets. There is no visible gender difference in the relation between taxable wealth and lottery ticket buying.

Graph 2. Relation between fiscal position, the number of lottery tickets bought and the type of payment, Leiden begin of the sixteenth century

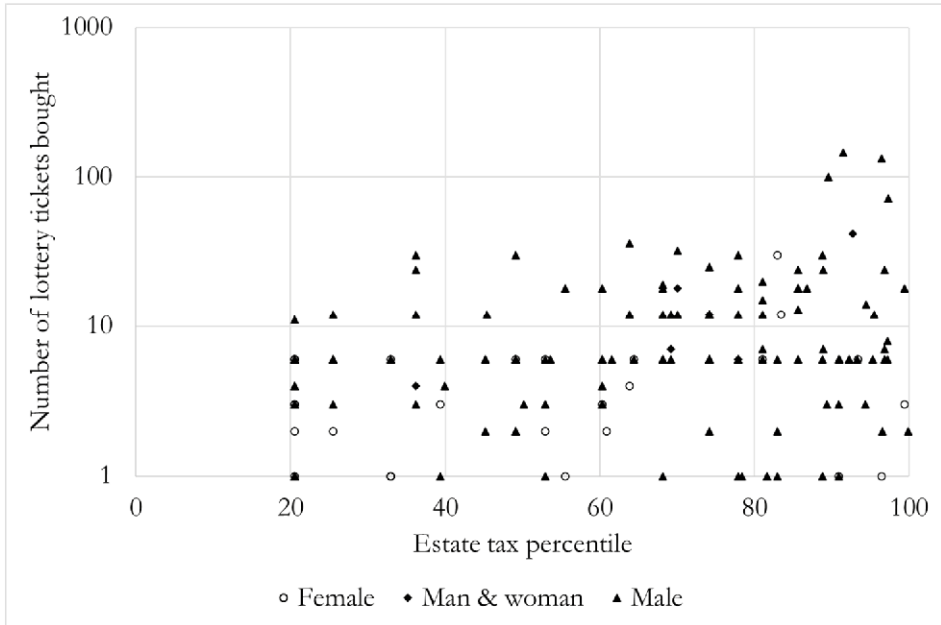


Source: database based on Regional Archive Leiden, Archief der secretarie van de stad Leiden SA I, 986 <https://oudleiden.nl/werkgroepen/jan-van-hout-archieffonderzoek/vermogensbelasting-1502-lening-1508>

The few participants who bought their tickets in cash are more evenly distributed over the fiscal scale, those who paid with arrears owed to them usually come from higher up the fiscal ladder, as is demonstrated by graph 2. That the richer would have participated in the city lottery is not unexpected. A more important finding is that those of the lower middle class also bought lottery tickets, albeit for lower amounts and more often paying in cash. Moreover, there was no real gender difference. This points to a fairly wide accessibility.

For the city lottery of 's-Hertogenbosch of 1564 I was able to identify 166 lottery participants in the 1557-1558 income tax.

Graph 3. Relation between fiscal position, gender and the number of lottery tickets bought, 's-Hertogenbosch around 1560



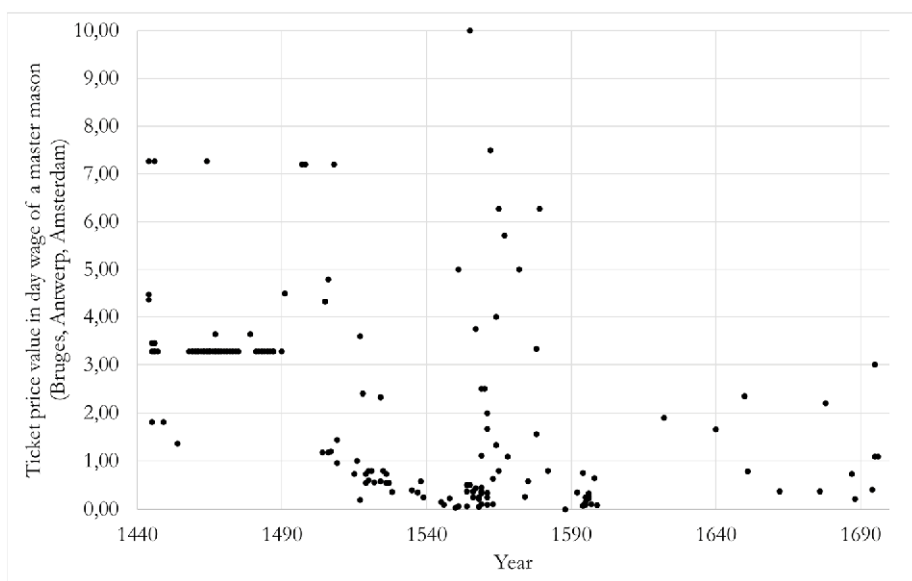
Source: database based on G. C. M. van Dijk, *De Bossche loterij, 1562-1564* & database on fiscal data of dr. Jord Hanus

In this lottery there is no clear relation between the taxed income and the number of tickets bought. Individuals lower on in the tax distribution were able to buy as many tickets as richer inhabitants of 's-Hertogenbosch. Only among the richest 10 percent do we see a few individuals who bought substantially more lottery tickets. No clear gender difference is visible here. An increase in accessibility of lottery play has clearly taken place since Leiden's 1504 lottery, fifty years prior to that of 's-Hertogenbosch. Sociologists have shown that modern-day German lotteries are highly regressive socially: players with lower incomes contribute to lotteries to a significantly higher degree than players from higher income groups. Expenditure on lotteries takes out a relatively larger bite of their budget (Beckert and Lutter 2009, 2012). This observation only partially holds for the evidence we have from the lottery of Den Bosch. More highly taxed Den Bosch individuals are more numerous and they buy similar number of tickets, whereas more middle income class individuals are less well-represented in our sample. However, these middle class and lower class individuals buy similar numbers of lottery tickets like the higher fiscal classes, except for the richest 10%. The budget of lower and middle class buyers was obviously smaller and thus lottery participation weighed more on their expenditures relatively, which is line with the research on modern-day German lottery players.

Ticket prices play an important role in the accessibility of lotteries to different

income groups. For 176 lotteries organized between 1441 and 1700 the price of one ticket could be found. The median ticket price was 1.4 daily wages of a master mason, the mean 3.29. The lowest ticket price was half a stuiver, a small fraction of one daily wage. The highest ticket price was 78 times such a daily wage, this lottery was organized by the city of Amersfoort and deliberately high end. One had to pay the ticket price in bank guilders of the Wisselbank of Amsterdam, a currency to which only elites had access to.³ But this was clearly an exception: more than half of the ticket prices was at or below the equivalent of three daily wages.

Graph 4. **Chronological evolution of single lottery ticket prices, expressed in terms of daily wages**



Source: author database, daily wages based on John H. Munro's timeseries <https://www.economics.utoronto.ca/public/workingPapers/UT-ECIPA-MUNRO-04-01.pdf> & those of Robert C. Allen <https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/>

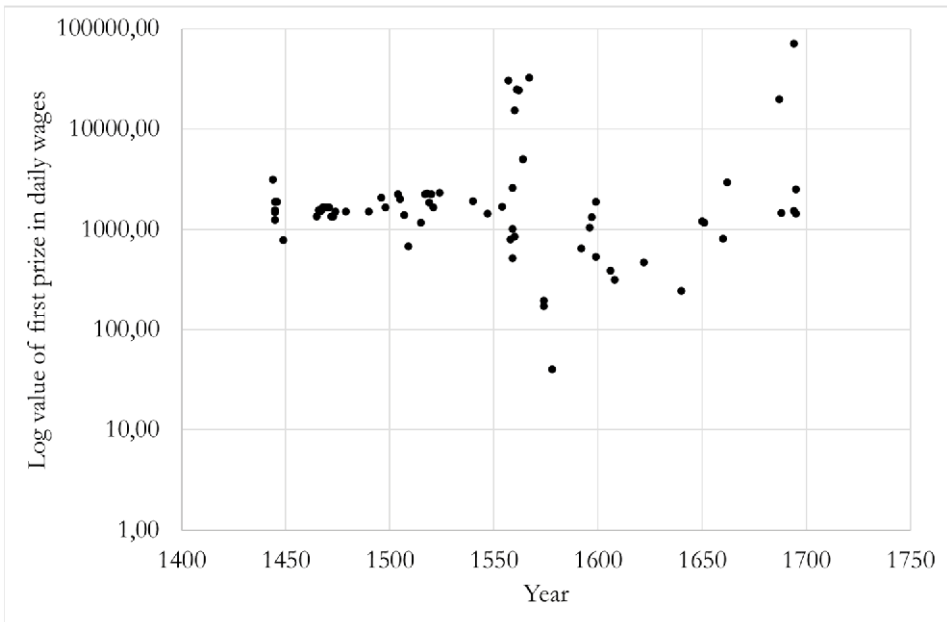
When plotted over time, interesting patterns are revealed. In the first ten years of lotteries in the Low Countries, a process of price discovery was clearly taking place. The price then converged to just above three daily wages for several decades. A few years into the sixteenth century, there is a drop to a ticket price of around or below one day of wages, with some outliers ranging between two to 8 daily wages. This pattern holds until the end of the sixteenth century. The more rare seventeenth-century lotteries range in ticket price between below one and up to three 3 daily wages.

³ [Loterije van verscheyde considerable soo heerlyke als andere vaste goederen ... - Google Boeken](#)

Lottery organizers clearly must have seen that it made sense to price the tickets low enough so that it became possible for almost anyone to acquire a single ticket.

What would player’s risks get them in case of winning? It is beyond the scope of this paper to discuss the variety of prizes that were offered and how this changed over time. In summary, in the fifteenth-century lotteries city offices, such a city clerkship or the revenue from the intra-urban transport of wine, and money were offered as prizes. This changed at the end of the fifteenth century when expensive pieces of silverware became the main prize. In the second half of the sixteenth century, together with private entrepreneurs such as merchants, art dealers and craftsmen setting up lotteries, luxury goods such as paintings, furniture and clothing were added as prizes (Vande Sompele 2015; Raux 2018). For this paper the size of the first main prize is what interests us. What was the value of the item or the amount of money that one could win with a lottery ticket? Using accounts, lottery advertisements and lists of prize winners, we could find out the first prizes of 71 lotteries. Their estimated monetary values were calculated into the daily wages of a master mason in Bruges, Antwerp or Amsterdam (dependent on the time and place of the lottery).

Graph 5. Chronological evolution of the log value of the main lottery prize in daily wages

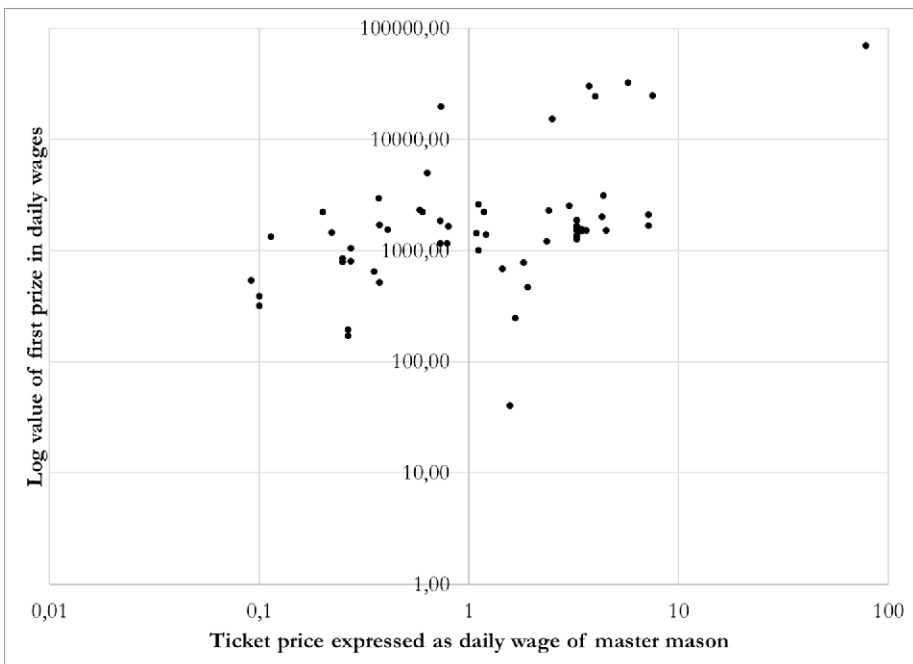


Source: author database, daily wages based on John H. Munro’s timeseries <https://www.economics.utoronto.ca/public/workingPapers/UT-ECIPA-MUNRO-04-01.pdf> & those of Robert C. Allen <https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/>

There is no clear change visible in the size of the main prize over time. With the exception of two clusters of lotteries with very valuable first prizes in the early 1560s and at the end of the seventeenth century: these main prizes were worth around 30,000 and 70,000 daily wages respectively. The mean was 4,449 daily wages as main prize, or 18 to 21 annual wages of a master mason. The largest main prize was the equivalent of almost 300 annual wages. Between five and ten years worth of wages was the most common main prize value. Although most main prizes were not astronomical, they would have meant a transformative experience for the winners. And this is just the first prize... Prizes further down the prize hierarchy could still be very substantial.

As for the relationship between differences in the main prize to be won and the ticket price, as can be seen from the graph below, more expensive lotteries in terms of ticket price did indeed offer even grander main prizes. But even in the segment of cheap lottery tickets (below one daily wage), many lotteries offered main prizes that were the equivalent of over a thousand daily wages.

Graph 6. Relationship between the ticket price (as daily wage of a master mason) and the log value of the first lottery prize (as daily wage)



Source: author database, daily wages based on John H. Munro's timeseries
<https://www.economics.utoronto.ca/public/workingPapers/UT-ECIPA-MUNRO-04-01.pdf>
 & those of Robert C. Allen
<https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/>

3. Fortune favours the bold: lottery poems and risk-taking

It is not easy to determine the decisive motivations of the players to buy a ticket. Ticket buyers could have a range of motivations to participate in a lottery: hope of material gain, improving one's social status by winning money or items which belong to upper class material culture, the enjoyment of sponsoring a charity, sensation and leisure, patriotism, social pressure among members of an organization and moral pressure from the church... Many ticket buyers also did not pay for their tickets in cash but converted money owed to them, usually by town governments, into tickets, a debt-for-chance-swap. Trading in lottery tickets could even be an entrepreneurial strategy: the sixteenth-century entrepreneur Daniel de Bruyne attracted investors and borrowed money to buy a large batch of lottery tickets from different lotteries at sub-nominal prices and then resold them, pocketing the difference.⁴ Tickets were continuously resold, especially the ones which were not drawn yet during an active draw. Lottery players bought tickets together with other people. Sometimes, syndicates or so-called *compagnieën* were formed, for example the «Company of Seven» which invested in a large number of tickets in the 1596 Leiden lottery.⁵ The Company of Seven lost out on winning the prize for the largest amount of tickets purchased: a rich single investor, Johan van Duvenvoorde, lord of Warmond, bought more than double of their inlay. Such lottery play in groups is often called syndicate play and is still a very common practice today. Lottery players bought tickets in more than one lottery, as the common lottery poem «unlucky in lotteries, what is he expecting» demonstrates.

The lotteries held in the Low Countries during the late medieval period and the 16th and 17th centuries were more like raffles or tombolas than today's lotteries. While tickets could be numbered, buyers did not pick specific numbers or combinations like in modern lotto games. Instead, they identified themselves on the ticket with either their name or a short verse – known as a lottery poem or *loterijproze*. These poems acted as both a form of identification and a verification tool: when a ticket was drawn, the town crier would read the poem aloud, allowing the ticket holder to recognize their entry. Because the poems were performed in front of a crowd, they were often humorous or entertaining, especially since most tickets resulted in no prize at all. Many verses played on this common outcome – a blank or *nyet*, meaning «nothing» – as pieces of paper drawn from the urn typically bore either a prize or, more likely, nothing. The poems also provided a level of anonymity (Terwisscha van Scheltinga, Budts, and Puttevils 2024). People could participate in the lottery without revealing their identity using a lottery poem – useful, for example, if they didn't want their spouse to know. The lottery registration ledger does record their name, of course.⁶ However, any anonymity disappeared if the person claimed

⁴ Felixarchief Antwerpen, Chamber of Insolvency, IB 788, Memorial Daniel de Bruyne (1561-1565).

⁵ On the practice of syndicate playing: (Guillén, Garvía, and Santana 2012; Garvía 2007; Zollinger 2006; Murphy 2006, 2009, 2005) On the *Compagnie van Zeven*: (Koppenol 1998, 75) & (Huisman and Koppenol 1991, 46).

⁶ Identity could be cross-checked with the ticket purchase registers and/or with the receipts ticket buyers received.

their prize in public, either on stage or at the lottery office. Indeed, the public draw turned the lottery into a social event, where players could witness the draw, hear the poems being read out loud and in fact play together. This mirrors the highly social nature of Mary Beard's aleatory society (Beard 2011).

The content found in lottery subscription ledgers is remarkably diverse. Verses touch on both Christian and pagan themes, and despite some level of censorship, there's still a noticeable presence of politically charged or risqué material. Topics like *caritas* (charity – since many lotteries supported charitable causes), Heaven, God, saints, and, naturally, the prizes themselves, appear frequently. It's also clear that ticket buyers were aware of their slim chances of winning. The recurring phrase «lotry boevery» or lottery villainy appears often in the ledgers, reflecting a certain cynicism or skepticism about the fairness of the draw. Almost 100,000 of these lottery poems are preserved. It is beyond the scope of this paper to fully analyse this corpus to risk behaviour.⁷ The word risk in all its varieties is missing in any case. It is, however, used in documents relating to lottery organisation, where the behaviour of the lottery ticket buyers is described. The term *risicqueren* – to risk – is often used alongside *inleggen*, meaning to subscribe or buy into the lottery. In this context, lottery participants both subscribe and take a risk. The word risk, in its various Dutch spellings (closely mirroring the French forms *resicq* and *risicque*), was typically associated with maritime insurance and trade during the sixteenth century. When it appears, it refers to the possibility of both gain and loss.⁸ In some cases, it's paired directly with profit, forming a conceptual pair – here, *resicq* clearly denotes potential loss.⁹

However, ticket buyers far more often «leggen in», «lay their money in» the lottery (728 poems or 2.6%). They also adventure in the lottery. In the currently available corpus of almost 28,000 digitized lottery *prozen*, *avonturen/aventuren/adventure* figures in 93 *prozen* (0.3%). A fascinating court case from 1571 between Jan Leys and Gillis De Witte reveals the following story: Jan had received several lottery tickets for Jaspas de Castro's lottery from his debtor, Hans Sgreven. However, Jan preferred certainty over chance, saying he'd «rather have something certain than stand in the adventure of Fortune». He ended up trading the lottery tickets for grey cloth from Gillis De Witte. In one of the case documents, Jan even added, «he'd rather have one bird in hand than ten in the skies,» echoing the familiar proverb.¹⁰ The word «aventure» (from the Latin *advenire*) had already taken on the meaning of fate or fortune by the early 14th century.¹¹ By the 17th century, an adventurer referred to a financial speculator – earlier still, it was used for merchants, such as the English Merchant Adventurers (Millikan 2011, 63). Lottery players did not just participate –

⁷ The poems were very diverse in content: prayers, scatological verses, references to sexuality, to winning the lottery, the purpose of the lottery, political statements, jokes, criticism of Catholicism or Protestantism. (Terwisscha van Scheltinga, Budts & Puttevils 2024).

⁸ Felixarchief Antwerpen, *Tresorij*, T1432: «de resterende nombren worden innegeleeth ende gerisicqueert». For the different meanings of *risico* in Middle Dutch: <http://gtb.inl.nl/iWDB/search?wdb=WNT&actie=article&uitvoer=HTML&id=M060264>.

⁹ FA, *Tresorij*, T1433: «250 000 florins quest le quart restan sa Majeste laisseroit au prouffict et risicq dicelle ville».

¹⁰ FA, *Processen Supplement*, 288 # 3912, pieces of evidence J & K.

¹¹ On the meanings of *aventure*:

<http://gtb.inl.nl/iWDB/search?actie=article&wdb=MNW&id=01968&lemma=aventure>.

they adventured, leaving the outcome up to fate. Prizes were awarded – or not – by adventure. This language was reflected in official documents too. For instance, in the Bruges Hallegeboden, the announcement for the city lottery of 1507 stated that «anyone who has subscribed to multiple tickets can win as many prizes as adventure grants him». ¹² But adventure was expected to be fair. In 1576, all lottery organizers were asked to present their official permissions, as some had been granted – or operated – illegally. Several of these licensed and unlicensed lotteries were said to be conducted «by not so fair adventure as it should be» ¹³. Whether this referred to skewed odds, lack of transparency in registration, or manipulation of the draw remains unclear.

Twelve lottery poems in French invoke the word *hazart/hasart*. In other documents than the poems, the word *hazard(er)* was commonly used in French texts to describe participation in lotteries – for example, phrases like «le hazard de povoir gagner plus que ne porteroit leur dite mise» and «hazarder leur argent» reflect this usage. ¹⁴ *Hazard* is a particularly rich and layered term. Originally tied to dice games, it conveys the idea of chance or randomness, and can suggest both negative outcomes (danger, risk) and positive ones (opportunity, reward). In some cases, *hazard* appears alongside *fortune*, as in: «ceux qui y auront mis de la sorte, attendront par dessus ce leur fortune & hazart». Here, *hazard* seems to imply the potential for loss, while *fortune* suggests the possibility of gain – what we might now call downside and upside risk. ¹⁵

Fortune itself is commonly mentioned in the lottery *prozen* (2%). What can these lottery poems that reference *Fortune* tell us about attitudes toward risk and uncertainty? Quite a lot, in fact. Many verses try to identify the kinds of people who deserve to be favored by *Fortune*. A common quotation is *Audaces* (or *Audentes/Fortes*) *fortuna juvat* – «*Fortune favors the bold*» – from Virgil's *Aeneid*. One poem even adds that *Fortune* rejects the timid. Others suggest that the industrious, the amorous, and virgins of honor are aided by *Fortune*. The virtuous, too, are said to attract her favor, as expressed in the line: «*Vertu conduyct, fortune la suyct*» («*Virtue leads, Fortune follows*»).

Some ticket buyers take a more passive stance in their lottery poem, showing patience or resignation in the face of *Fortune's* whims. One warns that dealing with *Fortune* requires a strong heart. Others choose a more active approach, attempting to flatter *Fortune* by praising her as excellent, refined, wonderful, and beautiful. Many verses pose the question: «*What will Fortune grant me?*» – often paired with the likely

¹² Stadsarchief Brugge, *Hallegeboden*, register 2, 158v: «Item es voort te wetene dat elc alzo vele prysen winnen zal moghen als hem de aventuere gheven zal naer dat in loten ghenouch ingheleit zal hebben».

¹³ Felixarchief Antwerpen, *Privilegiekamer*, Pk 2276, f. 315v.

¹⁴ Felixarchief Antwerpen, *Tresorij*, T1433: «desdit estatz se trouveroient assurez que au pis venir ilz ne pourroient perdre que le quart de l'importance de leurs mises selon quil apperrera par ladite carte montant ledit quart a 225 000 florins retenans ce pendant le hazard de povoir gagner plus que ne porteroit leur dite mise». Algemeen Rijksarchief Brussel, Chambres des Comptes, 142, Patent of Pierre Prevost: «beaucoup de belles merceries dont ceulx qui y voudront hazarder leur argent nen pouront sentir aulcun prejudice».

¹⁵ Nationaal Archief, Archive of Johan van Oldenbarnevelt, 731: *Tres riche fort avantageuse & generale Loterie*.

outcome: a blank, a *nyet* or *niet*, meaning «nothing.» In these cases, the verse would be drawn and read aloud, followed by the result from the prize urn – typically, nothing.

Fortune is often described as fickle, ever-changing like the wind – a common metaphor. She is also blind, unfaithful, and unreliable. People plead for her favor: «O Fortuna, please favor me». Yet even if she smiles upon you, that luck can vanish quickly. Some poems personify Fortune with companions – Prudence and Concord – perhaps suggesting that balance and wisdom are needed to navigate her volatility. Fortune is also described as «round and unknown,» a reference to the famous Wheel of Fortune. A few verses claim that «Fortune is hard to fathom,» and some go further, portraying her as all-powerful and beyond control: «If Fortune does not hold a man dear, all he begins is lost,» and «Contre la fortune nulz ne peult», «No one can stand against Fortune.» I have written elsewhere about the relation between God and Fortune and about the invocation of Mary and a plethora of saints in the lottery poems (Puttevils 2017).

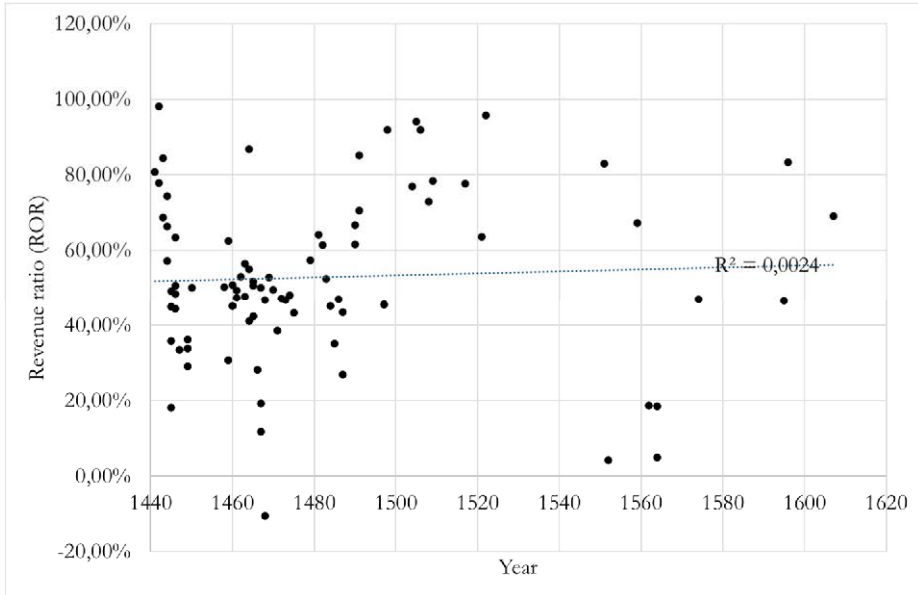
To stay in tune with the other part of this conference, on insolvency and bankruptcy, two lottery poems refer to these issues. Lijsbet Snewater, living in Amsterdam at the Ossenmarkt, bought seven tickets for the 1607 Oudemannenhuis lottery (hospital for elderly men) from ticket seller Cornelis Sijverssoon Bankroet. These seven tickets carried the poem «Die te Amsterdam wyl bedijen Die speel bankerot offe stelt op loterijen» or «who wants to live in Amsterdam, either plays bankruptcy or engages in lotteries». The meaning of the poem is ambiguous (as they often are). One plays the lottery, rather than bankruptcy. Or is Lijsbet perhaps arguing that many Amsterdam bankruptcies are actually feigned? Does a bankruptcy actually allow one to walk off with enough money to live well in Amsterdam? The «opstellen» of lotteries also has a double meaning: put one's faith into lotteries or organize them. If one wins, one can make a decent living in Amsterdam or a lottery organizer can live from the proceeds. An anonymous from Antwerp purchased twelve tickets in the 1564 's-Hertogenbosch lottery with the proze «Souden zy all prys hebben die nae prys haken, die vanden Bosch mochten wel bancqueroet maken» or «if all those who are fishing for a prize get a prize, those of Den Bosch would be bankrupted». In this case the meaning is clear: many want to win and if the city government of Den Bosch would need to satisfy all ticket buyers with a prize, it would go bankrupt. The connection between debt and possible insolvency is a matter that requires more investigation for the Low Countries. There are indications that some private individuals may have received a lottery permit because they were in debt and needed to sell some of their assets and did so through a lottery. Evelyn Welch has shown how even sixteenth-century Roman patricians made use of lotteries when they were experiencing financial difficulties (Welch 2008).

4. Risk-managers: the lottery organizers

In this part we turn from the lottery players to the lottery organizers. A first question to be addressed is the overall profitability of lotteries in the Low Countries. The accounts of city governments, churches, charity institutions, and a rare

private lottery entrepreneur can be used to determine the profits and losses to be made in lottery organization. We calculated the revenue ratio (= revenue minus costs divided by revenue) of 83 lotteries organized between 1441 and 1607.

Graph 7. Revenue ratio of lotteries over time

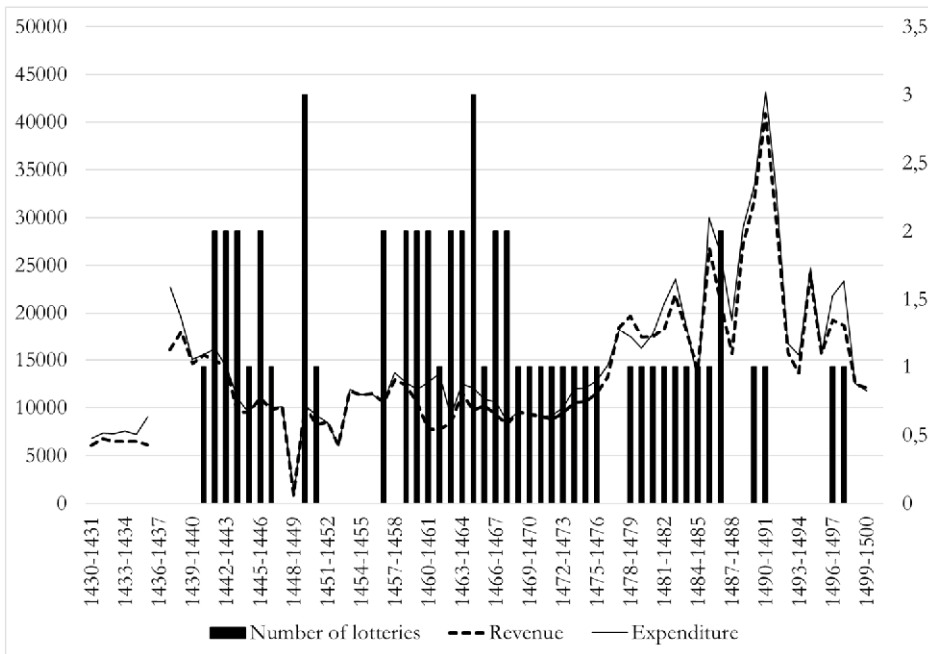


Source: author database.

The above graph visualizes several important findings. First, only one true loss was made on a lottery. The lottery of the Bruges city government in July 1468 significantly undersold, compared to the previous and later lotteries. The city tried to cut costs by spending less money on advertisement through couriers and placards in other towns in the Low Countries. This resulted in lower costs but also in substantially lower numbers of lottery tickets sold, a clear indication of the fact that lotteries sold well beyond the city walls. Bruges did not repeat that mistake: there was increased advertisement and the lottery of February 1469 delivered a handsome profit. Second, some lotteries, like that of 's-Hertogenbosch in 1564 flirt with loss. The 5% ROR of that lottery is explained by the huge investment in large pieces of silverware to serve as main prizes, a much larger cost compared to previous lotteries, and the mediocre response to this by lottery players. It is striking in this case that the city government of 's-Hertogenbosch did not reduce the number of prizes to be won. This was an option to those who had an official lottery license from the central government: if the lottery sold less than a fixed number of tickets, the lottery organizers were allowed to reduce the number of prizes a ratio of number of unsold tickets. At

several times did lottery organizers make use of this option which probably explains the rarity of realized losses in Low Countries lotteries. Third, with a median 50% and mean 53% revenue ratio, lotteries were clearly profitable. For city governments like Bruges in the second half of the fifteenth century, lotteries proved to be a valuable addition to their fiscal instruments.

Graph 8. Number of lotteries organized in Bruges and overall revenue and expenditure of the Bruges city government



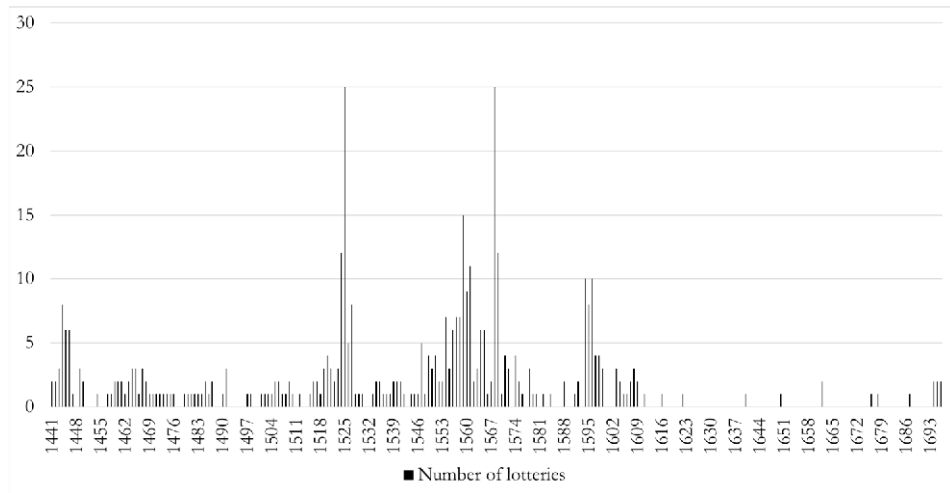
Source: Stadsarchief Brugges, Bruges city accounts, ARB, Rekenkamer, Bruges city accounts, author database.

What chronological patterns emerge out of an analysis of the Bruges lotteries? The first lottery organized in Bruges in 1441 was clearly intended to finance the large rise in expenditure (paying off the ducal fine after the 1436-1438 Bruges Revolt). Gradually, expenditure declined between 1441 and 1451 but this was obviously not only due to the revenue coming from lotteries: the lotteries held in this period contributed between 2.6 and 16% (6.2 % on average) of the city government’s annual income. There were no lotteries in Bruges between 1452 and 1456, likely due to the instability during the Ghent Revolt (1449-1453). From 1457 to 1476 the Bruges government held a lottery (or several) almost every year. On average 2.3% of the annual urban government income came from lotteries in these years. The political instability after the death of Charles the Bold may explain the short pause in lottery organization

in 1477-1478. But the steep increase in expenditure in these years quickly turned Bruges to lotteries again from 1478 onwards (1.1% of total revenue). The Flemish revolts against Maximilian of Austria of the 1480s and early 1490s similarly led to growing expenditures. There were no lotteries in years of open war (1488-1489). It was too dangerous to send out messengers and transfer money in these years. But soon after the treaty of Montil-lez-Tours (1489), Bruges started to organize lotteries; these fetched large profits which helped Bruges to face the huge increase in expenditure after the Revolt. It took some time after 1491 for the lottery market to pick up again. But when it did, it paid off handsomely for the city's coffers: 21% of city government revenue came from the 1498 lottery. So, the relative value of lotteries to the city budget could fluctuate between 1% and 21%. It goes without saying that the city aldermen will have appreciated the revenues from this undisputed and voluntary tax.

Fourth, the revenue ratio is very variable, with interesting patterns over time. Some lotteries almost approach 100%, whereas others are at less than 40%. In the first decade of lottery organisation (1440s), there is steep drop in the revenue ratio. Perhaps the first lotteries, because of their novelty, sold really well and interest of the clientele declined quite quickly. The revenue ratio is between 40 and 60% in the next three decades (1450s-1470s). The 1490s, because of the ongoing Flemish Revolt, count substantially less lotteries. However, the few lotteries that were organized at the very end of the fifteenth century did exceptionally well.

Graph 9. Number of lotteries organized in the Low Countries between 1441 and 1700



Source: author database.

427 lotteries could be traced in a plethora of archives in and about the Low Countries between 1441 and 1700. This means that every year 1.64 lotteries were organized. But this number also includes the years in which no lotteries were

organized. If we take only the years in which at least one lottery was organized, the mean rises to 2.90 lotteries. 66 years had at least one lottery, 61 years between two and five. Eighteen years counted between 6 and 15 lotteries and the years 1525 and 1568 both had 25 lotteries organized in that year. These peak years were both driven by a substantial number of private lotteries, many of them without an official license.

The frequency of lotteries being organized and their almost guaranteed profitability makes one wonder why either the central government or city governments did not install a more frequent lottery than the one-offs that they were offering. Only Bruges in the fifteenth century organized a lottery on a yearly basis but stopped doing so in the sixteenth century. Did organizers think the market was already saturated? Did they feel it would be immoral to increase the frequency? What is clear is that for such a more frequent regime, weekly or monthly, risk-lovers would have to wait for the French Royal Lottery of the eighteenth century (Stigler 2022). Lotteries, like taxation and the issuing of debt, for example with annuities, were thus usually organized ad hoc to compensate current deficits (Boone 2022).

How did lottery organizers go about estimating the expected revenue of their lotteries? This was clearly a Knightian risk: how many tickets would their lottery sell? With this number in mind they could purchase prizes and gauge the costs of their enterprise. The estimated number could be based on prior experience or the agreement they made with the central government when they lobbied for the lottery license. However, we have seen that the number of tickets offered could be reduced en cours de route, the number of prizes could be reduced or the subscription period could be prolonged (Puttevils 2017, 706-707). It appears that the number of lottery tickets issued was calculated by multiplying the ticket price by the amount of revenue needed to fund construction projects or other intended purposes, after accounting for organizational costs. In this sense, the number of tickets was based less on projected demand and more on the specific financial target that organizers aimed to reach. The goal was to raise a predetermined sum to pay for certain budget tasks or to eliminate a deficit, not to maximize revenue beyond what was necessary. Therefore, ticket quantities were driven by immediate funding needs rather than market-driven estimates of how many tickets might realistically sell.

Interesting insights in ideas about risk and uncertainty in lottery organization can be gained from a trial at the Council of Brabant (the highest court of law in the Duchy of Brabant) at the end of the 1550s and the early 1560s between Jan Tourier and Franchois Van Lare provides. The conflict concerns the transfer of a lottery license and the value of the lottery. Jan Tourier had received a lottery license and had appointed Van Lare to do the administration of the lottery, but Van Lare mismanaged the lottery after having received the license. Tourier, in one of the pleadings argues as follows: «it is untrue that all winnings from lotteries are uncertain because, even if in other lotteries which have to be finished by a certain deadline the winnings are uncertain, the lottery of the plaintiff [Tourier], is different. The plaintiff does not have to have to end the lottery by a prefixed time, he can wait until the number of lots is full. If the full number is not reached, the privilege of His Majesty allows him to diminish the prize, so that he cannot but profit from the lottery and cannot lose». Franchois Van Lare begs to differ: «it is clear and notorious that all winnings and revenue of lotteries is uncertain (onseker)» and «the revenue and winnings of lotteries

are uncertain and hazardous, there might be no sure profit or loss to come from it». Van Lare also argues that the lottery that he received from Tourier was in fact also a lottery with a fixed deadline and as such the profit was uncertain. According to Van Lare, it was also not possible to reduce the number of prizes since this was not announced in the lottery advertisement. Reducing the prizes would enrage ticketholders and scare away potential buyers. Hence, the entire discussion pivots around the issue of risk and uncertainty of profit or loss for lottery organizers, with the number of lots and the subscription period as important variables.¹⁶

Historian of science Lorraine Daston has shown that the relationship between insurance – whether marine, life, or fire – and the development of mathematical probability was far less direct than it might initially seem. Insurance professionals were surprisingly slow to integrate the insights of early probabilists into their business practices. As Daston notes, «despite the best efforts of the mathematicians, the practice of risk was almost wholly untouched by the theory» (Daston 1988, 114). «It is clear that those who ran the lotteries had little to gain from calculating exact probabilities so long as profits rolled in» (Daston 1988, 145). In the case of lotteries, this seeming gap between theory and practice is even more striking – especially considering that several key figures at the forefront of seventeenth-century probability theory, such as Johan De Witt and Christiaan Huygens, were from the Low Countries and explicitly referred to lotteries (Hacking 1975).¹⁷

Recent research, however, has shown that this supposed gap between theory and practice did not exist, contrary to what I have also been arguing in previous work. Historian of mathematics Ad Meskens has found evidence for the calculation of the expected value of a lottery in 1580, so more than seventy years before Pascal and Fermat discussed it in correspondence in 1654 and before Christiaan Huygens defined expected value formally in *De ratiociniis in ludo aleae* (1657) (Meskens 2025). Geeraerd Gramaye (c. 1515–1588), a prominent lottery organizer who was ordered by the central government to set up a major state lottery that would never actually take place, left behind a handwritten booklet dated 1580. In it, he outlined various ideas for using state lotteries to generate revenue for the princely government – while also aiming to recover the fortune he had lost following his bankruptcy, another case of the interlinkage of risk, insolvency and lotteries. Gramaye's notes demonstrate his creativity in leveraging lotteries as a tool to convert the Low Countries' significant public debt or to sell off large, confiscated church properties by lottery. Winners of such estates would also receive the added reward of immediate ennoblement.

His calculations, though dealing with large sums – millions of guilders – are straightforward: he lists the prizes, their relative values, the total number of tickets, and the ticket price. However, he never considers the possibility that not all tickets might sell – a factor that could significantly reduce profits. Nor does he calculate the minimum ticket sales required to ensure that the organizer's share would exceed the costs of running the lottery. But he does calculate the expected value of lottery participation. Gramaye calculates the potential gain when one would buy 4,000 tickets

¹⁶ Rijksarchief Brussel, Raad van Brabant, Procesdossiers Particulieren, 309.

¹⁷ The texts by Huygens and De Witt can be found at:

<https://archive.org/stream/oeuvrescompltesd14huyg#page/64/mode/2up>
& http://www.dbnl.org/tekst/witt001waer01_01/witt001waer01_01_0002.php

for a value of 12,000 guilders. He arrives at an expected value of FL. 5,386, very close to the result of the modern expected value calculation of 5,317 guilders.¹⁸ The error is irrelevant here, it is the attempt and the logics of Gramaye's calculation of the profit one would win with 4,000 tickets that is significant here: there was clearly a connection between the practice of organizing lotteries and probability mathematics. Gramaye's calculation was an early instance of this, probably too early for its potential to be fully realized. Or as historian of the Roman world Jeffrey Toner put it: «Pascal's 1654 discovery of probability represented a significant step forwards in the understanding of uncertainty. But it was a shift along a spectrum, not a sudden change from darkness to enlightenment, from total ignorance to knowledge» (Toner 2023, 5).

5. Conclusion

In the second volume (*Les jeux de l'échange*) of his monumental work *Civilisation matérielle, économie et capitalisme* the French Annales historian Fernand Braudel describes the pre-industrial capitalist sector as a « système clos », something like a bell jar (according to Braudel's English translator, a term picked up by development economist Hernando de Soto) and urges historians to gain an understanding of why it took so long for capitalism to expand and conquer the whole society. Under the bell jar, merchant capitalists and members of the pre-industrial haute finance were at work but they had little impact beyond the realm of wholesale commerce and finance. In premodern times, Braudel's bell jar could be slightly lifted up, allowing the jinn of capitalism to escape to enthral the world outside the jar. With this paper, I have argued that the lotteries organized in the Low Countries from 1441 onwards did exactly that: they lifted Braudel's bell-jar, attracting lottery players from all social backgrounds into a capitalist system. Whereas banks, annuities, bonds, bills of exchange – often put forward as modern financial instruments – were mostly used by the richer and mercantile layers of society, lotteries, because of the relatively low ticket prices, enticed a socially much more widespread clientele.

Various documents on the lottery phenomenon show that both lottery players and organizers saw the lottery as a form of risk, they «adventured» on it. Some players invested large sums of money and co-operated with one another in syndicates to share their risks. The lottery poems and references in various documents also point out that the players were not irrational fools, an accusation launched at lottery players already in the early modern period and down to today. They were realistic and clearly aware that the chances of winning were slim. If their ticket didn't bring them a prize, at least it contributed to a good purpose, as many said. The lottery organizers risked losing a lot of funds if their lottery did not attract enough revenue to cover its costs. Whereas this conference deals with risk mitigation, lotteries were about the domestication and popularisation of risk, to channel funds from risk-loving lottery ticket buyers towards the coffers of the lottery organizers, whether they be governments, churches, or private entrepreneurs.

Several historians see in the earliest lotteries the seeds of an emerging capitalist

¹⁸ The modern calculation: the sum of the expected values of the different prizes in the lottery, which are the probabilities that one wins one of these prizes.

society (Muchembled 1994). That seems evident: the lottery fits well within the bourgeois, materialistic culture that was developing in the wealthy trading cities. However, the creation of the lottery was far from marking the definitive breakthrough of a fully capitalist economy and society in the late Middle Ages and the early modern period. What it did do, though, was commodify chance. Through the lottery, chance was transformed into an economic product with tangible value – it was given a price, both in the form of the money paid to participate and in the prizes that could be won if Fortuna happened to smile upon someone. As an economic practice, the lottery was therefore one of the commodification processes that laid the foundation for the capitalist economy we know today.

Because of their public nature and the tolerant attitude of the government towards lotteries, lotteries had the capacity to draw far wider and larger social groups into Braudel's bell jar. Recent work by Nicholas Scott Baker on betting on the next pope in sixteenth-century Rome has shown how Italian merchant-bankers combined this business with other banking operations, of the kind that we clearly recognize today. Baker argues that this shows «the diversity and variability of commercial capitalism in the premodern world. It highlights the complexity of the economic culture of the period and argues strongly against simplistic notions of linear progression toward a single form of modern capitalism» (Baker 2024). However, such betting was limited to a much smaller number of people than the large numbers of those who participated in the lottery market of the Low Countries. Hence, the lotteries of the Low Countries as a particular culture of risk were a significant part of the history of capitalism.

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