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War, Taxes, and Borders: How Beer Created Belgium

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Abstract. The present-day border between Belgium and the Netherlands traces back to the separation of the Low Countries after the Dutch Revolt (1566-1648) against Spanish rule. The capacity to finance war expenditures played a central role in the outcome of this conflict. Excise taxes on beer consumption were the single largest income source in Holland, the leading province of the Dutch Republic. Beer taxes thus played a crucial role in financing the Dutch Revolt which led to the separation of the Low Countries and, eventually, the creation of Belgium.

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1. Introduction

Around the world, Belgium is famous for its beers and its brewing tradition. According to one estimate, the small country has 178 breweries producing some 1100 beer varieties, many of which have a long history (Deweert, 2011; Persyn et al., 2011). Moreover, in the rapidly growing craft beer industry, “Belgian-style” beers are a particularly popular variety.

In this paper we argue that Belgium’s borders, and arguably even the origin of the country itself, were determined by beer. However, somewhat paradoxically, it was not “Belgian beer” which played an important role, but rather beer consumed by what is now its northern neighbor, the Netherlands. The fiscal revenues from beer taxes gave this region the military power to break away from the Spanish-occupied Low Countries in the course of the Dutch Revolt (ca. 1568-1648), leaving the territory of present-day Belgium behind as the remainder of the Spanish Low Countries.¹ The border established by this separation today still forms the division between Belgium and the Netherlands.

More specifically, the present-day border between Belgium and the Netherlands traces back to the border established by the Treaty of Münster (1648), ending the Dutch Revolt, in which the Spanish accepted the independence of the Netherlands. The border established by this treaty did not coincide with any pre-existing geographical, cultural or institutional dividing line. Instead, the border reflected the military positions of the Dutch and the Spanish forces at the end of the Dutch Revolt.

¹The term “Low Countries” refers to the territory occupied by present-day Belgium and the Netherlands. To avoid confusion, throughout this paper we use the term “Netherlands” only to describe the territory presently occupied by this country. Thus, whenever we refer to Spanish-occupied territory in the Low Countries we will use the term “Spanish Low Countries” instead of the more common term “Spanish Netherlands”.

The outcome of this Revolt was unusual, in that a small rebellious region eventually prevailed over the mighty Spanish Empire. The explanation for this remarkable outcome lies in a combination of developments in war technology and the extraordinary capacity of the Dutch to finance the war. Because of technological developments and innovations in strategy and tactics, warfare during the Dutch Revolt was an increasingly capital-intensive undertaking. The capacity to finance war expenditures therefore became of paramount importance. The Spanish army in the Low Countries was constantly short on funds, which led to frequent payment arrears among its troops. As a result, demoralization, desertion and mutinies undermined the Spanish position. The Dutch, on the other hand, could count on a superior system of public finance to finance war expenditures. As we document in this paper, a substantial part of the Dutch taxation system consisted of taxes on beer. In fact, the excise tax on beer was the single largest component of government revenues in Holland, the leading province in the Dutch Republic. Hence, beer taxes played a crucial role in financing the Dutch Revolt, and thus in the separation of the Low Countries and the determination of the present-day border between Belgium and the Netherlands.

To the best of our knowledge, we are the first to make this argument. We draw upon important contributions by Fritschy (2002) and Liesker and Fritschy (2004) who document the composition of government finances in Holland during the Revolt, and by Unger (2001, 2004) and Yntema (1992, 1994) on the history of beer and beer taxes in the Low Countries. Our argument is related to the analysis of John Nye (2007, 2011) on how beer taxes and wine tariffs were crucial for the development of the British empire. He shows how during the Anglo-French wars at the end of the seventeenth century the British imposed high tariffs on French wine, thereby stimulating the rise of a domestic brewing industry. By encouraging oligopoly, government regulations created rents in the industry, which it could subsequently tax. The beer

taxes contributed strongly to an increase in tax revenues which the British state used to finance its imperial expansion and which eventually made Britain the dominant military power in the world.

The paper is organized as follows. The next section presents a brief history of the Dutch Revolt and explains how the borders between present-day Belgium and the Netherlands were determined during the Dutch Revolt. The second and third section document the paramount importance of war finance in determining the outcome of military conquests during the Dutch Revolt. The fourth section discusses the Dutch system of public finance and documents the importance of beer excises in Holland. The fifth section then turns to an explanation of the importance of beer in financing the Revolt. The final section concludes.

2. The Origins of Belgium and its Northern Border

Today's border between Belgium and the Netherlands has its roots in the Treaty of Münster (1648), ending a remarkable revolt which had started eighty years earlier. In the late sixteenth century, the Low Countries were part of the Spanish Empire under Philip II (Map 1). As ruler of an empire 'on which the sun never set', Philip tried to centralize the administration of his empire in Madrid. Moreover, as a fervent catholic, Philip considered it his mission to suppress heresy throughout Europe. Both factors led to unrest in the Low Countries.² Philip's attempts at centralization threatened important privileges of the nobility and the towns. At the same time, his hostility to the growing Protestant faith troubled the cities of the Low Countries where the new religious ideas of the 16th century had found fertile ground. Spanish attempts to violate traditional privileges in order to increase taxes, together with their harsh repression of

² Classic accounts of the Dutch Revolt are Parker (1977) and Israel (1995).

Protestantism, sparked a series of upheavals which culminated in a declaration of independence by several northern provinces in 1581, uniting themselves in the Dutch Republic.

The Dutch fight for independence against the Spanish lasted for eighty years, making it one of the longest revolts in European history.³ During this struggle, the border between the Dutch Republic and the Spanish-occupied parts of the Low Countries moved regularly, as large territories changed hands several times. The Treaty of Münster (1648) put an end to the Dutch Revolt. It cemented the military positions at the time of the Treaty into the official borders between the Dutch Republic and the Spanish Empire, thus separating the northern Low Countries (the Dutch Republic) from the southern Low Countries (Map 2). The borders of 1648 still divide present-day Belgium and the Netherlands (Map 3).

Initially, this border was largely artificial, in the sense that it was determined by military conquests and had little to do with pre-existing geographical or cultural differences or administrative borders. The border between the Spanish Low Countries and the Dutch Republic did not coincide with any major river or other natural defenses. On both sides of the border, Dutch dialects were spoken, and both sides of the border initially held large numbers of both Catholics and Protestants – in fact, Protestantism had originally been at least as important in the South as in the North.⁴ Moreover, the new border cut right through existing administrative units

³ The fighting was interrupted by the Twelve Years' Truce (1609-1621). The Dutch Revolt is also known as the Eighty Years' War, taking as a starting point the Battle of Heiligerlee in 1568. However, this choice of starting point is mostly inspired by the fact that it leads to exactly eighty years of conflict. Various other events could equally be chosen as the starting point of the Revolt, such as the Iconoclastic Fury of 1566 or the capture of the town of Den Briel by the rebels in 1572.

⁴ During the Iconoclastic Fury of 1566, for instance, iconoclasm – the destruction of religious images, symbols and statues – was most widespread in the south of Flanders and around Antwerp, from which it then spread to towns in the north (see the map in Parker, 1977).

and provinces. For example, the province of Brabant was split up, with a northern part being occupied by the Dutch while the southern part of the province remained under Spanish control (Van Ham, 1996). Similarly, the Dutch controlled the north of Flanders which allowed them to block Antwerp's access to the sea. In both cases, the provincial capital, which contained the seat of the provincial government, remained in Spanish hands.⁵

After 1648 however, the border itself created important cultural and institutional differences between the regions. While the Low Countries as a whole had prospered strongly in the sixteenth century and had been among the world's wealthiest and most powerful regions, the fates of North and South diverged strongly after the Treaty of Münster. The Dutch Republic witnessed a cultural and economic Golden Age in the 17th century and became a colonial power. In contrast, the southern Low Countries became 'an economic backwater' (Parker, 1975). For instance, while Antwerp had been one of the most important ports in Europe during the 16th century, the blockade of its port during the Dutch Revolt had completely undermined its position and shifted trade to Amsterdam, which took over Antwerp's leading position. Many artists, skilled workers and intellectuals migrated north, leading to a "brain drain" from the southern to the northern Low Countries. Hence, while the Dutch Republic grew and became one of the most powerful nations in the world, the southern Low Countries declined in politics, economics and

⁵ This created an interesting political situation. The Dutch Republic was essentially a union of autonomous provinces, represented in national politics by delegates from the traditional provincial governments. However, since the Dutch-occupied parts of Brabant and Flanders were cut off from their provincial government, they could not send any delegates. As a result, these regions were put directly under the control of the federal government as 'Staats-Brabant' and 'Staats-Vlaanderen', which meant they had the status of a colony of the Dutch Republic. Such areas were called 'Generality Lands' since they were governed by the States-General (the federal government). This category also included overseas areas controlled by the Dutch Republic, such as Staten Island in New York, New Zealand (initially called 'Staten Landt' by its discoverer, Abel Tasman) and Isla de los Estados (a literal translation of the Dutch name 'Stateneiland') off the coast of Argentina.

culture. These differences were reinforced by diverging evolutions in the religious composition of the two regions. Many Protestants left the south for the Dutch Republic, with the result that the north became mainly Protestant, while the south became Catholic. In short, although the 1648 borders were initially rather arbitrary, by the early 19th century they had led to significant economic, political and cultural differences between the northern and southern Low Countries.

These differences later on played a crucial role in the creation of Belgium and its northern borders. Following the French revolutionary wars and Napoleon's imperialism, both the Dutch Republic and the southern Low Countries became part of the French empire. After Napoleon's defeat, the Congress of Vienna (1815) reunited both regions in the United Kingdom of the Netherlands, as a buffer against further French aggression. However, the two regions had gone through radically different developments since their separation during the Dutch Revolt. This resulted in the break-up of the United Kingdom of the Netherlands in 1830, with the borders between the Netherlands and the newly formed Kingdom of Belgium coinciding with those established between the Dutch Republic and the Spanish Low Countries more than 180 years earlier. Thus, the Dutch Revolt not only led to the separation of the Low Countries, but the dividing line of 1648 today still forms the border between Belgium and the Netherlands.

3. The Costs of the Revolt and its Unlikely Outcome

The Unlikely Outcome of the Dutch Revolt

The Spanish concessions obtained in the Treaty of Münster were a remarkable achievement for the Dutch, given the disadvantageous position they had started from.

To understand how advantageous the eventual settlement was to the Dutch, consider the difference between the demands of the Dutch and the Spanish at the beginning of the conflict and the final settlement in 1648. Initially, the Dutch rebels were willing to accept Spanish rule in return for religious liberties and respect for their traditional privileges.⁶ By contrast, the Spanish aimed to reclaim the Low Countries entirely and reinstall the Catholic Church as the one true faith. Instead, the 1648 Treaty officially recognized the Dutch Republic as an independent state, with a territory that was even larger than what it had occupied during much of the Revolt. While the Spanish held control over the important city of Antwerp, the Dutch kept possession of the north of Flanders which enabled them to block Antwerp's access to the sea. Additionally, the Dutch kept their overseas possessions and their monopoly over the East Indies Trade which they had acquired during the Revolt and which were severely hurting Spanish interests. As Parker (1976a, p. 66) concluded: "After struggling for so long, Spain eventually gave in on all points."

This outcome is hard to imagine when considering the initial military situation and the length of the conflict. The Dutch Revolt was the longest uprising in modern European history, lasting roughly eighty years. It was an unequal struggle, pitting the enormous Spanish empire against a handful of provinces and towns in the Netherlands. In 1574, a few years after the start of the uprising, the resistance consisted of only about twenty towns with a total population of some 75,000 people. Amsterdam, the largest town in the northern Low Countries, was at the time still loyal to the Spanish king (Parker, 1976a). The rebels faced a Spanish Empire with a large and well-trained army and wealthy colonies in America to finance the war. Yet in the end, the Dutch Republic prevailed.

⁶ This is still evident from the Dutch national anthem, which states "the King of Spain, I have always honored".

The explanation for this remarkable outcome can be found in the changing nature of warfare during this period in European history and its financial implications. As a result of technological and organizational innovations known as the “military revolution”, warfare had become increasingly capital intensive in the years leading up to the Revolt. The rebels dragged Spain into a long and costly war of attrition in which the financial capacities of the combatants eventually determined the outcome of the struggle. Although Spain had a mighty empire and rich colonies, the Dutch developed a highly efficient system of public finance, which in the end allowed them to outlast the Spanish.

The sixteenth-century “Military Revolution” and its implications

In the century leading up to the Dutch Revolt, the costs of fighting a war had increased tremendously due to changes in the scale and nature of warfare. This “military revolution” had several aspects (Parker, 1976b). One factor was the increasing professionalization of armies. Whereas earlier battles had been fought with armies raised for the occasion, rulers turned to maintaining well-trained and permanent armies, organized into units with standardized weapons (and sometimes uniforms). In addition, there were changes in tactics and strategy, as armies started using more complex arrangements of troops.

Yet, the most important factor was the consequence of technological and architectural innovations. Somewhat paradoxically, technological progress in artillery made it more difficult to swiftly conquer towns. Improved cannons made it relatively easy to break medieval fortifications which typically consisted of walls that were high but relatively thin. In response, military architects designed new fortifications which could withstand artillery attacks and made it much more difficult to conquer a town by force. Whereas in the past towns could be captured

by assault, aggressors now had to encircle the town and starve it into submission. This move from quick assaults to lengthy sieges increased the size of the army needed for a successful attack: the size of armed forces in major European states increased tenfold between 1530 and 1710 (Parker, 1976b). In summary, permanent armies, extensive training, standardized weaponry, new fortifications, and a larger number of soldiers fighting lengthier battles caused an increase in military expenditures. This had major implications for the public finance systems of the states involved in warfare.

These evolutions towards more professionalization, new fortifications, lengthier sieges – and thus higher military expenditures – were all clearly at work during the Dutch Revolt. The Spanish army was highly professional and had a complex training scheme, whereby new recruits were not immediately sent to the frontline but spent up to two years in Italy or Northern Africa to learn combat discipline (Parker, 1976b). Likewise, the rebels relied on a professional mercenary army led by prince Maurice of Nassau. Both the Dutch and the Spanish invested heavily in improving the fortifications of their towns.⁷ This forced aggressors into protracted sieges throughout the Revolt. The Spanish conquest of Haarlem in 1573 required seven months of siege. It took the Spanish fourteen months to capture Antwerp in 1585, eleven months to capture Breda in 1625, and three years and three months to capture Ostend in 1604. Despite repeated attempts in 1588, 1605 and 1622 the Spanish never managed to capture the town of Bergen-op-Zoom.

⁷ As noted by Parker (1975), a comparison of maps of Dutch towns in the 1550s with maps made a century later clearly reveals these changes.

Such campaigns were costly to the Spanish. Already in 1574, still in the early years of the Revolt, and after the long siege of Mons (1572 - six months), the siege of Haarlem (1573 - seven months), and the failed attempt to capture Leiden (1573-1574 - one year of siege), the Spanish commander Requesens wrote that *“there would not be time or money enough in the world to reduce by force the 24 towns which have rebelled in Holland, if we are to spend as long in reducing each one of them as we have taken over similar ones so far”* (cited in Parker, 1976a, p. 57).

4. Spanish Financing of the War

Requesens’ predictions proved to be correct. Parker (1975) documents the “debilitating haemorrhage” of the Spanish treasury and the “virtual destruction” of the Spanish economy as a result of taxes to finance the war in the Low Countries. According to Drelichman and Voth (2010) who reconstructed government expenditures under Philip II, military outlays were by far the largest item in the Spanish budget. Between 1566 and 1596, total budget expenditures by Philip II amounted to 408 million florins, 193 million of which were spent on the Dutch Revolt.⁸ In other words, about half of the Spanish budget was used to finance the war in the Low Countries during the reign of Philip II (1566-1596).⁹ Table 1 shows estimates by Parker (1972) of the Spanish war budget in the Low Countries for selected years. According to Parker’s

⁸ For a note on currencies, see the Appendix. For comparability, we have chosen to report all amounts in florins. Drelichman and Voth (2010) report the totals for this period in ducats. The average exchange rate for this period is about 2.5 florins to the ducat.

⁹ This estimate does not even take into account the costs of outfitting the Armada, the “invincible” fleet sent against England in 1588. Although directed against England, the military reason for this operation was that England had been providing support to the Dutch rebels. In this perspective, the Armada should be considered as part of the Spanish attempts to suppress the rebellion in the Low Countries. The costs of the Armada were large: at 28 million florins, outfitting the fleet had cost the equivalent of two years of Spanish tax revenues (Drelichman and Voth, 2010).

calculations, between 1566 and 1648, the Spanish army in the Low Countries received at least 642 million florins from the crown, or on average 7.7 million florins per year.

To put this amount in perspective, compare these amounts with the revenues Spain obtained from silver and gold mined in the New World. After the discovery of important silver mines in its American colonies, a steady flow of silver found its way to Europe starting from the 1540s. The Spanish government allowed private entrepreneurs to mine the silver, but levied a 20% flat tax, which rapidly became an important source of revenue. By 1596, one fourth of the Spanish government budget was financed with silver taxes (Drelichman and Voth, 2010). Over the 1566-1648 period, the tax revenues from the massive inflow of gold and silver from Spain's colonies in America were about 374 million florins (4.7 million florins per year). Hence, the cost of maintaining the Spanish troops in the Low Countries was more than 70% higher than revenues from the gold and silver inflows from the colonies.¹⁰

Since the silver inflows from America were not sufficient, the Spanish empire repeatedly increased taxes in its heartland, the kingdom of Castile, in order to finance the war.¹¹ Between 1591 and 1631, the per capita tax burden in Castile doubled.¹² But even these efforts to increase tax revenues could not close the gap between expenditures and revenues. As a result, the Spanish

¹⁰ Data on revenues of the Spanish army, 1566-1648, are taken from Parker (1972) using his conversions into florins. Data on Spanish silver inflows, 1571-1650, are taken from the European State Finance Database (<http://esfdb.websites.bta.com/Database.aspx>) using data provided by Gelabert (1999). The numbers from the ESFD have been converted into florins using the procedure outlined in the Appendix.

¹¹ Although Philip II was king of Castile and of Aragon (the two kingdoms forming Spain), Castile was by far the dominant kingdom, accounting for more than 80% of the population (Drelichman and Voth, 2010). Hence, we follow Drelichman and Voth (2010) in focusing on Castile rather than Spain as a whole.

¹² Data from the European State Finance Database indicates that the per capita fiscal burden increased from around 3400 florins in 1591 to 7000 florins in 1631.

government debt grew. Between Philip II's accession in 1557 and his death in 1598, the Spanish national debt grew from 36 million ducats to 85 million ducats. It kept growing during the rest of the conflict. By 1623, debt had increased to 112 million ducats, and it would increase further to 180 million ducats in 1667 (Parker, 1975).¹³

Not all of this increase can be ascribed to the Dutch Revolt since Spain was involved in several military campaigns throughout the period. However, the Dutch Revolt was the largest item on the Spanish budget, and increases in government debt correspond closely with the periods of greatest war expenditures in the Low Countries (Parker, 1975; Drelichman and Voth, 2010). The Dutch Revolt was such a large and permanent drain on the Spanish treasury that it inspired the Spanish expression *poner una pica in Flandes* ("to put a pike in Flanders"), which refers to starting a very costly and difficult undertaking.¹⁴

Because of their difficulties in financing the war, the Spanish often built up large wage arrears. Throughout the Revolt, wage payments to the Spanish troops in the Low Countries were problematic. Troops often went unpaid for several months or even years (Parker, 1972). As a result, the Spanish army was plagued by widespread desertion and frequently paralyzed by mutinies which undermined its military strength in the Low Countries. Mutinies "became almost

¹³ We report these numbers in the original currency to allow easier comparison over time; converting into florins would obscure the evolution because of the changing exchange rate between the ducat and the florin. The ducat was worth around two florins in 1557, three in 1598, four in 1623 and three and a half in 1667 (cfr. the Appendix).

¹⁴ Given these extraordinary costs, one may wonder why the Spanish insisted on continuing their campaign against the rebels. It is clear that Spain was not willing to strike a compromise. While the Dutch would have been willing to return to Spanish rule on condition of religious liberty and a restoration of ancient privileges, the Spanish crown would not make any concessions concerning the exclusive position of the Catholic Church or the sovereignty of the king. The Spanish intransigency is probably due to their concern that surrender in the Low Countries would inspire rebellion and heresy in other parts of the Spanish Empire. By showing themselves willing to fight to the utmost, the Spanish hoped to maintain a reputation which would deter such uprisings in the future (Parker, 1976a).

an institution of military life” (Parker 1976b, p. 212). The army witnessed at least 46 major mutinies between 1570 and 1607, or on average more than one mutiny per year during this period. These mutinies were well-organized, with soldiers electing their representatives to negotiate with the army leadership to make payments to the mutineers.¹⁵

Mutinies had disastrous effects. One striking example concerns the siege of Zierikzee (1576) which was captured by the Spanish after nine months. However, after conquering the town, the soldiers discovered that the army could not pay the wages. A mutiny broke out and the Spanish soldiers left the city. Likewise, Parker (1976a) argues that the failure of the Spanish to capture Alkmaar (1573) and Leiden (1574) was due to mutinies. In addition to abandoning their positions, mutineers could also turn to undisciplined looting. In 1576, Spanish mutineers made a surprise attack on Antwerp and pillaged the town, killing 8,000 civilians in what became known as the “Spanish Fury”, an event that destroyed what little was left of Philip's authority in the Low Countries. Mutinies also sabotaged major Spanish offensives in 1589, 1593 and 1600. A major mutiny in Diest (1607) undermined the Spanish bargaining position during the negotiations of the Twelve Years' Truce. In some cases, mutinous Spanish garrisons even sold their forts to the Dutch (Parker, 1973).

¹⁵ The average mutiny lasted 189 days, involved 1350 men, and cost the Spanish treasury 241 florins per mutineer in settlement. This was a large sum, considering that the daily wage of a soldier in 1568 was approximately 0.2 florins. This may indicate that wage arrears were large and/or that the army leadership could only end mutinies by paying large bonuses to the mutineers. These numbers have been calculated using the data provided by Parker (1972, Appendix J). The numbers give the median values for the three categories. For the daily wage of a soldier, see Parker (1977, p. 110), who gives the daily wage as 3 or 4 ‘stuivers’ (one florin was 20 stuivers).

5. War Finance in the Dutch Republic

On the Dutch side, as on the Spanish, the costs of war were large. Annual war expenditures increased from 2.9 million florins in 1586 to 8.2 million florins in 1600. Even during the Twelve Years' Truce (1609-1621) the war budget was between 7 and 9 million florins. Once fighting resumed, expenditures doubled to around 18 million florins annually until the end of the Revolt in 1648. As shown in Figure 1, war expenditures as a percentage of GDP increased from 4.5% of GDP in 1586 to around 8% in 1600. Even during the Twelve Years' Truce, Dutch war expenditure was around 6% of GDP. Afterwards the financial burden of the war increased further to a peak of almost 12% of GDP in 1630, decreasing toward 7% at the end of the Revolt.¹⁶

As the comparison of war expenditures for Spain and the Dutch Republic in Figure 2 shows, Dutch expenditures were considerably below Spanish expenditures during the first decades of the Revolt. The rebels had trouble financing the war during this early stage. In fact, William of Orange's initial rebellion against the Spanish in 1568 failed because he was unable to pay his soldiers and "the revolt ran out of money before it had really started" (Fritschy, 2002). For some time, revenues came from a haphazard combination of piracy, support from foreign powers, confiscations of church property, debasements of the currency, and advances from army

¹⁶ GDP numbers were calculated by taking the GDP estimates for Holland from Van Leeuwen and Luiten van Zanden (2011) and assuming Holland accounted for 60% of Dutch GDP. Alternative assumptions about the importance of Holland do not lead to drastic changes in these estimates of the burden of war. Assuming Holland accounted for only 50% of Dutch GDP, the burden of war was around 4% in 1586; assuming Holland's share in Dutch GDP was 80% gives a figure of 6%. We do not present similar calculations for Spain, since estimates of Spanish GDP or fiscal pressure are notoriously unreliable, with GDP estimates often varying by a factor of two or more (Alvarez-Nogal & Prados de la Escosura, 2007).

leaders. This system was unsatisfactory, and the rebels searched for a more systematic way of financing the war.

By developing an efficient system of taxation, the Dutch managed to increase their war budgets by 8.3 percent per year between 1586 and 1600 – one of the highest growth rates of war expenditures of all states in early modern Europe (‘t Hart, 2005). As a result, after 1600, Dutch expenditures were considerably larger than the Spanish – almost double from the 1630s onwards.¹⁷ Soldiers in the Dutch army were employed the year round and received a regularly paid wage, which played a major role in keeping up morale. As a result, the Dutch army suffered markedly less from mutinies (Parker, 1976b). This gave the rebels an important military advantage. With their troops regularly paid, the Dutch could “wait for the predictable spells of Spanish exhaustion” (Feld 1975, p. 437). As noted by Parker (1976b, p. 212), “It was the Dutch who first perfected techniques of war finance capable of sustaining an enormous army almost indefinitely”.

The province of Holland, in particular, managed to increase its tax revenues dramatically in order to finance the Revolt.¹⁸ Institutional reforms in the 1540s had given the province of Holland the possibility to raise province-wide taxes, as opposed to the system of fiscal autonomy

¹⁷ The figures for Spanish war expenditures may understate the true amount, since these numbers only give the amounts transferred from Spain to the army in the Low Countries and do not include money raised in the Low Countries. However, Parker (1972) notes that transfers from Spain were the most important revenue source for the Spanish army, accounting for some 80% of expenditures. Even if we assume Spanish expenditures were 25% higher than the amounts shown here, it would still be the case that Dutch war expenditures considerably exceeded the Spanish budgets in the last three decades of the Revolt.

¹⁸ The literature on the public finances of the Dutch Revolt focuses almost exclusively on Holland, since this province was the wealthiest, most populous and most powerful of the seven Dutch provinces. As a result, in the quota system that was used to finance the central government’s war budget, around 60% of the expenditures were assigned to Holland. We follow the literature in concentrating on Holland.

of towns that existed before (De Vries and Van der Woude, 1997). Having a provincial tax administration made it possible to quickly introduce new taxes when war expenditures required an extra effort. As the Revolt continued, the province would repeatedly use this power to increase taxes. In this way, Holland secured a steady source of tax revenues which in turn enabled access to capital markets at relatively low interest rates.

A key feature of taxation in Holland was its reliance on excise taxes. Recent research on the composition of government finances in Holland allows us to estimate the importance of excises in total revenues. Figure 3 replicates the reconstruction by Fritschy (2002) of Holland's sources of funding between 1572 and 1648. During this period, Holland accounted for around 60% of total tax revenues of the Dutch Republic. This figure makes clear that credit, often cited as a major reason for Dutch success, only became important after 1620. Before that date, Holland financed the war overwhelmingly through taxes, mostly a real estate tax and, more importantly, the provincial excise taxes known as the 'common means'. Both were levied for the first time in Holland following the tax reforms of the 1540s. The excise taxes were clearly the most important source of revenues. Over the entire period (1572-1648), the 'common means' made up more than half of total provincial revenues in Holland. Moreover, the real estate tax does not show any strong growth in revenues over time; almost the entire growth in tax revenue is due to the 'common means'. Excise taxes accounted for the bulk of government revenues in the province of Holland, a fact which surprised many contemporary observers ('t Hart, 2005).

6. The Share of Beer Taxes

Analyzing tax revenues in more detail shows the importance of beer taxes for financing the Dutch Revolt. By 1572, some 30% of total provincial tax revenues came from the excise on beer

(Tracy, 2008).¹⁹ However, the revenues were insufficient to finance the war effort. In 1573, Holland doubled the tax on beer and wine while suspending all other excises, but the demands of war kept outpacing revenues. The town deputies who made up the representative assembly of Holland then took a drastic step. In 1574 they decided that cities would only be entitled to keep one-third of their urban beer and wine excises, the main source of revenues for the towns. The remaining two-thirds were taken by the province, which added the money to the revenues from its own provincial beer and wine excises. This was an unprecedented appropriation of city revenues by the provincial government and one that was not universally accepted: the towns in North Holland insisted on keeping half of their excise revenue. This demand was granted to them, provided they used the money for fortifications (Tracy, 2008).

The available evidence indicates that beer excise taxes were the single most important element of provincial excise taxes. Liesker and Fritschy (2004) estimate that in 1575 the beer and wine excise jointly accounted for 44% of excise tax revenues. Assuming beer accounted for three quarters, this puts the contribution of the beer excise in total excise tax revenues at 33% in 1575. In 1590 the taxes on beer amounted to some 490.000 florins on estimated total excise revenues of 1.8 million florins, or 28%. In 1608, at the eve of the Twelve Years' Truce, taxes on beer accounted for 1.5 million florins on total excise revenues of 4.3 million florins, or 35% (Liesker and Fritschy, 2004). Similarly, using data on the southern part of Holland in 1650 (shortly after

¹⁹ Tracy (2008) gives a number of 40% for the combined share of wine and beer. Given wine's status as a luxury good and beer's widespread consumption, it appears realistic that beer accounts for three-quarters of this. Van Uytven (1990) notes that the importance of wine in towns' tax revenues declined rapidly from the fourteenth century onwards. Although he does not offer data for towns in Holland, his numbers show that the share of beer in the combined revenues from beer and wine was 70% in Bruges in 1532, more than 70% in Antwerp in 1560 and more than 80% in Leuven in 1569. Assuming this ratio was 75% in Holland, this would imply that in the 1570s, 30% of total provincial tax revenues came from the excise on beer alone.

the end of the Revolt), 't Hart (1990) shows beer taxes brought in almost 30% of revenues in the 'common means'. Hence, the beer excise seems to have accounted for about one third of total excise revenues across Holland, a proportion which was remarkably stable throughout the Revolt (Table 2).

Combining this information on the relative share of beer in total excises with data on the importance of the excises in total revenues allows us to calculate the net contribution of beer taxes to provincial finances in Holland. Over the entire period of the Dutch Revolt, the excise taxes accounted for 56% of revenues (see Table 3). The share was usually above 50% and in some years even reached 70%. Between 1572 and 1620, excise taxes accounted for 64% of revenues; between 1621 and 1648, when Holland increasingly used loans to finance expenditure, this share decreased to 52%.

Over the course of the Dutch Revolt, beer excises thus probably accounted for 16% to 24% of total revenues in Holland. Not only was beer the single largest component of the provincial excises, the share of beer in total revenues also seems to have been at least as great as that of the real estate tax (which accounts for 18% of total revenues during the Revolt). Hence, beer taxes were the single largest revenue source of the province of Holland during the Revolt.²⁰

Moreover, while the real estate tax was important, total revenues from this tax did not increase strongly throughout the Revolt. By contrast, whenever more revenue was needed, the

²⁰ The approach adopted here (following Fritschy, 2002) counts credit as a revenue source, which is only correct from a cash flow perspective. If loans were not counted as revenue, the share of the common means in total revenues stands at 69% throughout the Revolt, and beer taxes account for 23% of "true" revenues.

tax on beer increased (see Table 4).²¹ In 1573, Holland had already doubled the excise on wine and beer (Tracy, 2008) while at the same time abolishing some less profitable excises (Liesker and Fritschy, 2004). Taxes on beer were further increased in 1576, and in 1579 a general beer tax was introduced (Unger, 2001). A series of tax reforms between 1604 and 1607 again increased the beer excise. Likewise, the tax reforms in 1622-1627 and 1636-1645 led to higher beer excises ('t Hart, 1990). Thus, the tax rate on beer increased steadily throughout the Revolt.

Table 4 presents provincial tax rates for beer sold in pubs for the years 1582, 1605 and 1655 (shortly after the end of the Revolt) as reported by Unger (2001). In 1582, the provincial tax rate on cheap beer was at least 20%, rising to more than 100% for more expensive domestic beers. Foreign beers were taxed even more.²² In 1605, the tax on cheap beer had increased to at least 30%. Beers of more than 40 *stuivers* per tun had to pay 73 *stuivers* in excises, which meant the tax rate was around 180% for beers costing over 40 *stuivers*.

On top of these taxes for beer sold in pubs, the province also levied a tax on beer in general (the *gijlimpost*), which was 2 *stuivers* per tun, at least from 1584 onwards (Unger, 2001). Moreover, apart from these provincial taxes, towns could add extra excises of their own. For instance, in 1582 towns could add an extra 8 *stuivers* to the excise on beer priced between 30 and 40 *stuivers*; this meant the tax rate in this category could already in 1582 be as high as 80%

²¹ The increase in tax revenues was partly the result of strong economic growth and a growing population (from about 350,000 in 1544 to about 760,000 in 1648), but also the per capita tax burden increased strongly during this period (Fritschy, 2002). At the start of the Revolt, the tax burden for an urban day-labourer was probably less than 5%; by 1600 this figure was probably almost 9%, and it would continue to increase to more than 12%. The tax burden for those earning a middle income showed a similar increase (Fritschy, 2002; 't Hart, 2005).

²² *Joopen*-beer was an expensive high quality beer, apparently dark, red-brown and sweet, which originated from Gdansk but was later also brewed in German towns.

(Unger 2001, pp. 145-147, 317-318). Beer was obviously an attractive source of revenue for authorities at all levels of government, and tax rates on beer reached very high levels as a result.

To appreciate the importance of taxes on beer in the context of the Spanish-Dutch conflict, it is instructive to contrast the size of the Spanish silver revenues from America with the Dutch revenues from taxes on beer. Figure 4 compares the evolution of Spanish silver tax revenue with the revenues from taxes on beer in Holland. Spanish silver revenues peaked during the last decade of the sixteenth century but remained important throughout the Dutch Revolt. Holland's beer tax revenue increased during the Revolt. We estimate that over the entire course of the war, beer taxes in Holland alone amounted to roughly one-third of the entire Spanish silver tax revenues.²³ Whereas these beer taxes only amounted to some 6% of Spanish silver tax revenues during the first decade of the Revolt, they increased to 34% during the Twelve Years' Truce (1612-1621), and to half of Spanish silver tax revenues during the 1630s. Beer taxes surpassed these silver tax revenues during the final years of the Revolt.

7. Why Beer Taxes?

As the previous section documented, beer was of crucial importance to government finances in Holland during the Dutch Revolt. Not only was the beer excise at least as important as the real estate tax (making it the single largest revenue component of the province), whenever more

²³ Even if we assume that beer taxes during the final three decades of the Revolt (1621-1648) were only half as much as our calculations suggest, it would remain true that Dutch beer amounted to 21% of Spanish silver tax revenues over the entire course of the Revolt. These calculations only take into account beer taxes in Holland. Although data on the other provinces are harder to find, beer taxes probably played an important role in some of the other provinces as well, most notably in Zeeland. Hence, the estimate presented here should be considered a lower bound.

funds were needed to finance the Revolt, beer taxes were among the first to be increased. Two factors explain this paramount importance of beer in financing the Dutch Revolt. First, in early modern times, beer played a central role in daily consumption patterns. Second, the towns of Holland had developed a very effective system of collecting the beer excise.

The role of beer in daily life during the Middle Ages and the Renaissance can hardly be exaggerated. To most people, beer was a necessity and an important part of their diets, “a beverage for all times of the day from breakfast to dinner and into the evening” (Unger, 2004, p. xiii). Most other beverages were unsafe or too expensive: water was often polluted and unhealthy, milk was perishable, tea and coffee were only introduced in later centuries, and wine was too expensive for most people (Egmond, 1999). By contrast, beer was relatively nutritious, healthy, cheap and (after the introduction of hopped beers) could be kept longer than most other beverages. As a result, beer consumption was high throughout Northern Europe.

The Low Countries in particular had a reputation for drinking vast quantities of beer (Van Deurzen, 1991). A per capita consumption of one liter per day for Dutch towns seems to be a reasonable estimate, with estimates of yearly consumption in the Netherlands ranging between 200 and 400 liters per capita (Unger, 2001, p. 90-92). This is much higher than current per capita consumption levels, which are around 80 liters per capita for the Netherlands and around 100 liters per capita for Belgium (Colen and Swinnen, 2010).²⁴

The high demand for beer explains the prominence of the brewing industry in the economy of medieval and early modern towns. In 1514, there were 148 breweries in Gouda, a city of 14,000 inhabitants. Haarlem, a city of a similar size, had 98 brewers, while Delft counted

²⁴ It should be noted, however, that beer had lower alcohol content in medieval and Renaissance times.

75 brewers on a population of 12,000 (Yntema, 1994; 't Hart, 1989). Many towns had brewers specializing in higher quality beers for export to other towns and regions. This production for export made beer into one of the pillars of the economy in Holland, comparable with the more famous textile industries (Egmond, 1999).

Not surprisingly, the success of beer drew the attention of rulers in search of tax revenues. As early as the ninth century, a widely used additive to beer called *gruit* was the subject of regulation and taxation efforts by rulers (Swinnen and Poelmans, 2011). The tax on *gruit* was eventually transformed into a general tax on beer of any type, levied by the towns. This excise on beer became the most important source of income for the towns. Table 5 shows the share of beer taxes in town income for several towns in the Low Countries in the fifteenth, sixteenth and seventeenth century. In many of the major towns, the beer excise accounted for more than 50% of total tax revenue in the fifteenth and/or sixteenth century. Beer excises accounted for up to 80% and 90% of town income in certain periods in Haarlem and Leiden (Unger, 2001). As early as the fourteenth century, cities in the Netherlands sold bonds secured specifically by this beer tax revenue. In short, “municipal finance ... floated as a cork on a great pool of beer” (De Vries and Van der Woude 1997, p. 93).

The success of the beer excise was in part due to a highly efficient system of tax enforcement (Unger 2001; 2004). During the sixteenth century, most cities in the Netherlands developed a similar system to minimize the possibility of fraud and tax evasion based on a strict separation of beer production, beer transportation and beer selling. In practically every town, only officially licensed and sworn beer porters were allowed to transport beer. No barrel of beer could leave the brewery unless there was a receipt to prove that all necessary excises had been

paid. Porters were forbidden from delivering beer unless there was a receipt, and it was their task to hand over the receipt to the buyer. Anyone who sold beer (e.g. in a tavern) needed receipts to prove that all taxes had been paid. The beer porters were *de facto* agents of the tax collector, with strict rules on their duties and rights. In Amsterdam, for instance, beer porters could not work on holidays, could not refuse work, and earned a fixed wage controlled by the town government. Moreover, porters were prohibited from selling beer themselves.

Governments were also concerned about other possibilities for tax evasion. Ship builders, for instance, could traditionally buy beer tax free. To avoid evasion, the town of Amsterdam decreed that they would have to pay the taxes first, and then ask a rebate afterwards. Another case concerns home brewing, which was in principle subject to taxation, although this was difficult to enforce in practice. In the 1580s the government of Holland, following an earlier move by the town of Amsterdam, simply outlawed home brewing in the entire province.²⁵

Hence, the success of beer taxes can be understood as the combined effect of the enormous popularity of beer on the one hand and a highly developed system for tax enforcement on the other hand. The notoriously high levels of beer consumption and the system with tax receipts and official beer porters acting as agents of the tax collector guaranteed a large and steady flow of revenues.

A final issue is why the Spanish did not use local beer taxes as well. Beer consumption was large throughout the Low Countries, and towns in the Spanish-occupied Low Countries had

²⁵ A similar approach was used to battle the problem of breweries and taverns outside town walls, which did not pay urban excises. In 1525, several towns petitioned the government of the province of Holland and offered a payment of 100,000 pounds in exchange for prohibiting all brewing in the countryside. Eventually, in 1531, the government agreed and issued a set of regulations on rural industry, including restrictions on brewing and selling beer outside towns (Unger 2001).

as much experience with taxing beer as those in the Dutch Republic. The answer probably lies in the differing institutional environments facing the Spanish government in the southern Low Countries and the provincial government of Holland. Following institutional reforms in the 1540s, the province of Holland had obtained the right to levy province-wide taxes, overruling the traditional privileges of urban autonomy in taxation. It was this provincial taxation power which made it possible to quickly raise funds through higher taxes whenever the demands of war required it.

In the Spanish Low Countries, the Spanish did not have such a degree of fiscal autonomy. Whenever the Spanish government in Brussels wanted to raise more funds, it had to engage in a long negotiation process with representatives of the different provinces and towns which insisted on their traditional privileges. Resistance to tax increases was strong and prevented the Spanish from extracting more funds locally. For example, the Duke of Alva, who had been sent by the Spanish king to restore order in the Low Countries, received the message that the cost of maintaining his troops was weighing too heavily on the Spanish treasury and that it was necessary to raise taxes in the Low Countries (Parker, 1977). Alva's subsequent attempt to impose new taxes in 1571, overruling traditional privileges, was the spark that re-ignited the Dutch Revolt. As a result, the Spanish government in Brussels never managed to extract any significant amount of revenues from the Low Countries, but had to rely on transfers from Spain throughout the Revolt (Parker, 1972). Because of these institutional obstacles, the Spanish were unable to tap into the same income sources which financed the Dutch rebels.

8. Conclusion

In the final decades of the sixteenth century, unrest in the Low Countries turned into a full-fledged revolution against Spanish rule. Initially, this Revolt seemed a hopeless case, with just a handful of towns struggling against the mightiest empire on earth. However, after eighty years of fighting, an exhausted Spanish Empire was prepared to sign the 1648 Treaty of Münster, giving the rebels independence on extremely favorable terms. The Treaty divided the Low Countries into the Dutch Republic in the north and Spanish-occupied territories in the south. This border, drawn in 1648, still separates Belgium and the Netherlands.

Instead of winning a quick victory against the rebels, Spain got dragged into one of the longest uprisings of European history. The conflict escalated into a war of attrition, with ever-increasing costs, which put an enormous pressure on the public finance systems of both Spain and the Dutch Republic. Taxes on the large silver inflows from the Spanish colonies in America only covered about half of the costs of war, and Spain constantly struggled to finance its military expenditures. As a result, Spanish soldiers went unpaid for months, and discontent and mutiny paralyzed the Spanish army in the Low Countries. The Dutch, by contrast, developed a highly efficient public finance system which allowed it to raise unprecedented amounts of tax revenue. This stable source of revenues gave the Dutch the means to finance the increasing costs of war while providing a regular pay to their soldiers.

In this paper, we have documented the contribution of beer to financing the Dutch struggle for independence from Spain. Throughout the Revolt, taxes on beer accounted for 19% of total revenues in Holland, the leading province of the Dutch Republic, making it the single largest source of revenue during the Revolt. A comparison with Spanish silver taxes

demonstrates that beer taxes in Holland alone brought in the equivalent of 31% of the Spanish silver taxes during the Revolt. During the last decade of the Revolt, these beer taxes probably brought in more revenue than the tax on silver from the Spanish colonies.

The surprisingly large contribution of beer taxes can be explained by the combination of the importance of beer in daily consumption patterns in early modern times and the efficient beer tax enforcement. Beer was the healthiest and most nutritious beverage at the time. As a result, per capita consumption levels were around one liter per day and even mid-sized towns often had a relatively large number of breweries. In addition to high consumption levels, the success of beer taxes is due to sophisticated methods used to implement the beer excise. Most towns in the Low Countries had a long history of taxing beer consumption, and had developed efficient systems to avoid evasion. In the sixteenth and seventeenth century, Dutch towns introduced a system whereby only a sworn beer porter was allowed to move beer from the brewer to the pub. Beer porters were not allowed to carry beer unless the brewer could provide the necessary receipts to prove that excises had been paid. These receipts were then handed over to the buyer, who needed to be able to demonstrate that all excise duties had been fulfilled. This system, which resembles the VAT system in use in many European countries, minimized the risk of evasion and enabled the successful collection of the tax.

The fiscal revenues from beer taxes thus played an important role in allowing the Dutch Republic to break away from Spanish rule, leaving the territory of present-day Belgium behind as the remainder of the Spanish Low Countries. The border established by this separation, although initially arbitrary, still forms the division between Belgium and the Netherlands. In this

way, beer contributed to the separation of the Low Countries, the creation of Belgium, and the present-day border between Belgium and the Netherlands.

References

- Alvarez-Nogal, C. and L. Prados de la Escosura (2007) “The decline of Spain, 1500-1850: Conjectural estimates” *European Review of Economic History* 11(3), pp. 319-366.
- Colen, L. and J. Swinnen (2011) “Beer Drinking Nations: The Determinants of Global Beer Consumption,” in: Swinnen, J. (ed.) *The Economics of Beer*, Oxford University Press.
- De Vries, J. and A. Van der Woude (1997) *The First Modern Economy: Success, Failure, and Perseverance of the Dutch Economy, 1500–1815*, Cambridge University Press, 767p.
- Deweert, H. (2011) *Alle Belgische bieren*. Stichting Kunstboek, 1216p.
- Drelichman, M. and H.-J. Voth (2010) “The Sustainable Debts of Philip II: A Reconstruction of Castile’s Fiscal Position, 1566-1596” *Journal of Economic History* 70(4), pp. 813-842
- Egmond, F. (1999) “De strijd om het dagelijks bier. Brouwerijen, groothandel in bier en economische politiek in de Noordelijke Nederlanden tijdens de zestiende eeuw” in C. Lesger and L. Noordegraaf (eds.) *Ondernemers en bestuurders. Economie en politiek in de Noordelijke Nederlanden in de late Middeleeuwen en vroegmoderne tijd*. (Amsterdam), p. 153-194.
- Feld, M.D. (1975) “Middle-Class Society and the Rise of Military Professionalism: The Dutch Army, 1589-1609” *Armed Forces and Society* 1, pp. 419-444
- Fritschy, W. (2002) “A ‘Financial Revolution’ Reconsidered: Public Finance in Holland during the Dutch Revolt, 1572-1648” *Economic History Review* 56(1), pp. 57-89
- Gelabert, J. (1999) “Castile, 1504-1808” in R.J. Bonney (ed.), *The Rise of the Fiscal State in Europe, c. 1200 – 1815*, Oxford University Press

Israel, J. (1995) *The Dutch Republic. Its Rise, Greatness and Fall, 1477-1806*, Clarendon Press, 1231p.

Liesker, R. and W. Fritschy (2004) *Gewestelijke Financiën ten tijde van de Republiek der Verenigde Nederlanden. Deel IV: Holland (1572-1668)*, Den Haag.

Martens, M. (1992) *Lodewijk van Gruuthuse: Mecenas en Europees Diplomaat, ca. 1427-1492*, Stichting Kunstboek, Brugge.

Nye, J. (2007) *War, Wine and Taxes: The Political Economy of Anglo-French Trade, 1689-1900*, Princeton University Press.

Nye, J. (2011) "Brewing Nation: War, Taxes, and the Growth of the British Beer Industry in the Eighteenth and Nineteenth Centuries," in: Swinnen, J. (ed.) *The Economics of Beer*, Oxford University Press.

Parker, G. (1972) *The Army of Flanders and the Spanish Road, 1567-1659. The Logistics of Spanish Victory and Defeat in the Low Countries' Wars*, Cambridge University Press, 309p.

Parker, G. (1973) "Mutiny and Discontent in the Spanish Army of Flanders 1572-1607" *Past and Present* 25, pp. 38-52

Parker, G. (1975) "War and Economic Change: The Economic Costs of the Dutch Revolt" in J.M. Winter (ed.) *War and Economic Development*, Cambridge University Press, pp. 49-71.

Parker, G. (1976a) "Why did the Dutch Revolt last eighty years?" *Transactions of the Royal Historical Society*, Fifth series, 26, pp. 53-72

- Parker, G. (1976b) "The 'Military Revolution', 1560-1660 – a Myth?" *Journal of Modern History* 48(2), pp. 195-214
- Parker, G. (1990 [1977]) *The Dutch Revolt* (revised edition), Penguin Books, 334p.
- Persyn, D., J. Swinnen and S. Vanormelingen (2011) "Belgian Beers: Where History Meets Globalization," in: Swinnen, J. (ed.) *The Economics of Beer*, Oxford University Press.
- Swinnen, J. and E. Poelmans (2011) "A Brief Economic History of Beer," in: Swinnen, J. (ed.) *The Economics of Beer*, Oxford University Press.
- 't Hart, M. (1989) "Cities and statemaking in the Dutch Republic, 1580-1680", *Theory and Society* 18, pp. 663-687
- 't Hart, M. (1990) "Staatsvorming, sociale relaties en oorlogsfinanciering in de Nederlandse republiek" *Tijdschrift voor Sociale Geschiedenis* 16(1), pp. 61-85
- 't Hart, M. (1993) *The making of a bourgeois state. War, politics and finance during the Dutch Revolt*, Manchester University Press.
- 't Hart, M. (2005) "De prijs van de vrijheid: de Opstand en de belastingdruk in de noordelijke Nederlanden", in: Raymond Fagel and David Onnekink (eds.), *Oorlog & Samenleving in de Nieuwe Tijd* (Maastricht, Shaker Publishing), pp. 11-28
- Tracy, J.D. (1985) "The Taxation System of the County of Holland during the Reigns of Charles V and Philip II, 1519-1566" *Economisch en Sociaal-Historisch Jaarboek* 48, pp. 71-117
- Tracy, J.D. (1990) *Holland under Habsburg Rule, 1506-1566 – The Formation of a Body Politic*, Berkeley: University of California Press,

- Tracy, J.D. (2008) *The Founding of the Dutch Republic*, Oxford University Press, 330p.
- Tracy, J.D. (2009) “Holland’s New Fiscal Regime, 1572-1576” in O. Gelderblom (ed.) *The Political Economy of the Dutch Republic*, pp. 41-54
- Unger, R. (2001) *A History of Brewing in Holland, 900-1900. Economy, Technology and the State* (Brill, Leiden-Boston-Köln), 428p.
- Unger, R. (2004) *Beer in the Middle Ages and the Renaissance*, University of Pennsylvania Press, 319p.
- Van Deurzen, A. Th. (1991) *Plain Lives in a Golden Age. Popular Culture, Religion and Society in Seventeenth-Century Holland*, Cambridge University Press.
- Van Ham, W.A. (1996) “Ontstaan door strijd. De territoria op het gebied van de tegenwoordige provincie Noord-Brabant tussen 1572 en 1795”, in J. Sanders (ed.) *Noord Brabant tijdens de Republiek der Verenigde Nederlanden, 1572-1795: Een institutionele handleiding*, Rijksarchief in Noord-Brabant & Uitgeverij Verloren, 575p.
- Van Leeuwen, B. and J.L. Van Zanden (2011) “The character of growth before ‘modern economic growth’. The GDP of Holland between 1347 and 1807”, working paper.
- Van Rhee, C.H. (1996) “Consumentenbescherming in het verleden. Prijs- en kwaliteitsbewaking van bier in vroeger dagen” in J.M. van Buren-Dee et al. (eds.), *Consument zonder grenzen. Opstellen aangeboden aan mr. M. van Delft-Baas*, Deventer, pp. 13-23.
- Van Uytven, R. (1990) “Le Vin et la Fiscalité des Villes”, in: *Les Routes de la Treille. Catalogue de l’exposition (Bruxelles, 16 Mars – 10 Juin 1990)*. Galerie CGER.

Yntema, R. (1992) *The Brewing Industry in Holland, 1300-1800: A Study in Industrial Development*, Ph.D. Dissertation, University of Chicago.

Yntema, R. (1994) “Een kapitale nering: De Brouwindustrie in Holland tussen 1500 en 1800”, in R. Kistemaker and V. Van Vilsteren (eds.), *Bier! Geschiedenis van een volksdrank*, (De Bataafsche Leeuw, Amsterdam), pp. 72-81

Appendix: Currencies

During the Dutch Revolt, the principal money of account used in the Dutch Republic was the florin (also called gulden or guilder), which consisted of 20 pattards (or stuivers). The Spanish army in the Low Countries used the gold escudo as principal coin in their bookkeeping. In his work “The Army of Flanders”, Parker (1972) converted these amounts into florins; all amounts referring to the Spanish army in the Low Countries were taken from this source using Parker’s conversions.

In order to convert other Spanish amounts into florins, we used information on the gold content of coins in Spain and the Low Countries following Drelichman and Voth (2010), who kindly provided us with the data and the procedure. For example, during the Revolt the gold content of the Spanish escudo was fixed at 3.101 grams of pure gold. Between 1609 and 1642, the escudo was valued at 440 *maravedis*, while by definition 375 *maravedis* constituted a ducat. Hence, during this period, the ducat was implicitly valued at 2.643 grams of pure gold. To compare this with the gold content of the florin, we take as a reference a gold coin used in the Low Countries at the time, e.g. the “Albertin” coin minted between 1610 and 1612. During these years the Albertin contained 2.307 grams of pure gold and was valued at 105 *deniers* of the Pond Groot Flemish. Since two *deniers* were equal to one *stuiver*, this amounts to 52.5 *stuivers*. There were 20 *stuivers* to the florin, so the florin at the time was valued as the equivalent of 0.88 grams of pure gold. Dividing the “gold equivalent” of the ducat (2.643 grams of pure gold per ducat) by the “gold equivalent” of the florin (0.88 grams of pure gold per florin), we obtain an exchange rate of 3.1 florins to the ducat. Repeating this procedure for different years gives us the florin-

ducat exchange rate during the Dutch Revolt. The following table provides the average exchange rate per decade:

Decade	Florins per Ducat
1571-1580	2.18
1581-1590	2.72
1591-1600	2.94
1601-1610	3.14
1611-1620	3.44
1621-1630	4.01
1631-1640	4.05
1641-1650	3.58

As a rule of thumb for the early decades, Parker (1976) notes that “there were two florins to the ducat, two florins also to the escudo until 1578 and thereafter two and a half or three”, which is consistent with the numbers calculated here.

Appendix: War Expenditures as a Percentage of GDP, Holland

GDP estimates for Holland are taken from Bas van Leeuwen and Jan Luiten van Zanden, “The origins of ‘modern economic growth’? Holland between 1347 and 1807”, Appendix 1, Table 2.

They report Holland GDP at current prices in florins, by decade:

1551-1560	16,202,000
1561-1570	23,276,000
1571-1580	27,783,000
1581-1590	38,435,000
1591-1600	62,563,000
1601-1610	69,013,000
1611-1620	81,242,000
1621-1630	98,743,000
1631-1640	122,927,000
1641-1650	149,004,000

To extrapolate these numbers into a GDP estimate for the entire Republic, we took Holland’s quota in the Republic’s tax system (which was around 60%) as a proxy for Holland’s share in the Republic’s GDP.

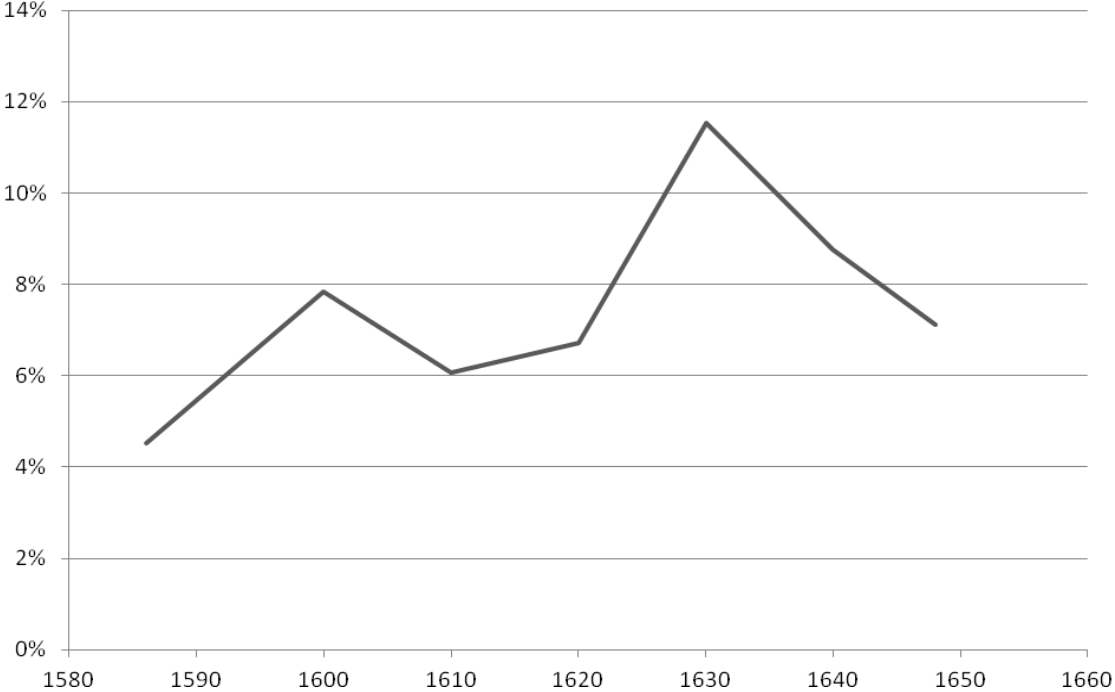
In the following table, we combined this information with data from ‘t Hart on war expenditures by the Dutch Republic for selected years. The GDP numbers are taken from the interval which included this year. For instance, the GDP number for 1586 is the GDP estimate for the years 1581-1590.

Year	Dutch War Expenditures	Dutch GDP	% of GDP
1586	2,900,000	64,186,450	4.5%
1600	8,200,000	104,480,210	7.8%
1610	7,000,000	115,251,710	6.1%
1620	9,100,000	135,674,140	6.7%
1630	19,000,000	164,900,810	11.5%
1640	18,000,000	205,288,090	8.8%
1648	17,700,000	248,836,680	7.1%

Changing the assumption about Holland’s share in the Dutch economy does not lead to drastic changes in the share of war expenditures in GDP. For instance, assuming Holland accounted for 80% of the Dutch economy, war expenditures were 6% of GDP in 1586, 15% in 1630, and 9.5% in 1648. Assuming instead that Holland accounted for only half of the Dutch economy, the corresponding numbers are 3.8% in 1586, 9.6% in 1630 and 6% in 1648.

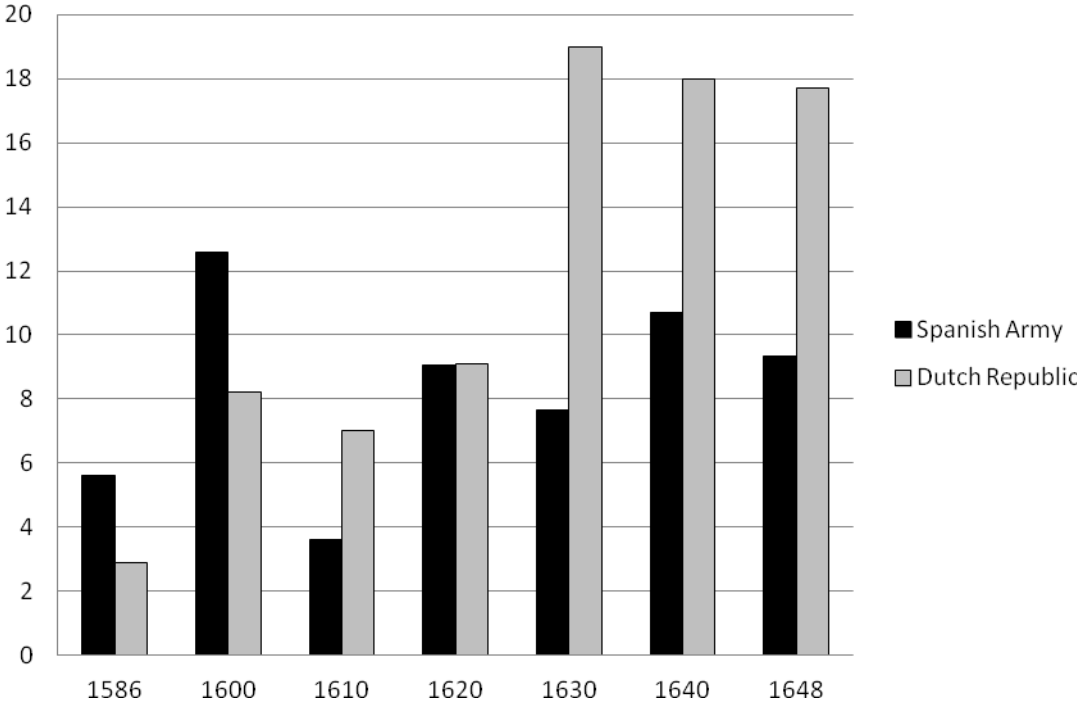
Figures

Figure 1. Costs of War as % of Dutch GDP



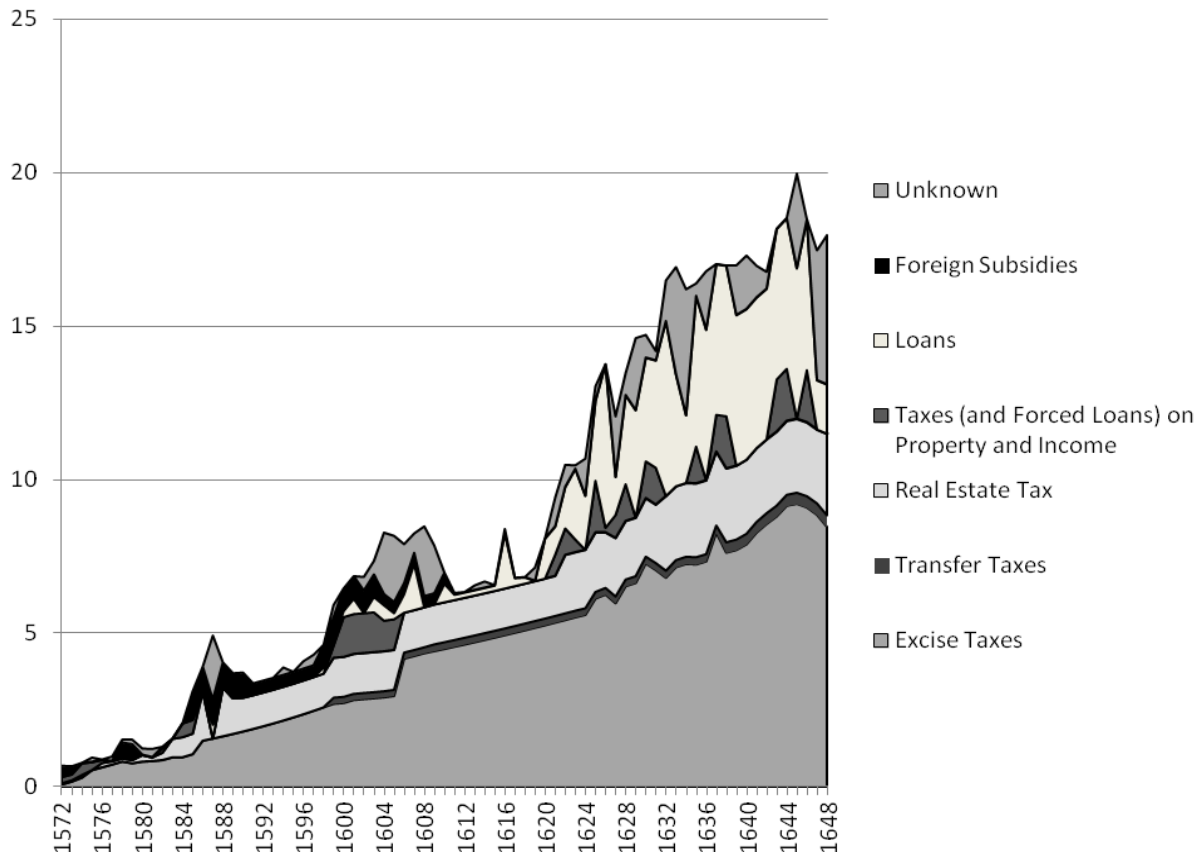
Source: see Appendix.

Figure 2. Spanish and Dutch War Expenditures, in million florins



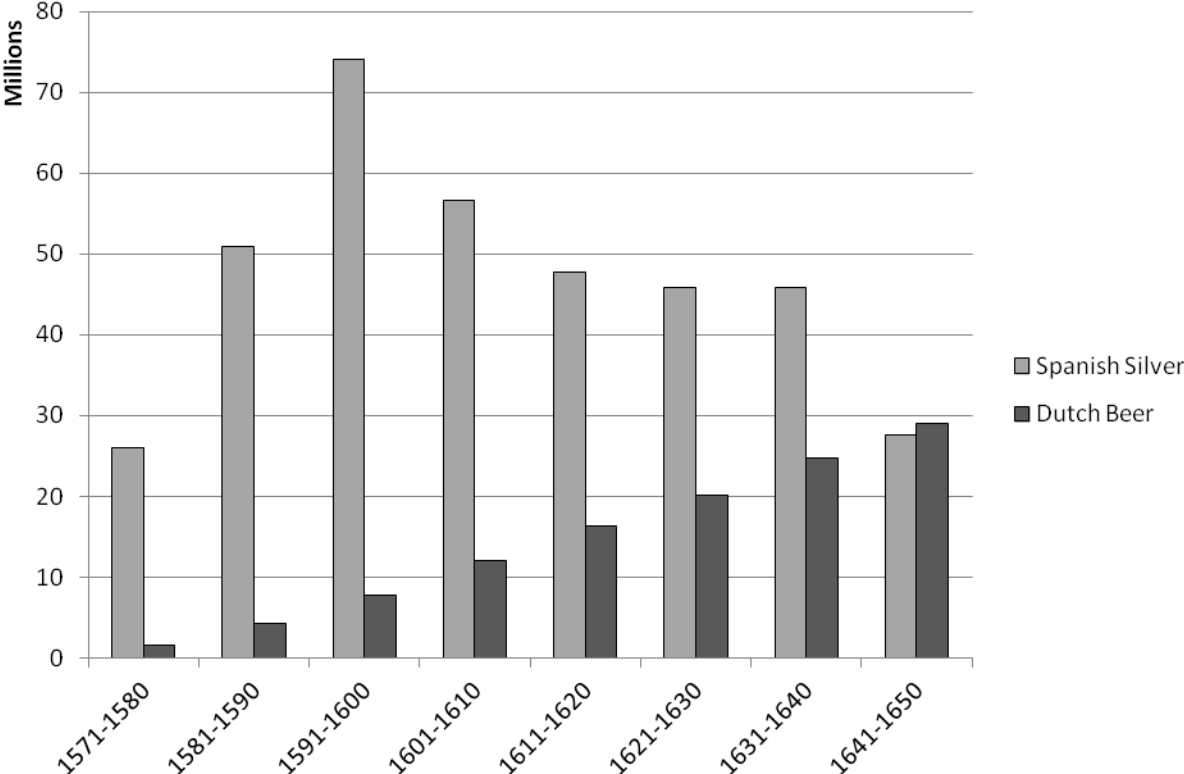
Source: see Table 1

Figure 3. Components of Revenue in Holland, in million florins



Source: Fritschy (2002), Liesker and Fritschy (2004).

Figure 4. Spanish Silver versus Dutch Beer, in million florins



Source: Data on Spanish silver from Gelabert (1999), converted into florins using the procedure outlined in the appendix. Data on Dutch beer taxes are author’s calculations based on Liesker and Fritschy (2004) and other sources mentioned in the text.

Table 1. Spanish and Dutch War Expenditures, in million florins

Year	Spanish Army	Dutch Republic
1586	5.6	2.9
1600	12.6	8.2
1610	3.6	7.0
1620	9.1	9.1
1630	7.7	19.0
1640	10.7	18.0
1648	9.3	17.7

Source: For the Dutch Republic, 't Hart (2005). For the Spanish Army of Flanders: data from Parker (1972), Appendix K. The Spanish expenditures for 1630 are an estimate based on interpolation. Spanish amounts were converted in *pattards* using Parker's annotations and then converted into florins at 20 *pattards* per florin (see the appendix for a note on currencies).

Table 2. Share of the Beer Excise in Total Excise Revenues

Period	Region	Share
1575	Holland	33% ^{a,b}
1579-1582	Amsterdam City	53% ^b
1579-1582	Dordrecht City	62% ^b
1590	Holland	28% ^b
1608	Holland	35% ^b
1650	South Holland	29% ^c

^a Assuming beer accounted for three-quarters of joint excise on beer and wine

^b Source: Liesker and Fritschy (2004)

^c Source: 't Hart (1990)

Table 3. Share of Excises in Total Revenues

Period	Excises as % of Total Revenues	Implied Share of Beer in Total Revenues
1572-1580	71%	24%
1581-1590	58%	19%
1591-1600	62%	21%
1601-1610	59%	20%
1611-1620	71%	24%
1621-1630	53%	18%
1631-1640	49%	16%
1641-1648	54%	18%
<i>1572-1648</i>	56%	19%
<i>1572-1620</i>	64%	21%
<i>1621-1648</i>	52%	17%

Source: Liesker and Fritschy (2004). Implied share of beer calculated by assuming beer accounted for one-third of common means revenues.

Table 4. Provincial Excises on Beer in Holland, in stuivers per tun

<i>Type of beer</i>	1582		1605		1655	
	<i>Tax</i>	<i>Rate*</i>	<i>Tax</i>	<i>Rate*</i>	<i>Tax</i>	<i>Rate*</i>
Priced less than 20 <i>stuivers</i> per tun	4 <i>st.</i>	20%	6	30%	11	55%
Priced between 20 and 30 <i>st.</i>	10	40%	22	88%	22	88%
Priced between 30 and 40 <i>st.</i>	16	45%	30	85%	30	85%
Priced more than 40 <i>st.</i>	42	105%	73	183%	73	183%
<i>Joopen-beer</i>	360		585		645	
Beer from England, Lübeck, Hamburg	60		110		140	
Eastern beer	50		93		n.a.	

Source: Unger (2001).

*Columns labelled “rate” give an estimate of the tax rate expressed as a value-added tax. The rate is calculated for beer priced 20*st.*, 25*st.*, 35*st.* and 40*st.* respectively. One florin consisted of 20 *stuivers*.

Table 5. Importance of Local Beer Taxes

Town	Share of town income from taxes on beer
Amsterdam	55% (1552)
Antwerp	54% (1530-1543)
Breda	52% (1492)
Dordrecht	40% (1522) 38% (1556-1558) 29% (1610-1612)
Ghent	25% (1465-1466) 41% (1528-1610)
Haarlem	89% (1437-1438) 35% (1440-1443) 65% (1556-1560) 23% (1595-1599) 27% (1600-1609)
Hasselt	33% (1490) 60% (1515) 70% (1622)
Leiden	58% (1413) 42% (1426) 53% (1427) 59% (1433-1434) 78% (1449)
Leuven	39% (Sixteenth century)
Mechelen	50% (Fifteenth century)
's-Hertogenbosch	51% (1567-1568)

Source: Unger (2004, p. 197)

Map 1. The Spanish Low Countries in 1555



Source: Tracy (1990)

Map 2. The Low Countries with the Border of 1648



Source: Wikimedia Commons, based on an original map by A.M. Gochet (1835-1910)

Map 3. Present-day Borders between Belgium and the Netherlands

