Wartime Volatility in Coastal Flanders: The Roosewalle Case

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Abstract

Warfare in the early modern period almost always coincided with large price shocks. Given that food was a necessity, prices in food markets were particularly prone to such volatility, posing significant challenges for farmers. This issue was especially pronounced for farms in highly commercialized areas like coastal Flanders. In this paper, I will investigate how the Roosewalle farm in coastal Flanders dealt with a volatile price environment in the war-stricken late seventeenth and early eighteenth centuries. Contrary to what one might expect, this paper shows that the Roosewalle farm did not attempt to buffer against volatility by halting production for the market or shifting toward greater self-sufficiency. Moreover, it did not seek to maximize food output during periods of the highest prices, as it was unable to accurately predict price movements. Instead, the farm adopted a strategy of expanding its activities, significantly increasing its sheep flocks and grazing lands to profit from the war in a low-risk manner. To achieve this, the farm also employed multiple strategies to secure sufficient capital. In this way, the Roosewalle farm was able to generate substantial profits during wartime.

Introduction

Wars have always had a disruptive impact on local economies, as pillaging, looting, and the consumption of resources by armies significantly affected local markets. However, the extent of this impact did not remain consistent throughout the entire duration of the wars. Constant military movements, disturbances of trade networks, and

shifts in taxation created peaks in market demand and supply, resulting in sudden price fluctuations, also known as volatility.[1]

One of the markets vulnerable to wartime volatility was the food market. Since food is a necessity good, short-term shocks were inevitable during armed conflicts.[2] Moreover, given that farmers had to plan most of their production months in advance, it was nearly impossible for them to make informed decisions about production in relation to future price shifts.[3] To address these price shocks, they had to adapt the use of the three means of production: land, labor, and capital. However, this task was not easy, especially in commercialized areas where both the output of the farm and its means of production were extensively traded on (volatile) markets. Such a difficult environment greatly hindered farm management and could lead to the bankruptcy of farms.[4]

Coastal Flanders during the late seventeenth and early eighteenth centuries found itself in such a situation. During this war-stricken period, this easily accessible and strategically important area became a target for French, English, Dutch, and Habsburg forces[5], causing the destruction and bankruptcy of several commercially oriented farms, especially small to medium-sized ones. However, large farms were able to profit from these crises and expanded their holdings.[6] In this paper, I will study the strategies employed by such a large farm (the Roosewalle farm) for surviving in this environment of extreme volatility.

1 Myron P. Gutmann, *War and rural life in the early modern Low Countries* (Princeton 1980); Erik Thoen, 'Oorlogen en platteland. Sociale aspekten van militaire destruktie in Vlaanderen tijdens de late Middeleeuwen en de vroege moderne tijden', *Tijdschrift voor Geschiedenis* 91 (1978) 366-371; Olaf van Nimwegen, *De subsistentie van het leger. Logistiek en strategie van het geallieerde en met name het Staatse leger tijdens de Spaanse Successieoorlog in de Nederlanden en het Heilig Roomse Rijk (1701-1712)* (Amsterdam 1995) 204;246-249.

2 Hakon Albers, Ulrich Pfister, and Martin Uebele, 'The great moderation of grain price volatility. Market integration vs. climate change, Germany, 1650-1790', *EHES Working Papers in Economic History* 135 (2018) 5-6; Van Nimwegen, *De subsistentie van het leger,* 204; Thoen, 'Oorlogen en platteland', 377.

3 Mark Casson, 'Entrepreneurship and the theory of the firm', *Journal of Economic Behavior & Organization* 58 (2005) 331-333.

4 Kristof Dombrecht and Wouter Ryckbosch, 'Wealth inequality in a time of transition. Coastal Flanders in the sixteenth century', *TSEG – The Low Countries Journal of Social and Economic History* 14:2 (2017) 76-79; Thoen, 'Oorlogen en platteland', 375.

5 Maurits Coornaert, *Heist en de Eiesluis. De geschiedenis, de topografie en de toponomie van Heist met een studie over de Eiesluis* (Tielt 1976) 176-180.

6 Sander Berghmans, 'War, taxation and the enlargement of farms in Coastal Flanders (seventeenth-eighteenth centuries)', *Agricultural History Review* 70 (2022) 200-201.

Volatility and war

Wartime volatility on the food market

While wartime volatility could impact every aspect of an economy, food markets, in particular, came under high pressure. With food being both necessary and irreplaceable, sudden changes in supply and demand impacted market prices greatly.[7] On one hand, the supply side was affected by increased taxation, leading to financial distress for local traders and farmers. Requisitions, blockades, or even the destruction of farms also had a negative impact on food production.[8] A perfect storm occurred when, in addition to war, there was a crop failure[9], animal diseases spread,[10] or a natural disaster (e.g., flooding took place.[11] In these cases, the food supply became so tenuous that food prices increased steeply.[12] If traders began to speculate, prices rose even further.[13] The demand side, on the other hand, was affected in two ways: local demand could increase due to the presence of armies or army depots that needed to be supplied,[14] but it could also decrease if armies forced local inhabitants to relocate or if part of the population was killed.[15] However, a decreasing population sometimes also impacted the food supply, for example, by a decrease in farmers,[16] possibly nullifying or even reversing the effect of a decrease in demand.

7 Christian Vandenbroeke, 'De graanpolitiek in de Oostenrijkse Nederlanden', *Revue Belge de Philologie et d'Histoire* 45 (1967) 369-387.

8 Gutmann, *War and rural life in the early modern Low Countries*; Jan Craeybeckx and Charles Verlinden, *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant* 2 (Bruges 1959) 30-42.

9 Sam Geens, 'The great famine in the county of Flanders (1315-17). The complex interaction between weather, warfare, and property rights', *The Economic History Review* 71 (2018) 1050-1053.

10 Daniel Curtis et al., 'The Low Countries', in: Guido Alfani and Cormac Ó Gráda (eds),*Famine in European history* (Cambridge 2017) 122.

11 Tim Soens, 'The social distribution of land and flood risk along the North Sea coast. Flanders, Holland and Romney Marsh compared (c. 1200-1750)', in: Bas van Bavel and Erik Thoen (eds), *Rural societies and environments at risk. Ecology, property rights and social organisation in fragile areas* (*Middle Ages-twentieth century*) (Turnhout 2013) 147-179.

12 Craeybeckx and Verlinden, *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 30-42.

13 Even so, governments tried to prohibit this practice. Remi Van Schaïk, 'Marktbeheersing: Overheids-bemoeienis met de levensmiddelenvoorziening in de Nederlanden (14de-19de eeuw)', *Ondernemers en bestuurders. Economie en politiek in de noordelijke Nederlanden in de late Middeleeuwen en vroegmoderne tijd* (Amsterdam 1999) 465-489.

14 Nimwegen, *De subsistentie van het leger,* 51-57.

15 Gutmann, *War and rural life in the early modern Low Countries*.

16 Wolfgang Hippel, 'Bevölkerung und Wirtschaft im Zeitalter des Dreissigjährigen Krieges. Das Beispiel Württemberg dem Andenken Horst Stukes gewidmet', *Zeitschrift für Historische Forschung* 5 (1978) 436-442.

Illustration 1 Uytkerke. Fig. map of the farm known as Roosewaele, parish terrier (son 5, 14,15), 0.70 X 0.35 (end.). Owned by: Dunes Abbey. Aut. Author: Fr. Verplancke. 1698.1698-1698 (source: Rijksarchief Brugge (RAB) – INV 81 – 1697 /A.)

Despite these issues, price spikes could be countered. Accessible and large markets had a stabilizing effect on grain markets. Research on the Rhineland showed that the limited integration of rural and urban markets in the region resulted in significant price and volatility differences.[17] Similarly, in the Paris basin, grain prices were more volatile in markets located further away from the larger Paris market.[18] In Flanders, the area of this study, the large cities with important markets were similarly able to stabilize grain prices.[19] However, the fact that prices were stabilized by a market did not necessarily mean that farmers' revenues were stabilized. On the contrary, the stabilization of market prices could nullify an inverse relationship between price and production, which was especially a problem for farmers when

17 Friederike Scholten, 'Landlords as rational investors? Grain storage on noble manors in the Rhineland area, 1650-1850', in: Wouter Ronsijn, Niccolò Mignemi, Laurent Herment (eds), *Stocks, seasons and sales. Food supply, storage and markets in Europe and the New World, c. 1600-2000* (Turnhout 2019) 29-34.

18 Philip T Hoffman, 'Land rents and agricultural productivity. The Paris basin, 1450-1789', *The Journal of Economic History* 51 (1991) 785.

19 Marie-Jeanne Tits-Dieuaide, *La formation des prix céréaliers en Brabant et en Flandre au XVe siècle* (Brussels 1975) 255-256.

their production or surpluses were impacted by war.[20] Moreover, it is important to note that, due to the nature of war, market accessibility was often compromised.[21] In such cases, accessible markets may not have had the same value and effect as in periods of peace.

Volatility in coastal Flanders

Wartime volatility and food markets in coastal Flanders

One area in Western Europe that was particularly hard hit by the wars of the early modern period was coastal Flanders in the Habsburg Southern Netherlands. The area bordered both France and the Dutch Republic, but was also only separated from England by the Southern Bight. The position of coastal Flanders right in between these powerhouses often turned the area into a theater of war.[22] Nevertheless, its location was also an asset for trade. Coastal Flanders was an area that was well integrated in trade networks with adequate infrastructure and navigable rivers and canals (e.g., the Yser River, the Blankenberge Canal, or the Canal Bruges-Ostend). Moreover, international trade was possible due to its favorable location next to the sea.[23]

Therefore, one would expect a 'moderating' effect on price volatility due to the possibility of trade. However, during wars, coastal Flanders's national and international trade networks would be disrupted by both naval[24] and land[25] warfare. Moreover, the large inland city of Ghent had staple rights on grain.[26] Consequently it could use its power to stabilize its own grain markets, potentially increasing volatility on the nearby markets of the towns in coastal Flanders. In addition, the destruction,

20 J.C.G.M Jansen, 'Landbouw rond Maastricht (1610-1865). Een analyse van de exploitatie-uitkomsten van enige lössbedrijven in halfwinning', *De Studies over de Sociaal-Economische Geschiedenis van Limburg* XIII (1968) 20-21; Joseph E Stiglitz, 'Some theoretical aspects of agricultural policies', *The World Bank Research Observer* 2 (1987) 44.

21 John Selwyn Bromley, 'The North Sea in wartime (1688-1713)', *BMGN-Low Countries Historical Review* 92 (1977) 270-290.

22 Coornaert, *Heist en de Eiesluis,* 168-170; Frans De Potter, *Geschiedkundige schets van de stad Blankenberge* (Ghent 1866) 35.

23 J. De Smet, 'De doorvaart voor de binnenscheepvaart te Brugge in de XVIIe eeuw', *Handelingen van het Genootschap voor Geschiedenis* 108 (1971) 192-208.

24 Bromley, 'The North Sea in wartime (1688-1713)', 270-290.

25 Frank Becuwe, 'Het gewicht van de oorlog in de kasselrij Veurne 1680-1780' (Unpublished master dissertation, Ghent University 1983) 48, 250-270.

26 Henri Nowé, 'Het streven van Gent naar de zee (XIIle-XIXe eeuw)', *Handelingen der Maatschappij voor Geschiedenis en Oudheidkunde te Gent* 1 (1952) 32-38.

taxes, and migration of troops all had an impact on the prices.[27] To make things worse, price shocks were aggravated by occasional bad harvest years/animal pests, hoarding, and speculation.[28] However, if the situation during war improved – that is, troops moving further away or lifting a siege – prices could equally drop significantly.

If one wants to look at how large this effect could be, grain prices are the most suitable manner to assess the impact of war on prices. Graph 1 represents the changes in the yearly average wheat prices on the market of Bruges (the most important grain market in coastal Flanders). The volatility for the whole time period was 28.74%. It is important to note that volatility for this whole paper is calculated by using the standard deviation for a sample of data which was subsequently divided by the mean of the same data (coefficient of variation). When taking a closer look at graph 1, one notices that price increases and decreases in wheat were more pronounced during wartime (red dots in graph 1).

In the literature, the wars between 1675 and 1725 have been described as especially devastating for coastal Flanders.[29] During both the Nine Years' War (1688-1697) and the war of Spanish Succession (1701-1713), armies were very active in the area, and while warfare was not as destructive for rural populations as in the medieval times, it still had an impact with requisitions, taxation, and – on a local level – sometimes destruction.[30] These wars were responsible for very large price shocks on the Bruges market. During this period, the volatility increased up to 34.28 percent for the Nine Years' War and a staggering 42.64 percent for the War of the Spanish Succesion. Meanwhile, the grain prices during the period of peace after the war of the Spanish Succession (1714-1739) had a volatility of only 18.04 percent. During the period 1675-1725, war was not the only hindrance. As one could see, even in peacetime, grain prices could fluctuate largely. This problem was partially caused by a period of low temperatures that defined the seventeenth and early eighteenth centuries, resulting in several years with lower yields. When such a bad harvest took place during a war year, it would add to the already difficult conditions.[31]

27 Gutmann, *War and rural life in the early modern Low Countries*.

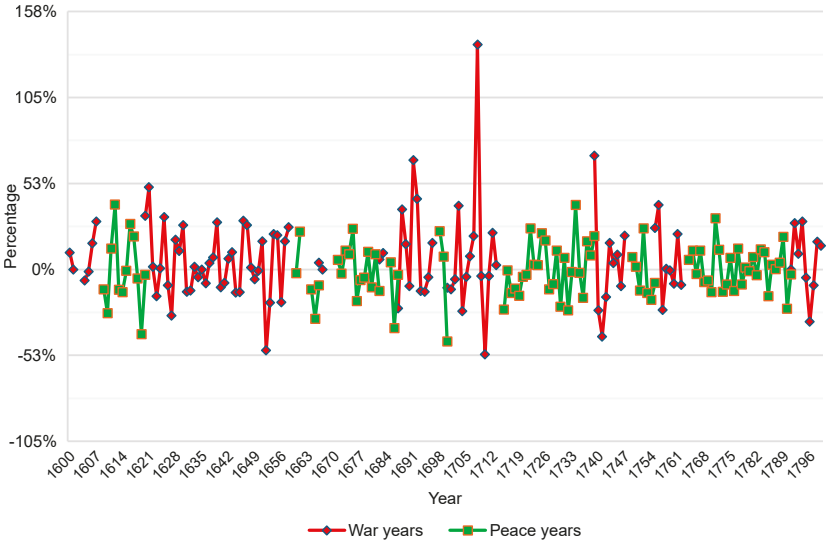
28 Van Schaïk, 'Marktbeheersing', 14-17.

29 Thijs Lambrecht, 'Agrarian change, labour organization and welfare entitlements in the North-Sea area, c. 1650-1800', in: Steve King and Anne Winter (eds), *Migration, settlement and belonging in Europe, 1500-1930's: comparative perspectives* (New York 2013) 204-210.

30 Gutmann, *War and rural life in the early modern Low Countries*, 46-52.

31 Thijs Lambrecht and Anne Winter, 'De vele gezichten van zorg. Armoede en armenzorg op het platteland in het graafschap Vlaanderen tijdens de achttiende eeuw', *Tijd-Schrift: Heemkunde en Lokaal-*

Graph 1 Yearly change in wheat prices on the Bruges market compared to the previous year – seventeenth and eighteenth century (Red (diamond) = war years and green (square) = non-war/armistice years)[32]



Obviously, grain markets as a whole were not isolated from other markets. In fact, by being a necessity good, developments on the grain market often trickled down into other areas of the economy.[33] Of increased importance in the context of agriculture was the relationship between grain prices and other kinds of food. According to some authors, a difference had to be made between basic necessities – like grain – and non-basic necessities – like meat or dairy. According to De Vries and Van Der Woude, the prices of the latter would, in general, not increase that much in times of need, and people likewise tended to consume less of the more expensive food like meat or dairy in times of crisis, sometimes even indicating a price decrease.[34] The research of Clark provides data that counter this statement. Derived from his

Erfgoedpraktijk in Vlaanderen 7 (2017) 49; Adam Sundberg, *Natural disaster at the closing of the Dutch Golden Age. Floods, worms, and cattle plague* (Cambridge 2022) 51-54.

32 These data are derived from Craeybeckx and Verlinden, *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 33-42. I would like to state that for this graph, and any other graph in this paper, the absence of a dot or bar means that there is no data available. Note that the grain prices are an average of three price points in the same year.

33 Victoria Bateman, 'The evolution of markets in early modern Europe, 1350-1800. A study of wheat prices 1', *The Economic History Review* 64 (2011) 450.

34 Jan De Vries and Ad Van Der Woude, *The first modern economy. Success, failure, and perseverance of the Dutch economy, 1500-1815* (Cambridge 1997) 199-200.

study on the prices in England, one could conclude that there was a mediocre correlation between the prices of grains and meat (0.451) and dairy products (0.456) for the period 1600-1750. This interaction means that meat and dairy followed similar price trends, although the same study shows that the volatility did not have the same magnitude for meat (10.12%) and dairy (14.01%) prices, compared to those of grains (18.35%).[35]

For Flanders, Thoen and Soens claimed that due to the lack of available data – on meat prices, for instance – it often remained unclear to what extent non-basic necessities were consumed during periods of hardship. According to them, the limited price series for Flanders shows that prices were formed by a complex cocktail of, among other things, wages, consumption patterns, production, and supply of other food. Moreover, meat prices are highly tentative as the quality and thus the price of meat was extremely variable.[36] Vandenborre noticed a similar issue, with a fat sheep or pig being on average double the value of a lank one in Bruges. Nevertheless, he stated that price shifts for meat were in general similar to the ones for grain (fourteenth-fifteenth centuries).[37] For butter, Hoornaert showed volatility in butter prices in the castellany of Furnes during the Eighty Years' War and a relative stable level before and afterward, similar to the changes in grain prices.[38] Studying a hospital in Lier, Schokkaert and Van der Wee noticed that the price elasticity was remarkably low for meat, although not so low as for rye, claiming that meat was an integral part of the diet of the urban middle class.[39]

While there are no reliable series present that would help us to reconstruct the meat and butter prices (due to differing quality), these studies thus indicate that they probably followed a similar trend to those of grain prices, meaning that all agricultural production in coastal Flanders was probably subject to wartime volatility.

35 Data derived from the price indices published in: Gregory Clark, 'The price history of English agriculture, 1209–1914', *Research in Economic History* 22 (2004) 41-123.

36 Erik Thoen and Tim Soens, 'Vegetarians or carnivores? Standards of living and diet in late Medieval Flanders', in: Le interazioni fra economia e ambiente biologico nell'Europa preindustriale: secc. XIII-XVIII – economic and biological interactions in the pre-industrial Europe from the 13th to the 18th centuries. In Serie II – Atti delle 'Settimane di Studi' e altri Convegni 41. p.495-527.

37 Chris Vanden Borre, 'Prijzen, lonen en levensstandaard in Brugge en omgeving tijdens de 14de en het begin van de 15de eeuw' (Unpublished master dissertation Ghent University, 1999) 104-107.

38 Laurent Hoornaert, 'Boter en kaas in de Kasselrij Veurne (16de-begin 19de eeuw)' (Unpublished master dissertation Ghent University 1997) 106-109.

39 Based on the study of a sixteenth-century hospital in Lier. Erik Schokkaert and Herman Van der Wee, 'A quantitative study of food consumption in the Low Countries during the sixteenth century', *Journal of European Economic History* 17 (1988) 144.

Factors of production and wartime volatility in coastal Flanders

Even though I have mainly discussed food markets until now, it is important to understand that wartime volatility and turbulence did not remain limited to the food markets; other markets were also affected. Regarding the labor market in Flanders, one can notice that monetary wages tended to follow volatility but did not follow the largest spikes in prices, causing trouble for those having to buy their meals on the market.[40] However, if wages were (partially) paid out in food,[41] farmers' labor expenses became more exposed to food price volatility. On the capital market, interest rates went up due to the high-risk environment.[42] Meanwhile, land markets often were also very volatile during periods of war. De Vijlder showed for inland Flanders and Brabant that, the War of Devolution (1667-8) and the War of the Spanish Succession (1702-1713) were defined by high market volatility, as indicated by the stark year-on-year changes in market activity, reflecting the higher economic and social uncertainty during this period of sustained warfare.[43] Moreover, wartime volatility also effectively decreased rents as landowners struggled to collect on their leases.[44] Hence, wartime volatility was not limited to food prices and was in fact a significant and complex phenomenon that could have far-reaching implications in almost all activities related to running a farm, demanding the farmer's utmost attention and careful consideration.

Farms and volatility

Volatility thus posed a significant challenge for farmers, as it hampered their ability to make informed decisions due to the lack of reliable information about the future.[45] Farmers were required to plan their production months in advance, without having knowledge what the

40 Curtis et al., 'The Low Countries', 123-129; Gutmann, *War and rural life in the early modern Low Countries*, 51-59; 197.

41 Lore Helsen, 'The persistent workforce. Female day labour on capitalist farms in eighteenth-century Flanders', *Rural History* 34 (2023) 30; Thijs Lambrecht, 'Slave to the wage? Het dienstpersoneel op het platteland in Vlaanderen (16de-18de eeuw)', *Oost-Vlaamse Zanten. Tijdschrift voor Volkscultuur in Vlaanderen* 76 (2001) 37.

42 Gutmann, *War and rural life in the early modern Low Countries*, 51-59.

43 Nicolas De Vijlder, 'The rural land market in early modern inland Flanders and Brabant. A long run perspective', *Rural History* 29 (2018) 123-124.

44 Herman Van Isterdael, 'Landbouwstructuren in het Land van Aalst (17de-18de eeuw)', *Het Land van Aalst* 40 (1986) 297-298; Lies Vervaet, 'Goederenbeheer in een veranderende samenleving. Het Sint-Janshospitaal van Brugge, ca. 1275-ca. 1575' (Unpublished PhD dissertation Ghent University 2015) 211-220.

45 Casson, 'Entrepreneurship and the theory of the firm', 331-333.

market conditions would be at the time they sold their production. This situation was already difficult during peacetime, but instances of extreme volatility intensified the level of uncertainty. Consequently, aligning production and farming activities with future demand for farm products became extremely challenging, if not impossible during war, which in turn could affect the performance of a farm. While farmers were greatly affected by (wartime) volatility, only a limited number of studies discussed how farmers dealt with it. In the Skane area (Sweden), it was noted that farmers withdrew from commercial grain production when grain prices were subject to increased volatility during the eighteenth and nineteenth centuries.[46] In her study on the Rhineland, Scholten stated that farmers and lords in the countryside had limited information about the (prospective) quantities and prices on the urban markets, making it difficult for most of them to act on price shifts[47]. Similarly, in a study on Würtemberg, Hippel explained that farmers could do little to counter volatility. Even producing proto-industrial goods was futile as the price of these goods followed the fluctuations of grain prices.[48] In the Maastricht area, the lack of volatility in fact proved to be a problem for farmers in the seventeenth century. The grain market of Maastricht was linked to the Amsterdam market, but the area was more vulnerable to warfare. Therefore, the war-tormented farmers in the Maastricht area had to sell their small surplus at low prices, causing them to default on their lease payments. The capital of the farmers dwindled, forcing the owners of the farms to introduce a sharecropping system in which they shared part of the risk.[49]

In areas like coastal Flanders, wartime volatility was a significant risk for farmers due to the commercial nature of the economic system.[50] Farmers in this area sold and purchased most of their goods and factors of production on markets. While farmers could easily and quickly buy or sell goods and services, this situation had an important consequence: Being price-takers, farms were largely dependent on the prices and quantities of the food markets.[51] It was precisely this combination of being price-takers and being dependent on the market that made

46 Mats Olsson and Patrick Svensson, 'Peasant economy–markets and agricultural production in southern Sweden 1711-1860', in: Vincente Pinilla (ed.), *Markets and agricultural change in Europe from the 13th to the 20th century* (Turnhout 2009) 99-101.

47 Scholten, 'Landlords as rational investors', 29-34.

48 Hippel, 'Bevölkerung und Wirtschaft im Zeitalter des Dreissigjährigen Krieges', 436.

49 Jansen, 'Landbouw rond Maastricht (1610-1865)', 21.

50 Dombrecht and Ryckbosch, 'Wealth inequality in a time of transition', 80.

51 Stiglitz, 'Some theoretical aspects of agricultural policies', 45-47.

volatility on the food market an acute problem for farmers. As farmers produced food, food price volatility effectively impacted their revenues, while the expenses of the farm (land, labor, and capital) were often also related to changes in grain prices. In coastal Flanders, farms had limited possibilities to shift their production to avoid the consequences of volatility. The larger farms that dominated coastal Flanders were generally too large to temporarily shift from commercial production to self-subsistence as smaller farms could.[52]

Nonetheless, the majority of these farms were leasehold farms, making it fairly easy for farmers to abandon their farms once the environment became too challenging.[53] Such abandonment of farms – or expulsion by the owner – took place during the wars that plagued coastal Flanders. In the main, however, small and medium-sized farms went bankrupt, whereas large farmers were able to survive. Earlier research has shown that there were at least two reasons for this contrast. First, the large farms were more productive than the smaller farms,[54] and second, unlike the larger farmers, smaller farmers had fewer possibilities to negotiate deferral of tax and rent payments, which were necessary to survive the hardships of war.[55] This explanation is not sufficient, though, when determining how these (large) farms dealt with volatility. If other expenses raised that much and revenues collapsed, no efficiency advantage or delay of payment could explain the survival or flourishing of the large farm. These farmers had to find solutions to quickly adapt themselves to the ever-changing environment of war, including sudden price and volume shifts of all kinds of goods and services; their actions had to go further than productivity and delay of tax and rent payments, as wartime volatility has the potential to affect every expense and revenue of a farm. Understanding how farms

52 Dombrecht and Ryckbosch, 'Wealth inequality in a time of transition, 78-81; Erik Thoen, 'Social agrosystems as an economic concept to explain regional differences. An essay taking the former county of Flanders as an example (Middle Ages-19th century)', in: Peter C.M. Hoppenbrouwers and Bas Van Bavel (eds), *Landholding and land transfer in the North Sea area* (*late Middle Ages-19th century*) CORN 5 (Turnhout 2004) 50-60.

53 This case was, for example, noticed in the parish of Uitkerke, a village close to Bruges. SAB Bruges, B.V. Registers, 5739-5741; 15600-15611, Ouytkercke 1680-1720.

54 Fulgence Delleaux, *Les censiers et les mutations des campagnes du Hainaut Français. La formation originale d'une structure socio-économique* (*fin XVIIe-début XIXe siècle*) (Namur 2012) 25-45; Piet van Cruyningen, *Behoudend maar buigzaam. Boeren in West Zeeuws-Vlaanderen, 1650-1850* (Wageningen 2000) 362-364.

55 Berghmans, 'War, taxation and the enlargement of farms in Coastal Flanders'; Erik Thoen and Tim Soens, 'Waterbeheer in de Vlaamse kustvlakte in de late Middeleeuwen en het Ancien Régime', *Jaarboek voor Ecologische Geschiedenis* (2003) 3-10.

dealt with the problem of wartime volatility will help us in the further understanding of the rural economy in coastal Flanders.

Case study

To investigate how farms dealt with volatility, I decided to study the case of a farm that survived the volatility of the late seventeenth and early eighteenth centuries. The Roosewalle farm in Uitkerke was a 101 hectares large farm owned by the Cistercian Abbey of the Dunes in Bruges.[56] Normally, Roosewalle was leased out, but when the previous leaseholder – Jan De Zittere – died at the beginning of the Nine Years' War (1688-1689),[57] the abbey was unable to find a new leaseholder, due to the difficult situation. Therefore, the abbey decided to send a steward to the farm to directly operate the farm. The direct exploitation by a large institution created the conditions necessary for the preservation of relevant archival material: due to record-keeping obligations, the stewards of the farm were required to provide an annual account.[58]

One could pose the question if studying an actual leasehold farm would not have been a better choice due to leasehold farms being more present. However, to my knowledge, no accounts are preserved from leasehold farms in this area. This should not be a problem as volatility is an external factor for a farm. Therefore, directly operated and leasehold farms were both exposed to this condition. Moreover, looking at the archives, one notices Roosewalle was operated like a leasehold farm. The steward was expected to deliver food or surpluses to the abbey (which could be seen as a proxy for rent). Moreover, the farm was run as a separate entity from the abbey, that is, with separate debts and loans. The only difference was that operations were financed by the owner rather than a leaseholder. One could state that an owner like the Abbey of the Dunes had 'deep pockets' and could, therefore, save a failing steward. However, no owner would have allowed such behavior, and one could have expected the abbey to prefer to leave its farm abandoned, rather than run deficits for several years in a row. While not exactly the typical leasehold farm, the direct exploitation of the Roosewalle farm,

56 Corresponding with 228 *gemet* 2 *lijnen* and 19 *roeden* the farm was expanded with a purchase of almost 4,42 hectares of land in 1714-1715 AGSB, rekeningen Ten Duinen, no. 144-145.

57 Archives Groot Seminarie Bruges (further AGSB), rekeningen Ten Duinen, no. 126 (Rekeningen kwartier Brugse Vrije).

58 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

therefore, resembles the leasehold farm greatly. As such, it serves as a good case for investigating how large farms faced volatility.

When conducting this study, the annual reports produced by the steward of the Roosewalle farm were the most important source of information. The annual reports provided a listing of all the cash flows, loans, and debts within the farm. Moreover, the annual reports also provided information on land use and employees.[59] Based on the information of the sources, a database was built which put the cash flows in meaningful categories, enabling me to assess how the farm was exposed to wartime volatility and how it dealt with it. As such, I could assess both the impact of volatility on the profits of the farm and on the three production factors: land, labor, and capital. In addition to the annual reports, I also made use of the accounts of the tax farmer of Uitkerke to get additional information on taxation and the number of abandoned farms.[60]

In this study, I first assessed the impact of wartime price volatility on the Roosewalle farm by investigating how volatile the farm's operating revenues and expenses were. By looking at the operating revenues and expenses, I could directly see how the farming activities were impacted by volatility, excluding the tempering/worsening effect of other kinds of non-operating transactions (e.g., financial loans and debts). Secondly, I assessed how the farm dealt with volatility in the food markets by investigating and analyzing every single type of transaction of the farm. Including every transaction instead of looking only at operational revenues and expenses helped me to unfold strategies – other than the operational ones – that were employed to face volatility. By doing so, I shed light on which strategies the farms in coastal Flanders used to survive periods of great turmoil in the food markets.

The activities of the farm

To start this case study, I will briefly introduce Roosewalle's farming activities. Being a mixed farm on 101 hectares, the farmland was used for both cattle and sheep breeding/fattening along with agriculture. Fattening sheep was the most important activity, with flocks on the farm most often ranging between 200 and 300 animals. The herds of cattle, kept for both meat and dairy, most often did not exceed 40 head. In addition to the revenues generated by animal husbandry, grains were grown on approximately 24 hectares of land. The land

59 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

60 SAB Bruges, B.V. Registers, 5739-5741; 15600-15611, Ouytkercke 1680-1720.

Illustration 2 Sheep fattening was the most important activity on the farm (source: Adriaen van de Velde (1636-1672), Nivaagaardmuseum, Niva, Denmark, 0058NMK.)

used for cultivating crops remained almost the same every year. Every type of food was consumed on the farm, but the majority was sold on the markets of Blankenberge and Bruges.[61] Sometimes food was shipped to the abbey or a beneficiary of the abbey as payment in kind to the owner. With this mixed production profile, the Roosewalle farm was similar to other large farms in the area.[62] As one can see in graph 2, both the revenues and expenses from operations[63] moved

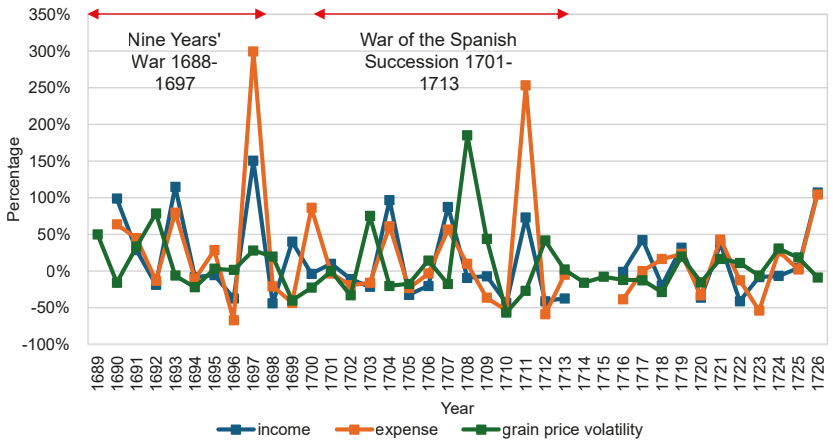
61 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

62 Tim Soens, Dries Tys, and Erik Thoen, 'Landscape transformation and social change in the North Sea polders, the example of Flanders (1000-1800 AD)', *Siedlungsforschung: Archäologie, Geschichte, Geographie* 31 (2014) 1121-1154; Lies Vervaet, 'Het Brugse Sint-Janshospitaal en zijn grote hoevepachters in de 15e en 16e eeuw. Wederkerigheid en continuïteit in functie van voedselzekerheid', *Revue Belge de Philologie et d'Histoire* 90 (2012) 1140-1141.

63 Which means in this case that all cash transactions were included, apart from financial transaction (like loans and interests), occasional revenues, or deliveries. The use of cash flows from operations

substantially over time, indicating that farming activities were seriously affected by war. Looking at these revenues and expenses is of crucial importance in identifying whether and which operations were affected by volatility. The volatility of the grain prices (39.81%), operating revenues (41.11%), and operating expenses (38.42%) remained very close – surprisingly, though, not always in a fashion similar with the grain prices.[64] In fact, if we look at the correlation, we only see a weak positive correlation between grain prices and revenues (0.1459) and expenses (0.1132). Meanwhile, revenues and expense were strongly correlated (0.7757), indicating that volatility on the grain markets and farm activities was definitely not a one-to-one relationship in which grain price shifts directly impacted sales. In the next paragraphs, I will elaborate on the farm's actions that led to this situation.

Graph 2 Yearly percentage change of operating revenues and expenses of the Roosewalle grange, compared to the yearly percentage change of wheat prices on the Bruges market (1689-1726)[65]



allows me to see how the farm's activities were exposed to a volatile environment, without including non-operational ways to temper volatility like taking loans.

64 Note that the grain prices from Craeybeckx and Verlinden, *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 30-42 are an average from three price points after the harvest. These price points are 11 November, 2 February, and Ascension Day. Therefore the average price covers parts of two years, while the annual accounts of Roosewalle cover one full year. As most of the grain and animals were sold immediately after the harvest, I decided to compare those with the grain prices that cover the end of the same year and the next one. So, for the year 1690 the numbers of Roosewalle are from the annual report of 1690, while the average grain price is the one of 1690-1691.

65 Numbers from AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle) and Craeybeckx and Verlinden, 30-42.

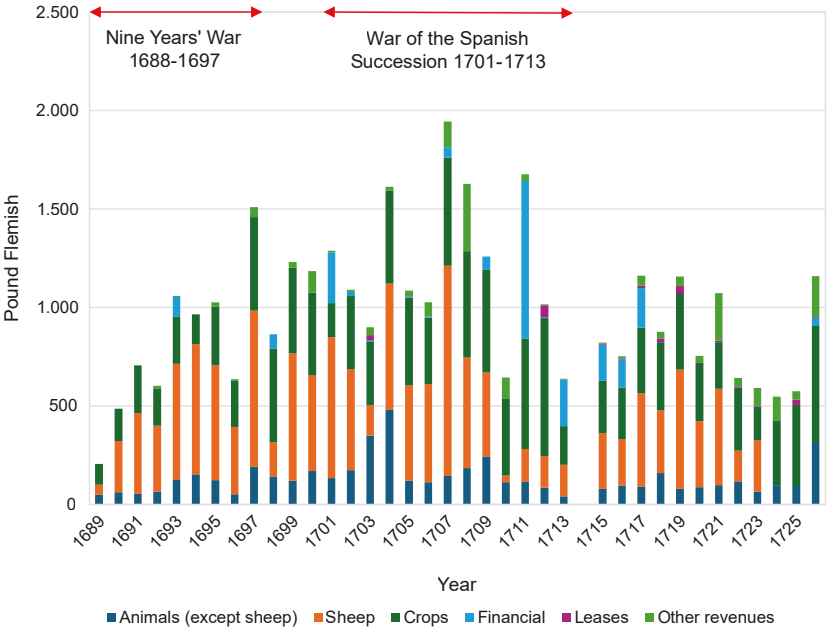
Where operating revenues and expenses help in discussing the impact on farming activities, adding all other cash transactions (like financial transactions) helps to sketch a picture of not only how the farm dealt as an entity with the volatility. Therefore, I will discuss every sort of transaction (operating or otherwise) that could be found in the accounts.

Inbound cash flows

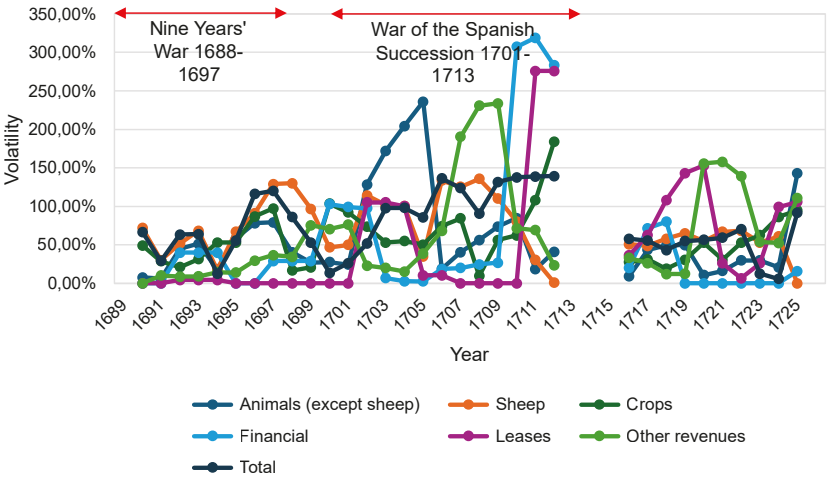
A cursory glance at the inbound cash flows shows us that sheep-fattening – including the sale of wool and hides – was not only the most important activity but also generated most of the inbound cash flows,[66] with an average share of 39% (graph 3 and table 1). The sale of animals and animal products other than sheep was not negligible but smaller. The second most important inbound cash flow came from crops (36%), with a volatility of almost 40.5% each year. While the surface area of the farm allocated for agriculture was smaller than the land used for animal husbandry (approximately 20% vs. 80%), this area was worked more intensively, resulting in a cash stream that almost equaled those of the sheep during the research periods (table 1). However, as seen in graph 3, the cash flow from the sale of crops was a smaller share in the first years and became more important in the last (peace) years, whereas the inbound cash flows from livestock were more important in the first (war) years and decreased in importance towards the end. Graph 4 clearly shows that in fact every inbound cash flow varied over time. Table 1 also shows that the total volatility of the inbound cash flow was lower than any single part, indicating that the different inbound cash flows compensated each other in a way, although it remained high at 38.3%. War years, and particularly the periods 1695–1698 and 1703–1712, show some extremely high volatility. In the next paragraphs, I will discuss the main causes for the volatility of each inbound cash flow.

66 This accounted for approx. 8,5% of all the income from sheep and should be considered a byproduct of the fattening of sheep rather than a main activity). The farm was thus not directly exposed to volatility and turmoil on the textile market. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

Graph 3 The inbound cash flows of the Roosewalle farm (1689-1726)[67]



Graph 4 Volatility of the inbound cash flows of the Roosewalle grange (based on the three year standard deviation)[68]



67 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle)

68 Numbers calculated from AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle)

Table 1 The shares and volatility of the different kinds of inbound cash flows of the Roosewalle farm, together with their correlation to the grain price (1689-1726)[69]

Inbound cash flows	Share (percentage)	Volatility (percentage)	Correlation with grain price
Animals (except sheep)	14	66.5	0.1342
Sheep	39	65.5	0.0289
Crops	36	40.5	0.2276
Financial	6	243.1	0.0453
Leases	1	211	-0.0817
Other inbound cash flows	5	141.4	-0.1778
Total	100	38.3	0.0826

Animals

Sheep

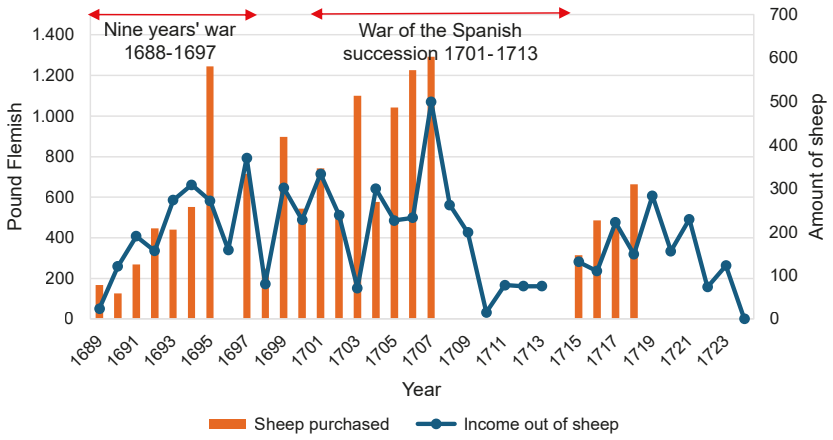
The main cause of the overall volatility in inbound cash flows can be traced back to the fattening of sheep.[70] The volatility of this cash stream could have two causes: changes in prices and changes in production output. While food prices obviously impacted the volatility, it was not the main driver for the volatility in this inbound cash, given the very low correlation with grain price volatility (table 1).[71] The variance in the size of flocks of sheep, however, played a bigger part in this volatility. Given the fact that most – if not all – of the sheep were sold at the end of every year, sheep purchases may give an idea about flock sizes. The number of purchased sheep was normally 200-300 sheep, but it could sometimes range from 59 to 603. This range resulted in a staggering 65.5 percent volatility for the inbound cash flow generated from sheep, with the highest peaks in sales and flock size noticed during periods of war (graph 5).

69 Numbers calculated from AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

70 This includes the sale of sheep but also wool and other products resulting from keeping sheep. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

71 Schokkaert and Van der Wee, 'A quantitative study of food consumption', 144; Herman Van der Wee, *Prices and wages as development variables. A comparison between England and the Southern Netherlands, 1400-1700*, Acta Historiae Neerlandicae X (The Hague 1978) 61-63.

Graph 5 Number of sheep purchased and inbound cash flow out of sheep by the Roosewalle farm (1689-1724)[72]



Other livestock

Leaving the incidental sales of horses, pigs, or chickens aside, the other animal species that generated income for the farm were cows. However, the sale of cows, milk, cheese, and hides made up only a small part of all the inbound cash flow (14 percent), compared to those of the sheep. The fact that the main manner of acquiring new cows was breeding cows instead of purchasing new cows indicated that cattle breeding, milking, and fattening had consequences for the farm.[73] As it took three to seven years to fatten cattle,[74] compared to one or two years for fattening sheep,[75] farmers could not rapidly increase their herds to act on short-term opportunities. If one would like to profit from temporary opportunities provided by war or peace, it would simply take too long to buy cattle, fatten them, and sell them on the market. However, due to the longer time frame in which cattle could be fattened, Roosewalle could use its cattle herd to wait until prices were favorable or when it was confronted by hardship with a difficult cash position. Therefore, the sale of livestock and animal products other than sheep was subject to more or less the same volatility as those of sheep (66.5 percent; graphs 3 and 4, table 1),

72 Income out of sheep includes the sales of fattened sheep and wool. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle)

73 This also made it impossible to make a useful calculation of the volatility in the acquisition of cattle. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

74 Evert Cornelis Enklaar, *Handboek voor den houder van rundvee* (Haarlem 1858) 16-17.

75 J.C. Ballot, *Iets over den Engelschen landbouw: met een woord van toepassing op den landbouw van Nederland. Eene voorlezing gehouden 6 January 1860* (Utrecht 1860) 16-18.

although it was achieved in a different way for cattle breeding (waiting for the right price level or/and when money was needed) than for sheep-fattening (rapid flock expansion). As such, it showed more correlation (0.1342) with the grain price, even though it remained minimal.

Crops

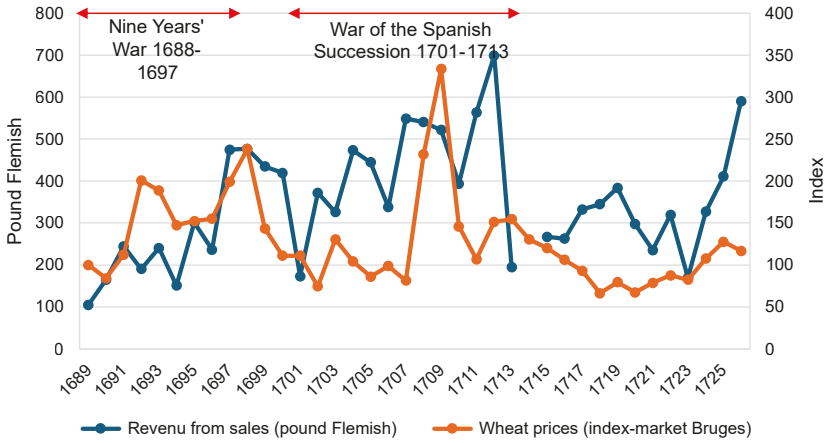
Much of coastal Flanders was known for its heavy clay soil on which grain grew easily.[76] Therefore, a substantial amount of the inbound cash flow (36%) of Roosewalle was generated by selling crops, especially wheat and rye, grown every year on approximately 20 hectares of the farm.[77] However, as can be seen in table 1, the income from crops was subject to a considerable amount of volatility (40.5%). Given that the inverse relationship between production and price did not materialize during war (which did not always impact production), it may not come as a surprise that the volatility was larger than those of the grain prices. What is more surprising is the fact that the volatility did not correlate with the grain price.

This difference can be explained by the fact that there was a considerable amount of consumption of grain on the farm (graph 7), which caused a major shift in surplus. In 1705, for instance, 29,584 liters of grain were harvested, and in 1706, 38,700 liters were harvested, amounting to an increase of 30.81 percent. However, due to the grain consumption of the servants on the farm, the amount of wheat sold by the farm was considerably lower than the amount harvested. For the same years, the amount sold rose from 14,190 liters in 1705 to 25,284 liters in 1706, which was a rather large increase of 78.18 percent. In this way, a small increase in production or a shift in consumption on the farm could cause large volatility in grain sales. Due to the fact that the volatility was mainly caused by surpluses that could be sold rather than the volatility in price related to war, the volatility of inbound cash flow from crops did not follow the trend of the total inbound cash flow volatility (graph 4) or that of wheat prices (graph 6). Still, as can be seen in table 1, it had the strongest correlation with the development of grain prices of all the inbound cash flows (0.2276).

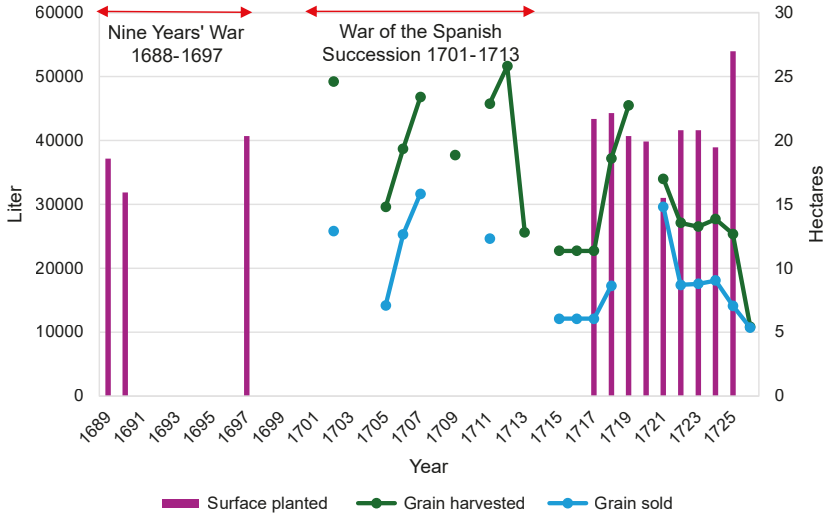
76 Tim Soens and Pieter De Graef, 'Polder mania or marsh fever? Risk and risk management in early modern drainage projects. The case of Kallopolder, Flanders, 1649 to 1662', *Agricultural History Review* 62 (2014) 245; Paul Vandewalle, 'Stabilité et perfection d'un systeme agricole. La châtellenie de Furnes', *Annales. Histoire, Sciences Sociales* 36 (1981) 382-385.

77 There were some occasional inbound cash streams from other crops like beans, onions, or peas. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

Graph 6 Grain price (index – right scale) and inbound cash flow from sales on the Roosewalle farm (pound Flemish – left scale) (1689–1726)[78]



Graph 7 Surface planted (hectares – right scale), grain harvested (liters – left scale) and grain sold (liters – left scale) on the Roosewalle farm (1689-1726)[79]



Financial transactions, leases, and other inbound cash flows

The smallest portion of the inbound cash flows was derived from financial cash flows, leases, and other sources, averaging 6%, 1%, and 5%, respectively (table 1). The financial cash flows consisted mainly of

78 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle)

79 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle)

loans and debt remission by the abbey. They did not form a substantial inbound cash flow but helped the farm to cover very difficult periods. Not surprisingly, the volatility of this inbound cash flow stood relatively high at approximately 243.1 percent. A particularly large loan was needed around 1711 to continue the farm's activities.[80] Regarding leases, one can state that little land was leased out by the farm, and when it was, mostly isolated parcels in other parishes were leased out. In fact, as I will show further in this paper, the farm tended to lease additional land rather than lease out land. The "other inbound cash flows" category consisted of occasional inbound cash flows that did not belong to the core business of the Roosewalle farm, such as selling old iron or some timber.[81] The volatility of this inbound cash flow was likewise fairly large at approximately 211%. Still, these three inbound cash flows had a stabilizing effect on the total volatility: without them, the total volatility would have been 42.8% compared to 38.3% when we include them.[82] This relation shows that the Roosewalle farm tried to compensate for dwindling operational inbound cash flows by seeking extra cash streams in the form of loans or by looking for non-recurring inbound cash flows, thereby tempering volatility. Due to the limited occurrence of these kind of transactions, it only has a very weak correlation to the prices.

Outbound cash flow

As stated earlier, coastal Flanders was a highly commercialized area,[83] therefore most of the production factors – land, labor, and capital – were also highly commercialized. War therefore had a potential disturbing effect on not only the inbound cash flows, but also the outbound cash flows of a farm.

As seen in graph 8 and table 2, taxes and animals were the most important outbound cash flows (together accounting for 58 percent of all the outbound cash flows), indicating that securing enough capital for these outbound cash flows may have been the most important challenge for the Roosewalle farm. Repairs to the farm would occasionally affect the outbound cash flows in a substantial way. Leases and wage labor related outbound cash flows were only of secondary importance, but as we will see further, leases played a major role in the volatility of the inbound cash flows. The group of diverse outbound cash flows, which

80 AGSB, rekeningen Ten Duinen, no. 145 (year 1711) Folio 3.

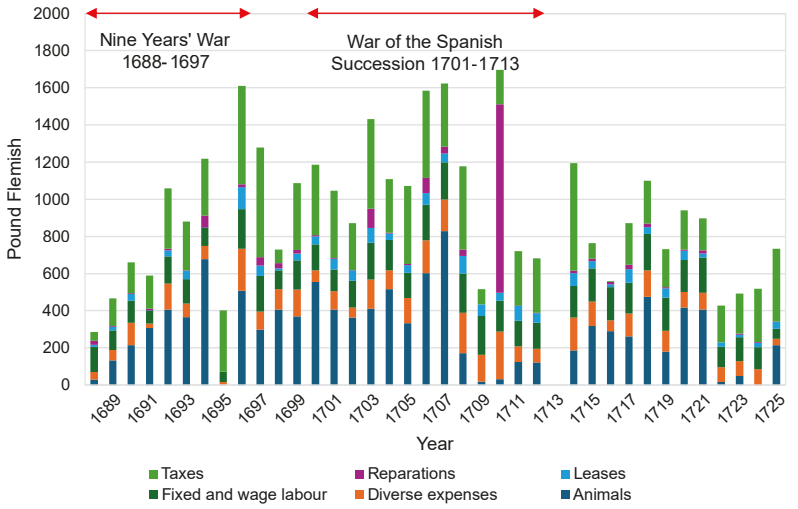
81 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

82 Surprisingly, this 42.8% is exactly the same volatility as seen on the Bruges wheat market!

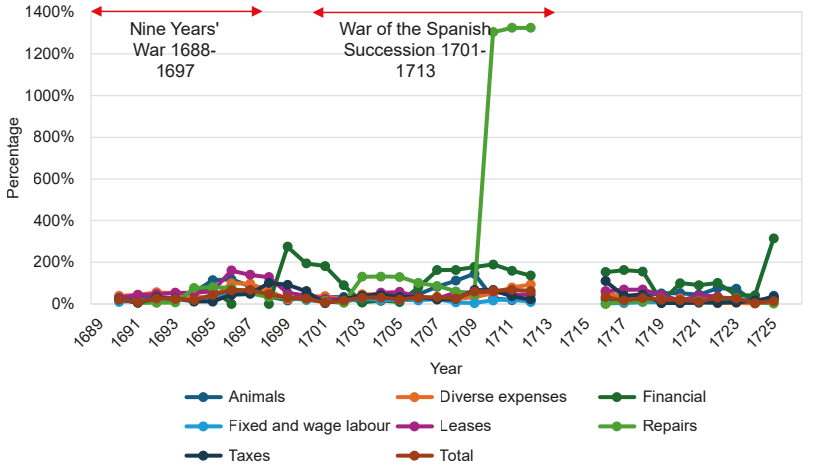
83 Dombrecht and Ryckbosch, 'Wealth inequality in a time of transition', 80.

mainly consisted of the purchase of food and household items, was of equally minor importance. Similar to the inbound cash transactions, volatility shocks can be noticed during the wartime periods of 1695-1700 and 1703-1712 (graph 9).

Graph 8 Outbound cash flow on the Roosewalle farm (1689–1720)[84]



Graph 9 Volatility of the outbound cash flows of the Roosewalle grange (three year standard deviation)[85]



84 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

85 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

Table 2 The shares and volatility of the different kinds of outbound cash flows of the Roosewalle farm, together with their correlation to grain price (1689-1726) (1689-1726)[86]

Outbound cash flows	Share	Volatility	Correlation to grain price
Animals	30%	66.9%	-0.0830
Diverse expenses	11%	51.2%	0.2677
Financial	7%	147.3%	-0.1220
Fixed and wage labor	15%	28.4%	0.1341
Leases (rents)	4%	62.7%	0.2594
Repairs	4%	379.6%	0.0464
Taxes	28%	51.6%	0.1844
Grand total	100%	40.5%	0.0715

Labor

Human labor was used to work the fields, take care of the livestock, and ensure the farmhouse was in a decent state. From an economic point of view, only free human labor input was considered labor, as draft animals were considered to be part of the capital of a farm.[87] Contrary to the small farms of inland Flanders, where farms mainly made use of in-house labor provided by the family, the large farms in coastal Flanders hired laborers for their extensive holdings.[88] As coastal Flanders was a sparsely populated region, a large portion of the servants and laborers migrated to the area.[89] Despite the wars, the Roosewalle farm never had issues finding laborers, even though several employees died during the crisis years.[90] The large leasehold farms made use of three kinds of laborers. First, there were servants and maids present at the farm. Generally, they lived in the farm buildings and received food from the farm as part of their remuneration.[91] The resident servants

86 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

87 Labor that was bought and owned by the farm/farmer was considered to be capital (e.g., horses, oxen, and in some parts of the world slaves).

88 Thoen, 'Social agrosystems as an economic concept to explain regional differences', 56-58.

89 Isabelle Devos and Tina Van Rossem, 'Oud, ouder, oudst. Regionale en lokale verschillen in sterfte in het graafschap Vlaanderen tijdens de zeventiende en achttiende eeuw', *Jaarboek de Zeventiende Eeuw* (Hilversum 2017) 39-52; Thoen, 'Social agrosystems as an economic concept to explain regional differences', 50-60.

90 Devos and Van Rossem, 'Oud, ouder, oudst', 43-45.

91 Only the monetary wages servants received are included in the data. AGSB, rekeningen Ten

could be considered as the minimum occupation needed to operate the farm. For Roosewalle, the number of servants was fairly constant with a work force of approximately 10-12 people, consisting of 2-3 women and 8-9 men. Second, day laborers were hired to supplement the work of the servants during busy periodes.[92] Given the fact that many laborers migrated, labor was relatively expensive in the area, with servants and laborers often earning double the amount they would in inland Flanders.[93] A third group were craftsmen, such as blacksmiths, who provided services to the farm[94]. Craftsmen lived in Uitkerke, the surrounding villages, and the towns/cities of Blankenberge and Bruges, and they often had a longstanding relationship with Roosewalle. During the research period, there was no mention of any issues regarding the prices of the craftsmen or the availability of services and goods.[95]

Despite the high wages in the area, labor accounted for a small proportion of total outbound cash flows, averaging 15 percent (graph 8 and table 2). However, this figure may not be comprehensive, for a portion of the servants' wages was paid in the form of food and housing, making it impossible to determine their exact value. Over time, labor expenses remained relatively constant, showing a volatility of only 28.4 percent. This stability was attributed to the fact that the labor wages paid were not that strongly influenced by fluctuations in grain prices (correlation of only 0.1341)[96], and the fact that the wages of the servants who resided on the farm were agreed upon upfront (before the price shock) and partially paid out in kind. Meanwhile, the farm's expansion of activities primarily involved increasing sheep flocks, which did not necessitate a substantial increase in the labor force.

Leases

Rents were not a significant cost (4 percent) for the Roosewalle farm, as the farm owned most of its land (graph 8). However, for most farms in coastal Flanders, rent payments were an important outbound cash flow. Because most the land was rented instead of owned, the land market was highly vulnerable during periods of war. Real lease prices plummeted

Duinen, no. 144-145 (Roosewalle).

92 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

93 Devos and Van Rossem, 'Oud, ouder, oudst', 42-43; Thoen, 'Social agrosystems as an economic concept to explain regional differences', 50-60.

94 The wages paid to craftsmen exclude the repair services that are incorporated in the category 'repairs'.

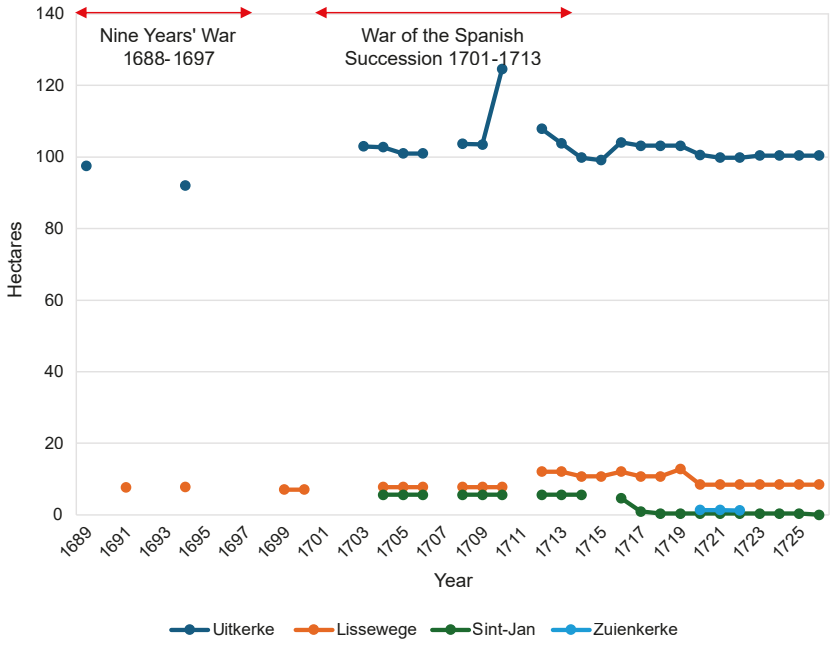
95 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

96 Curtis et al., 'The Low Countries', 123-129.

because leaseholders were often unable to pay the leases or even went bankrupt.[97] Leaseholders, especially those on large farms, were difficult to replace due to the high capital requirements. Therefore, landowners allowed rent payments to be delayed. Nevertheless, crippled by taxes and other adverse effects of war, many farms still went bankrupt during wars.[98]

Knowing that 101 hectares were part of the Roosewalle farm, graph 10 gives an indication how much additional land Roosewalle leased (for which it had to pay taxes) at various points in time. The lands were generally leased for one year, but in some cases, leases of three, six, or more years were negotiated. These were regular leases negotiated with the landowners and were offered to the farm, often when a previous leaseholder of the land had gone bankrupt or died.[99] Due to the brief availability of leasehold lands, it was also a highly volatile outbound cash flow (62.7 percent).

Graph 10 Surface for which the Roosewalle farm had to pay parish taxes (by parish)[100]



97 Thoen and Soens, 'Waterbeheer in de Vlaamse kustvlakte in de late Middeleeuwen en het Ancien Régime', 3-10.

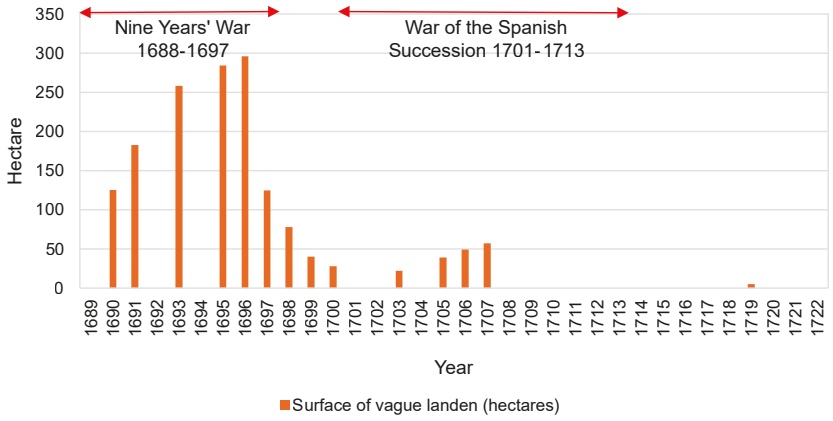
98 Berghmans, 'War, taxation and the enlargement of farms in Coastal Flanders'.

99 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

100 These Lissewege lands were leased early on its exploitation (1691), whereas the lands in Sint-

Apart from the regular leases, Roosewalle also leased grazing rights, roadsides, and dikes, but it also leased *vague landen* (not included under leases in graph 10). *Vague landen* were farms or lands for which no suitable leaseholders could be found and, as a result, were exempted from taxation. Often these farms and lands had belonged to small and medium-sized leasehold farms of which the leaseholder had gone bankrupt. To recover at least part of these taxes, the tax collector could lease out the *vague landen*. From the sources, we know that Roosewalle regularly leased *vague landen*, particularly during wartime. While the exact extent of the *vague landen* leased by the Roosewalle farm is unclear, as the exact surface was not written down by the steward, we do have numbers for the parish of Uitkerke – where the farm was located – as a whole.

Graph 11 The amount of *vague landen* in the parish of Uitkerke in hectares (1689-1727)[101]



Graph 11 shows that the availability of *vague landen* could fluctuate sharply. There is a clear link between the extent of the *vague landen* and war, with war providing opportunities for farms like Roosewalle to lease vast amounts of land at very low prices. For instance, in 1696, almost half of the parish area was leased out as *vague landen*. Due to the fact that leases of *vague landen* were very inexpensive, and even the regular leases were not significant compared to the farm's total area, leases

Jan probably around 1703. Those in Zuienkerke were leased for only three years (1720-1722). AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

101 SAB Bruges, B.V. Registers, 5739-5741; 15600-15611, Ouytkercke 1680-1720. Info available for 1691, 1692, 1694, 1696, 1697, 1698, 1699, 1700, 1701, 1704, 1706, 1707, 1708 and 1720.

only accounted for a small portion of the outbound cash flows (graph 8 and table 2). Despite their low cost, the importance of the leases – and especially those of the *vague landen* – cannot be underestimated, as will be discussed in the next paragraphs concerning the purchase of livestock.[102]

Livestock[103]

The purchase of animals was the most important outbound cash flow for the farm (30 percent). This was a direct consequence of its main activity: animal husbandry. Most of the animals bought were sheep, with occasional acquisitions of cows, chickens, pigs, and horses. This was because the majority of the sheep flock was sold at the end of the year to butchers, and new sheep were purchased the following year, meaning that sheep effectively stayed only a few months on the farm.[104] Other animals were both bought and bred at the farm and were kept for longer periods of time (cows and horses) or mainly for consumption on the farm (chickens and pigs). Although there was a sheep barn on the farm, sheep were mostly fattened on pastureland. This pastureland could be either the land owned by the farm, land leased in the form of a regular lease, or the previously mentioned *vague landen*.[105]

The *vague landen* provided an opportunity to lease pastureland for a one-year period at low prices. This situation clearly suited the economic profile of the Roosewalle farm and explained the large volatility in sheep flock size and income discussed earlier. Roosewalle renewed its flock every year, as a young sheep (unlike cows or horses) could be fattened in a few months. Roosewalle could therefore easily expand or shrink its flock of sheep every year (graph 3 and 5), depending on the availability of land. Therefore, the purchase of new animals (mainly sheep) was an extremely volatile outbound cash flow. Acquiring new sheep for these *vague landen* was extremely profitable as there was already a shepherd present at the farm, so no additional employees had to be hired, and the *vague landen* could be leased at extremely low costs.[106] Therefore, little risk was taken in expanding the flock. Moreover, sheep-fattening countered the uncertainty farms had to deal

102 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

103 Sadly, the accounts did not allow me to split up the purchase of animals (as could be done with the sales), because the amounts paid for the animals were often combined.

104 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

105 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

106 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

with in a volatile environment. They could easily sell part of their flock at almost any time of the year (as opposed to their crops) or keep part of the sheep for a longer period, enabling them to counter unpredictable shifts in demand and prices that defined wartime volatility. One can therefore observe a very large volatility (66.9 percent), which was very similar to that of leases, as both embodied the short-term expansion of the farming activities.

Taxes and financial cash flow

The second largest outbound cash stream of the farm was taxes (28 percent). The vast majority of the taxes in the books were land taxes. In addition smaller taxes were levied for water boards, slaughtering animals, or alcoholic beverages. Especially during war years, land was subjected to high taxation, which explained its high share in the outbound cash flows. Obviously, not every war year was the same. During some war years, the fiscal pressure rose, mainly when armies were operating in the area. Therefore, the volatility stood high at approximately 51.6 percent during the researched period.

Due to their importance, taxes were a significant hindrance for the operation of the Roosewalle farm. Large farms were very capital intensive, needing sufficient capital to buy flocks, farming equipment, horses, and so on.[107] Sudden increases in taxes could therefore impact the farm's ability to pay for these things. As such, wartime volatility could put a sudden and immense pressure on the capital of a farm, forcing the farm, as well as other people (not only farmers), to make use of additional credit to survive. Because leasehold farmers did not have a lot of collateral to secure a loan from regular lenders, a commonly used strategy for farmers in coastal Flanders was requesting a deferral of tax payments from the tax farmer.[108] Deferred payments were allowed for taxation, in particular, as both the farmer and tax farmer would benefit from the survival of the farm: the farmer had a future for his farm, and the tax farmer retained the possibility that they could collect the outstanding rent or taxes in the future. Moreover, during wars, it was difficult to find new leaseholders in case of bankruptcy. This situation compromised future taxation revenues. Earlier research has shown that the larger these farms were,

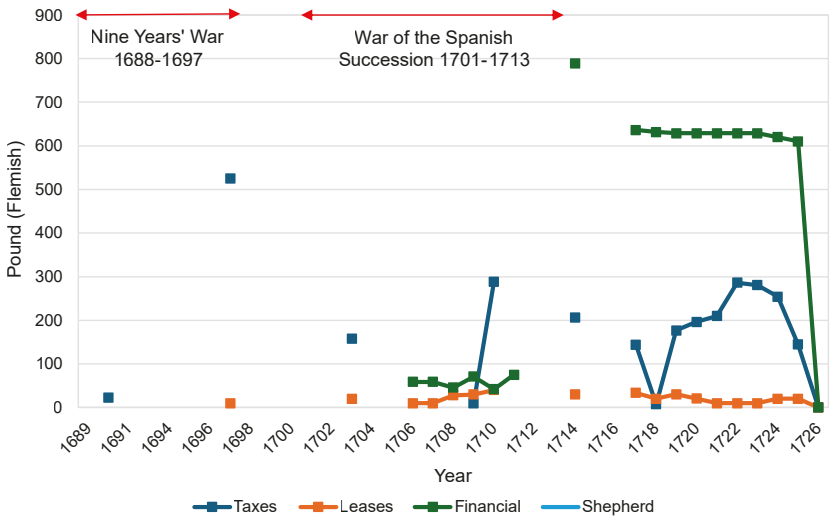
107 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

108 A similar practice could be observed for the rents. Eric Clement, 'Het cultuurareaal van de Abdij Ter Duinen. Het Vlaamse Westkwartier tijdens de Brugse periode (1625-1791)' (Unpublished master dissertation Katholieke Universiteit Leuven 1972) 130-160; Frans De Wever, *Pachtprijzen in Vlaanderen en Brabant in de achttiende eeuw. Bijdrage tot de konjunktuurstudie* (Leuven 1972) 196-198.

the more chance they had to be allowed deferral of tax payment as they were the most difficult to replace and had the most social, economic, and political power. Moreover, the fact that large farmers were keen to rent *vague landen* strengthened their position.[109]

Roosewalle often made use of this option and delayed part of its tax payments almost every year. In fact, it was the main source of credit in the middle- to long-term (graphs 12 and 13). The importance of the delay in tax payment cannot be underestimated. The delay of a part of the tax payment helped the farm to allocate this money to expand its flocks and keep the farm running during war years. This is clearly seen in graph 8 and 9, in which both the increase and volatility of tax payments (1695 and 1709) only go up after the increase and volatility of the purchase of livestock starts (1693 and 1706). Despite the deferred of tax payments, one can still notice a volatility of the outbound cash flows of 51.6 percent, although this probably would have been different if no delay of tax payment had been asked. With more taxes that would have been paid during the war, whereas less would have been paid in times of peace.[110] Nevertheless, given the fact that deferral of tax payment could also be used to free money to expand activities, the correlation between taxes and grain prices remains weak (0.1844).

Graph 12 Old debt of Roosewalle (originating ≥ 2 years earlier)[111]

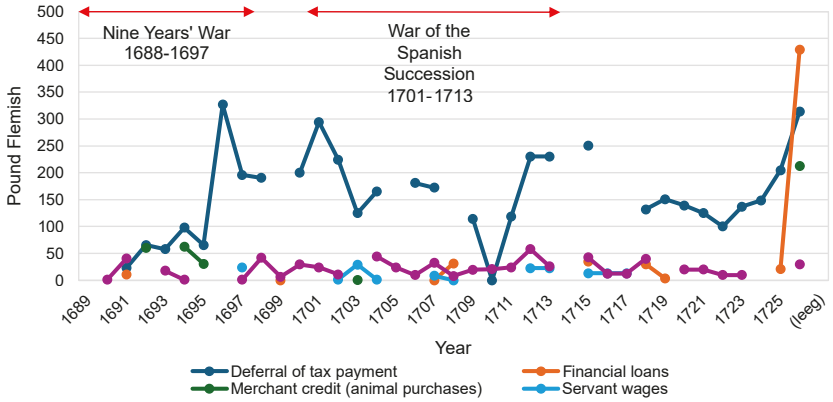


109 Berghmans, 'War, taxation and the enlargement of farms in Coastal Flanders', 216-220.

110 Ibid., 212-213.

111 These numbers are derived from a debit/credit statement at the end of some of the annual reports.

Graph 13 Outbound cash flows of which at least a part originated in an outbound cash flow ≥ 2 year earlier[112]



Related to the (belated) tax payments were the financial outbound cash flows. These were all kinds of interest payments and repayments of loans. Representing 7 percent of the outbound cash flows, financial cash streams were smaller than the tax payments. The volatility of this outbound cash flow was 147.3 percent, due to its rare occurrence and the sudden nature of the repayments. While generally limited to cover minor needs, the Roosewalle farm became highly indebted at one point in time (1713-1714), due to bad management during the final year of the first steward. The farm had no problem with acquiring loans to cover for the issues caused by this steward. Moreover, it was able to repay all of its debt in 1725-1726, when the farm was again leased out.[113] As a result there was a weak negative correlation with the grain prices, as loans and interests would be paid back irregularly during better times (-0.1220).

Repairs and diverse outbound cash flow

Money was also needed for repairing the farm. In general, this outbound cash flow was fairly small, accounting for only 4 percent of the outbound cash flows on average. As seen in graph 8, the outbound cash flow could dramatically fluctuate (379.6 percent) because a large expense was made in 1711, when the sheep barn was repaired

AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

112 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

113 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

and an oven was built.[114] This repair had been postponed for several years, awaiting the cessation of active warfare in the region. During the other years, the repairs remained limited to maintenance, therefore correlation with grain prices was almost 0 (0.0464)[115] The diverse outbound cash flows of the farm (11 percent of the total outbound cash flows) were an amalgam of outbound cash flows: mainly consisting of the purchase of household items or food. These outbound cash flows were generally very similar every year but could rise in years of bad harvest when certain types of grains had to be bought. Moreover, large and expensive purchases like goods made of iron, such as kettles, could impact this outbound cash flow category, resulting in a volatility of 51.2 percent.[116]

Deliveries to the abbey and bishop of Bruges

Finally, I will briefly discuss another aspect of the annual reports associated with the farm's production, though it forms a separate category: deliveries to the abbey and the bishop of Bruges. The deliveries to the bishop were part of a yearly allowance the abbey had to pay ever since it had acquired the properties of the abbey of Ter Doest. I made the decision to exclude these deliveries from the inbound- or outbound cash flow category and discuss them in this separate section for two reasons. First, most of them were not cash streams (apart from the 'financial' deliveries), but actual deliveries. The prices attached to these goods may therefore not have reflected the actual value of what was donated. Second, these deliveries showed what the abbey generated as 'profit'. It could even be seen as a proxy for the real lease price that could have been paid by the farm in periods of distress, during which leases were only paid up to a level feasible for the leaseholder.

As seen in graph 14, the deliveries fluctuated largely (volatility of 105.3 percent), showing the difficulties of the farm to provide a steady stream of deliveries to its owner and the bishop. Surprisingly, the farm performed best during the war years of extreme volatility. As was discussed earlier in this paper, this performance was caused by the fact that the highly volatile environment of wars created opportunities for large farms such as the Roosewalle farm. Graph 14 therefore adds further context to the earlier statement that the farm actively and

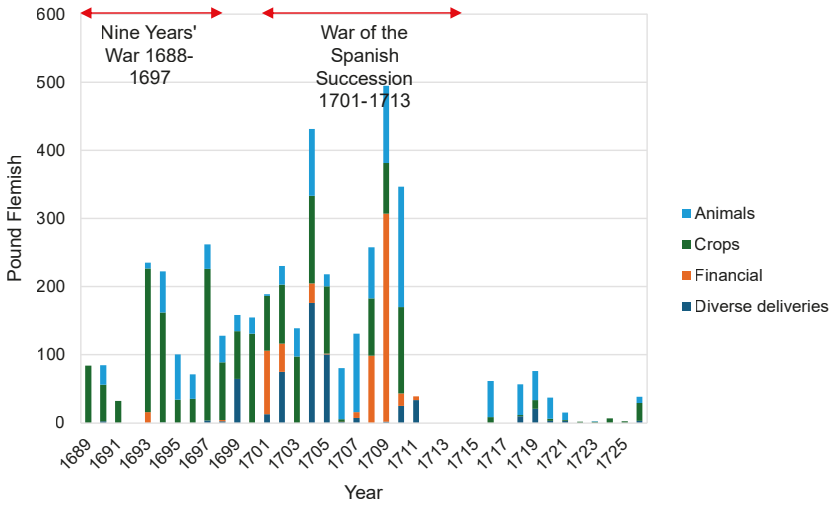
114 In fact so large that other expenses were limited that year. AGSB, rekeningen Ten Duinen, no. 145 (year 1711) Folio 11-14.

115 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

116 AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

even aggressively sought opportunities to profit from the war and was succesfull in doing so.

Graph 14 The deliveries of the Roosewalle farm to the abbey of the dunes and the bishop of Bruges (1689-1726)[117]



Conclusion

Commercial farms in coastal Flanders faced volatility in both the food and production factors markets, making it a complex problem. This volatility was especially pronounced during periods of war and crisis due to shocks in supply and/or demand caused by warfare. Consequently, wartime presented significant challenges for commercial farms, necessitating the implementation of various adaptive strategies to cope with rapidly changing conditions. Notably, large commercial farms demonstrated particular proficiency in navigating these challenges. To my knowledge, this study of the Roosewalle farm is the first to delve deeply into the choices made on a farm to counter the potential financial hardships and difficulties of war. Given the difficulties associated with war and wartime volatility, it may come as a surprise that the Roosewalle farm did not limit the impact of volatility by reducing its exposure to the market. However, given its size, it was

117 No deliveries were made for the years 1692, 1712, 1713, 1715 and 1717. No data are available for the year 1714. AGSB, rekeningen Ten Duinen, no. 144-145 (Roosewalle).

fairly difficult to do so, for the farm could only consume a small part of its own production.

While Roosewalle remained active on the market, the business undertaken by the farm did not closely correlate with shifts in food market prices, as shown in this study. This excludes two other possible strategies: adapting production to profit from expected price shifts or doing nothing and being subject to price movements.[118] In both cases, there would have been a clear link between the results of the Roosewalle farm and grain prices. The first strategy was impossible, as farmers could not anticipate future price shocks, making it equally impossible for them to plan the farm's production accordingly. The second strategy, while possible, was not used by the farm. Instead, the farm adapted its production, though not in line with wartime food market volatility.

Most importantly, the farm significantly expanded its sheep fattening activities after some of the most difficult years of the war when bankrupt farms could be cheaply leased as *vague landen*. Meanwhile, there was a possibility of selling additional cattle –which were kept for multiple years – that could serve as a means to cover difficult periods for the farm. Grain cultivation also played a significant role in the farm's seeming lack of linkage to food market volatility, even though the planted surface remained approximately the same. This was because there was a considerable discrepancy between the surplus available for sale and actual production due to the consumption by inhabitants of the farm. With fairly constant consumption, even a modest increase in production could result in a significant increase in inbound cash flow. Thus, it was the available surplus that mainly drove the volatility in grain revenues, not the food prices. The lack of correlation should be explained by the fact that – since it was impossible to predict price shocks – the farm's strategies were related to present opportunities (e.g., flock expansion), difficulties (e.g., selling more cattle when the farm was short on money), and uncertainty (e.g., the farm chose flock expansion because of the low investment), rather than the market prices they were subject to.

118 We would have observed that with an unchanged production pattern, the farm's inbound cash flows would have correlated with market volatility during the war. This is because (part of the) price movements during the war were caused by factors unrelated to the farm's yields and output (contrary to peacetime), such as disrupted trade routes and the consumption needs of soldiers. As such, farmers would have profited from price increases, and its results would have correlated with food prices.

Moreover, to face the challenges of war and employ these strategies, this study has shown that monitoring outbound cash flows was crucial for a capital-intensive farm like Roosewalle. To finance the expansion of sheep farming and maintain a healthy cash position, farms like Roosewalle took various measures. For instance, they could delay the payment of war taxes, a luxury not available to smaller farmers who often went bankrupt under the heavy burden of increased taxes. Merchant credit and lenders[119], also provided solutions during moments of financial hardship. Furthermore, repairs could be delayed. While safeguarding the capital was important, this study shows that the farm had no difficulties in acquiring labor or land. Land was abundant and inexpensive due to the bankruptcies of other farms. Human labor input was not a significant cost, due to the use of draught animals and non-labor intensive animal husbandry. Given the high wages paid in the area, it was not difficult to find laborers. Since all of these expenses were primarily used to support the inbound cash flows, there was equally little correlation between the outbound cash flows and the grain prices.

The Roosewalle case thus sheds a clear light on the strategies that could be used by large farms in coastal Flanders. It shows that, while subject to wartime food market volatility, such farms were able to chart their own course and, in fact, profit from the wartime situation. Due to the lack of information about future prices, large farms could not adapt their production in what would otherwise be the most economically efficient way. Instead, large farms in coastal Flanders decided that expanding activities for short periods at low costs and risks provided the best opportunities. The low-risk aspect of the large farm's expansion of flocks supports Fulgence Delleaux's idea of the "*worried rural human*", who sought profit but also feared financial losses.[120] In this context, sheep fattening was the best choice for the Roosewalle farm – and other large farms in this area – in this turbulent environment. The only precondition was safeguarding their capital. Given the finding that large farms had higher survival rates and over time incorporated smaller farms at low rent prices,[121] one can indeed see that they were

119 If the farm would have been a leasehold farm, it would also have negotiated delays or adjusted rent payments, a practice commonly used by farmers during periods of crisis. Jeroen Buntinx, 'Lichtelaar te Lochristi, Redewinkel te Zeveneken en het Torregoed en Bruinewalle te Zaffelare. Een onderzoek naar de sociaal-economische betekenis van grote abdijpachthoeven en hun bewoners (late 13de eeuw-einde Ancien Régime)', *Handelingen der Maatschappij voor Geschiedenis en Oudheidkunde te Gent* 52:1 (1998) 40.

120 Fulgence Delleaux, *Inquiétude dans les champs. Essai sur la gestion des exploitations agricoles dans l'espace Francophone (Vers 1730-Vers 1830)* (Louvain-La-Neuve 2022).

121 Berghmans, 'War, taxation and the enlargement of farms in Coastal Flanders'.

successful in the execution of this strategy. As such, large farms – like the Roosewalle farm – in coastal Flanders were subject to wartime volatility but were most often not victims of it.

About the author

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