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Feeding inequalities: the role of economic inequalities and the urban market in late medieval food security. The case of fourteenth-century Ghent

1. INTRODUCTION

Food security is the situation where "all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life."[2] The definition, put forward by the Food and Agricultural Organization (hereafter FAO) in 1996, stressed the importance of a long-term, socially inclusive and multidimensional approach to the topic and replaced an older vision that focused mainly on the availability of food.[3] Scholars working on contemporary food security have since largely adopted this theoretical framework to better understand why certain groups or societies are more vulnerable to undernourishment than others. For example, recent research has focused on the unequal impact of (future) climate change.[4] In contrast, historians studying the pre-modern period have been much slower to integrate new perspectives, which is unfortunate given that history is the instrument par excellence to assess long-term evolutions. Despite repeated calls for new approaches by some scholars, especially famine experts, empirical studies on pre-modern food security remain rare to this date.[5]

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[2] FAO, *Rome declaration on World Food Security*, Rome 1996. For other definitions of food security, see: M. SMITH, J. POINTING, S. MAXWELL, *Household Food Security, Concepts and Definitions: An annotated Bibliography*, Brighton 1993.

[3] Notice that the definition still includes the availability of food as one variable of food security (i.e. "physical access to sufficient food"). M. SASSI, *Understanding Food Insecurity*, Cham 2018, pp. 89-120.

[4] Both in academics and policy-making. For example: M. NILES, M. BROWN*, A multi-country assessment of factors related to smallholder food security in varying rainfall conditions*, in "Scientific Reports", 7, 2017, pp. 1-11.
FAO, IFAD, UNICEF, WFP and WHO, T*he State of Food Security and Nutrition in the World. Building climate resilience for food security and nutrition*, Rome 2018, pp. 38-111.

[5] Some strong advocates include but are not limited to: M. BOURIN, F. MENANT, *Les disettes dans la conjoncture de 1300 en Méditerranée occidentale*, in *La conjoncture de 1300 en Méditerranée occidentale*, M. BOURIN, F. MENANT, J. DRENDEL eds., Rome, 2004, pp. 9-33; P. SCHOFIELD, *Approaches to famine in medieval England*, in *Crisis alimentarias en la Edad Media*, ed. P.B. I MONCLÚS, Lleida 2013, pp. 71-86; IDEM, *De Labrousse a Sen. Modelos de causalidad y paradigmas interpretativos de las crisis alimentarias preindustriales*, in

The reason for the slow shift is twofold. First, according to Dominik Collet, "historians have by and large ignored the challenge of development economics [because they] held on to established modernisation narratives."[6] In this view, modern societies are fundamentally different from those in the past as they are not bound to similar Malthusian constraints thanks to their technological advances. Within such a framework, pre-modern food security is simply determined by the total food stock divided by the total population. Second, historic food security has been a fragmented field of study. Rather than a subject in its own right, the topic has largely been dealt with indirectly. The closely related field of famine studies analyses the variable effects of food shortages across time, space and social layers.[7] However, by focusing on very short periods of distress, it often ignores how access to food evolved in years of normal harvest, even though the extent of chronic malnutrition and its impact on a (sub)population may be far greater than that of any temporary shock.[8] In this regard, the field of living standards has been more perceptive to long-term evolutions in food security by using economic and health indicators (height, diet, income, etc.).[9] But here, the component of access is often lacking, obscuring how events and social structures such as markets affected the experience of individual households.

To fill this historiographic gap and to showcase the strengths of the model proposed by the FAO, the present article assesses the evolving food security of the citizens of Ghent in the fourteenth century. Both the timing and the geographical scope proposes a challenge to the dominant (neo-)Malthusian model. At the heart of the late medieval crisis, the fourteenth century is often regarded as the archetype of such a theory. Crudely put, the European population supposedly outstripped its production capacity by 1300, triggering inevitable positive checks such as the Great Famine (1315-17) and the Black Death (1347-52). The massive mortality in the second half of the century brought a new balance, resulting in significant gains in food security.[10] During this turbulent period, Ghent was the second largest city North of the Alps with an estimated population of 60,000.[11] Furthermore, the industrial metropole was located in one of the most densely populated regions of medieval Europe, namely the county of Flanders. If a Malthusian breakdown of

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ibidem, pp. 15-32; E. VANHAUTE, *From Famine to Food Crisis: What History Can Teach Us About Local and Global Subsistence Crises*, in "Journal of Peasant Studies", 38, 2011, n. 1, pp. 47-65.

[6] D. COLLET, *Storage and Starvation: Public Granaries as Agents of Food Security in Early Modern Europe*, in "Historical Social Research", 35, 2010, n. 4, pp. 234-253, 235.

[7] For a recent overview of European famines see: *Famine in European History*, G. ALFANI, C. Ó GRÁDA eds., Cambridge 2017.

[8] In 2017, an estimated 821 million people suffered from chronic malnutrition according to FAO, *The State of Food Security and Nutrition in the world*, Rome 2018, p. XIII. For the impact of malnutrition see: V. MARTINS et al., *Long-lasting effects of undernutrition*, in "International journal of environmental research and public health", 8, 2011, n. 6, pp. 1817-46.

[9] For example: R. ALLEN, T. BENGTSSON, M. DRIBE, *Living Standards in the Past. New Perspectives on Well-Being in Asia and Europe*, Oxford 2005.

[10] For an overview of Malthusian inspired models: J. HATCHER, M. BAILEY, *Modelling the Middle Ages. The History and Theory of England's Economic Development*, Oxford 2001, pp. 21-65.

[11] D. NICHOLAS, *The population of fourteenth-century Ghent*, in "Handelingen der Maatschappij voor Geschiedenis en Oudheidkunde te Gent", 24, 1970, pp. 97-111.

food security was imminent, one would expect to find it there. Did (certain groups of) citizens in Ghent experience chronic malnutrition and why (not)? Did the massive mortality fundamentally change medieval food security in the metropole?

If we want to answer the above questions, economic inequality is a key concept. Both levels of income and wealth play a crucial role in food security as they determine to what extent household could adapt to changing food supplies.[12] Most famously, the relationship between ownership and malnutrition has been described by Amartya Sen. According to him, physical, social and economic access to food is determined by one's legal opportunities to convert his or her resources into food. Sen then proceeds to distinguish four major groups of opportunities, or entitlements as he calls them, related to trade, labour, inheritance and production.[13] After a brief discussion of the specific context of fourteenth-century Ghent, the article addresses each of these four entitlements in turn. How did opportunities for different groups evolve throughout the century?

2. THE CASE OF FOURTEENTH-CENTURY GHENT

As one of the largest cities north of the Alps, the wealth of Ghent at the start of the fourteenth century was mainly supported and upheld by the prosperous merchant families and the textile industry producing high-grade woollen cloth. After the Battle of Courtrai in 1302 and the legal recognition of guilds, the composition of the city council changed from the infamous group of XXXIX patricians towards a broader political participation among the wealthy.[14] From then onwards, the population of Ghent was informally divided into four "members": the *poorters*, the weavers, the fullers and the small guilds.[15] The internal competition between the members for power and the continuous struggle to safeguard their urban privileges against the counts of Flanders, resulted in several violent conflicts during the fourteenth century.

Two episodes stand out as having a large impact on the Ghent economy and potentially the food security of its citizens. During the Hundred Years' War, the Flemish count sided with his overlord, the French king, and instituted a trade embargo on English wool. For the city of Ghent, this raw material was essential for its all-important textile industry. Under control of Jacob van Artevelde, a rich cloth trader, Ghent allied itself to the English cause. Although Van Artevelde was

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[12] M. ELMES, *Economic Inequality, Food Insecurity, and the Erosion of Equality of Capabilities in the United States*, in "Business & Society", 57/6, 2018, pp. 1045-1074; FAO, IFAD, UNICEF, WFP and WHO, The State of Food Security and Nutrition in the World, Rome 2018, p. 90; J. HESSELBERG, J. YARO, *An assessment of the extent and causes of food insecurity in northern Ghana using a livelihood vulnerability framework*, in "GeoJournal", 67, 2006, pp. 47-48.

[13] A. SEN, *Poverty and Famines. An Essay on Entitlement and Deprivation*, Oxford 1981, pp. 1-8.

[14] P. ROGGHÉ, *Het Gentsche Stadsbestuur van 1302 tot 1345: En een en ander betreffende het Gentsche Stadspatriciaat*, in "Handelingen der Maatschappij voor Oudheidkunde en Geschiedenis te Gent", new series 1 (1944), pp. 135-63. F. BLOCKMANS, *Het Gentsche stadspatriciaat tot omstreeks 1302*, Antwerp 1938.

[15] A *poorter* was a rich person with a certain exclusive social and economic status in the city. This group had a lot of different backgrounds: from rich families engaged in trading to large landowners to rich guild masters.

eventually overthrown and assassinated, the rebellion against the count continued up until 1349.[16] After the capitulation, a huge number of partisans was exiled, including many weavers. The loss of their expertise further damaged the already struggling industry. For the next two decades, the relations with the count were without conflict, but then the 'Ghent War' broke out. The bailiff, who was the representative of the count in the city, ignored some of the privileges of the citizens. As a reaction he was murdered in 1379.[17] After failed attempts of reconciliation, the issue escalated into a series of violent conflicts, ravaging the surrounding countryside. The rebellion eventually died out undecided in 1385 when all privileges of the Ghentenars were reaffirmed and amnesty was granted to the entire city. In exchange, they had to renounce their allegiance to the English King and recognise the French King as their sovereign.[18]

These episodes of civil conflict combined with the various plague outbreaks, especially those of 1349 and 1368-71, were catastrophic for Ghent. Its population probably declined by half in the second half of the fourteenth century.[19] While English textile cities succeeded to flourish after the Black Death thanks to substantial export intensification, such an evolution was not self-evident for Ghent due to its demographic difficulties. Closer to home, rural and Brabantine textile centres grew in importance. The city therefore re-orientated toward regional grain trade, providing both the domestic market and the smaller communities of eastern-Flanders and Brabant.[20] This new economic focus partly compensated for the declining textile industry. According to David Nicholas, had it not been that Ghent was placed so strategically and that it had the rights on the Scheldt grain staple, the decline of the city would have continued into a major urban catastrophe. But was this really the case? The main question answered hereafter is what effects the political conflicts, epidemiological calamities and economic shifts had for the food security of the inhabitants of Ghent.

3. WILL THE MARKET PROVIDE? TRADE BASED ENTITLEMENTS

Traditionally, famine studies have used the price of grain to isolate dearth periods. In pre-modern Europe, grain in the form of bread was the main source of

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[16] For more information on this rebellious episode see the extensive works of: P. ROGGHÉ, *Vlaanderen en het zevenjarig beleid van Jacob van Artevelde: Een critische-historische studie*, Eeklo 1955, 2 vols. D. NICHOLAS, *Artevelde, Jacob van, kapitein van Gent*, in *Nationaal Biografisch Woordenboek*, Brussels 1972, vol. 5, pp. 22-36.

[17] R. DEMUYNCK, *De Gentse oorlog 1379-1385. Oorzaken en karakter*, in "Handelingen der maatschappij voor geschiedenis en oudheidkunde te Gent", 5, 1951, pp. 314-316. A. HOLSTERS, *Moord en politiek tijdens de Gentse opstand 1379-1385*, "Handelingen der maatschappij voor geschiedenis en oudheidkunde te Gent", 37, 1983, pp. 89-111.

[18] M. BOONE, *Gent en de Bourgondische hertogen ca. 1384 - ca. 1453: een sociaal-politieke studie van een staatsvormingsproces,* Brusses 1990 (Koninklijke academie voor wetenschappen, letteren en schone kunsten van België, 133).

[19] D. NICHOLAS, *The Metamorphosis of a Medieval City: Ghent in the Age of the Arteveldes, 1302-1390.* Lincoln 1987 (University of Nebraska Press), p. 290.

[20] *Ibid.*, pp. 178-198.

calorie-intake for the vast majority of the population. Lots of elements were in play when it comes to the composition of its price: the harvest quality, a diverging economic strategy of different players on the market, the type of transaction that took place, any type of solidarity between a set of players, the time of the year in which grain was sold, etc. Therefore, the selection of dearth periods cannot be founded solely on these prices and must be nuanced with the trajectory of wage levels and standards of living interlinked with the grain prices (see section 4). But this does not mean that the price level loses its importance. The evolution of prices is closely related to the regulation of the urban or regional market and the integration or segmentation of those markets in a larger network of urban regions. Additionally, farmers directly lose a huge part of their income when the grain price drops significantly over a short time span.

Starting with the first entitlement of Sen, the definition of trade-based entitlement determines that "someone is entitled to own and use what they obtain by trading something they own with a willing party or a willing set of parties", which is perfectly applicable to the late medieval grain market. For Ghent, we were able to construct a price series for rye for the entire fourteenth century by combining newly processed data with already published data sets (see graph 1).[21] Some of the data gaps, mainly before 1330, have been supplemented with rye prices for Bruges.[22] The series only entails the rye price as it is the main type found in the available sources. This limitation is however not problematic as rye was probably the most consumed cereal within Ghent. With the inclusion of data before the Black Death, which have been largely lacking up until now, this study opens new perspectives on the severity of this plague episode in the Southern Low Countries. The huge price peak during the years 1315-16, known as the Great Famine, stands out immediately. This

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[21] Prices for the abbeys of St. Peter and St. Bavo are published in: K. DEBLONDE-COTTENIER, L. VAN DAMME-DE MEY & W. PREVENIER, *Prijzen en lonen in de domeinen der Gentse abdijen (St. Pieters en St. Baafs) (13e-14e eeuw)*, in C. VERLINDEN *et. al.* eds., *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 4, Bruges 1973, pp. 230-325. The rye price for the period of 1380-1400 has been published in: W. WYFFELS, *Prijs van rogge te Gent (14de-16de eeuw)*, in C. VERLINDEN *et. al.* eds., *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 2A, Bruges 1965, pp. 161-162. Earlier price data in the fourteenth century were collected from the archives of the table of the Holy Ghost of the church of St. Nicolas: GENT, Rijksarchief Gent (RAG), *Sint-Niklaaskerk & Sint-Veerlekapittel*, K87, n° 496-522; PAR90, n° 119-132. They start in 1311 and continue towards the end of the fourteenth century, with a gap for the first two decades after the Black Death (1348-1360).

[22] The coefficient of determination between Ghent and Bruges is strong enough ($R^2 = 0,7162$) to assume that an evolution in the course of grain prices in Bruges would have seen a parallel movement in Ghent. The rye prices for the period before 1348 have been constructed by using the equation of the linear trend line of the scatter plot for the Bruges' wheat and rye price in the post-1348 period on the Bruges' wheat price before 1348. This early fourteenth century wheat price is composed of data from hospital accounts scrutinized in C. VANDENBORRE, *Prijzen, lonen en levensstandaard in Brugge en omgeving tijdens de 14de en het begin van de 15de eeuw* (Ghent University: unpublished MA-thesis, 1999). For the post-1348 period, rye prices for Bruges are found in A. VERHULST, *Prijzen van granen, boter en kaas te Brugge volgens de 'slag' van het Sint-Donatiaanskapittel (1348-1801)*, in C. VERLINDEN *et. al.* eds., *Dokumenten voor de geschiedenis van prijzen en lonen in Vlaanderen en Brabant*, 2A, Bruges 1965, pp. 33-71. The prices have been converted to grams of silver per hectolitre to filter out the severe coin debasement of the *Flemish groat* after 1350. The silver values for the *Flemish groat* can be found in: J. H. MUNRO, *Values of English and Flemish Coins*, Department of Economics, University of Toronto <www.economics.utoronto.ca/munro5/MoneyCoinage.htm> (accessed 25 June 2019).

ecological catastrophe was a consequence of a back-to-back harvest failure due to multiannual heavy rainfall.[23] Other high prices arise in the first years of the 1320s, the start of the 1340s and during the 1360s. On the long run, prices dropped significantly after 1370, reaching its century low in the last two decades when prices constantly plunged below 20 grams of silver per hectolitre.

Graph 1. **The rye price in Fourteenth-century Ghent**
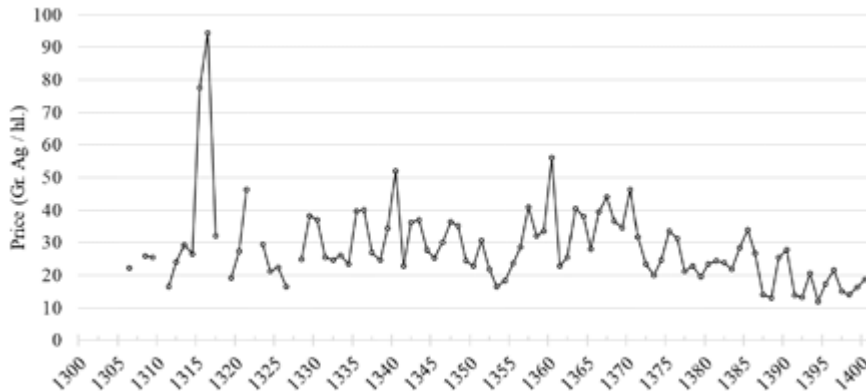
Source: S. Espeel, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

Some caution is needed when using the price series. First, we have to keep in mind that most of these prices are gathered from accounts of ecclesiastical large landowners, each endeavouring profit using a differing strategy. They do not necessarily reflect the contemporary price on the Ghent market, but since these large landowners undoubtedly had a role in the urban and rural (land)markets, there is a high probability that they come close. Second, the importance of these grain prices for food security is socially biased. Most of the urban population did not own farm lands, making them highly dependent on the grain market and on the amount of grain that was being sold in the city.[24] In contrast, richer burghers did own (farm) land outside of the city (cfr. section 6) on which they could rely on for food provisioning. Accordingly, the low price for grain in the last two decades of the fourteenth century should have been beneficial to the poorer half of the urban population. To assess the precise impact of the price evolutions on the food security

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[23] W.C. Jordan, *The Great Famine: Northern Europe in the Early Fourteenth Century* (Princeton: Princeton University Press, 1996); H. Van Werveke, *De Middeleeuwse Hongersnood*, in "Mededelingen van de Koninklijke Vlaamse Academie voor Wetenschappen, Letteren en Schone Kunsten van België, Klasse der Letteren", 29, 195, n. 3, pp. 5-12.

[24] R.W. Unger, *Feeding Low Countries Towns: the Grain Trade in the Fifteenth Century*, in "Revue belge de philologie et d'histoire", 77, 1999, n. 2, pp. 329-358, 332.

of the latter group, we will include the wage level in the next chapter (cfr. section 4), combining the trade- and labour-based entitlement.

Apart from trying to keep the price at a reasonable level, the city of Ghent had to maintain the quantity of the influx of grain to feed its inhabitants sufficiently. Having a grain staple on the confluence of the Lys and the Scheldt river helped them considerably.[25] This prerogative implied that the city had the right to act as a trade centre and exclusive depot for all types of grain within a given area, meant for consumption or re-export.[26] An exact year when the staple was allocated in Ghent remains unknown. Marie-Jeanne Tits-Dieuaide argues that the regulations for the grain market coincided with the realisation of the staple between 1337 and 1366.[27] David Nicholas dates this long before 1323, based on a charter which mentioned that a new wharf had to be built to accommodate the growing staple.[28] In any case, it achieved its final form in 1357 with the regulation from count Louis of Male that defined the respective spheres of competence for the shippers of Ghent and Douai.[29] Some grain naturally did escape this staple. Grain that was (re)sold to the tenants by the large landowners or that was received as annuities, did not reach the urban market. Nonetheless, the staple obviously had an important impact on the food security of the Ghentenars. It was a vital mechanism of control for the quality and quantity of the grain influx, regardless of the price.[30] The city also limited the amount of grain that outsiders could buy and even preferred that they bought the grain that was intended for their own consumption outside of the city. Citizens of Ghent could buy small amounts on the rural markets surrounding the city, but larger stocks had to be brought to the staple.[31]

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[25] Due to its strategic location and its central position in the urban network of Flanders the installation of the grain staple in Ghent seems to be predestined. See W. PREVENIER, J.-P. SOSSON, M. BOONE, *Le reseau urbain en Flandre (XIIIᵉ-XVIIIᵉ siècle): composantes et dynamique*, in *Le reseau urbain en Belgique dans une perspective historique (1350-1850). Une approche statistique et dynamique. Actes du 15e colloque international. Spa, 4-6 Sept. 1990*, in "Crédit communal, Coll. Histoire", Série in-8°, 86, 1992, pp. 157-200.

[26] D. NICHOLAS, *Town and Countryside. Social, Economic, and Political Tensions in Fourteenth-Century Flanders*, Bruges 1971, p. 118.

[27] M.-J. TITS-DIEUAIDE, *Le grain et le pain dans l'administration des villes de Brabant et de Flandre au Moyen Âge*, in *L'initiative publique des communes en Belgique : fondements historiques (Ancien Régime)*. Actes du 11ᵉ colloque international, Spa, 1-4 September 1982, in "Crédit communal, Coll. Histoire", série in 8°, 65, 1984, pp. 485-487.

[28] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., pp. 241-2. Georges Bigwood also stated that the staple was already effective in the first quarter of the fourteenth century, see: G. BIGWOOD, *Gand et la circulation des grains en Flandre du XIVᵉ au XVIIIᵉ siècle*, in "Vierteljahrschrift für Sozial- und Wirtschaftgeschichte", 4, 1906, n. 3, pp. 424-426.

[29] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 242. The Douaisians were allowed to bring grain as far as *Tussen Brugghen*, but they had to recharge it there to the shippers of Ghent. In turn, the Ghentenars were not allowed to enter Douai with their goods.

[30] Although, Johan Dambruyne stated that the staple in the sixteenth century still was an effective instrument to manipulate the grain prices in Ghent. J. DAMBRUYNE, *Interregional grain trade in the Low Countries and its economic and social effects on sixteenth-century Ghent*, in P. VAN CRUYNINGEN, E. THOEN eds., *Food supply, food demand and food trade: aspects of the economic relation between town and countryside (middle ages - 19th century)*, Turnhout 2012, pp. 49-83.

[31] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 242.

Any short-term price peak could have disrupted the food security in the short run. The city however tried to mitigate such peaks through various interventions. A clear example dates from the Hundred Years' War. When Ghent took the English side in the early 1340s, the French king tried to cut off the grain supplies. With the sandy area surrounding the city, the largest bulk of grain came from the richer northern French regions through the Lys-Scheldt river system.[32] Only later, from the Fifteenth century onwards, the importance of the Baltic region increased.[33] Subsequently, the French trade embargo caused multiple shortages, reaching critical levels in 1343. The Ghent aldermen ordered grain to be gathered in the surrounding parishes and any hoarders were sought out and forced to market their goods.[34] In 1343 and in 1350-1351, the export of grain outside the city was severely limited and nobody could keep more than a six-month supply due to severe shortages. Any resale of grain within the surroundings of the city was also prohibited.[35] The urban government issued that the houses and barns in the castellany of Ghent had to be searched and the surplus of grain had to be marketed in the city three times a week.

With the formalisation of the staple in 1357, they tried to mitigate the problems of grain scarcity more efficiently during dearth periods. Grain sales were confined to the *Koornmarkt* and it could only be unloaded at *Tussen Brugghen*.[36] Later that year, a different statute stipulated that half of the amount of grain entering Ghent by the streams had to remain in the city.[37] In 1361, a statute permitted citizens to buy their provisioning outside of the city, in nearby villages or rural markets, but people who did not have the luxury to go through this trouble had to pay the higher market price.[38] This permission was revoked in 1366, during another shortage, when citizens were prohibited to buy grain for any purpose outside the city.[39] Numerous cases show however that burghers did buy large quantities outside of the city without any reprimanding.[40] Grain merchants in charge of the grain staple were too busy with the more profitable and sizeable *Koornmarkt* and the markets for re-export to be bothered by the occasional burgher who was willing to take the trouble to buy grain

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[32] J. DAMBRUYNE, *Mensen en centen: het 16de-eeuwse Gent in demografisch en economisch perspectief*, Ghent 2001 (Handelingen der Maatschappij voor Geschiedenis en Oudheidkunde te Gent, 26), p. 291; A. DERVILLE, *Le grenier des Pays-Bas Médiévaux*, in "Revue du Nord", 273, 1987, pp. 267-280, 276.

[33] M.-J. TITS-DIEUAIDE, *La formation des prix céréaliers en Brabant et en Flandre au XVe siècle*, Brussels 1975, pp. 214-242; M.-J. TITS-DIEUAIDE, *The Baltic grain trade and cereal prices in Flanders at the end of the Middle Ages: some remarks*, in W. MINCHINTON (ed.), *The Baltic grain trade, five essays*, Exeter 1985, pp. 11-20; R.W. UNGER, *Feeding the Low Countries Towns*, cit., p. 333.

[34] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 243, see also H.S. LUCAS, *The Low Countries and the Hundred Years War, 1326-1347*, Ann Arbor 1929, pp. 219-272.

[35] N. DE PAUW, *De voorgeboden der stad Gent in de XIVe eeuw,* Ghent 1885, pp. 36-37, 48.

[36] The *Tussen Brugghen* refers to the medieval port of Ghent on the river Lys, next to the nowadays "Korenlei".

[37] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 244.

[38] *Ibid.*, p. 244.

[39] Those who did buy grain on other markets in eastern Flanders had to bring it immediately to Ghent for resale. *Ibid.*, p. 245.

[40] *Ibid.*, p. 246.

on the rural markets surrounding Ghent.[41] Restrictions on re-export generated vast profits for the city. This trade was so intense that the facilities were not sufficient to accommodate the demand of the many merchants from all over the Low Countries.[42]

During the 'Ghent War' of 1379-1385, the trade over the Scheldt undoubtedly suffered, as it did in 1343, 1350 and 1360. In Rupelmonde, one of the larger towns further down the Scheldt river, the toll revenue in 1384 had dropped a staggering 50% in comparison with that of 1378.[43] Nonetheless, the grain trade seemed to recover swiftly. According to the Dendermonde toll records, another large town downstream the Scheldt, nearly twenty-two million litres of grain passed through the city to Ghent in 1386-1387, most of which originated from northern France.[44] Thus, the staple did not only provide a higher degree of food security, but also played an important part in securing revenue for the city in the form of food assizes and profits on re-export. But apart from the general food security, some inhabitants of Ghent had advantages on the food market. Any burgher with sufficient funds and courage could have fed their household by going occasionally to a rural market. Bakers and brewers had priority for one week to buy grain before it was sold on the market. While this privilege was linked to their profession, it also provided them an extra level of food security compared to other Ghentenars.[45] These bakers, limited to bread makers, were closely linked with the millers. Sometimes the same person practised both trades. Bakers constituted 4.2 percent of the labour force and owned more houses and mills than most (see section 5 & 6 for an in-depth analysis).[46] Richer burghers, bakers and millers boosted higher entitlements to food than those who did not have any links to the grain trade.

Aside from regulations, market structures can have a large impact on food entitlements. For example, during the Great Famine in England (1315-17), market failures worsened the effect of harvest failures.[47] Most of the grain consumed in Ghent originated from the nowadays northern French region.[48] Accordingly, the

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[41] *Ibidem.*

[42] *Ibid.*, p. 245. N. DE PAUW, *De voorgeboden*, p. 84-6.

[43] D. NICHOLAS, *The Scheldt trade and the "Ghent War" of 1379-1385*, in "Handelingen van de Koninklijke Commissie voor Geschiedenis", 144, 1978, pp. 189-359, 228.

[44] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 244. When we assume that 1 litre of grain is needed per person per day, this amount of grain could have fed a city with almost 61,000 inhabitants.

[45] *Ibid.*, pp. 245-246.

[46] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., p. 74-6, 250.

[47] P. SLAVIN, *Market failure during the Great Famine in England and Wales (1315-1317)*, in "Past and Present", 222, 2014, n. 1, pp. 9-49.

[48] J. DAMBRUYNE, *Mensen en centen*, cit., p. 291; A. DERVILLE, *Le grenier des Pays-Bas*, cit., p. 276. The treaty of Athis-sur-Orge (1305) recognised the Flemish independence at the cost of the castellanies of Lille, Douai and Orchies and the paying of exorbitant fines to King Philip IV. This treaty was closed after the Battle of Mons-en-Pévèle in 1304, where the French King sought revenge for the defeat in the Battle of the Golden Spurs in 1302. In 1369 all three castellanies were yielded back to Flanders with the marriage of Philip the Bold, Duke of Burgundy, and Margaret of Dampierre, Countess of Flanders. However, this political and legal dispute did not impede the cities in the nowadays northern French region to stop trading with other Flemish cities. A short general overview of this Franco-Flemish war

integration with these markets was one of the cornerstones of the Ghent market structure. As we have seen, the French trade embargo during the Hundred Years' Wars caused severe shortages. To test the relationship between Ghent and the Northern-French region, the wheat prices for Lille, Douai and Cambrai are compared with the rye price of Ghent (graph 2).[49] We have to keep in mind that we are comparing different types of grain, but this is inevitable due to the lack of data for wheat for the city of Ghent and vice versa for rye in the Northern French region.

Graph 2. **The grain prices in Ghent & northern France in the Fourteenth century**
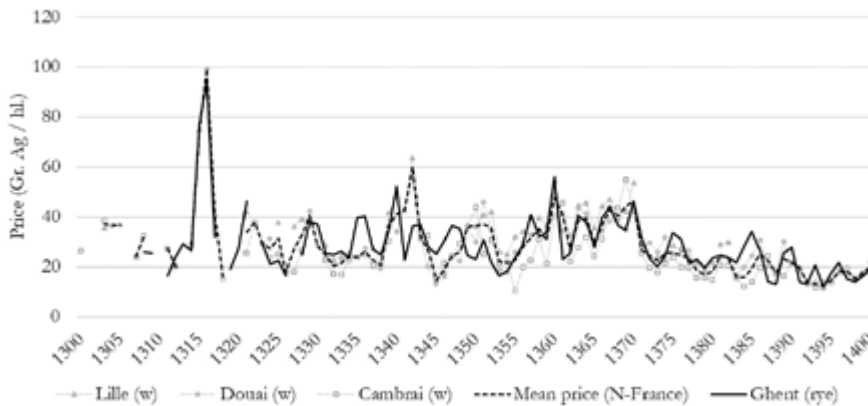
Source: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

For the descriptive statistics, we have chosen to divide the century into three different sub-periods based on economic and demographic trends: a first one from

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(1298-1305) is given in: J.F. VERBRUGGEN, *The battle of the Golden Spurs (Courtrai, 11 July 1302): a contribution to the history of Flanders' war of liberation, 1297-1305*, ed. K. DE VRIES, Woodbridge 2002, pp. 1-18; J.F. VERBRUGGEN, *Vlaanderen na de Guldensporenslag. De vrijheidsstrijd van het graafschap Vlaanderen 1303-1305*, Bruges 1991.

[49] The prices for these three cities that nowadays are located in the north of France are scrutinised by the project *Shock Cities* (2016-2020) at the University of Antwerp. Graphically, we have chosen to clearly visualize the mean price of the Northern French cities versus the series for Ghent. For Lille, the accounts of the hospital of St. Sauveur (LILLE: Archives Départementales du Nord (ADN), *Archives Hospitalières* (AH): VI, E7-11) and those of collegiate church of St. Peter (ADN, série 16 G: *Chapitre Saint-Pierre*, several n°) have been used. For Douai, the main account series that were used are those of the collegiate church of St. Amé (ADN, série 1 G: *Chapitre Saint-Amé*, several n°), the hospital of Wetz (DOUAI: Archives Municipales de Douai (AMD), 2NC n° 1296-7, 1336-8) and the abbey of *Notre-Dame des Prés* (ADN, série 30 H: *Notre-Dame des Prés*, n° 363). The last one has been scrutinised in M. MESTAYER, *Les prix du blé et de l'avoine de 1329 à 1793*, in "Revue du Nord", 178, 1963, pp. 157-176, but has been corrected by the authors. The main account series that were used to compose a price series for Cambrai are those of the hospital of St. Julian (ADN, série 172 H: *l'hôpital Saint-Julien*, n° 53-90) and those of the metropolitan collegiate church of Our Lady (ADN, série 4 G: Chapitre Notre-Dame, 813-8; 6840-86).

the start of the century up until the Black Death, a second one between 1349 and 1370 and the last one from 1371 to 1400. The general trend in the rye price for Ghent is equally visible for the wheat price in the other three cities. From 1370 onwards, the price for the main type of grain consumed in the respective cities drops significantly. The descriptive statistics (table 1) confirm this: the price for all four cities in the period before 1370 is on average (over) 10 gr. silver/hl. higher than the price in the period 1371-1400. The northern French market is likewise less volatile after 1370 than before. The standard deviations of the different price series are significantly lower for all four cities after 1370 than before. This image corresponds neatly with the argument put forward by Bruce Campbell, in which he labels the three decades between 1340 and 1370 as a highly disruptive period after which the medieval economy and demography knew a full-scale recovery.[50] Looking at the period before the Black Death, a high mean is combined with a high standard deviation for Ghent, Lille and Douai. The standard deviation for Lille is lower, partly because the highest peak of the Great Famine (1315-1317) is absent here. For Cambrai, data for the high price periods of 1315-1317 and at the start of the 1340s is absent, explaining the lower standard deviation. In the two decades after the Black Death, the means for all three northern French cities go up, while the mean for Ghent practically remains the same. Although the standard deviations drops for Ghent, those for Lille and Douai are still fairly high. The one for Cambrai is now even the highest of all cities.

Table 1. **Descriptive statistics for the Flemish grain prices (gr. silver/hl.) in the fourteenth century.**

Period		Ghent	Lille	Douai	Cambrai
1300-1400	# data	90	75	76	86
	Mean	28.722	33.062	28.725	22.546
	Std.Dev.	12.489	10.171	13.689	10.062
1300-1348	# data	38	23	24	34
	Mean	32.236	35.474	33.199	25.243
	Std.Dev.	15.134	11.158	19.610	9.267
1349-1370	# data	22	22	22	22
	Mean	32.069	40.457	34.767	29.044
	Std.Dev.	9.982	7.543	8.273	10.539
1371-1400	# data	30	30	30	30
	Mean	21.816	25.790	20.716	14.726
	Std.Dev.	6.349	5.246	4.412	3.847

Source: S. Espeel, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

[50] B.M.S. CAMPBELL, *The Great Transition. Climate, Disease and Society in the Late-Medieval World*, Cambridge 2016, p. 3-19. Although we have to keep in mind that we are comparing the northern French supply region with Ghent so the geographical distance is limited. As Campbell's argument is mainly a climatological one, this would not have had much of an impact on two nearby regions. Testing the market integration of Flanders in the 14th century across different European regions will be carried out in a separate article by one of the authors, Stef Espeel.

As for market integration, this has been put at the centre of the debate of pre-industrial economic growth, given that growth is mainly ascribed to the expansion of markets and the resulting increase of the division of labour and specialisation.[51] Scientific attention for market integration has exploded in the last decades, especially for the early modern and modern period.[52] An important role was set aside for the agricultural markets in pre-modern periods, which improved allocation of (amongst others) grain products. A lower price volatility caused more stable food prices which lead to a higher food security and attenuated the negative relationship between income and death rates, which is presumed to be at work in hunger crises.[53] A definition for market integration has been put forward by A. Cournot, who states that an integrated market is 'an entire territory of which the parts are so united by the relations of unrestricted commerce that prices take the same level throughout with ease and rapidity'.[54] This implies that the level of prices have to be at an equilibrium and that they must return quickly to that equilibrium after a price shock. The first preposition deals with the famous Law of One Price (LOP), implying that perfectly integrated markets handle the same prices for the same commodity, save for the transport costs between those markets.[55] The second preposition focusses on the efficiency of the market. Information sharing and arbitrage imply that whenever price series move away from an equilibrium, they swiftly adjust. This can be measured with the speed of adjustment and the development of stable linear developments.

In this analysis, a three-way methodology will be used to test the level of these two prepositions of integration.[56] To uncover the price convergence (stemming from the LOP), we will look at the cross-sectional coefficient of variation (CV) of the prices in the four cities.[57] The operational efficiency of the market will be tested

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[51] G. FEDERICO, M.-S. SCHULZE, O. VOLCKART, *European goods market integration in the very long run: from the Black Death to the First World War*, in "Economic History Working Papers", 277, 2018; M. KELLY, *The dynamics of Smithian Growth*, in "The Quarterly Journal of Economics" 112, 1997, n. 3, pp. 939-964; S.R. EPSTEIN, *Freedom and Growth: The Rise of States and Markets in Europe, 1300-1750*, London 2000.

[52] An overview of the results and methodology that were used in the studies regarding market integration which were published in the last six decades is published by: G. FEDERICO, *How much do we know about market integration in Europe?*, in "Economic History Review", 65, 2012, n. 2, pp. 470-497.

[53] D.S. JACKS, K.H. O'ROURKE, J.G. WILLIAMSON, *Commodity price volatility and world market integration since 1700*, in "Review of Economics and Statistics", 93, 2011, n. 3, pp. 800-183; H. ALBERS, U. PFISTER, M. UEBELE, *The Great Moderation of Grain Price Volatility: Market Integration vs. Climate Change, Germany, 1650-1790*, in "EHES Working Papers" 135, 2018.

[54] A. COURNOT, *Recherches sur les principes mathematiques de la theorie des richessesses*, Paris, 1838; ID., *Mathematical Principles of the Theory of Wealth,* New York 1971, pp. 51-52.

[55] J. E. ANDERSON & E. VAN WINCOOP, *Trade Costs*, in "Journal of Economic Literature" 42 (2004), pp. 691-751.

[56] Based on the methodology of D. CHILOSI et al., *Europe's many integrations: geography and grain markets, 1620-1913*, in "Explorations in Economic History" 50, 2013, pp. 46-68, 48.

[57] A cross-sectional coefficient of variation is calculated with the prices of different cities in one year. This has only been constructed when there were at least three out of four data points available. G. FEDERICO, *When did European markets integrate?*, in "European Review of Economic History" 15/1 (2011), pp. 93-126.

by two other measures. Looking at the speed of adjustment is not possible, because prices usually adjust within a year in integrated markets and the frequency that our sources permit us to use are annual averages.[58] The measures that we are therefore bound to use are, first of all, the rolling coefficient of correlation (CC), which analyses the presence (or absence) of a stable linear relationship or co-movement between markets.[59] Highly correlated prices signal on-going trade. By using the average 21-years rolling correlation coefficient between the price in each city and the average price, we will be testing the co-movement over time.[60] A second measurement looks at the price volatility in individual localities, for which a rolling coefficient of variation over 11 years for each series will be used.[61] Efficient markets imply better protection from local shocks, which causes more stable prices over time.[62]

For Fifteenth century-Flanders, the integration of the Low Countries cereal market with several other European regions has been studied by Richard Unger. He argues that the distant grain trade had become indispensable to the Low Countries, with clear signs towards a highly integrated market.[63] For the fourteenth century, Richard Unger observes that the degree of integration and the importance of the long distance trade is still uncertain because his analysis only commences in the last decades of the fourteenth century.[64] Moreover, his analysis remained limited to one preposition by studying the correlation coefficients of the price series in question. For the neighbouring duchy of Brabant, Herman Van der Wee stated that the markets were also moving towards a growing integration in the Fifteenth century, a process which became more pronounced over time.[65] In this paper, we are able to go back earlier in time thanks to our exceptional early data, looking at the pivotal period surrounding the disastrous pan-European outbreak of the Black Death. Next to the diachronic expansion, we also integrate the three-way methodology proposed by Chilosi et al. to study the market integration in a more extensive way than the two authors above. Because we are dealing with fourteenth-century grain prices – which are rare for the Low Countries – there are some gaps in the data, especially for the

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[58] H. ALBERS, U. PFISTER, M. UEBELE, *The Great Moderation of Grain Price Volatility: market integration vs. climate change, 1650-1790*, in "EHES Working Papers in Economic History", 135, 2018, pp. 9-15.

[59] R. STUDER, *India and the Great Divergence: Assessing the efficiency of grain markets in eighteenth- and nineteenth-century India*, in "Journal of Economic History", 68, 2008, n. 2, pp. 393-437.

[60] A rolling coefficient of correlation over 21 years has only been constructed when there were at least eleven out of twenty-one data points available for both series in question.

[61] A rolling coefficient of variation over eleven years has only been constructed for each series when there at least 6 data points available for the series in question.

[62] K.G. PERSSON, *Grain Markets in Europe, 1500-1900: Integration and Deregulation*, Cambridge 1999; S.R. EPSTEIN, *Freedom and Growth*, cit.; V.N. BATEMAN, *The evolution of markets in early modern Europe, 1350-1800: a study of wheat prices*, in "Economic History Review", 64, 2011, n. 2, pp. 447-471; D. CHILOSI et al., *Europe's many integrations*, cit., p. 48.

[63] R.W. UNGER, *Feeding the Low Countries Towns*, cit., p. 334.

[64] *Ibid.*, p. 334 and IDEM., *Integration of Baltic and Low Countries grain markets, 1400-1800*, in, *The interactions of Amsterdam and Antwerp with the Baltic region, 1400-1800*, ed. W.J. WIERTINGA, Leiden, 1983, pp. 1-10.

[65] H. VAN DER WEE, *The Growth of the Antwerp Market and the European Economy (Fourteenth - Sixteenth centuries)*, The Hague 1963, pt. II, p. 407-422.

earlier decades. Therefore, when looking at long term evolutions, this analysis is only reliable from the second half of the 1320s onwards.

The evolution of the price convergence within fourteenth century-Flanders, presented by the cross-sectional CV (Appendix 1, graph A), can be divided into five periods. The first one, from the late 1320s to around 1340, the grain prices in Ghent and northern France are converging towards each other. After 1340, until the mid-1350s, the CV is rising again, signifying a divergence of the prices. The third period, running from the mid-1350s to 1370, had converging prices with a falling coefficient, steeper than during the first period. In the subsequent decades, until 1390, prices are diverging again and in the last decade of the fourteenth century another convergence can be distinguished. A clear-cut path for the long term evolution of the price convergence cannot be discerned from the cross-sectional CV, although there are clear periods of convergence and divergence. For the period after the Ghent War, prices seem to convergence, resulting in an enhanced market integration.

The operational efficiency of the market is partly tested by looking at the co-movement (Appendix 1, graph B). Over the course of the century, again several periods can be discerned. The average rolling CC remains quite stable during the 1330s, but rises steeply in the 1340s and 1350s. Afterwards, it hovers around 0.8 until 1375. In the last quarter of the century, the trend for comparison between Ghent and Lille/Douai and Ghent and Cambrai differs significantly. While the CC for the series between Ghent and Lille/Douai rises again towards 0.7, the one with Cambrai drops dramatically, even to 0 from 1385 to 1395. When we switch back to the absolute prices, this is not surprising: Ghent, and to a lesser extent Lille and Douai, knew a small peak during that period, while Cambrai did not. The general drop in the CC that started after 1370 can probably be attributed to the drop in the absolute price level and its corresponding drop in the standard deviation after 1370 for all four cities (see table 1). This drop was greater for Cambrai and lesser for Ghent, causing a greater disparity between them in the transition years towards those decades of lower prices.

Lastly, the third analysis of the market integration looks at the price volatility over time (Appendix 1, graph C). At the end of the 1320s and beginning of the 1330s, the average rolling CV is low and stable, after which it rises to a peak in the first years of the 1340s. From then onwards, the volatility over time keeps dropping, with some minor peaks in the second half of the 1350s, the first half of the 1370s and around 1390. The least volatile period for the whole century lies in the second half of the 1370s and right at the end of the century.

Was the integration between 1355 and 1375 greater than for the period after? These statistical numbers seem to prove so. But in times of lower productivity and higher prices, the smaller volume of grain that reached the market will be driven towards the most competitive markets, resulting in a more (inter)regional trade and higher integration.[66] *Vice versa*, when a more than average volume of grain reaches

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[66] A mechanism put forward by D. FARMER, *Prices and Wages*, in *The Agrarian History of England and Wales, 1042-1350*, ed. H.E. HALLAM, London 1988, pp. 715-817; IDEM, *Prices and Wages, 1350-1500*, in *The Agrarian History of England and Wales, 1348-1500*, ed. E. MILLER, London 1993, pp. 431-525.

the market during a period of low prices, trade will be more localised, resulting in a lower integration. Since the price volatility is at its lowest point in the last quarter of the century, but the cross-sectional CV and rolling CC is higher than the previous period, it seems that this mechanism was in place between Ghent and northern-France: more localised trade due to better conditions caused less volatile, but more divergent price paths. Nonetheless, the integration between Ghent and Douai/Lille stayed strongly in place (illustrated by the individual series in Appendix 1), implying a lasting strong link for grain trade between these latter cities making sure that the grain supply from the northern-French region towards Ghent (and Flanders) hardly suffered in the period after the Ghent War, on the contrary.

4. A GOLDEN AGE? LABOUR BASED ENTITLEMENTS

The question of food security and dearth periods is not solvable using only grain price series, as we have seen in the first part. It only describes one side of the debate. To uncover the question of how food security changed, it is vital to include the evolution of wages, especially in the decades before and after the Black Death.[67] For Flanders, we have reconstructed a series of nominal wages for both skilled and unskilled construction workers in the fourteenth century based on the combination of published and unpublished wage data.[68]

Combining the nominal wages with a nominal price series of rye, we can construct a series of real wages expressed in the amount of grain one could buy with the money they earned in a day. Because sources are lacking to systematically construct price series for other commodities, using this kind of real wage is most suited to study the evolution for the standard of living of the fourteenth-century Ghentenars. The real wage of both skilled and unskilled construction workers is shown in graph 3. On average, the ratio between the real wage for unskilled and skilled workers is about half. We should keep in mind that we are only discussing the income of full-time wage workers who live in the city. On the countryside, the nominal income of farmers would have dropped significantly due to the general falling grain prices in this century (cfr. section 3).

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[67] For a discussion of the Golden Age of Labour, see: J. HATCHER, *Unreal Wages: Long-Run Living Standards and the 'Golden Age' of the Fifteenth Century*, in *Commercial Activity, Markets and Entrepreneurs in the Middle Ages: Essays in Honour of Richard Britnell*, B. DODDS, C. LIDDY eds., Woodbridge 2011, pp. 1-24.

[68] One of the authors (Sam Geens) currently prepares a publication of this data into more detail, but for this article a summarised methodology can be found in appendix 2.

Graph 3. **Real wages in Fourteenth-century Ghent expressed in l. grain per day**
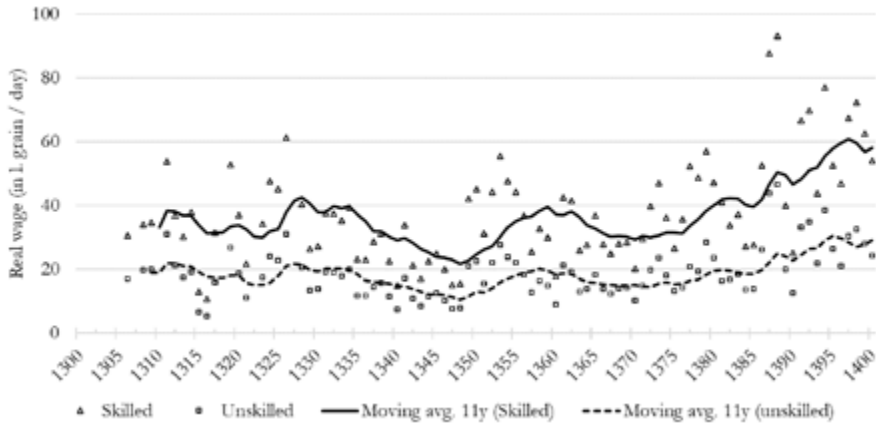
Sources: S. Espeel, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question & S. Geens, Database fourteenth-century Flemish wages (see Appendix 2).

The period with the lowest real wages was the one just before the Black Death struck the European continent in 1348. In the following decade, real wages rose again. Its peak was situated at the end of this century, especially after the 'Ghent War'. To make any conclusions about food security, we need to look at the amount of days that are needed on an annual basis to support a household. In the literature, this is traditionally calculated with so-called consumer baskets.[69] These have been compiled for Flanders from 1349 onwards by John H. Munro.[70] Ideally, such baskets include an amount of different types of grain, some meat, fish, clothing, fuel and house rent. Because of lacking data, Munro has only included grain, butter, cheese and clothing in his Flemish consumer basket for the late middle ages. Since the period before the Black Death proves even more challenging to gather data, we will only consider the amount of grain that was needed to feed oneself (drink not included). In the basket constructed by Munro, this leads up to a total of 124.257 l. of farinaceous products per individual. Because a typical fourteenth-century urban household consisted of 4.5 members, we assume that 559.16 l. of grain was needed for subsistence.[71] Using the real wages, we can subsequently calculate how much

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[69] The use of this methodology for the study of standards of living has been put forward by Jean-Pierre Sosson in: J.-P. Sosson, *Les niveaux de vie au bas Moyen Âge: en guise d'introduction,* in: J.-P. Sosson, C. Thiry, S. Thonon, T. Van Hemelryck eds., *Les niveaux de vie au Moyen Âge: mesures, perceptions et representations*, Louvain-la-Neuve, 1999, pp. 13-17.

[70] J.H. Munro, *Builders' Wages in Southern England and the Southern Low Countries, 1346-1500: A Comparative Study of Trends in and Levels of Real Incomes*, in *L'Edilizia prima della rivoluzione industriale, secoli XIII-XVIII*, Atti delle "Settimana di Studi" e altri convegni, n. 36, ed. S. Cavaciocchi, Istituto Internazionale di Storia Economica "Francesco Datini", Florence 2005, pp. 1013-1076, 1049.

[71] On the size of medieval urban households in the Low Countries see P. Stabel, *De kleine stad in Vlaanderen: bevolkingsdynamiek en economische functies van de kleine en secundaire stedelijke centra in het Gentse*

days an (un)skilled labourer needed to work to purchase this amount (graph 4). In our model, extra proto-industrial work is excluded, as well as the potential earnings of the wife and children because of lack of sources or estimates. If the amount of days surpasses the theoretical maximum employment, we can label it as (extreme) poverty. Estimates of maximum working days range from 210 to 312 days per year.[72] In this study, we have chosen to use a maximum of 250 days.[73] However, we still have to adjust this number since expenditure did not consist solely of grain. According to estimates by Phelps Brown and Hopkins for consumer baskets in medieval England, edible grain types amounted only to 20% of the total basket, excluding housing.[74] Correspondingly, the benchmark line for poverty has to be set on 50 days. Thus, if someone had to work more than 50 days to buy the 559.16 l. of grain needed to feed his household, they are regarded as poor and we can label that year as a 'dearth' year. Naturally, people tend to adjust their expenses from costly (non-edible) commodities to food types with the most calorie-intake per amount of money, even if grain was higher priced than 'normal'. Nonetheless, one should not lose their entitlement to basic needs, such as clothing, because of rising grain prices and we regard adjustments in the most basic composition of a consumer basket as dearth.

On the long term, the standards of living in the building industry were rather favourable, especially for the skilled artisans. Its moving average never even crossed the amount of 40 days to work to purchase enough grain for their household. Only during the Great Famine (1315-1317), one of the worst subsistence crises in the whole of north-western Europe, it surpassed the poverty line (52 days of work). For unskilled labourers, the long-term moving average passes the poverty benchmark at the end of the 1340s. The amount of working days for these unskilled construction workers surpasses the poverty line in no less than 9 out of 38 years before the Black

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kwartier, 14de-16de eeuw, Brussels 1995, pp. 74-76; W. PREVENIER, *La démographie des villes du comté de Flandre aux XIIIᵉ et XIVᵉ siècles*, in "Revue du Nord", 257, 1983, pp. 255-275; M. HOWELL, *Women, Production, and Patriarchy in Late Medieval Cities*, Chicago 1986, pp. 191-192.

[72] The highest estimate of 312 was obtained through the theoretical 52 weeks multiplied by 6 working days per week. In the thirteenth century, an English agricultural labourer worked a maximum of 264 days (see: *Walter of Henley and Other Treatises on Estate Management and Accounting*, ed. D. OCHINKSKY, Oxford 1971, pp. 314-315). Etienne Scholliers similarly states that 264 is the maximum amount of days people could work in fifteenth- and sixteenth century Antwerp with conditions of full employment (see: E. SCHOLLIERS, *Loonarbeid en honger. De levensstandaard in de XVᵉ en XVIᵉ eeuw te Antwerpen*, Antwerp 1960, p. 87). In the publications of Herman Van der Wee the average amount of days of employment in the building industry in the Brabantine region was 210 (see: H. VAN DER WEE, *Growth of the Antwerp Market*, I: *Statistics*, cit., Appendix 48, pp. 540-4). This number is adopted by John Munro, arguing that sometime in the course of a year employment would have been disrupted by bad weather or discontinuities in supplies of building materials (see: J.H. MUNRO, *Builders' Wages in Southern England and the Southern Low Countries*, cit., p. 1029).

[73] Robert Allen likewise applies this number, but by using the logic of working 5 days per week for 50 weeks (see: R. ALLEN, *The Great Divergence in European Wages and Prices from the Middle Ages to the First World War*, in "Explorations in Economic History", 38, 2001, n. 4, pp. 411-447, 425). Although, the normal working week was 6 days per week in the pre-modern era, but the employment would have been less, which is why we have chosen to use a maximum number of 250.

[74] E.H. PHELPS BROWN, S.V. HOPKINS, *Seven Centuries of the Prices of Consumables, Compared with Builders' Wage Rates*, in "Economica, New Series", 23, 1956, n. 92, pp. 296-298.

Death. Afterwards, this only happened twice: in 1360 and 1370. In 1357, 1367 and 1390 it hovered around 45 days. In terms of food security in the long-term, this would have been a huge improvement. At the end of the century, the standards of living were of the highest for the entire century. Again, it has to be stressed that these wages are for the construction workers who actually found work and got paid, which constituted only a fragment of the urban population. The standard of living for a lot of citizens would have been way lower than the unskilled workers.

Graph 4. **Annual standards of living in fourteenth-century Ghent (expressed in minimal days to work to feed a family of 4.5 for one year)**
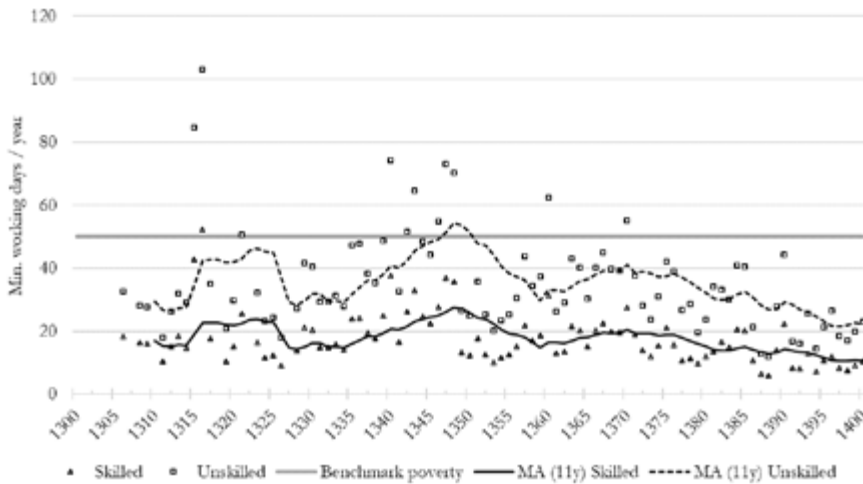
Sources: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question & S. GEENS, Database fourteenth-century Flemish wages (see Appendix 2).

When looking at the moving average, we are ignoring the short-term price peaks in which people were unable to afford sufficient nourishment. The most important issue for these high price peaks is exactly how long people could not afford their subsistence. By using annual standards of living and the moving average, it is impossible to unravel if a dearth period lasted for several months, a whole year or even multiple years. Famine studies regard a high price peak period as one where the grain price rose more than 100% above the 'normal' price.[75] These high price periods were prone to have caused famines. Such price peaks occurred in Ghent

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[75] This is a methodology adopted from J. DIJKMAN, D. CURTIS, T. LAMBRECHT & E. VANHAUTE, *Low Countries*, in G. ALFANI & C. Ó'GRÁDA eds., *Famine in European History*, Cambridge 2017, p. 123-125. The 'normal' price level is defined as the average price in the ninth to second year before the crisis, leaving out the highest and lowest value. This method is carried out using the nominal prices expressed in *Flemish groat* per hectolitre.

during the Great Famine (+299% in 1315 and +230% in 1316), in 1340 (+119%) and in 1360 (+115%).[76] Interestingly, when we compare graph 1 and graph 4, a high price peak does not necessarily coincide with a dearth period. Therefore, the methodology for the selection of famine periods based solely on price levels is not sufficient, in the sense that no wage levels are included. Using graph 5, we have selected problematic periods of which some were already highlighted by the price level of grain. Obviously, the Great Famine still stands out as the harshest period of the whole century. The year 1316 is also the only one where even the skilled artisans would not have reached the necessary amount of working days, as stated before. Next, the graph above indicates that the period from 1335 to 1348 knew worsening standards of living. In the decades after the Black Death, the years 1360 and 1370 witnessed the severest conditions for the Ghentenars. While the Great Famine probably interrupted the provisioning and the security of food for the Flemish cities (and even countryside) for several years, we are unable to check precisely when this started and stopped. For the other dearth periods, we do have monthly price averages.[77] Using the monthly standards of living, we can now look in depth at the duration of certain dearth periods and exactly pinpoint how long a household would be food insecure.

Since we are now dealing with monthly averages, the data in graph 5 and 6 has also been converted to the amount of working days per month that is needed to feed a family of five for one month: just over 4 days. For the first period in which we are taking a closer look (1335-1348), the data for unskilled workers indicates a dearth period that starts at least in August 1339 and only drops under the poverty line again in November 1345. Of course, there is a lot of missing data, for instance the huge gaps between July 1340 and August 1341 and between April 1343 until December 1344. During those gaps, the standard of living could have ameliorated again, but we cannot know for sure. It is noteworthy that the annual data (graph 5) do not show any sign of skilled workers struggling, but with the more detailed monthly averages it is clear that they too struggled during the spring of 1342. Those months were clearly the harshest during the dearth of 1335-1348 in Ghent, when the minimal employment for the unskilled even climbed to 7.7 working days per month (85% higher than the benchmark poverty line). Assuming that the standards of living did not improve during the data gaps, there is a period of at least 6 years of hardship for the majority of Ghent inhabitants. If it did improve, there were at least three periods where the dearth lasted for one year or more (during 1340, 1342 and 1345). Note that the standard of living worsened again from 1347 onwards for the unskilled workers, but monthly averages are lacking for the following years. Again, it has to be stressed that people could of course have adjusted their spending pattern and invest

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[76] If we include 'minor' price peaks of +50% significantly more price peaks are discerned: 1321, 1330, 1343, 1347, 1357, 1363, 1367, 1370, 1390, 1396. It is striking that the period around the Black Death was not that impactful for the price of rye in Ghent.

[77] For Ghent, these are in small numbers supplies by the accounts of the poor table of St. Nicolas: RAG, *Sint-Niklaaskerk & Sint-Veerlekapittel*, K87, n° 496-522; PAR90, n° 119-132. These have been supplemented with monthly wheat prices from the hospital of Saint-Sauveur in Lille ($R^2 = 0.868$) after adjusting the series with the correct equation.

more in the more calorie-rich bread grains or other food types, but this would have come at the cost of another basic commodity.

Graph 5. **Monthly standards of living during the years of 1335-1348 in Ghent (expressed in minimal days to work to feed a family of 4.5 for one month)**
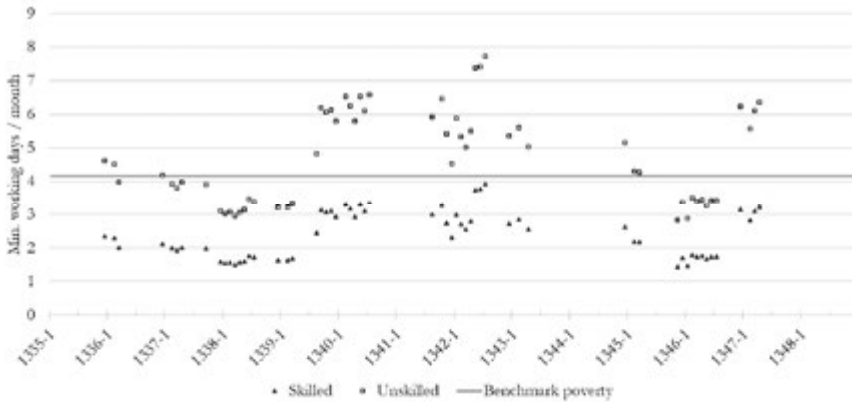
Sources: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question & S. GEENS, Database fourteenth-century Flemish wages (see Appendix 2).

Graph 6. **Monthly standards of living during the periods of 1358-62 and 1368-72 in Ghent (expressed in minimal days to work to feed a family of 4.5 for one month)**
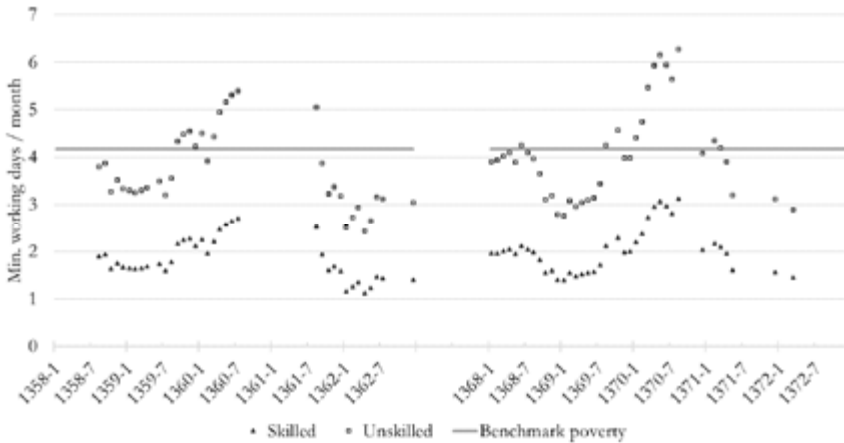
Sources: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question & S. GEENS, Database fourteenth-century Flemish wages (see Appendix 2).

For the years around 1360, shown in graph 6, the standard of living for unskilled construction workers crosses the poverty line in September 1359. Employment climbs up to 5.4 working days (29.6% higher than the poverty line) in July 1360. Afterwards, there is a gap in the data until August 1361, when it still stands at 5.1 working days per month (22.4% above poverty). Next, it drops quickly to a reasonable amount of around 3 working days (28% below poverty). The skilled workers probably had no problems during this period, although it is equally unclear what happened between July 1360 and August 1361. If we assume that it did not drop below the poverty line in that hiatus, this dearth period lasted 24 months. A decade later, around 1370, the standard of living already crossed the poverty benchmark in June 1368 (4.3 days, 3.2% above poverty). From August 1369 on, it knew a steep rise with a peak in the following August 1370 (6.3 days per month, 51.2% above poverty). It only dropped beneath the poverty line after April 1371, comprising a dearth period with a length of 20 months. Both these dearth periods after the Black Death were less extensive and less severe than the one in the 1340s, but we cannot disregard the interplay with other factors, such as disease. In 1360 and 1369 there were plague outbreaks which had more impact on the Flemish cities than the initial Black Death of 1349.[78] W. Blockmans studied the mortality rate derived from tutelage records from the city of Ghent. Tutelage was twice as high in 1360-1361 and two and a half times higher in 1368-1369 than during the five preceding 'normal' years. It reached its peak in the months June until November for both plague outbreaks, which coincides with the 1360 peak of bad standards of living, but not with the 1370 one. For the latter period, the highest mortality has been recorded during the small peak of bad standards of living in June 1368. Mortality rates just after the Black Death (1350-52) only reach a surplus of 13% above 'normal'. This is a clear indication that periods of disease did not necessarily coincide with high prices or dire standards of living. We should also be aware that in the case of malnutrition, there could have been a time lag between worsened standards of living and a rising mortality. In any case, in times of such hardship, the city council did try to regulate the grain market in the form of export bans and other measures in such manner that there would be sufficient quantities of grain in the city (cfr. section 3), but controlling the price levels was not always successful.

Combining newly and especially detailed price and wage series for Ghent to assess the standard of living in the fourteenth-century city proved fruitful. The new data dating back to before the Black Death provides a clear picture of the long-term evolution. Food security improved by a significant degree towards the end of the fourteenth century. People were more capable in feeding themselves after the Black Death, mainly because of rising wage levels. However, this view on the long run excludes dearth periods in which people experienced serious difficulties for several

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[78] W. BLOCKMANS, *The social and economic effects of plague in the Low Countries: 1349-1500,* in "Revue belge de philologie et d'histoire", 58, 1980, n. 4, pp. 833-863, 839-841. Recently, Joris Roosen & Daniel Curtis wrote an article about the severe effect of plague in the Southern Netherlands including a detailed mortality rate for the county of Hainaut (south of Flanders). They also stress that the crisis of 1360 was harsher than others, although their sources only date back to 1349. J. ROOSEN, D. CURTIS, *The 'light touch' of the Black Death in the Southern Netherlands: an urban trick?,* "Economic History Review", 72, 2019, n. 1, pp. 32-56, 42-43.

months or even years in a row. In those cases, the monthly price averages are extremely useful, showing when precisely such hardship started and how long people had to endure. Constructing a detailed chronology of dearth periods is an essential element in the study of famines. Using this methodology, the length of the dearth period of the 1340s stands out. For six years, urban households had to adapt their expense patterns for basic commodities. After the Black Death, the price peaks of 1360 and 1370 caused similar hardship, although for a shorter period.

5. TO INHERIT IS TO THRIVE? INHERITANCE BASED ENTITLEMENTS

Aside from income, economic inequality is most commonly defined as the distribution of wealth. In terms of food security, it constitutes an important set of assets, the so-called inheritance-based entitlement, that can be transferred directly into or traded for food (cfr. section 3 and 4). It is therefore necessary to retrace the distribution of wealth in fourteenth-century Ghent. Did inequality and wealth levels change over time? If so, who benefitted and who lost? To what extent did wealth composition contribute to food security?

According to recent studies of Italian societies, inequality declined sharply after the Black Death and would not reach its previous levels until the sixteenth century.[79] While the precise drivers are still uncertain, it is clear that the downward trend is driven by a significant loss in the share of the richest 10%. Who benefitted from this redistribution varied however from one community to another. For example, in Santa Maria Impruneta gains were relatively even across all social layers, while in Poggibonsi the higher middle classes profited most.[80] Food security probably improved for the majority of the population in the former case, whereas improvements were potentially concentrated to a limited group in the latter case. Of course, any positive effects by changes in the distribution (relative) could be offset by a decrease in the total wealth (absolute). And even if inequality and wealth levels remained stable, changes in the composition of wealth could have an impact on food security.

To chart the evolution of wealth inequality, levels and composition in Ghent, we employ inheritance inventories. Compared to tax registers, the most frequently used source for medieval inequality, probate inventories provide only a sample of the population rather than a cross-section. And while both suffer from a social bias, often excluding the propertyless, it is much harder to estimate the distribution of the total population with a dynamic sample entailed in inheritance inventories. Despite these drawbacks, the source type has already been successfully employed by other scholars to produce assessments of wealth in historic societies.[81] Probate inventories

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[79] G. ALFANI, F. AMMANNATI, *Long-term trends in economic inequality*, in "Economic History Review", 70, 2017, n. 4, pp. 1072-1102; G. ALFANI, *Economic Inequality in Northwestern Italy*, in "Journal of Economic History", 75, 2015, n. 4, pp. 1058-1096.

[80] G. ALFANI, F. AMMANNATI, *Long-term trends*, cit., pp. 1091-1092.

[81] H. CANBAKAL, A. FILIZTEKIN, *Wealth and Inequality in Ottoman Bursa, 1500-1840*, Unpublished paper presented at the conference on the Political Economy of the Muslim World, Houston 2013; P.

complement tax registers as they have the important advantage of providing a more comprehensive picture of household assets.[82] Furthermore, inventories tend to be more abundantly available than taxation lists, allowing us to analyse evolutions at more frequent intervals.

For the city of Ghent, probate inventories connected to the inheritance of orphans are preserved from 1349 on, making them one of the oldest series for Europe.[83] According to the city's customs, the aldermen were responsible for appointing guardians for and register the share of inheritance bequeathed to minor citizens who had lost one or both parents. In other words, anyone who did not have minor heirs are not included in the source, i.e. children, clergymen or unmarried singles. However, since the mortality rate in medieval cities was relatively high and the age of the majority was much higher than today (25 years or when someone married) the probability of leaving an inheritance to (a) minor(s) was far from rare.[84] According to Liliane Wynant, the inventories represent on average 10% of all married adult deaths.[85] Another, perhaps more important, social bias involves the cost of registration. Contrary to other Flemish cities, citizenship in Ghent was free and thus, in theory, the orphan inventories could include all social layers. In practice, the lower classes with limited to no assets did not register their inheritance as a fee of 40 *deniers Flemish groat* (equivalent of 4 days of skilled work) had to be paid for drawing up the inventory.[86] Nevertheless, the level of recorded wealth (see table 2) seem to hint at a rather inclusive source with minimal values equal to 147 gr. silver or 15 days of skilled work. The inclusiveness also seemed to increase throughout the period as more inventories equal to less than a year of skilled work were recorded. At the upper end of society, the high nobility is also underrepresented as they used their own courts to settle and register inheritances. Lower nobility, mostly daughters married to rich traders or merchants, are however well recorded (around 6.75% of all inventories).

LINDERT, *Unequal English Wealth since 1670*, in "Journal of Political Economy", 94, 1986, n. 6, pp. 1127-1167.

[82] Except for the detailed Florentine *catasti*, most tax registers only record a general assessment of wealth based on vague criteria.

[83] Summaries of the inventories have been made for the period 1349-1400 and have been used to construct the database. L. WYNANT, *Regesten van de staten van goed: 1349-1400*, Brussels 1985.

[84] A. GHEDOLF, *Coutume de la ville de Gand*, Brussels 1868, pp. 95-98.

[85] L. WYNANT, *Peiling naar de vermogensstruktuur te Gent op basis van de staten van goed 1380-1389*, in *Studiën betreffende de sociale strukturen te Brugge, Kortrijk en Gent in de 14de en 15de eeuw*, Heule 1973 (UGA, Standen en Landen, 63), pp. 48-138, 50.

[86] L. WYNANT, *Regesten*, cit., vol. 2, n°4808.

Tab. 2. **Wealth levels in the orphan inventories of Ghent (1349-1400).**

	Sample period			
	1349-55	**1371-75**	**1379-85**	**1395-1400**
Total (N)	**302**	**391**	**635**	**477**
Inclusiveness (wealth < 1year skilled wage)	4.0%	9.2%	5.8%	13.2%
Median wealth (in gr silver)	13,449	10,106	12,654	9,172
Median wealth (> 1 year skilled wage)	14,510	11,183	13,759	11,640
Min wealth (in gr silver)	548	330	427	147
Max wealth (in gr silver)	821,859*	557,966	455,549	575,237
Gini (all)	0.68*	0.68	0.58	0.67
Gini (> 1 year skilled wage)	0.68	0.65	0.56	0.63

*: Numbers calculated without probate inventory n°210 involving the inheritance of the count's sister, which had a disproportionate effect on the distribution and can be considered exceptional as no other inventory achieved such wealth levels.
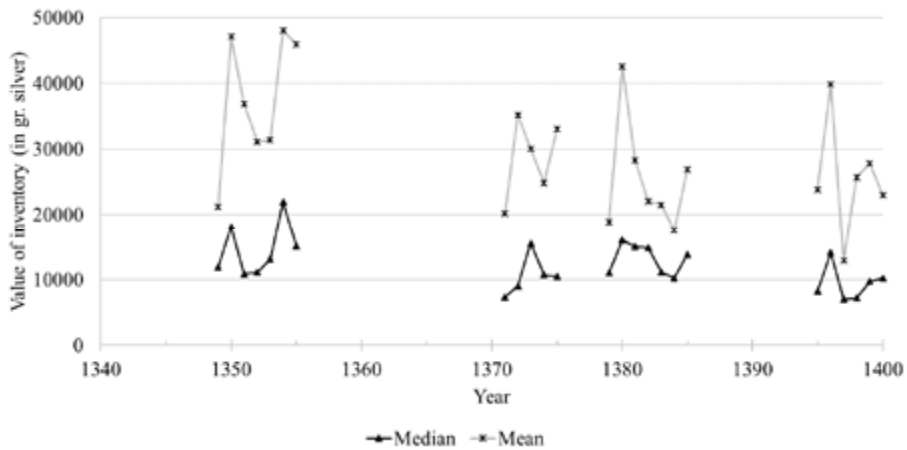Source: S. Geens, W. Ryckbosch, Database of the Ghent orphan inventories.

To assess the evolution of inheritance-based entitlements, we have selected inventories for three sample periods spread evenly across the century: 1349-55, 1371-75 and 1395-1400. We have also included a sample for the Ghent revolt of 1379-85 to analyse the impact of warfare. Together, the four samples encompass 1805 inventories. The orphan registers generally recorded annuities, chattels, liquid assets, houses and land, though the level of detail may vary from one to another. We have estimated the total wealth of households by calculating the value of every component based on the recorded real values, rental or lease values, the size, or – if no information is given – the median value of all similar assets with a value in other inventories of the sample period (see appendix 3 for a more detailed description of the method). For around one third of the records (n = 682) no information on the wealth components is given, because the heirs opted to pay a one-time sum (called *afkoop*) to free themselves from the legal obligations regarding the minors. This sum was proportional to the total estimated wealth and records involving *afkoop* could therefore be included in our database. Especially the higher classes made use of this right (around half of the inventories in QU4-5 vs. 29% in QU1-3).

In terms of absolute levels of wealth, the second half of the fourteenth century seems to be one of declining prosperity, which is in line with its economic trajectory. Both median and average levels reduced by around one fifth between the first and last sample period, even when controlling for the changing inclusiveness of the orphan registers. This trend was probably reinforced by the impact of the first plague waves. Although our observations are limited for the pre-Black Death period (n=10 for 1349), the value of household assets in 1349 was similar to those in later

periods.[87] Massive mortalities caused a sudden increase in wealth per household because the total stock was redistributed among fewer households. Indeed, the annual evolution of wealth (see graph 7) is characterised by spikes one year after plague years (1350, 1354, 1380), which resulted in disproportional higher levels in some sample periods.[88] Remarkably, median and average values fell sharply shortly after plague waves. Such an observation is in line with the thesis of an increased migration from countryside to towns after mortality spikes, proposed by several scholars.[89] Poorer households in search for new opportunities upheld the urban population of Ghent to some degree but also brought wealth levels back down.

Graph 7. **Annual evolution of the total wealth in the orphan inventories of Ghent (1349-1400)**

Sources: S. GEENS, W. RYCKBOSCH, Database of the Ghent orphan inventories.

When excluding the short spikes from plagues, the decline of wealth levels in the orphan registers and thus the total assets that could be traded for food was rather limited. Similarly, table 2 reports relatively few changes in the total inequality over the long term (Gini coefficient decreased only by 0.05). However, this does not mean that everything remained the same. We need to remind ourselves that our sample only includes citizens with at least a modest set of assets. Changes in the wealth of non-citizens and those with little to no wealth are thus not registered and

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[87] Even though the Black Death reached the Low Countries in 1349, orphan inventories of this year are largely unaffected by these events because wealth accumulation after plague years is associated with an increased share of bequests per capita. We expect that those dying during the epidemic had profited little from this boom in inheritances.

[88] Although a clear spike in mortality, it is uncertain if 1353 was related to plague. For the identification of plague years: J. ROOSEN, D. CURTIS, *The 'light touch' of the Black Death*, cit., pp. 32-56.

[89] *Ibid.*, pp. 51-52; G. ALFANI, F. AMMANNATI, *Long-term trends*, cit., p. 1098.

could influence real inequality. Nevertheless, important evolutions in both the distribution of wealth and its components can be found in our samples.

Appendix 4 shows the share of total wealth owned by each decile per sample period, the absolute and relative growth rates between the sample periods. The latter information is also summarised in graph 8. After the Black Death, the picture for Ghent looks very similar to the one for Poggibonsi (cfr. supra). Except for significant losses within the richest 10% of society, all classes saw their share in the total wealth increase. The largest gains were situated in D8 and 9, which explains why the general Gini coefficient remained almost the same.

Graph 8. **Evolution of the relative growth rate per decile in the orphan inventories of Ghent between different sample periods (1349-1400)**
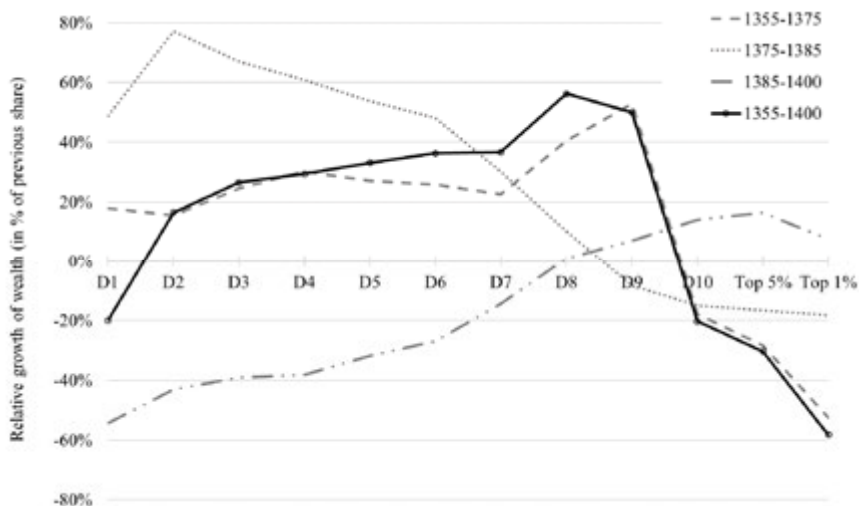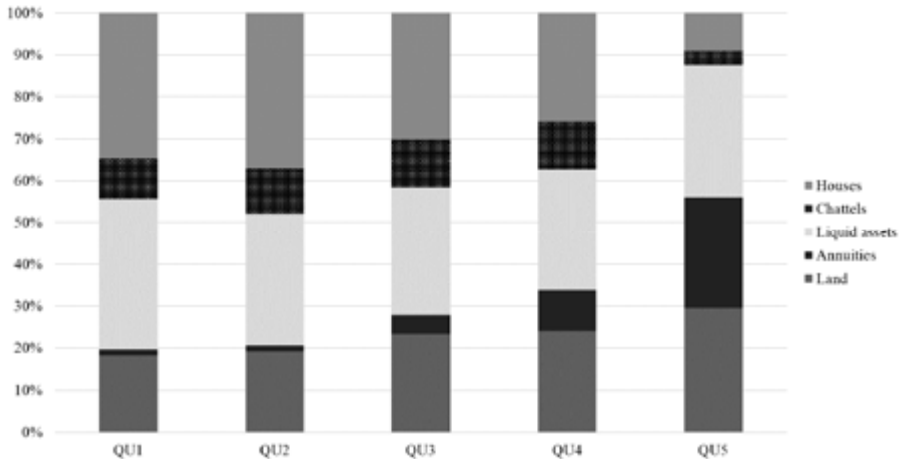

Source: S. GEENS, W. RYCKBOSCH, Database of the Ghent orphan inventories.

Inequality decreased in the 1370s when the lower classes in our sample (D1-6) enlarged their household assets comparatively more than other groups. While a precise explanation of this trend falls outsides the scope of this article, we presume that such gains are connected to the massive increase of real wages during this period (cfr. section 4) because citizens of these deciles were highly dependent on wages for their income. In addition, lots of properties were destroyed or forfeited during the Ghent revolt (1379-1385). Traders had fled the city. Land prices declined by two thirds.[90] Annuities, leases and debts were often impossible to collect. [91]

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[90] E. THOEN, *Landbouwekonomie en bevolking in Vlaanderen gedurende de late Middeleeuwen en het begin van de Moderne Tijden. Testregio: de kasselrijen van Oudenaarde en Aalst (eind 13de- eerste helft 16de eeuw)*, Ghent 1988, pp. 882-883.

These types of assets were especially important to the higher classes (see graph 9). Consequently, the top 20% of our sample was hit the hardest as is evident from the falling average and maximum wealth levels.

Graph 9. **Wealth composition of the orphan inventories per quintile (1349-1400)**

Source: S. GEENS, W. RYCKBOSCH, Database of the Ghent orphan inventories.

After the revolt, almost the exact opposite trend is visible, wiping out (almost) all gains of the lower classes (D1-4). The shock to the economic capital and the unstable political situation was disastrous for the urban economy and, presumably, employment levels. The textile industry, still the largest sector in the city, reached its nadir during the 1380s. The evolving composition of household wealth largely confirms this trend. The share of land, of liquid assets (including debts) and of annuities in the total value of all inventories declined sharply during the revolt (their share was respectively reduced by 39%, 12% and 19%). Afterwards, investments outside the city increased significantly, probably compounding the declining urban economy. The share of land and annuities increased again (+48% and +104%), while that of houses was reduced by half.

Despite relatively unchanging inequality and median wealth levels, the detailed study of the distribution revealed some clear winners and losers in terms of inheritance-based entitlements during the second half of the fourteenth century. The higher middle groups (D8-9) were most successful in enlarging their total assets, much at the cost of the richest groups. Of course, such a reduction had little effect on the food security of the latter as the median value of their wealth was still equal to 40 years of skilled labour. Solid gains were also visible for deciles 2 to 7. In contrast, the poorest households in our samples lost ground after the Ghent revolt. Accounting for the difference in inclusiveness, the median value of the lowest decile

[91] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., pp. 10-16.

declined from the equivalent of 111 hectolitres of rye to 67.5 hectolitres, a reduction of more than one third.[92] For this group, their modest wealth could prove a critical buffer in times of need. Crudely put, if they sold their entire property but their house, they would be able to feed their household for 3 years before the war and only 2 years after.[93] For lower groups, such a reduction would be problematic and could push them into poverty. The minimal reported wealth in the inventories of the 1395-1400 sample, for example, could only overcome two months of hardship. Although those poorer households are largely absent in the orphan registers, their fate seems to mirror that of the first decile of the database. Evidence from charity institutions and donations, suggests that poverty declined substantially after the Black Death but became problematic again after the Ghent revolt.[94]

6. PRODUCTION BASED ENTITLEMENTS

The last group of entitlements relates to the assets and skills that can be used to produce food for own consumption. According to Amartya Sen, households owning such entitlements are more food secure because they are not (entirely) dependent on their exchange entitlement. In the case of increasing prices, having direct access to food is certainly advantageous. The share-cropper, for example, is certain of an income in food, whereas the landless labourer would witness a serious decline in purchasing power during price peaks. On the other hand, the former is more prone to production failures.[95] This last section explores who controlled the modes of production in the city of Ghent and how these entitlements changed over time.

The orphan inventories discussed in previous paragraphs contain valuable information on the owners of various modes of production. Graph 10 shows the economic position of several occupational groups based on their property. Naturally, owning a bakery, for example, didn't necessarily mean that they were bakers, but the inventories provide unfortunately scant information on the occupational status of the deceased. Taken all samples together, we managed to identify 116 inventories of food related occupations (bakers, brewers, butchers, millers) and 99 inventories of other sectors (textile, transportation and building). Except for butchers, all food related occupational groups were wealthier than the average citizen of Ghent. Owners of mills were exceptionally wealthy, half of them belonging to the richest 25% in our samples. They also boasted the highest proportion of nobles for any occupational group (5 out of a total of 26 were or were married to a noble) and often held large amounts of lands. The inventory of Gillis van den Hulle showed that some bakers also owned a mill. Boudin Ghiselaes and Clays van der Venne also

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[92] To account for inclusiveness, we have taken the median value of the poorest 10% of inventories in the sample of 1395-1400 with a value equal or greater to the minimum value in the sample of 1349-55.

[93] Calculation based on the earlier assumption that a household of 4,5 needed 559,16 liters of grain per year and that this constituted 20% of the total expenditures (see section 4).

[94] *Ibid.*, pp. 56-57.

[95] A. SEN, *Poverty and Famines*, cit., pp. 4-6.

possessed a brewery.[96] Such an overlap between related professions was certainly not rare within fourteenth-century Ghent.[97] These groups naturally ticked all the boxes in terms of food security: they possessed both the agricultural production and the means to process their grain into basic food, such as beer and bread.

Graph 10. **The economic position of different occupational groups in the orphan inventories of Ghent (1349-1400)**
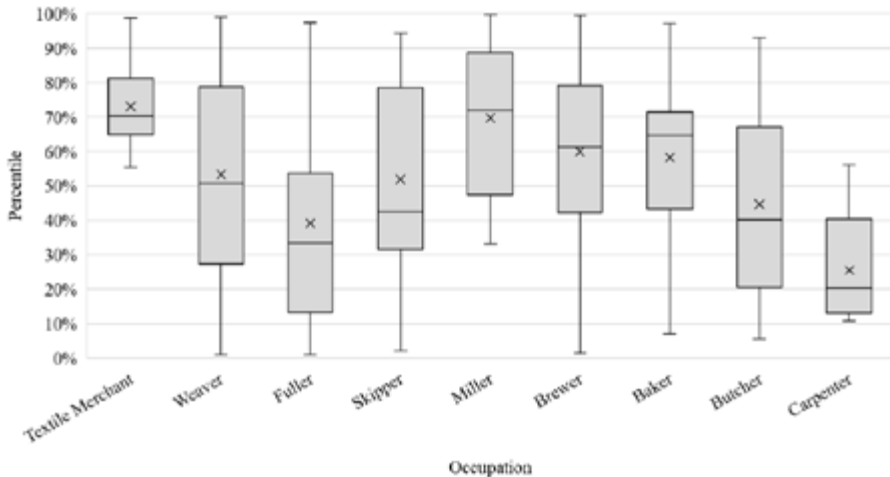
Source: S. GEENS, W. RYCKBOSCH, Database of the Ghent orphan inventories.

The relatively low economic position of the butchers seems somewhat surprising given their political power, the hereditary nature of the profession (meat stalls could only be inherited), and the increased consumption of meat in the second half of the fourteenth-century Flanders.[98] However, income from meat stalls was relatively limited. A lease of a stall in 1387, for example, was only worth the equivalent of 91.5 days of skilled labour. Furthermore, the butchers failed to institute an effective monopoly on the sale of meat. While meat slaughtered outside the city had to be brought to the butchers, citizens of Ghent were free to own animals, slaughter them within the city and sell them to others. Apparently, bakers made frequent use of this right. They even controlled much of the pig trade with the local churches.[99] Generally speaking, the food processing industry of Ghent was thus mainly

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[96] L. WYNANT, *Regesten*, cit., vol. 2, n°4741, 3552, 4823.

[97] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., pp. 252-253.

[98] E. THOEN, T. SOENS, *Vegetarians or Carnivores? Standards of living and diet in late medieval Flanders*, in *Economic and biological interactions in the pre-industrial Europe from the 13th to the 18th centuries, Atti delle "Settimana di Studi" e altri convegni, n. 41*, ed. S. CAVACIOCCHI, Florence 2010, pp. 495-527.

[99] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., pp. 253-261.

controlled by wealthy citizens who were often active in different branches of the sector.

While assets like bakeries and breweries were essential components of the food sector, it is land that constitutes the most important source of production in a premodern society. As Sam Geens has shown, the access to land played a crucial role in food security during the Great Famine of 1315-17. Size of the property, the distribution of rights over and the use of land determined how resilient farm owners were against one of the worst subsistence crises in history.[100] Several scholars also highlight the importance of the flexibility in which leases could be paid. Most lease contracts in late medieval Flanders stipulated a cash sum to be paid in regular intervals. Indeed, only 3.6% of all leases (22 out of 616) in the database of orphan inventories record payments in kind. However, in practice, it was common that payments were (partially) fulfilled in kind, especially during periods of crisis.[101] Accordingly, citizens who owned land enjoyed a higher food security.

Land ownership of the citizens of Ghent has been the subject of some scholarly attention. Already from the late thirteenth century, urban patricians started to invest in land, especially in the valuable peat lands north of the city. During the second half of the fourteenth century, historians assume that wealthy merchants and craftsmen also started to invest in land, but a precise chronology and social scope of this trend has remained difficult to assess.[102] To trace those evolutions in land ownership into more detail, we have calculated the share of inventories with land, the median size of land, and the estimated median income derived from land per quintile for each sample period (see appendix 5). Additionally, we have mapped the location of each possession to trace any changes in the geographical scope.

Appendix 5 largely confirms the impression of earlier works as land ownership by citizens increased significantly after the Black Death. In our first sample period (1349-55), land was still mainly a prerogative of the richest in society. Whereas inventories of quintile 5 recorded such assets frequently (73.3%), land in other inventories was mostly absent (52.4% of QU1-4 reported no land) or limited in size (approximately 2.5 hectares). During the 1360s and 70s, the higher middle groups invested their increased wealth (cfr. supra) in land. Possession for quintile 4 increased to 72.2% and the median size almost doubled. Two decades later, the middle classes followed the same trend (possession increased to 70.4% for QU3). The reason was probably different though. After the revolt of Ghent (1379-85), the total wealth of these groups did not increase, but, in fact, decrease substantially. The investment in the countryside, in our view, was a symptom of the failing economy after the war. Moreover, land prices had dropped steeply during this period, presenting the opportunity to buy assets that were considered profitable and

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[100] S. GEENS, *The Great Famine in the county of Flanders (1315-17): the complex interaction between weather, warfare, and property rights*, in "The Economic History Review", 71, 2018, n. 4, pp. 1048-1072.

[101] For example, L. VERVAET, *Goederenbeheer in een veranderende samenleving. Het Sint-Janshospitaal van Brugge ca.1275- ca.1575*, Ghent 2014, unpublished Phd, pp. 218-226.

[102] F. BLOCKMANS, *Het Gentsche stadspatriciaat*, cit., pp. 288-299; E. THOEN, *Landbouwekonomie*, cit., pp. 512-527; L. WYNANT, *Peiling naar de vermogensstruktuur te Gent*, cit., pp. 47-137; L. VAN CAMP, *Het buitensteeds onroerend bezit van de Gentse gegoede stand in de XIVᵉ eeuw*, Ghent 1965, unpublished MA thesis; A. DE VOS , *Inventaris der landbouwpachten in de Gentse Jaarregisters van de Keure*, Ghent 1958.

relatively risk-free. The destructive impact of the war on the land market is clear across all social layers considering that possession of land dropped for almost every quintile.

Map 1. **The evolution of land possessions in the orphan inventories of Ghent (1349-1400)**
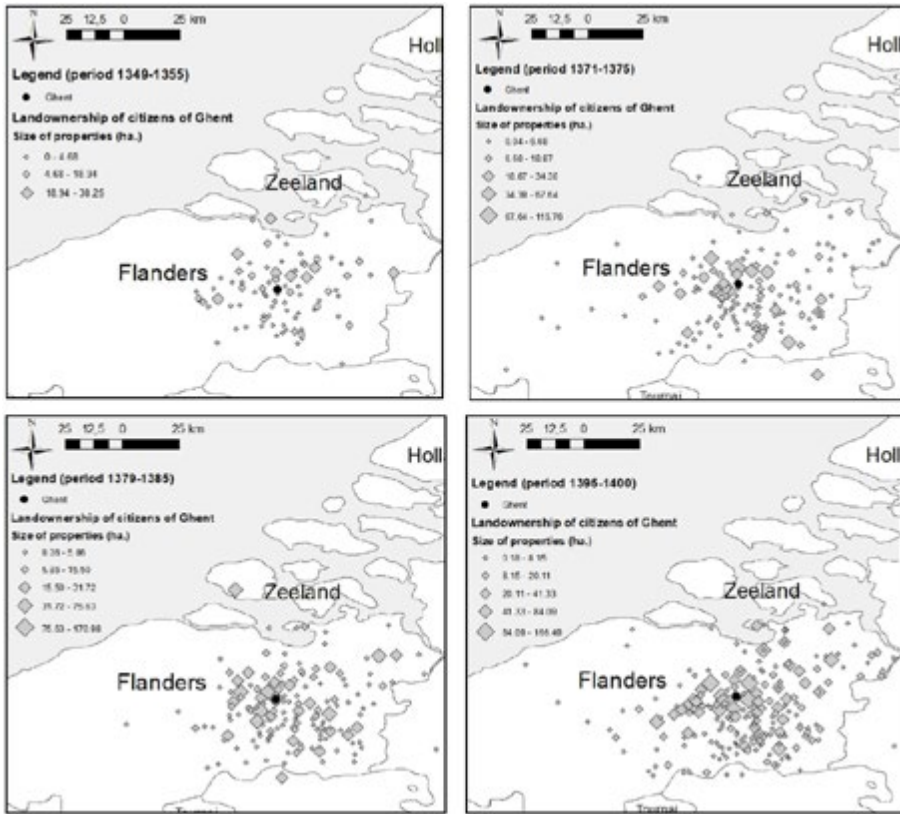
Source: S. GEENS, W. RYCKBOSCH, Database of the Ghent orphan inventories.

Map 1 geographically visualises the described evolution for the four sample periods. In 1349-55, urban land ownership was still mostly concentrated north of the city, reflecting the elite pattern described by Frans Blockmans for the late thirteenth and early fourteenth century.[103] The first boom of urban land ownership is visible in the second map. Higher middle classes seemed to have favoured properties south of the city and especially towards the small town of Deinze. During the destructive epi-

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[103] See the map drawn by E. THOEN, *Landbouwekonomie*, p. 517 based on F. BLOCKMANS, *Het Gentsche stadspatriciaat*, cit.

sode of the revolt, the geographical scope of ownership decreased, concentrating rather on the areas closest to the city. The last map depicts the second phase of expanding ownership. The pattern of possessions mainly suggests a strengthening of areas invested in during the first boom of 1371-1375, which is consistent with the observation that the higher middle groups further expanded their land assets. At the same time, investments east of the city seemed to have increased. In general, the maps show that citizens of Ghent came to hold considerable shares of land in a radius of approximately 30 kilometres around the city.

To evaluate the impact of the described evolutions on food security, we have expressed the median income from leasing out land in litres of rye using the price series constructed in section 5. Just as in the previous section, the higher middle groups are the clear winners. Their income from land possession quadrupled from 5.3 hectolitres in 1349-55 to 23.1 hectolitres in 1395-1400. Put differently, it would almost provide them with enough income to feed their family of 5 for an entire year.[104] Gains were also visible for the richest (QU5) and the middle groups (QU3), but they were not as impressive. At the other end of the spectrum, the lower groups (QU1-2) clearly lost in the long run. Land possession for the poorest inventories decreased by a third. The number of inventories containing land remained relatively stable for the second quintile, but their income from these assets declined from 5.7 hectolitres to 4.3 (a loss of 25%). At the end of the fourteenth century, wealth compositions thus became more polarised. Lower groups progressively lost the little access to land they had, while (higher) middle groups imitated investing patterns of elites.

CONCLUSION

By testing the four different food entitlements on a fourteenth-century large city, we have attempted to unravel the influence of grain markets and economic inequality on the ability of people to provide themselves with sufficient nourishment. During the calamitous fourteenth century, this would have undoubtedly been a problem for several periods and for several groups of people. With numerous political conflicts, biological disasters and hazardous weather anomalies, the later middle ages are a perfect laboratory for answering this question.

The long-term decline of grain prices in the second half of the fourteenth century caused an improvement in labour- and trade-based entitlements, especially after the Black Death and even more so after 1370. While this evolution seems to mirror demographic trends, real wages of the early fourteenth century do not conform to an often-hypothesized Malthusian ceiling. In most years, both skilled and unskilled workers were still able to earn enough to provide food for their household. In this regard, the pessimistic view of Jean-Pierre Sosson on the labour-based entitlements of unskilled workers in the middle ages seems unwarranted for our case study. Furthermore, non-demographic markets, such as the integration and

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[104] See note 93.

regulation of markets, probably contributed to the long-term increase in food security.

Moving from the long-term to the short-term, we identified several periods of dearth. Rather than reporting the mere occurrence of high prices, we have focussed on the duration of increased price levels to pinpoint those moments when people had to adjust their spending pattern. Although the city council tried to regulate the important grain market, it could not work miracles. Trade-based entitlements failed during the Great Famine (1315-17), 1340s, 1360 and 1370, when prices peaked during several consecutive months or even years. The 1340s especially stand out as the most bitter ones of this century. We should however be wary of the fact that these evolutions are all based on wage data of fulltime construction workers, while we lack any evidence for other groups. The situation for people who were paid less or even did not find any type of (regular) employment would have been much worse.

Aside from labour and trade, wealth constitutes an important entitlement to food. Although average levels of wealth remained relatively stable in the second half of the fourteenth century, the distribution among the different citizens witnessed significant evolutions. In this period, the upper middle groups managed to strengthen their position at the expense of other groups. The richest of the sample clearly lost, but their food security was probably never in any danger given their financial situation. After the Black Death, the lower groups initially fared well, but the Ghent Revolt had a huge impact on their inheritance-based entitlements. The level of wealth recorded in the probate inventories dropped by more than one third. Likewise, the number of poor seemed to have peaked during this period. A similar trend was observed when focussing on specific assets related to production-based entitlements. Within the city, food producing assets, such as bakeries or breweries, were concentrated in the hands of the upper middle classes and the wealthy. Outside the city, land made up the most important source of production. Land ownership by citizens increased significantly after the Black Death, but this evolution was once more skewed towards the (upper) middle classes. While these groups profited from the low land prices after the devastating Ghent Revolt, lower groups were gradually pushed out of the market and lost the little access to land they had before.

In general, the combination of trade-, labour-, inheritance- and production-based entitlements shows a clear winner in terms of food security in fourteenth-century Ghent, namely the (upper) middle classes. Real wages of skilled workers suggest that they only experienced hardship in one year (1316), which was one of the worst famines in European history. Incomes and wealth levels increased during the second half of the century and were invested in landed property, potentially providing direct access to food production. In stark contrast, the evolution of the wealthy citizens seems one of declining security though never reaching critical levels. Lastly, the picture for the lower classes is more ambiguous. While their entitlements clearly bettered after the Black Death, their wealth levels and access to land declined sharply after the Ghent Revolt. Real wages might indicate that their incomes still increased during the latter period, it is doubtful that they could have found the same level of employment as before the revolt given the state of the urban economy. Lower classes thus ended up in a worse situation at the end of the century.

APPENDIX 1. MARKET INTEGRATION BETWEEN GHENT AND THE NORTHERN-FRENCH CITIES.

A. **The cross-sectional coefficient of variation for Ghent (rye) and Lille, Douai and Cambrai (wheat) in the fourteenth century. This graph signifies the price convergence of these series over time.**
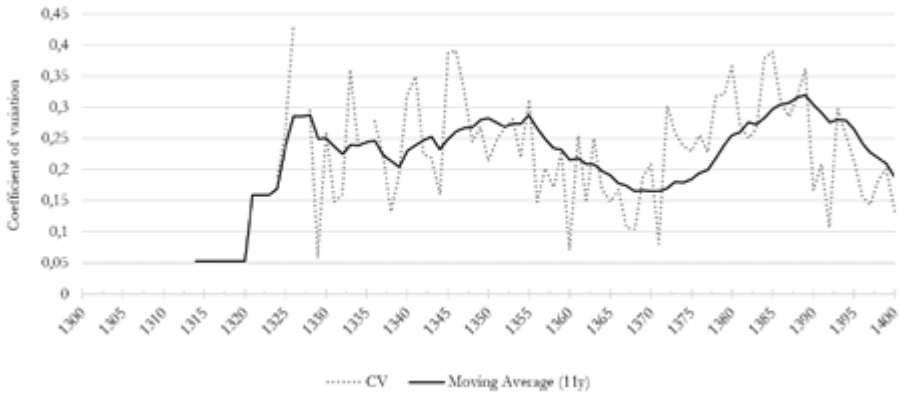
Source: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

B. **The rolling coefficient of correlation over 21 years for the prices series of Ghent (rye) and Lille, Douai and Cambrai (wheat). This signifies the price co-movement of the wheat prices in the northern-French cities with the series for Ghent over time.**
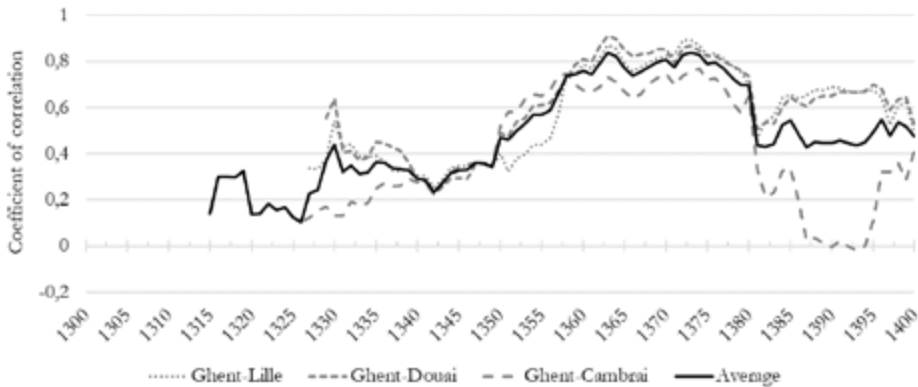
Source: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

C. The rolling coefficient of variation over 11 years for the price series of Ghent (rye) and Lille, Douai and Cambrai (wheat). This signifies the price volatility (oscillations) over time for the price series in question.
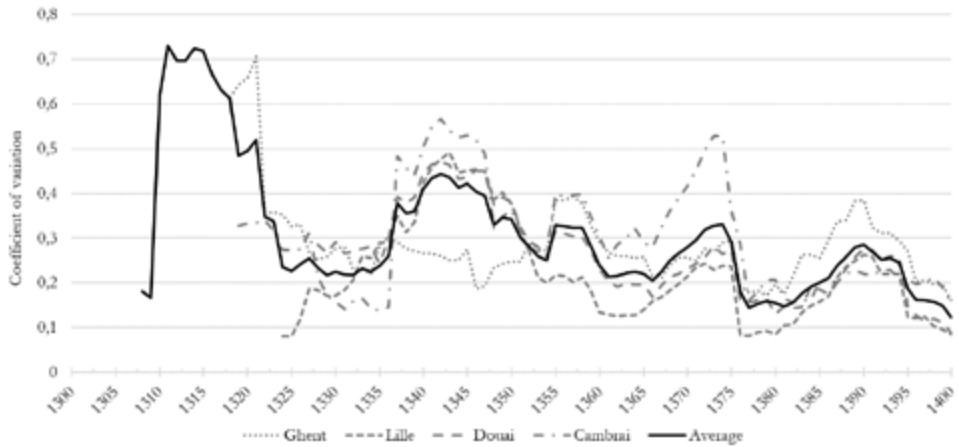

Source: S. ESPEEL, Database fourteenth-century Flemish grain prices, compiled of the sources stated in note 49 for the cities in question.

APPENDIX 2. RECONSTRUCTING NOMINAL WAGES IN GHENT.

Nominal wages for fourteenth-century Ghent are rare as the city accounts, the most commonly employed source, provide only scant information on daily wages. To fill the many gaps, we have mainly resorted to the more abundantly available wage data for the city of Bruges because numerations were almost identical. Before the Black Death, the account of the water board of Blankenberge proved to be the most complete series.[105] In total, we only lacked any wage indication for 20 out of 101 years, all in the first half of the century. Gaps were not larger than 7 consecutive years and on average only 3. Because of wage stickiness, such gaps don't really pose an issue to our series.[106] Below, we report all used sources and adjustments made. The publication of all figures is not included as it would result in an unnecessary long appendix. However, one author currently prepares an article on these series to make them available to all.

Period	Geography	Source	Adjustments	Skilled	Un-skilled
1349-1485	City of Bruges	J. Munro, *Builders' wages*, 2004, p. 1054.	Unadjusted	X	X
1349-1485	City of Bruges	J. Sosson, *Les travaux publique*, 1977, Annexe 26-27	Unadjusted	X	X
1304-1316	City of Bruges	C. Wyffels, J. De Smet, *De rekeningen van de stad Brugge*, 1965	Unadjusted	X	X
1321-1376	City of Ghent	E. Thoen, *Landbouwekonomie*, 1988, p. 1318	Unadjusted	X	X
1400-1500	City of Ghent	Verlinden*, Dokumenten voor de geschiedenis van prijzen*, 1972, pp. 388-426	Unadjusted	X	X
1285-1500	Blankenberge	Bruges, Rijksarchief Brugge, Watering Blankenberge, n° 333-334 Bruges, OCMW-Archief Brugge, Sint-Jans hospital, n° 3, 4, 12-14.	Skilled x 1.5*	X	X
1342-1397	Eiesluis	Bruges, OCMW-Archief, St-Jan wateringen, doos 10 Bruges, Bischoppelijk Archief, A277	Skilled x 1.5*	X	X
1377-1494	Vlissegem	Sosson, *Les travaux publique*, Annexe 45	Skilled x 1.5*	X	
1322-1408	Land of Rode	Thoen, *Landbouwekonomie*, p. 1321	Skilled x 1.5*	X	X
1372-1485	St Peter's Abbey Ghent	Thoen, *Landbouwekonomie*, p. 1323	Skilled x 1.5*	X	X
1324-1331	Bornem	Brussels, Algemeen Rijksarchief, Rolrekeningen, nr. 2947-50	Unadjusted**	X	
1312-1337	City of Ypres	Des Marez, De Sagher, *Comptes de la ville d'Ypres*, 1909	Unadjusted	X	

* Adjusted to account for the difference between town and countryside. This relationship is calculated from matching years and is also reported by C. Vandenborre, *Prijzen, lonen, levensstandaard in Brugge*, unpublished MA thesis, pp.161-162. He also reports that unskilled wages did not differ, which our series confirm.
** Although Bornem was not a town, the craftsmen employed were clearly urban labourer.

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[105] This series was already used, albeit less extensively, in T. SOENS, *Spade in de dijk?*, Ghent 2009, to calculate real wages.

[106] J.H. MUNRO, *Wage Stickiness, Monetary Changes, and Real Incomes in Late-Medieval England and the Low Countries, 1300-1500: Did Money Matter?*, in "Research in Economic History", 21, 2003, pp. 185-297.

APPENDIX 3. ESTIMATING WEALTH IN THE ORPHAN INVENTORIES OF GHENT

In order to make a robust estimation of household wealth reported by the orphan inventories, we have selected only those cases in which the manner of distribution of assets amongst all the different heirs was clear. Some inventories were specific on the part bequeathed to the minors, while most remained mute. In these cases, we have chosen to only select the inventories of minor children inheriting from the first deceased parent(s) because customary law in Ghent was very clear on how assets should be partitioned with regards to children. All assets acquired during marriage were to be divided equally among the longest living parent (if any) and his or her children, while the former enjoyed the lifelong usufruct of all immovable goods. Except for fiefs, the assets acquired before marriage followed a similar logic and were thus recorded regardless of which parent died. The selected inventories are therefore the most complete recording of total household wealth. Moreover, deceased parent(s) with minor children make up the majority of the inventories.

It is important to note that some assets were considered indivisible and were accordingly recorded as a whole in the inventories, whereas for partible assets the inventory only recorded the share of the deceased. The first category entails any land and annuities. Houses or buildings in general were seen as partible, similar to chattels and liquid assets.[107] This distinction is important to calculate the household assets before partition. Specifically, we employed following methodology for each asset group:

A. Immovable goods

   1. Land

     - If real value was given (n=29), most often because it was sold, we used the reported value.

     - If lease value was given (n=630), we have used the rate of return calculated from the median lease price per hectare (n=499) divided by the median sale price of land per hectare (n=19). The rate of return is estimated at 4.0%, which is consistent with figures reported by Frans De Wever for the same region in the sixteenth century.[108]

     - If only the size of the property was given (n=1122), we have used the median price per hectare per period.

     - If none of the above information was given, we used the median value of land per period. This was only the case in a relatively small number of inventories (n=286 or 13.8% off all recorded land possessions).

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[107] L. WYNANT, *Peiling naar de vermogensstruktuur te Gent op basis van de staten van goed 1380-1389*, cit., pp. 53-55.

[108] F. DE WEVER, *Pacht en verkoopprijzen in Vlaanderen (16ᵉ-18ᵉ eeuw)*, in "Bijdragen tot de Geschiedenis", 59, 1978, pp. 268-269.

2. Annuities
- If value was given in cash (n=558), we estimated its value by dividing it with the nominal interest rate reported by David Nicholas for fourteenth-century Ghent.[109]
- If value was given in kind, we did not include the annuity in the estimation because detailed prices for every component are often lacking. Furthermore, these rents were often of symbolical importance rather than economical, such as the tribute of roosters. In total 85 of the 643 annuities recorded were excluded for this reason.

B. Movable goods

For all movable goods, we checked whether there was a parent still alive. If so, we doubled the value of the asset given that the latter still held half of the household wealth in property.

1. Chattels
- In most cases the total value was given (n=529).
- In a few inventories (n=27 or 5% of those with chattels) the chattels were not appraised. We then used the median value of chattels per period.

2. Houses
- If real value was given (n=55), most often because it was sold, we used the reported value.
- If rental value was given (n=290), we multiplied by 20 in accordance to the estimation used by the aldermen to determine the value of houses.[110]
- If no information was given, we used the median house value per period multiplied by the share or numbers of houses owned by the household (n=1382). Considering this large group of homogenized estimations, real inequality is probably underestimated for this asset. However, the data is too scarce to allow for a more detailed estimation, for example per street. Furthermore, we are confident that the impact is rather limited because richer households tend to not only own more expensive houses but also more houses. At the same time, the share of houses in the total value of rich inventories is rather limited compared to other groups. In general, only 17 inventories (<1%) consists of only a house without any information on its value.

3. Liquid assets
Although the precise components of the liquid assets are rarely given, virtually all inventories with liquid assets (n=809) report their total value.

C. Settlement (*afkoop*)

As mentioned in the article, heirs had the right to pay a fee to liberate themselves from the legal obligations to record and supervise the inventory. Based on comparisons between inventories for which we have both a detailed inventory of the wealth and the sum of a later settlement, this fee amounted to an average value

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[109] D. NICHOLAS, *The Metamorphosis of a Medieval City*, cit., pp. 216-217 (life annuities) and 220-222 (heriditary annuities).

[110] *Ibid.*, p. 100.

of 7.76% of the total wealth.[111] Total values for settlements (n=682) are thus calculated by dividing the sum of *afkoop* by previous number.

APPENDIX 4. THE DISTRIBUTION OF WEALTH PER DECILE IN THE ORPHAN INVENTORIES OF GHENT

Decile	Share of wealth (in %)				Absolute growth rate (% in total wealth)				Relative growth rate (% of previous)			
	1349-55	1371-75	1379-85	1395-1400	1355-75	1375-85	1385-1400	1355-1400	1355-75	1375-85	1385-1400	1355-1400
D1	0.48%	0.57%	0.84%	0.38%	0.09%	0.28%	-0.46%	-0.10%	17.81%	48.85%	-54.31%	19.87%
D2	0.94%	1.09%	1.92%	1.09%	0.15%	0.84%	-0.83%	0.15%	15.51%	77.20%	-43.11%	16.45%
D3	1.27%	1.58%	2.64%	1.61%	0.31%	1.06%	-1.03%	0.34%	24.49%	66.97%	-39.14%	26.50%
D4	1.71%	2.23%	3.59%	2.22%	0.52%	1.36%	-1.37%	0.50%	30.25%	60.87%	-38.23%	29.43%
D5	2.33%	2.96%	4.55%	3.10%	0.63%	1.59%	-1.45%	0.77%	27.14%	53.76%	-31.88%	33.17%
D6	3.22%	4.05%	6.00%	4.39%	0.83%	1.95%	-1.61%	1.17%	25.87%	48.11%	-26.88%	36.31%
D7	4.71%	5.78%	7.52%	6.44%	1.07%	1.74%	-1.08%	1.73%	22.64%	30.12%	-14.33%	36.71%
D8	6.57%	9.24%	10.16%	10.27%	2.66%	0.93%	0.11%	3.70%	40.51%	10.03%	1.05%	56.23%
D9	10.98%	16.79%	15.39%	16.47%	5.81%	-1.40%	1.08%	5.49%	52.93%	-8.33%	7.02%	50.04%
D10	67.79%	55.72%	47.38%	54.03%	-12.06%	-8.34%	6.65%	-13.76%	-17.80%	-14.97%	14.03%	-20.30%
Top 5%	56.76%	40.70%	33.97%	39.55%	-16.06%	-6.72%	5.58%	-17.21%	-28.30%	-16.53%	16.43%	-30.31%
Top 1%	36.01%	17.09%	13.99%	15.05%	-18.92%	-3.10%	1.05%	-20.96%	-52.53%	-18.13%	7.53%	-58.21%

Source: S. Geens, W. Ryckbosch, Database of the Ghent orphan inventories

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[111] L. WYNANT, *Regesten*, cit., vol. 2, n°2121, 4941, 4952.

APPENDIX 5. LAND OWNERSHIP IN THE ORPHAN INVENTORIES OF GHENT

QUINTILE	Land possession (number of inventories)				Land possession (% within quintile inventories)			
	1349-55	1371-75	1379-85	1395-1400	1349-55	1371-75	1379-85	1395-1400
QU1	20	25	38	22	36.4%	33.8%	37.3%	23.9%
QU2	24	29	38	39	45.3%	40.3%	37.6%	47.0%
QU3	29	38	44	57	63.0%	55.9%	46.3%	70.4%
QU4	19	39	52	52	48.7%	72.2%	65.8%	77.6%
QU5	11	41	55	48	73.3%	95.3%	94.8%	88.9%

QUINTILE	Median size (in hectare)				Size growth (% of previous)			
	1349-55	1371-75	1379-85	1395-1400	1349-75	1371-85	1379-1400	1349-1400
QU1	0.47	0.53	0.67	0.89	112.6%	125.3%	133.9%	188.9%
QU2	2.53	1.34	1.54	1.43	52.9%	115.0%	93.3%	56.8%
QU3	2.92	2.45	3.59	3.30	84.1%	146.6%	91.8%	113.2%
QU4	2.34	4.37	4.01	7.69	186.7%	91.8%	191.6%	328.5%
QU5	16.06	20.90	16.05	25.76	130.1%	76.8%	160.5%	160.4%

QUINTILE	Mean lease income (in liter of grain)				Income growth (% of previous)			
	1349-55	1371-75	1379-85	1395-1400	1349-75	1371-85	1379-1400	1349-1400
QU1	107.62	152.17	164.93	269.20	141%	108%	163%	250%
QU2	573.72	381.23	379.30	431.57	66%	99%	114%	75%
QU3	662.34	698.93	886.45	992.49	106%	127%	112%	150%
QU4	531.54	1.245.32	989.59	2.312.42	234%	79%	234%	435%
QU5	3,648.05	5,959.04	3,961.07	7,750.63	163%	66%	196%	212%

Source: S. Geens, W. Ryckbosch, Database of the Ghent orphan inventories