Abstract
In this paper we use new, unique data on population composition and socio-economic structure for the c. 670 municipalities of the Belgian provinces of East Flanders, West Flanders and Antwerp in 1796, 1815 and 1846, in order to gain insight into the changing patterns of local migration intensity from the late eighteenth to the mid-nineteenth century. Although so-called micro-mobility is often disregarded in migration studies, this paper argues that a spatial and diachronic analysis of local migration rates provides insight into dynamics of social and economic change in relation to migration behaviour. The data show that the proportion of non-native residents varied strongly in accordance with different regional economies at the end of the eighteenth century, but that spatial variation declined markedly as overall migration rates converged on a higher average level by the mid-nineteenth century – leading to a re-interpretation of the mobility transition hypothesis.

Keywords
Migration History; Mobility Transition; Micro-mobility; Belgium; Eighteenth Century; Nineteenth Century; Population censuses

Introduction
The European nineteenth century has long been considered a century of ‘modernisation’, a process of societal transformation that included a makeover of – among other things – socio-economic structure and demographic behaviour. Hand in hand with broader societal changes, this period was also considered one of structural increase in migration incidence and distance, one that heralded, in Zelinski’s famous phrasing, ‘the mobility transition’ – in analogy to the demographic transition.¹ Embraced by early sociologists, the notion of a fundamental transformation in migration behaviour in the nineteenth century, was challenged by migration historians from the 1980s onwards. Their research highlighted how also the preindustrial period was characterised by high levels of mobility and circulation, and how overall changes in migration behaviour during the transition from preindustrial to industrial society were less novel and spectacular than originally envisaged.² In their

² E.g. Colin G Pooley and Jean Turnbull, Migration and mobility in Britain since the eighteenth century (London 1998); Leslie Page Moch, Moving Europeans: Migration in western Europe since 1650 (Bloomington & Indianapolis 2003).
influential estimation of long-term migration rates in Europe, Lucassen & Lucassen reached a new synthesis by arguing both that migration was a familiar feature of pre-industrial Europe, and that the nineteenth century did record an unprecedented rise in overall migration numbers and rates, thus restoring the idea of a mobility transition in this period. Given that we can therefore consider nineteenth-century migration not as a new phenomenon but as a mixture of old patterns and new features, the question on why and how this ‘mobility transition’ took place, assumes new relevance. It also implies that for adequately tackling this question, it is essential that we can relate and compare data pertaining to this period of purported transition with the situation prior to the transition.

In this article we use new, unique data on population composition and socio-economic structure for the c. 670 municipalities of the Belgian provinces of East Flanders, West Flanders and Antwerp in 1796, 1815 and 1846, in order to gain insight into the how and why of changing patterns of migration intensity in this period of transition. Whether in terms of demographic behaviour, industrialisation or urbanisation, Belgium was among the most precocious in Europe’s transition from preindustrial to industrial society. The data are unique in that for no other European region similar comprehensive data on the number of immigrants at municipal level – i.e. the smallest administrative unit of individual villages and towns – are available at so early a date, which shed light on mobility’ patterns that can be considered representative for the eighteenth century. In this article we will analyse and confront the census data of 1796, 1815 and 1846 in order to gain insight into the determinants of migration intensity, and into the nature, direction and causes of change during the transition from the ancien régime to early industrial society. In what follows, we first provide an overview of literature, then present the case study and data, before discussing the empirical results.

**Proxies for mobility in Early Modern and early industrial Europe**

The traditional idea that Early Modern Europe was a sedentary, stationary society has been shattered in the past decades as scholars time and again demonstrated the familiarity of various types of migration and mobility in this period. How mobile Early Modern society was exactly, however, remains a difficult question, in particular when it comes to comparing with the nineteenth century. Identifying yardsticks for the incidence of migration in a pre-statistical age is obviously no easy undertaking. Even for cities, direct sources on migration in the Early Modern period are rare and unevenly spread, and often pertain to cross-sections of particular groups only, such as brides and grooms, apprentices, ‘burghers’, hospital inmates or at best household heads. Most of these


sources show high levels of mobility. In booming seventeenth-century Amsterdam, only one in three bridegrooms had been born in the city, and one in two came from outside the borders of the Dutch Republic. Likewise, the lion’s share of apprentices in sixteenth-century London came from out of town, often from many hundreds of miles away. Most of the Early Modern German towns that have been studied, had equal proportions of natives and immigrants among its Bürger. More than half of the hospital inmates in fast growing sixteenth-century Lyon was born elsewhere, just as almost 60 per cent of male household heads around 1600. According to one of the rare pre-industrial censuses that records the place of origin for the whole population, 65 per cent of the resident adults of Würzburg in 1701 was born elsewhere. Other research on urban migration has juxtaposed the more widely available numbers of recorded baptisms and burials with observed population change to calculate rates of net migration. Both the direct and indirect calculations consistently point towards high levels of immigration to Early Modern cities. Even a small-size town with a relatively stable population is estimated to have had around one third of its inhabitants born elsewhere, while this would easily include the large majority in fast growing towns.

We are much less informed on the levels of migration in the Early Modern countryside, on which very few direct or indirect sources are available. Available figures remain scattered as they depend on detailed case studies of family reconstitution and/or rare sources. In late seventeenth-century rural Crulai in Normandy, only one in five wedding partners had been born outside the parish, of whom the large majority had been born less than 10 km away. A study of 20 municipalities in the French Pyrenees revealed that 88 per cent of the inhabitants in the late eighteenth century had been born in the municipality of residence. Not all rural contexts displayed low levels of mobility, however. In rural Cardington in English Bedfordshire, only one in three male household heads in 1782 had been born in the parish, and even fewer of their spouses. By that time, approximately two out three Cardington children of the previous generation who reached

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9 Olivier Zeller, Les recensements lyonnais de 1597 et 1636: Démographie historique et géographie sociale (Lyon 1983).
12 Moch, Moving Europeans, 44.
adulthood, had left the parish. Yet they probably did not travel far: 57 per cent of the immigrant household heads had covered less than 10 miles between their places of birth and residence.\textsuperscript{15} Scarce family reconstitution studies for rural German parishes suggest that between 35-50 per cent of children who achieved maturity, left their village of birth in the seventeenth and eighteenth centuries. Turnover rates were highest among children of day-labourers and peasants with insecure tenancy, but most did not travel far.\textsuperscript{16}

The scarcity of studies and their mixed results, especially for continental Europe, have so far hindered more general insight into the dynamics of rural migration in the Early Modern period. This has contributed to the maintenance of the image of a relatively sedentary countryside, characterised at most by ‘micro-mobility’ between neighbouring parishes, in contrast to the more mobile cities, where migration rates were higher and the distances covered larger.\textsuperscript{17} Yet this homogenising characterisation of ‘micro-mobility’ in the countryside might be obscuring very large and relevant differences in the degree of such mobility. Studies cited above, indicate that rates still varied greatly in the late eighteenth century, from as low as 12 per cent of non-native residents in relatively isolated villages in the French Pyrenees, to up to 67 per cent in a Bedfordshire village. Although in both cases the distances covered were relatively small, they do reveal the existence of very different intensities of mobility. While rural micro-mobility did not qualify as ‘cross-community’ migration and its significance in cultural terms was evidently much smaller than with long-distance moves,\textsuperscript{18} differences in the intensity of rural mobility did have major economic and social implications: it constituted the migration horizon of the large majority of Europe’s population and had direct implications for dynamics of labour allocation in the countryside. Gaining better insight into the extent and causes of variation in preindustrial rural migration rates, therefore provides an important contribution to our understanding of spatial dynamics of social and economic change in preindustrial Europe.

The absence of clear indications or explanations on the scale of rural migration in Early Modern Europe make it difficult to evaluate the nature of change during the so-called mobility transition of the nineteenth century. By the 1880s, when national population registration was in full swing, the proportion of Europeans living in their parish of birth – what Ravenstein called the ‘parochial element’ – varied from 57 and 60 per cent in France and Germany, over 67 and 69 per cent in the Netherlands and Belgium, to 73 and 80 per cent in Norway and Sweden.\textsuperscript{19} Whether this

\textsuperscript{16} Hochstadt, ‘Migration’, 209.
\textsuperscript{18} Lucassen and Lucassen, ‘The mobility transition’, 6.
was high or low compared to what came before, remains a difficult question to answer in the light of erratic and selective data. As far as cities are concerned, the proportion of non-native residents listed in the first ‘modern’ censuses were not necessarily much higher than in the more scattered records available for the preceding centuries – at least not before the very end of the nineteenth century. Indeed, most case studies indicate that the most marked change in the course of the nineteenth century lay more in the increase of gross migration flows and migration distance, than in their net contribution to population figures. At the same time, research from a life-course perspective has stressed essential continuities with earlier migration patterns in terms of both destinations and incidence. These observations have led to the revision of early interpretations of the mobility transition as a one-off population transfer from the European countryside to the cities, to a more complex image of temporary migration, return migration and circulation between and within cities and the countryside. To the extent that nineteenth-century migration was not as a new phenomenon but a mixture of old patterns and new features, a systematic quantitative and spatial analysis of both rural and urban migration rates during the period of the so-called mobility transition, can in turn provide crucial insight into the extent and causes of changes in migration behaviour in this period.

**Case Study and Data**

This study will shed new light on the nature of migration change during the transition from preindustrial to industrial society by analysing and comparing the proportion of non-native residents at the level of municipalities in the present-day provinces of East Flanders and West Flanders and Antwerp in Belgium in 1796, 1815 and 1846. The three provinces correspond to what in the eighteenth-century Southern Low Countries made up the County of Flanders and the northern part of the Duchy of Brabant respectively, home to a total of c. 1.25 million inhabitants in 1796 and 1.85 million in 1846. The censuses of 1796, 1815 and 1846 were nominal, manuscript censuses on pre-printed forms organised by the central authorities and executed at municipal level, which included individual details such as name, marital status, age and occupation for each resident (in 1796 and 1815 only for those aged 12 or more, in 1846 also for children), and identified those born outside the municipality’s boundaries by recording their year of immigration (in 1796) or place of birth (in 1815 and 1846). Although undertaken in a period of regime change and with fewer ‘scientific’ guidelines than in 1846, also the censuses of 1796 and 1815 enjoy a relatively good reputation,

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20 Henk Van Dijk, Rotterdam 1810-1880: Aspecten van een stedelijke samenleving (Schiedam 1976); James Harvey Jackson, Migration and urbanization in the Ruhr Valley, 1821-1914 (Atlantic Highlands, N.J. 1997); Steve Hochstadt, Mobility and modernity: Migration in Germany, 1820-1989 (Ann Arbor 1999); Anne Winter, Migrants and urban change: Newcomers to Antwerp, 1760-1860 (London 2009).

21 Pooley and Turnbull, Migration and mobility.

22 Jackson, Migration and urbanization; Hochstadt, Mobility and modernity.
notwithstanding some underreporting of conscription-aged men.\textsuperscript{23} In this article we make use not so much of the manuscript nominal data – which are far too numerous to digitize by hand – but of a range of aggregate data derived from these nominal censuses, published in the so-called \textit{Werkdocumenten} (for the 1796 and 1815 census), and in the census tables (for the 1846 census), and made available by the STREAM and LOKSTAT digitisation projects co-ordinated at the University of Ghent.\textsuperscript{24}

The proxy for migration intensity in the censuses of 1796, 1815 and 1846 is the proportion of inhabitants born outside the municipality where they resided at the time of the census, i.e. the inverse of what Ravenstein called the ‘parochial element’.\textsuperscript{25} This proxy has obvious limitations. First of all, the definition of ‘migration’ is predetermined by the census: all moves crossing a municipal border, irrespective of the distances involved. This means that intra-municipal moves are obscured from view on the one hand, and that short-distance and long-distance moves are lumped together in one figure on the other hand. As the aggregate data do not inform us where non-native residents originated, they therefore do not allow to determine migration fields (a shortcoming which we will try to compensate partially by bringing in some nominal data). Furthermore, the proxy refers to resident migrants only, and tends to disregard highly temporary groups such as seasonal workers. Secondly, the census figure informs us on the ‘stock’ of immigrants present at a certain point in time, which offers only partial insight into the actual ‘flows’ of migration that lay behind it: the proportion of non-native residents at the time of a census was the result of an unknown interplay of not only immigration and emigration, but also fertility and mortality in the preceding period.\textsuperscript{26}

Notwithstanding its obvious shortcomings, the proportion of non-native residents in the different municipalities, does have important value as a proxy for spatial mobility patterns. Although the particular contexts of the census operations influenced the number of non-natives present and/or recorded, their number in the three censuses is sufficiently indicative for the relative incidence of cross-municipal residential migration from the late eighteenth to the mid-nineteenth

\textsuperscript{23} For a critical discussion and a general exploration of the different censuses, see Guy Gadeyne, ‘Bevolkingsregisters en tellingen’, \textit{Handelingen van het Genootschap voor Geschiedenis te Brugge} 112 (1975) 231–357; Guy Gadeyne, ‘De volkstelling’, \textit{Belgisch Tijdschrift voor Nieuwste Geschiedenis} 12:1–2 (1981) 59–76; Lieve Jaspers and Carine Stevens, \textit{Arbeid en tewerkstelling} (Gent 1985); Claire Gyssels and Lieve van der Straeten, \textit{Bevolking, arbeid en tewerkstelling in West-Vlaanderen} (Gent 1986); Claire Gyssels and Lieve van der Straeten, \textit{Bevolking, arbeid en tewerkstelling in de provincie Antwerpen} (s.l., s.d 1990); Sven Vrielinck, \textit{De territoriale indeling van België (1795-1963): bestuursgeografisch en statisch repertorium van de gemeenten en de supracommunale eenheden (administratief en gerechtelijk): met de officiële uitslagen van de volkstellingen} (Leuven 2000).

\textsuperscript{24} See appendix.

\textsuperscript{25} Ravenstein, ‘The laws of migration’, 242, defined the ‘parochial element’ as ‘those inhabitants who resided at the time of the census in the parish in which they were born’.

\textsuperscript{26} High levels of non-native immigrants, other things being equal, could be the result of high levels of immigration by non-native residents and/or high levels of emigration by native residents and/or low levels of natural increase, over a longer or shorter span of time in the past. With the data available, it is impossible to disentangle these different gross components of population change before the middle of the nineteenth century, when yearly data on the number of immigrations and emigrations become available, see Sven Vrielinck, ‘De macht van het getal. Een statistische kritiek van de bevolkingsstatistieken in België (1801-1976)’, \textit{Journal of Belgian History} (2013), 43: 2–3, 74–113.
century. Although some types of mobility are obscured, including seasonal migration and intra-municipal residential moves, the proxy does allow for a systematic diachronic analysis of local variations in the intensity of migration in a very early stage of the so-called mobility transition. The marked spatial variation in socio-economic structure makes the northern part of present-day Belgium well suited to explore the influence of social and economic factors – for which the censuses also provide important proxies – on migration patterns over time. Although the definition of migration is very wide and includes (as we will see, predominantly) so-called micro-mobility, even differences in the incidence of micro-mobility provide important insight into spatial dynamics of economic and social change. When analysed spatially and diachronically, the aggregate census results can therefore alert us to the existence of regional clusters of more mobile and more sedentary communities respectively, to the nature of change over time, and to the possible causes of spatial and temporal variation.

**Mobility levels in 1796 and 1846**

As aggregate data from the 1815 census are available only for the province of West Flanders, comparing the results for the censuses of 1796 and 1846 provides the best starting point to gain insight into the direction of change over time. For 1796, census returns for 343 municipalities have been conserved, while for 1846 we have information for the totality of 675 municipalities in the provinces of East and West Flanders and Antwerp. Table 1 shows that in 1796 the recorded municipalities housed an average of 26 per cent non-native residents. This average however obscures a large spread. The middle 50 per cent of municipalities had between 15 and 35 per cent of non-natives, while the bottom ten per cent housed less than 10 per cent of non-natives, and the top ten per cent more than 45 per cent non-natives. By 1846 the average proportion of non-natives had increased to 32 per cent. If we restrict the sample to those municipalities for which we have observations in both years and whose borders did not change over the period, the change is one

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27 The census returns of 1796 record the number of non-native residents among the adult population aged twelve and over, while those of 1846 inform us on the number of non-native residents in the whole population, i.e. including children – which means these two measures are not directly comparable. As the 1796 returns do not inform us on the number of non-native children, while those of 1846 do not inform us on the number of children in the total population, there is no possibility for direct extrapolation. In order to put them on the same footing, we therefore recalculated the number of immigrants for 1796 to represent their proportion in the total population. Assuming that the ratio of immigrant children to immigrant adults in the total population was the same as that observed in the only case in this period where we have detailed information on the number of immigrants according to age, and that is that of Antwerp in 1830, where Juul Hannes, Bijdrage tot de ontwikkeling van een kwantitatief-kritische methode in de sociale geschiedschrijving (Ghent 1969) PhD Thesis University of Ghent, recorded 1,346 non-native children on a total of 19,905 children aged less than twelve and 21,837 non-native adults on a total of 51,944 adults aged twelve and over. We therefore assumed for C(i) as the number of immigrant children, C as the number of total children, A(i) as the number of immigrant adults and A as the total number of adults in a municipality that C(i) = C*A(i)/A*(1346/19905)*(51944/21837).
from 26 to 33 per cent.28 By 1846, the overall spread had decreased considerably: the middle 50 per cent had between 25 and 37 per cent of non-natives, the bottom ten per cent less than 21 per cent and the top ten per cent more than 43 per cent. While these figures are clearly much higher than for isolated French villages in the same period, they remain markedly lower than in Cardington in the late eighteenth century.

Table 1: Non-natives as a percentage of total population in 1796 and 1846

<table>
<thead>
<tr>
<th></th>
<th>Full sample</th>
<th></th>
<th>Restricted sample</th>
<th></th>
<th>Increase 1796-1846</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1796 (in %)</td>
<td>1846 (in %)</td>
<td>1796 (in %)</td>
<td>1846 (in %)</td>
<td>(in pct. points)</td>
</tr>
<tr>
<td>Mean</td>
<td>26.24</td>
<td>31.82</td>
<td>26.30</td>
<td>33.10</td>
<td>6.80</td>
</tr>
<tr>
<td>Std. Dev.</td>
<td>13.14</td>
<td>9.10</td>
<td>13.13</td>
<td>8.71</td>
<td>10.58</td>
</tr>
<tr>
<td>P10</td>
<td>9.94</td>
<td>20.72</td>
<td>9.39</td>
<td>22.22</td>
<td>-5.60</td>
</tr>
<tr>
<td>P25</td>
<td>15.48</td>
<td>25.26</td>
<td>15.43</td>
<td>26.67</td>
<td>-5.00</td>
</tr>
<tr>
<td>P50</td>
<td>24.70</td>
<td>31.51</td>
<td>24.87</td>
<td>32.78</td>
<td>6.04</td>
</tr>
<tr>
<td>P75</td>
<td>35.25</td>
<td>37.30</td>
<td>35.17</td>
<td>38.17</td>
<td>12.66</td>
</tr>
<tr>
<td>P90</td>
<td>44.75</td>
<td>43.29</td>
<td>44.28</td>
<td>43.99</td>
<td>20.50</td>
</tr>
<tr>
<td>Municipalities</td>
<td>343</td>
<td>674</td>
<td>318</td>
<td>318</td>
<td>318</td>
</tr>
</tbody>
</table>

* Restricted sample includes only municipalities observed in 1796 and 1846 with municipal borders that did not change over time.

The average proportion of non-native residents thus increased from 26 per cent in 1796 to 32 or 33 per cent in 1846. The overall increase of 6 to 7 percentage points in non-native residents is in line with an overall increase in mobility according to the idea of a ‘mobility transition’. A more detailed analysis shows, however, that this average increase was the result of very distinct spatial trends over time. Maps 1a to 1c map the proportion of non-natives in 1796, 1846 and the change over time. Maps 1a and 1b show the existence of regionally distinct patterns of mobility whose spatial situation was highly similar in 1796 and 1846. Relatively high levels of mobility (more than 35-37 per cent) were observed in the coastal areas and around the two major cities of Ghent and Antwerp, with the former area more restricted than the latter.29 The lowest levels (less than 15-25 per cent respectively) were recorded in a 20-25 km-wide middle corridor stretching north to south situated to the west of the eastern boundary of the province of East Flanders and on the eastern border of the province of Antwerp. The other areas displayed intermediate levels of non-native residents. The continuity of spatial patterns observed in Maps 1a and 1b imply that the proportion of non-natives in 1796 and 1846 was positively correlated, which is confirmed in the left-hand scatterplot of Graph 1: most municipalities with high levels of non-natives in 1796 were also among those with relatively high levels in 1846 and vice versa (r=.60, p<.001).

28 A small number of municipalities underwent significant changes in their borders or were merged into one bigger municipality between 1796 and 1830. As such changes could drastically, artificially reduce the number of ‘non-native’ residents when most immigrants were from nearby municipalities, these were left out from the comparative analysis.

29 Interestingly, the high mobility rates around Ghent were relatively concentric while these around Antwerp were situated to the East. This is in line with what we know of the eastward oriented nature of the Antwerp migration field in this period, and the role of river Scheldt as a physical, political and spatial barrier in migration patterns: see Winter, Migrants and urban change.
Maps 1a-c. Non-natives as a percentage of total population in 1796 and 1846

Data: STREAM 1796 & LOKSTAT1846. Maps: Torsten Wiedemann and Sven Vrielinck (Ghent University, Quetelet Center, LOKSTAT).
Although the overall spatial and rank distribution of the share of non-natives remained relatively constant over time, the period witnessed an overall convergence of mobility levels – which was also reflected in the marked decrease in standard deviation from 13 to 9 percentage points (Table 1). The right-hand scatterplot of Graph 1 shows how the overall increase in mobility levels between 1796 and 1846 in percentage points was negatively correlated with the proportion of non-natives in 1796 ($r=-.75$, $p<.001$). In other words: municipalities with high levels of immigrants in 1796 tended to reduce their proportion of non-native residents over time, while those with low levels in 1796 were involved in a catch-up movement. This is also reflected spatially in Map 1c, where the highest decrease in the proportion of non-natives is observable in the coastal areas and the southern part of the province of Antwerp, which were areas with the highest levels of immigrants in 1796. Conversely, the highest increase is recorded in municipalities with intermediate and low levels of immigrants in 1796. The main exception to the observed negative correlation between immigration levels in 1796 and increase over time are the cities of Antwerp and Ghent and their immediate surroundings: as we would expect in a period of increasing urbanisation, the proportion of immigrants in the region’s largest cities and suburbs, while already relatively high in 1796, continued to increase between 1796 and 1846. For the totality of rural municipalities, however, the main trend was a more complex mix of both converging and – on average – increasing migration levels over time.

**Graph 1: Relation between the percentage of non-natives in 1796 and 1846**

The observed evolution, then, is one of both continuity and change. Continuity is manifest in the spatial and rank-correlation distribution of migration intensity. Change is evident in the dynamics of
convergence. The average increase in the proportion of migrants was thus all but evenly spread, and was most manifest in the municipalities situated in the lower half of the distribution, which implies that the observed distribution became more concentrated over time (Graph 2).

Graph 2: Convergence in non-native population shares between 1796 and 1846

![Graph showing convergence in non-native population shares]

Note: The lines were obtained by kernel density estimation using standard (Epanechnikov) functions.
Data: STREAM1796 & LOKSTAT1846

In the rest of this article, we will attempt to gain better insight into the factors that determined immigrant levels in 1796 on the one hand, and the change in immigrant percentage between 1796 and 1846 on the other hand.

Determinants of mobility levels in 1796

Existing studies have laid bare a great variety in social and economic structure in the countryside of Flanders and Brabant, ranging from capital-intensive large-scale farming in the fertile polders, densely populated peasant households combining labour-intensive husbandry with proto-industrial textile manufacturing in the southern inland areas, to the more isolated and egalitarian communities of farm-owning peasants on the sandy Campine soils in the east of the province of Antwerp where wastelands and commons survived well into the nineteenth century. Already one of the most densely populated regions in Europe, total population in the area increased by almost half between 1750 and 1800, especially in the crowded municipalities of inland Flanders, leading to a further fragmentation of land and increasing the reliance on potato cultivation and rural linen industry as a complementary or even main source of income for many villagers.\(^{30}\)

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\(^{30}\) Erik Thoen, ‘A commercial survival economy in evolution. The Flemish countryside and the transition to capitalism (Middle Ages–19th century)’, in: Peter Hoppenbrouwers and Jan Luiten van Zanden (eds.), Peasants into farmers? The transformation of rural economy and society in the Low Countries (Middle Ages - 19th century) in light of the Brenner debate (Turnhout 2001) 102–57; Eric Vanhaute, ‘Rich agriculture and poor farmers. Land, landlords and farmers in Flanders, 18th-19th centuries’, Rural History 12:1 (2001) 19–40; Erik Thoen, ‘Social agrosystems as an economic concept to explain regional differences. An essay taking the former County of Flanders as an example (Middle Ages-
The census of 1796 provides us with valuable proxies for variations in local economic structure. As to occupational distribution, the most important data are the occupations of male household heads on the one hand, and the number of servants in the totality of the population on the other hand (Maps 2a-2d). In addition, the census also provides basic demographic data on total size of the population and overall age distribution. Unfortunately, no systematic data are available for this period on farm sizes or land ownership, which are available at the earliest only with the agricultural census of 1846. We will therefore use the 1846 data on farm sizes and land ownership as proxies for the variation in 1796. Although we know that relations to land underwent considerable change between 1796 and 1846, it can be safely assumed that the relative predominance of large versus small holdings and self-owned versus leased holdings in 1846 was indicative for their relative importance in 1796.\(^{31}\) Because holdings larger than 20 ha necessitate the hiring of labour outside the family, their share of the soil together with the proportion of labourers among male heads of household, are used as proxies for a commercial and capital-intensive type of agriculture combining large landholdings with wage labour. In contrast, the share of small-scale (2-5 ha) and micro (< 2ha) holdings function as a proxy for the predominance of a more subsistence-oriented form of agriculture (Maps 3a-d). Similarly, the number of farmers among male heads of household can help to identify the incidence of independent farmers, while the proportion of textile workers serves as a proxy for involvement in the proto-industrial linen industry. In addition, data on total population size, age structure and crude birth rate were calculated from the 1796 *Werkdocumenten* to explore the influence of basic demographic characteristics on the proportion of non-natives.

Maps 2a-2d: Occupational distribution, 1796

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\(^{31}\) The most important changes over time were an overall increase in the number of micro-sized farms of less than 2 ha and a decrease in the number of self-owned farms (Vanhaute, ‘Rich agriculture’, *). While polarisation was therefore probably more marked in 1846 as in 1796, all available studies confirm that the major regional contrasts in terms of landholding structures were sustained in this period.
Note: all % refer to proportion of given occupation among male household heads, with the exception of servants, where the % refers to the share of male and female servants in the overall population. Data: STREAM1796. Maps: Torsten Wiedemann and Sven Vrielinck (Ghent University, Quetelet Center, LOKSTAT).

Maps 3a-d: Percentage of cultivated soil occupied by different farm sizes, 1846
Data: LOKSTAT1846. Maps: Torsten Wiedemann and Sven Vrielinck (Ghent University, Quetelet Center, LOKSTAT).
Before we can quantify the relation between the various proxies for the economic and demographic structure of municipalities (the independent variables) and their mobility levels (the dependent variables), it is vital to control for municipal variations in unit area. The borders between municipalities determine – unavoidably arbitrarily – the kind of mobility that is recorded in the sources: a movement beyond those borders makes one into a non-native resident, one within these borders not. Other things being equal, municipalities with a relatively small size have a larger chance to have more non-native residents, as its borders are more rapidly crossed even when moving over relatively short distances.\(^{32}\) If two municipalities merge into a single larger municipality, then the percentage of non-natives decreases because movements between both municipalities no longer count as migration. Other things being equal, unit area size will therefore negatively affect local mobility levels, a relation which is also confirmed in our data \((\beta = -.24, p < .01)\): with an average municipal area of 13 km\(^2\), every increase in unit area size with one km\(^2\) reduces the predicted percentage of non-natives by .24 percentage points.

Table 2 shows the relations between the selected independent variables and the percentage of non-natives in 1796. The table presents estimated regression coefficients, holding constant the unit area size of municipalities. Every coefficient in the table relates to a separate regression model and the number of municipalities included in the analysis is mentioned in parenthesis.\(^{33}\) The size of the coefficients can be interpreted as follows: the estimated effect of ALLSERV_PCT on IMM1796_PCT is 1.486, which implies that that an increase of the percentage of servants in the total population with 1 percentage point is associated with an increase of the percentage of non-natives with 1.486 percentage points – holding area constant.

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\(^{32}\) See also Ravenstein, ‘The laws of migration’, 245-246.

\(^{33}\) Regressions which rely on 1796 data are based on a smaller number of municipalities because of missing data in 1796 (supra).
Table 2: Relation table socio-economic and demographic proxies, 1796

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Variable description</th>
<th>( \beta ) (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Occupational composition (VT1796)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALLSERV_PCT</td>
<td>Percentage of servants in total population</td>
<td>1.486*** (314)</td>
</tr>
<tr>
<td>PR_ARB_M_PCT</td>
<td>Percentage of labourers among male household heads</td>
<td>0.180*** (317)</td>
</tr>
<tr>
<td>PR_TEXT_M_PCT</td>
<td>Percentage of textile workers among male household heads</td>
<td>-0.329*** (317)</td>
</tr>
<tr>
<td>PR_LAND_M_PCT</td>
<td>Percentage of farmers among male household heads</td>
<td>-0.031 (317)</td>
</tr>
<tr>
<td><strong>Land relations (LT1846)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HA_M20_SOIL</td>
<td>Percentage of soil occupied by farms larger than 20 ha</td>
<td>0.263*** (318)</td>
</tr>
<tr>
<td>HA_5_20_SOIL</td>
<td>Percentage of soil occupied by farms between 5 and 20 ha</td>
<td>-0.225*** (318)</td>
</tr>
<tr>
<td>HA_2_5_SOIL</td>
<td>Percentage of soil occupied by farms between 2 and 5 ha</td>
<td>-0.680*** (318)</td>
</tr>
<tr>
<td>HA_L2_SOIL</td>
<td>Percentage of soil occupied by farms smaller than 2 ha</td>
<td>-0.661*** (318)</td>
</tr>
<tr>
<td>OWNER</td>
<td>Percentage of farms held in ownership</td>
<td>-0.317*** (324)</td>
</tr>
<tr>
<td><strong>Demographic characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>POP.</td>
<td>Population size</td>
<td>-0.442* (318)</td>
</tr>
<tr>
<td>NEIGHB.POP.</td>
<td>Population sum of nearby municipalities</td>
<td>-0.192*** (318)</td>
</tr>
<tr>
<td>AGE_PCT_40PLUS</td>
<td>Proportion of population aged 40 and more</td>
<td>-0.599* (318)</td>
</tr>
<tr>
<td>CBR</td>
<td>Crude birth rate (1791-1796)</td>
<td>0.341*** (302)</td>
</tr>
</tbody>
</table>

* p<.05; ** p<.01; *** p<.001. Estimated effect of each variable in linear models that include a constant term and two independent variables, including municipal unit area size. POP. is the number of inhabitants (in thousands) in 1796. NEIGHB.POP. is the sum of inhabitants (in thousands) of all municipalities whose parish church is situated within a radius of 10km. Robust standard errors are used in all tests.

Data: STREAM1796 & LOKSTAT1846.

A quantitative and spatial exploration of the relation between the proportion of immigrants in 1796 and the most relevant proxies for local economic structure demonstrates that the intensity of mobility was tied in with the main regional economies in the area (Table 2 & Maps 2-3). The high correlation between the proportion of servants in the total population and the number of immigrants reflects the fact that most servants were migrants, but it is also indicative for agricultural practices that engage a large amount of waged labour, whether on long-term, living-in contracts in the form of servants or on shorter-term contracts in the form of day labourers. This is confirmed by the strong overall correlation between the proportion of servants in total population and the proportion of labourers among male household heads \( r = .27, p < .001 \), and by the very similar spatial distribution of both proxies on Maps 2d and 2a, which in turn show a great overlap with municipalities characterised by large-scale farms (Map 3a). Overall, the bivariate results demonstrate a strong positive correlation between proxies for commercial capital-intensive agriculture on the one hand and the proportion of non-native residents on the other hand, which can be explained by a greater degree of commodification of labour in the area, leading to more flexible patterns of labour allocation. The proportion of the soil taken up by farms of more than 20 ha correlates strongly with the proportion of immigrants, while the opposite is true – and even to a stronger extent – for the proportion of the soil taken up by the other size categories, especially the two smallest categories: each additional percentage of soil taken up by large farms of more than 20ha, increases the share of non-natives by .26 percentage points, while each additional percentage
of the soil taken up by small-scale (2-5 ha) and micro-scale (<2 ha) farms reduces the share of non-natives by .68 and .66 percentage points respectively. Similarly, the proportion of labourers among male household heads correlates markedly with the proportion of non-natives, while the opposite is true for the proportion of textile workers. Lastly, as can be expected, farm ownership is negatively correlated with the proportion of non-natives.

The effects of the proxies for demographic characteristics also yield some interesting results. That population size was negatively correlated with the proportion of non-native residents is intuitively to be expected to the extent that a larger population enlarges the denominator of the proportion of non-native residents, but this correlation was not significant. That the variable neighbouring population size was also negatively correlated, runs counter to the intuitive expectation that, other things being equal, the likelihood of having more non-native residents increases the larger the population in adjacent municipalities. Yet this might be explained by the interference of a regional effect to the extent that the coastal municipalities with their relatively high proportion of non-native residents, were also relatively smaller in population size. The proportion of non-native residents was also negatively correlated with the proportion of the population older than 40 years of age, and positively correlated with the municipal crude birth rate, which probably reflects the fact that most migrants were relatively young adults.

The data on local economic structure, then, confirm the intimate connection between mobility patterns and regional agrarian structures in 1796, as was already suggested by earlier, more descriptive, research.³⁴ The coastal areas characterised by large-scale capital-intensive farming mobilising wage labour in the form of living-in service and day labourers, recorded relatively high levels of mobility with more than one in three residents born outside the municipality. Inland Flanders, characterised by small-scale and micro-scale farming, often in combination with proto-industrial textile manufacturing, which ensured sufficient income opportunities in situ, was in contrast characterised by relatively low levels of mobility. By far the lowest levels of mobility were recorded in the Land van Aalst in the southeastern corner of East Flanders which combined small-scale farming with high rates of farmer ownership.

The origins of non-native residents in 1815
The census data from 1796 unfortunately do not inform us on the origin of the immigrants recorded. The observation that relatively high levels of mobility existed along the coastal area and lower levels of mobility in inland regions, leaves open different possible underlying patterns of mobility: higher levels of micro-mobility in the former region than in the latter, or net transfers of population from inland to coastal regions, or a combination of both. In order to gain some insight into the

³⁴ Gyssels and van der Straeten, Bevolking, 93–98.
spatial dynamics of migration involved, we collected nominal data on the place of origin of the more than 11,000 non-native residents recorded in a random sample of 24 West-Flemish municipalities in 1815 – the earliest census to record place of origin in a systematic way. Although the nature of the sample – representing 8% of all municipalities in the province of West-Flanders – limits the overall interpretation, combining the data with GIS referencing does provide an indicative view of the migration distances involved (all distances are measured between village centres in km as the crow flies).

Map 4: Distance flowmap between place of origin and residence of non-native residents, 1815

Data: Sample 1815.

The data demonstrate the predominance of very short-distance migration, equivalent to what has been called micro-mobility in the literature. Map 4 represents the overall flows involved between place of birth and of residence, and Graph 3 shows the overall distance distribution. Overall, the median distance was 5.6 km and the average distance 8.6 km. Only 10 per cent of all non-native residents in these 24 municipalities had been born more than 15 km away, and only 6 per cent had covered more than 20km. Taking into account total municipal population, only 2.5 per cent of all residents had travelled more than 20km. The sample does yield some differences between coastal and inland municipalities, in that the former recorded somewhat higher migration distances (see Map 5). While in almost all coastal municipalities more than 5 per cent of all inhabitants had been born more than 20km away, in the inland municipalities this was often less than 2 per cent.
Graph 3: Distribution along distance between place of birth and residence for non-native residents, 1815

Map 5: Proportion of the population born more than 20km from their place of residence, 1815

This tentative exploration of migrants’ origins for 1815 suggests that the spatial patterns in mobility levels revealed by the 1796 census results were mainly the result of higher or lower levels of micro-mobility within regions rather than of population transfers between regions. Higher levels of non-native immigrants did correlate positively with migration distance in that the more mobile coastal parishes also recorded relatively higher migration distances – yet even there the number of residents who had covered more than 20km was never more than 8 per cent of total population. The tentative conclusion therefore is that the commercial capital-intensive agriculture of the coastal area was conducive to higher levels of migration over slightly higher distances than the more subsistence-
oriented agriculture of the inland regions, but that the main difference lay in the intensity of micro-mobility rather than in the distances involved.

**Determinants of change in mobility levels over time**

How, now, did the socio-economic determinants explored for the 1796 data influence the observed change in mobility levels over time? In table 3 we repeat the coefficients examined earlier for the regressions between a number of proxies for local economic and demographic structure and the proportion of non-natives in 1796 (column 1), but now we include their regression coefficient with the observed increase in percentage points of the proportion non-natives between 1796 and 1846 (column 2) and with the resulting percentage of non-natives in 1846 (column 3), as well as two additional independent variables that are available only for the census of 1846. It is worth to highlight that the increase in the proportion of non-native residents between 1796 and 1846 was not related in any significant way to overall population growth in this period (POP.INCREASE.PCT), which implies that local population growth was overall occasioned much more by natural growth than by any net transfer of population between municipalities.

The comparison of the first and second columns demonstrates how all factors that were significantly positively correlated with high levels of mobility in 1796 had a negative effect on the increase in the proportion of non-natives between 1796 and 1846, while all factors that were significantly negatively correlated with high levels of mobility in 1796 had a positive effect on the observed increase in immigrants over time. This is commensurate to the earlier observation of overall convergence, where we observed that municipalities with overall high levels of immigrants in 1796 tended to reduce that proportion over time, while those with low levels of immigrants in 1796 tended to increase the proportion of immigrants by 1846. Municipalities characterised by economic structures associated with low levels of immigrants in 1796, such as a heavy reliance on proto-industrial textile manufacturing or a predominance of small and micro plots, were involved in a catch-up movement in terms of immigrant levels by 1846, while the opposite was true for those scoring high on economic proxies associated with relatively high levels of mobility in 1796, such as large-scale farming and high proportions of labourers and servants.
This does not mean that the effect of these proxies for economic structure changed direction over time – the regression coefficients in column 3 still have the same sign as in column 1 – but it does suggest that their effect lessened over time. In other words, municipalities with for instance many labourers in 1796 were still among those with relatively high levels of immigrants in 1846, but less so. This is reflected in the fact that the regression coefficients in the third column are smaller than in the first, and often only half as large, suggesting a substantially smaller effect. While the average effect of one additional percentage point of labourers among male household heads in 1796 was to increase the proportion of non-natives by .180 percentage points in 1796, for instance, this increase was only .089 in 1846 – or about half as large.

Unfortunately, the data presented in Table 3 have one main shortcoming, and that is that no identical proxies for local economic structure are available for both 1796 and 1846. This means that it is impossible to determine to what extent the weakened effects in column 3 are attributable to real changes in economic structure over time – e.g. a decline in the proportion of wage labourers between 1796 and 1846 – or a weakening of the connection between economic structure and mobility levels per se. As to land relations, there are in any case no indications that overall polarisation in landholding declined between 1796 and 1846. On the contrary, if anything, the
proliferation of micro holdings increased in the half century up to 1846, so that the reduced effect of landholding relations in column 3 was certainly not attributable to a greater harmonisation of holding size. It is interesting to note, moreover, that farm ownership is one of the few economic proxies of which the size of the negative effect on immigration levels more or less persists between 1796 and 1846: municipalities characterised by high levels of farm ownership had very low levels of immigrants in 1796 as well as in 1846. Conversely, there was no effect whatsoever on the change in the proportion of immigrants. In other words, municipalities with high levels of ownership were not engaged in any catch-up movement in terms of mobility and maintained their low levels of immigrants over time.

With the exception of farm ownership then, the economic proxies that shaped the proportion of immigrants in 1796 became less useful to predict the proportion of immigrants by 1846. Although the data do not allow to disentangle changing effects from changing causes, these results do confirm that the correlation between economic regions and mobility levels weakened over time. Over time regionally delineated patterns of mobility appear to have become superseded by an increasing convergence in migration behaviour. In the areas of capital-intensive farming, technological change is likely to have reduced the number of hands needed in the form of labourers and servants by the middle of the nineteenth century, decreasing the incidence of this specific type of mobile wage labour in the coastal areas. In the more inland areas, in contrast, growing demographic pressures, increasing subdivision of land and the 1840s crisis of the linen industry, are likely to have contributed to an overall process of uprooting, in which mobility became a more familiar feature in these previously less mobile communities – albeit still to a lesser degree than the traditionally more mobile coastal areas.35 The only sedentarising characteristic that maintained its hold on the peasantry was that of farm ownership.

What we appear to be observing, then, is a move away from regionally specific patterns of mobility that were tied in with very distinct regional economic structures, towards a more generalised and more ubiquitous mobility: overall, a growing proportion of people moved at least once in their lifetime, and they were more evenly distributed by the mid-nineteenth century than in the late eighteenth century. This observation is supported by the changing effect of the population size of the neighbouring communities – one of the few independent variables that we can calculate directly for 1796 and 1846 separately. While this effect was still negative in 1796, the sum of the total population in the neighbouring municipalities in 1796 did have a strong, positive effect on the increase in the proportion of non-natives between 1796 and 1846. This is commensurate with the idea of increased overall mobility per se: when more people everywhere are likely to move, other things being equal, municipalities with a large population reservoir nearby are likely to record more

35 Matthijs, *De mateloze negentiende eeuw.*
immigrants. Given the facilitation of transport means, it is likely that this dynamic went hand in hand with an overall increase in migration distance, but this can only be verified by taking into account the origin of migrants in the 1846 census – an exercise which in any case falls beyond the scope of the present article.

**Conclusions**

This article has explored the extent and causes of variation in the proportion of non-native residents in more than 600 municipalities in the Belgian provinces of Flanders and Antwerp in 1796 and 1846. Although as a stock variable it has some inevitable drawbacks, the proportion of non-native residents at municipal level provides an important and valuable proxy for spatial variations in the overall incidence and intensity of mobility – one that to our knowledge is not available for any other European region at so early a date and for the totality of villages and towns within such a large area. The great variety in socio-economic structure within the area studied moreover allowed us to explore causal relations that transcend the specific spatial boundaries of the case study. The added value of this study therefore lies both in providing insight into the black box of preindustrial rural mobility by studying overall migration incidence within a large and diversified geographical area in the late eighteenth century, and into the direction of change that took place during the period of the purported ‘mobility transition’ of the nineteenth century.

Our analysis for the late eighteenth century demonstrated very large variations in migration rates, that corresponded spatially to the great variety in economic structures on the Flemish and Brabantine countryside. Although most migrants moved only over very short distances, the extent to which they did so was tied in with dissimilar regional systems of labour allocation. Overall, the degree of labour commodification clearly had a strong, positive influence on the incidence of mobility, which is confirmed by positive correlations between levels of mobility and proxies for large-scale commercial farming predominant in the coastal areas, and negative correlations with proxies for small-scale subsistence farming characteristic of the inland areas. These regional patterns of mobility as well as the correlations were much more muted by 1846: the proportion of non-native residents decreased in most coastal municipalities, while it increased for the previously much less mobile inland areas. Overall variation in migration rates decreased markedly as outliers converged. The only important exception to this pattern are the cities and their surrounding municipalities, which unsurprisingly continued to increase their share of non-native residents in this period of marked urbanisation.

Was there, then, a mobility transition in the larger area under study? Yes and no. Yes, in the sense that mobility became a more generalised experience and that a growing number of people throughout the area ended up living in a place other than that of birth by the middle of the
nineteenth century, and that they probably moved over slightly larger distances. No, in the sense that mobility did not increase everywhere: those regions characterised by high levels of mobility in the eighteenth century, experienced an overall reduction in migration levels. The overall trend of increasing and generalised mobility was the result of regional-specific evolutions in opposite directions. Rather than moving from generally low levels of mobility to generally higher levels of mobility, then, we witness an overall convergence in migration behaviour that previously was much more contingent on regionally specific economic structures. While in the ancien régime rural mobility was a regional affair, by the middle of the nineteenth century it was a generalised affair. The causes for the decrease of regional factors in favour of a more generalised experience were probably complex, but likely involved an overall decrease in labour demand in coastal agriculture in the wake of technological change, the growing disintegration of livelihoods in inland Flanders due to the increasing fragmentation of land, rising rents and the decline of proto-industrial textile production, and more generally the growing integration of labour markets over a wider area – and in this last respect the growing average level of mobility may have represented a sign of ‘modernity’ after all, but one that was induced by regional factors. Yet while it was the outcome of regionally-specific processes, the situation of generalized mobility by mid-century was nevertheless new: mobility itself may not have been a ‘modern’ phenomenon, but its omnipresence was. In turn, this omnipresence may have facilitated more migration in the decades to come – and in that sense may have been part and parcel of some kind of mobility transition after all.

**List of variables**

- ALLSERV_PCT: Percentage of servants in total population (1796)
- PR_ARB_M_PCT: Percentage of labourers among male household heads (1796)
- PR_TEXT_M_PCT: Percentage of textile workers among male household heads (1796)
- PR_LAND_M_PCT: Percentage of farmers among male household heads (1796)
- AGRARBEV (LT1846): Percentage of population working in agriculture (1846)
- HA_M20_SOIL: Percentage of cultivated soil occupied by farms larger than 20 ha (1846)
- HA_5_20_SOIL: Percentage of cultivated soil occupied by farms between 5 and 20 ha (1846)
- HA_2_5_SOIL: Percentage of cultivated soil occupied by farms between 2 and 5 ha (1846)
- HA_L2_SOIL: Percentage of cultivated soil occupied by farms smaller than 2 ha (1846)
- OWNER: Percentage of farms of which more than half of the land is held in ownership (1846)
- POP: Population size (1796 and 1846)
- NEIGHB. POP: Population sum of adjacent municipalities (1796 and 1846)
- POP. INCREASE (PCT): Population increase from 1796 to 1846 relative to 1796 population size
- AGE_PCT_40PLUS (1796): Proportion of population aged 40 and more (1796)
- CBR (1796): Crude birth rate (1791-1796)

**Appendix**

The main data used in this article were derived from the 1796, 1815 and 1846 censuses. For the 1796 census, we could rely on a great body of work that was carried out in the 1980s at the
University of Ghent under supervision of Jos De Belder, when all traceable nominal lists of the 1796 for the provinces of East Flanders, West Flanders and Antwerp were collected and subjected to a uniform aggregation procedure to calculate a series of demographic and socio-economic figures for each municipality, including an age pyramid, a classification of occupations and the proportion of non-native residents, which were published in a limited edition of so-called ‘Werkdocumenten’. The aggregate figures published in these ‘Werkdocumenten’ were recently collected and entered in a database (‘STREAM1796’) by Glenn Plettinck in the context of the on-going STREAM data-collection project (Spatiotemporal Research Infrastructure for Early Modern Flanders and Brabant) co-ordinated by Isabelle Devos (University of Ghent): www.streamproject.ugent.be. Also in the context of the STREAM project, Glenn Plettinck complemented these aggregate data with nominal data on the place of origin for all 11,815 immigrants recorded in the 1815 census in a random sample of 24 municipalities in West-Flanders, extracted from the nominal census lists published by the Vlaamse Vereniging voor Familiekunde (VVF), and in turn combined with the aggregate data from the ‘Werkdocumenten’ for the 1815 census for these 24 municipalities (‘Sample1815’). The census returns of the 1846 population and agricultural census were digitised in the context of the LOKSTAT project (Historische databank van lokale statistieken) co-ordinated by Eric Vanhaute & Sven Vrielinck (University of Ghent): www.lokstat.ugent.be (‘LOKSTAT1846’). The fact that the three censuses were undertaken in a period of societal turbulence – annexation by France, integration with the Netherlands, and the subsistence crisis of 1845/7 respectively – might have inflated migration levels, although unlikely to a great extent: both in 1796 and 1815 the most turbulent events were over and had little effect on day-to-day lives for the majority of inhabitants, and existing research has demonstrated that the crisis of 1845/7 had only a modest effect on migration behaviour. Although the censuses overall enjoy a relatively good reputation, we have little ways of knowing how diligently this particular piece of individual information was recorded. Although some under-reporting is likely, there is no reason to suspect that this would have varied in any systematic or selective way between municipalities or between censuses – as moreover the results corroborate. The fact that all three census forms included a column for migration status, helped to ensure that at least all census takers can be considered to have been attentive for this information.

37 Ministère de l’Intérieur, Recensement général (15 octobre 1846) (Brussels 1849); Idem, Agriculture: recensement général (15 octobre 1846) (Brussels 1850), 4 vols.
38 Nick Deschacht and Anne Winter, ‘Rural crisis and rural exodus? Local migration dynamics during the crisis of the 1840s in Flanders (Belgium)’, Explorations in Economic History 56 (2015) 32–52.