Retail development in the consumer revolution: The Netherlands, c. 1670–c. 1815

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Abstract

The Netherlands pioneered an early modern ‘Retail Revolution’, facilitating the Consumer Revolution. We analyze 959 Dutch retail ratios using multivariate regressions. Retail density rose with female headship everywhere. Density was high in Holland, but moderate in intermediate provinces and low in Overijssel. Differences in retail density between large and small settlements were trivial in Holland, moderate in intermediate provinces, and prominent in Overijssel. Retail ratios stagnated everywhere across the eighteenth century but rose sharply after 1800. The Dutch Retail Revolution did not unleash ineluctable growth, we conclude, but varied significantly with agrarian structure, the institutional powers of guilds, and female autonomy.

JEL classification:
L81
N33
N43
N73
N93
R12

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Consumer revolution
Netherlands
Women
Guilds
Agglomeration economies
Agrarian structure

1. Introduction

The ‘Retail Revolution’ is increasingly viewed as a key component of economic growth in early modern Europe. Between 1650 and 1800, shops, stalls, hawkers, and peddlers proliferated alongside established merchants, the number of retailers expanded, and the ‘retail ratio’ – the number of retailers per 1000 inhabitants – rose enormously. This retail growth, it is argued, fuelled the Consumer Revolution and its parallel ‘Industrious’ Revolution by lowering the transaction costs of bringing new market wares to wider strata of poorer customers. Yet although the retail ratio is increasingly viewed as a key quantitative indicator of the Consumer Revolution, we still know very little about its chronological development, spatial variation, and demographic, economic and institutional correlates.

This paper seeks systematic answers to open questions about the Retail Revolution using much richer data on early modern retailing than any previous study. We analyze more than nine hundred observations of the retail ratio in the early modern Netherlands between 1673 and 1813 — the core period of the early modern revolutions in retailing, consumption, and industriousness. This dataset is far...
larger than those used by previous studies, which cover only a small number of dates and localities, and are concentrated in urban centers and particular provinces.5 As Maps 1 and 2 show, our data include settlements in the northern Dutch province of Friesland, the eastern provinces of Overijssel and Gelderland, the southern provinces of Limburg and Brabant, and the provinces of Holland and Zeeland in the west; a lighter shading in the maps highlights the only three provinces for which we lack data (Utrecht, Drente and Groningen). For the Netherlands alone, we have collected over three times as many observations as the largest previous European study which included 308 English, Flemish, Dutch and German settlements.6 Our data provide a measure of ‘maximal’ retail density which takes account of the fact that some people engaged in retailing as a subsidiary occupation, as opposed to those for whom retailing was their main occupation, who are the only ones registered in the more conventional ‘minimal’ measure. Our data are also much richer than previous studies in enabling multivariate analysis using a range of other variables widely regarded as affecting retail growth, such as settlement size, the female household headship rate, and the presence of retailers’ guilds.

The Netherlands offers an ideal laboratory for testing theories about the Retail Revolution. For one thing, although historians have observed retail growth in a number of early modern European societies,7 the Dutch Republic is universally regarded as the first economy to experience an explosive transformation in retailing that enabled broad masses of consumers to shift from household to market consumption and production.8 To understand the role of the Retail Revolution in early modern European economic development, we need to analyze how it manifested itself in the Netherlands as the first economy in which it took place.

Second, the Netherlands grew rapidly up to the end of the seventeenth century, but then stagnated or declined during much of the eighteenth century, and industrialized only quite late in the nineteenth century.9 This uneven development trajectory is one of the great unsolved puzzles of early modern economic history and provides an excellent context for analyzing the relationship between retailing and economic growth. Moreover, Dutch economic institutions were fundamentally reformed at the end of the Ancien Regime in 1798, after which guilds were abolished and replaced by state licensing of occupations. This period is spanned by our dataset, making it possible to investigate how the retail sector responded to the new institutional regime.

Third, our Dutch data make it possible to address open questions about the geographical correlates of the Retail Revolution. The Netherlands included one of the most highly urbanized zones of Europe but also encompassed sparsely settled rural regions: this makes it a good test case for the widely held view that retailing grew with the agglomeration economies generated by urbanization.10

Our large dataset for the Netherlands also enables us to analyze how retail density varied within a national economy. Previous studies contrast retail development across different early modern societies, with the Netherlands, Flanders, and England manifesting very high retail densities compared to, for instance, central European territories.11 But does this mean that within the high-retail-density Dutch economy, the retail ratio was equally high everywhere? Or did retailing also vary regionally within national economies? The Netherlands provide a particularly good context for exploring this question, since it was a federation of disparate provinces which varied in location, geographical features, political power, urban institutions, and agricultural structure.12 Examining how retailing differed spatially within a particular country enables us to hold constant national characteristics while allowing regional and provincial factors to vary.

The Netherlands also provide an excellent context for exploring recent hypotheses linking the Consumer and Industrious Revolutions – and the associated Retail Revolution – with the economic position of women.13 Dutch and English historians have presented rich evidence showing that women were heavily involved in shopkeeping and have argued that females had labor characteristics that made them particularly productive in the retail sector.14 But studies of other early modern European economies, even ones with high female labor force participation and high female household headship rates, suggest that women’s participation in retailing could be severely constrained where institutional barriers to entry were high.15 Whether retailing was systematically associated with economic independence for women is thus still an open question. Dutch women are well known to have enjoyed an unusually high economic status, so the Netherlands offers a good framework for exploring whether the postulated association between female economic independence and retail density holds when other characteristics are held constant.

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6 Ogilvie (2010), 301–05.
7 Shammas (1990); Mui and Mui (1989); Stobart and Hann (2004); Ogilvie (2010); Ogilvie et al. (2011); De Vries (2008), 164, 169, 172–3; Blondé and Van Damme (2010).
9 De Vries and Van der Woude (1997); Van Zanden and Van Riel (2004). Van Zanden and Van Leeuwen (2012) present new macroeconomic estimates suggesting that the province of Holland experienced stagnation rather than actual decline between c. 1670 and c. 1800, but their figures refer solely to Holland, by far the most economically successful province of the Netherlands. Even for Holland, they find that industry had a near-zero growth rate between 1665 and 1800 and trade contracted at a rate of 0.13% p.a. between 1720 and 1800 (Table 4).
10 Van den Heuvel (2007); Ogilvie (2010); Blondé and Van Damme (2010).
11 Ogilvie (2010), 302–04.
Map 1. 'Maximal' Retail Ratios, 1673-1813.

Retailers per 1,000 pop.
- 0
- 0.01 - 4.99
- 5.00 - 9.99
- 10.00 - 19.99
- 20 and above

Map 1. 'Maximal' retail ratios, 1673–1813.
Map 2. 'Minimal' Retail Ratios, 1673-1813

Map 2. ‘Minimal’ retail ratios, 1673–1813.
2. Characteristics of early modern Dutch retail ratios

We follow the recent literature on retail ratios by including as retailers all persons practicing a commercial occupation autonomously — that is, excluding only those working as employees in businesses headed by others and craftsmen retailing their own products. We include, of course, anyone whose occupational descriptor referred explicitly to retailing, such as ‘winkel’ (shopkeeper), ‘winkelhouder’ (shop-holder), ‘winkel’ (shop), ‘vorkoper’ (a seller of a particular type of wares), ‘zoetelaar’ (sugar-seller), ‘venter’ and ‘kramer’ (different types of peddler). But we also include anyone described as ‘koopman’ or ‘koopvrouw’ (male or female merchant), even though these descriptors might imply, at least in some contexts, that the commercial activities of these individuals included wholesaling as well as retailing.

Good reasons exist for including general ‘traders’ and ‘merchants’ as well as specialized shopkeepers within the definition of retailers. The commercial pattern whereby some general traders and merchants specialized solely in wholesaling and withdrew completely from retailing was primarily observed in large urban centers, which comprise a very small share of our dataset (only 16% of our observations are for settlements with over 1000 inhabitants). In smaller settlements and rural areas, individuals designated as traders and merchants almost invariably engaged in retailing as well as (or instead of) wholesaling. Even for larger cities and more urbanized regions, there are many examples of general traders and merchants, including very wealthy ones, who engaged in retailing alongside wholesaling, and much secondary literature emphasizes the inappropriateness of drawing a clear distinction between wholesaling and retailing in the early modern Netherlands.

Including general traders and merchants may slightly over-estimate the maximal retail density becomes even more marked in the multivariate analysis below and sheds light on how retailing practices could vary substantially within a national economy, even one with a very high level of economic integration. One distinctive contribution of our analysis is to offer two different measures of the retail ratio. For comparability with other studies, we analyze the conventional minimal retail ratio which is calculated only on the basis of those individuals for whom retailing was their main occupation. But we also use archival sources recording multiple occupations for each household, which enable us to analyze a broader maximal measure of the retail ratio that includes retailing as a subsidiary as well as a main occupation.

Tables 1 and 2, as well as the regression equations in Tables 3 and 4, separately analyze the minimal and maximal retail ratios by dividing the data into three subsets: the entire dataset of 959 observations for which only the maximal retail ratio can be analyzed; the data subset of 873 observations for which both minimal and maximal retail ratios can be analyzed; and a third data subset of 751 observations for which the female headship rate is known and thus can be analyzed as a possible influence on both measures of the retail ratio.

As the descriptive statistics in Table 1 reveal, the minimal and maximal retail ratios show very substantial differences for some Dutch provinces (North Holland, South Holland, and Gelderland) which contrast strikingly with much smaller differences between the two measures of the retail ratio in other provinces (Friesland, Limburg, and Overijssel). This distinction between patterns of minimal and maximal retail density becomes even more marked in the multivariate analysis below and sheds light on how retailing practices could differ across relatively small geographical units within the wider national economy.

A second striking feature is the sheer degree of geographical variation in retail ratios across the Netherlands. In the largest sample of retail ratios that has previously been analyzed (308 central and northwest European settlements), retail densities were found to be significantly higher in early modern England, Flanders and the Netherlands than in German territories. The surprising finding to emerge from our data is that retail density could also vary substantially within a national economy, even one as small and highly integrated as the Netherlands. Thus Table 1 shows that the minimal retail ratio (the conventional measure) covered a considerable range, from 0 to over 80 retailers per 1000 inhabitants, while the maximal ratio (including by-employed retailers) covered an even wider range, from 0 to over 110 per 1000 inhabitants. About half of all settlements in our dataset had no retailers, while the other half had quite high retail densities by European standards — an average of 15.2 per 1000 compared to the mean of 12.8 in the European sample of 308 settlements.

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17 Slicher van Bath (1977b), 181; Roessingh (1965), 232; De Vries and Van der Woude (1997), 602.
18 The Noorderkwartier and Zuiderkwartier (referred to in this paper as North Holland and South Holland) were two separate administrative entities within the province of Holland. We therefore analyze the two parts of the province separately, an approach that econometric tests (see below) demonstrate to be empirically justified.
19 Ogilvie (2010), 301–04.
20 Although such regional variation also emerges strongly from studies such as Van Bavel (2010), 2–6, 9–13.
21 Ogilvie (2010), 302 (Table 2).
focus on large urban centers might seem justified in light of the Netherlands’ high level of urbanization.\(^2\) But the historiography Consumer and Industrious Revolutions around 1650 to at least 1750, with the exception of a few period as a whole. In others, retail density is tacitly assumed to have followed a generally upward trend from the beginning of the over time. In some cases, high retail ratios from the early to mid-eighteenth century are assumed to apply to the early modern on the Retail Revolution also emphasizes the importance of growth in rural retailing.\(^2\) Furthermore, as Table 1 reveals, even the per 1000 inhabitants, and the cities of Leiden and Zwolle showed similar levels.\(^2\) Even higher retail ratios were found in the range of 20 settlement sizes from very small (a hamlet of 5 inhabitants) to very large (a city of 67,000). Although the mean settlement in our dataset had a population of about 970, the median settlement had only 285 inhabitants, showing a size distribution heavily skewed towards small villages. In the dataset as a whole, one-fifth of settlements had fewer than 100 inhabitants, two-thirds had over four-fifths had fewer than 1000. The multivariate analyses below show how retail density varied with set of observations and narrow geographical and chronological range. Furthermore, this striking geographical variation was not randomly distributed across the country. As Table 2 shows, mean retail density differed considerably among Dutch provinces. Average retail density for Overijssel and Friesland was below 5 per 1000 for all data subsets, Limburg lay in the range 4–8 per 1000, and Gelderland between 3 (for the minimal retail ratio) and over 13 (for the maximal ratio). Holland had much higher average retail densities than other Dutch provinces, although South Holland (at a mean of 18 per 1000) was lower than North Holland (at a mean of over 27). But the key finding is that only Holland shows the high mean retail densities reported in earlier studies as characteristic of the entire country.\(^2\)

This may result from a further salient feature which emerges from Table 1: the small size of many early modern Dutch settlements. Previous analyses of the Retail Revolution have focused primarily on urban centers, showing high retail densities in the range of 20–40 per 1000 inhabitants. By the mid-eighteenth century, for instance, Amsterdam had estimated 18–23 retailers per 1000 inhabitants, and the cities of Leiden and Zwolle showed similar levels.\(^2\) Even higher retail ratios were found in the Brabant town of ‘s-Hertogenbosch in 1742 (37 per 1000) and in towns in the province of Zeeland in 1807 (26.5 per 1000).\(^4\) This focus on large urban centers might seem justified in light of the Netherlands’ high level of urbanization.\(^2\) But the historiography on the Retail Revolution also emphasizes the importance of growth in rural retailing.\(^2\) Furthermore, as Table 1 reveals, even the Netherlands contained very small settlements alongside large cities: the localities in our Dutch dataset span the whole range of settlement sizes from very small (a hamlet of 5 inhabitants) to very large (a city of 67,000). Although the mean settlement in our dataset had a population of about 970, the median settlement had only 285 inhabitants, showing a size distribution heavily skewed towards small villages. In the dataset as a whole, one-fifth of settlements had fewer than 100 inhabitants, two-thirds had fewer than 500, and over four-fifths had fewer than 1000. The multivariate analyses below show how retail density varied with these wide differences in settlement size — albeit in different ways in different regions of the country.

Our data also show distinct chronological features. Earlier studies of the Retail Revolution have tended to abstract from change over time. In some cases, high retail ratios from the early to mid-eighteenth century are assumed to apply to the early modern period as a whole. In others, retail density is tacitly assumed to have followed a generally upward trend from the beginning of the Consumer and Industrious Revolutions around 1650 to at least 1750, with the exception of a few ‘declining’ centers such as

\(^2\) Van den Heuvel (2007); Ogilvie (2010), 302 (Table 2).
\(^8\) De Vries (1974); De Vries (1975); Mui and Mui (1989).

Table 1
Descriptive characteristics of retail ratio dataset, the Netherlands, 1673–1813.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Primary occupation not fully recorded, head’s sex not fully recorded</th>
<th>Primary occupation fully recorded, head’s sex not fully recorded</th>
<th>Primary occupation fully recorded, head’s sex fully recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>Max</td>
</tr>
<tr>
<td>Maximal retail ratio</td>
<td>7.9</td>
<td>1.7</td>
<td>112.4</td>
</tr>
<tr>
<td>Minimal retail ratio</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Settlement size</td>
<td>921</td>
<td>283</td>
<td>67,000</td>
</tr>
<tr>
<td>Female headship</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Retail guild present</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>1670s</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>1740s</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>1790s</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>1800s</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>North Holland</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>South Holland</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Friesland</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Gelderland</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Limburg</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Overijssel</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

Notes:
Maximal retail ratio = number of retailers (including multiple occupations) per 1000 population.
Minimal retail ratio = number of retailers (primary occupations only) per 1000 population; available only for 873 observations.
Settlement size = number of inhabitants in the settlement at the date of observation.
Female headship = number of female household-heads per 100 households; available only for 751 observations.
1670s = 1673–1680.
1740s = 1735–1749.
1790s = 1795–1797.
1800s = 1803–1813.
Our data also include 3 observations for Brabant (for the town of ’s-Hertogenbosch in 1742, 1775, and 1808), and 5 observations for Zeeland (for 5 different towns in 1807), but these provinces are excluded from analysis because of the small number of observations and narrow geographical and chronological range.
Antwerp.27 Our data, by contrast, reveal a much more uneven development trajectory. Retail ratios were already quite high in the 1670s, but fell between then and the 1740s and declined further up to the 1790s, before rising spectacularly by 1803–13.

Even in cross-tabulations, therefore, our unprecedentedly large dataset of retail ratios reveals unexpected findings that contrast intriguingly with widely held views of the early modern Retail Revolution. But descriptive statistics can only take us so far. Not all the differences in mean retail densities reported above are statistically significant and they do not control for other variables. We may observe unusually high retail ratios for North Holland simply because a large share of the observations for that province came from a period when retailing was expanding; or we may observe exceptionally high retail ratios for the early nineteenth century because those data came from unusually large settlements. To understand the quantitative contours of early modern Dutch retail development requires a multivariate approach, to which we now turn.

3. The multivariate analysis of retail ratios

We carried out a series of Tobit regressions to explore the association between retail density and a number of key variables which the historiography regards as being associated with the Retail Revolution: women’s economic autonomy, urbanization and agglomeration economies, location, development over time, and retailers’ guilds. As discussed below, not all of these variables can be regarded as strictly exogenous causes of retail density, for which reason the regression results must be interpreted as multivariate correlations rather than unidirectional causal effects.

We analyzed our two measures of retailing separately—the maximal retail ratio (including by-employs) in Table 3 and the minimal retail ratio (including only main occupations) in Table 4. The minimal retail ratio could be analyzed only for a subset of 873 observations, so for comparability we estimated a separate model for the maximal retail ratio using that smaller data subset (Table 3 Regression 2).

Although historians of the Netherlands analyzing occupational structure have made very wide use of the documentary sources we employ,28 we regarded it as important to consider the possibility that variations in the type or quality of these documentary sources might have affected the statistical findings. For the pre-1795 period, most of the observations were derived from registers of inhabitants recording their liability (or otherwise) to pay a wealth tax; a few observations were derived from censuses and billeting lists. For the post-1795 period, most of the observations were derived from censuses or from registers recording people’s liability to pay the Patent Tax, a tax on occupations. Both in coverage and in accuracy, we were able to establish that the pre-1795 sources were as reliable as the post-1795 ones. As far as coverage was concerned, the vast majority of the observations in the dataset came from registers which either explicitly stated that they recorded the whole population (including the untaxed), or included persons who were ‘poor’, ‘retired’ or ‘without occupation’ (which can be interpreted as strong indications of complete registration). In a number of cases, we were also able to corroborate the number of inhabitants or number of retailers in the register using other documentary sources for that settlement. As far as accuracy was concerned, where comparisons (including record-linkage) with other sources were possible, they demonstrated that the registers were extremely accurate in recording the identities of retailers actually present the locality at the relevant date. A small number of sources held some potential for

28 Among basic works using these registers to reconstruct Dutch occupational structure, see Faber (1972), Harten (1971), Slicher van Bath (1977b), Roestingsh (1965), and Van der Woude (1972).
Table 3
Determinants of ‘maximal’ retail ratio in the Netherlands, 1673–1813.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression 1</th>
<th>Regression 2</th>
<th>Regression 3</th>
<th>Regression 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Primary occupation not fully recorded, head’s sex not fully recorded</td>
<td>Primary occupation fully recorded, head’s sex not fully recorded</td>
<td>Head’s sex fully recorded</td>
<td>Head’s sex assumed not fully recorded</td>
</tr>
<tr>
<td></td>
<td>(n = 959)</td>
<td>(n = 873)</td>
<td>(n = 751)</td>
<td>(n = 751)</td>
</tr>
<tr>
<td>Coefficient (std err.)</td>
<td>Marg. eff. (std err.)</td>
<td>Coefficient (std err.)</td>
<td>Marg. eff. (std err.)</td>
<td>Coefficient (std err.)</td>
</tr>
<tr>
<td>Female headship</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Log size Friesl.</td>
<td>10.187***</td>
<td>4.859***</td>
<td>9.735***</td>
<td>4.225***</td>
</tr>
<tr>
<td>Gelderl., Limb.</td>
<td>(1.025)</td>
<td>(0.386)</td>
<td>(1.086)</td>
<td>(0.358)</td>
</tr>
<tr>
<td>Overijssel</td>
<td>(1.622)</td>
<td>(0.689)</td>
<td>(1.642)</td>
<td>(0.616)</td>
</tr>
<tr>
<td>South Holland</td>
<td>(1.242)</td>
<td>(0.589)</td>
<td>(1.093)</td>
<td>(0.449)</td>
</tr>
<tr>
<td>Log size</td>
<td>−2.630</td>
<td>−1.254</td>
<td>−2.580</td>
<td>−1.120</td>
</tr>
<tr>
<td>North Holland</td>
<td>(2.194)</td>
<td>(1.055)</td>
<td>(2.184)</td>
<td>(0.960)</td>
</tr>
<tr>
<td>Gelderland</td>
<td>−1.437</td>
<td>−0.664</td>
<td>−1.355</td>
<td>−0.569</td>
</tr>
<tr>
<td>Limburg</td>
<td>−8.391</td>
<td>−3.332</td>
<td>−7.231</td>
<td>−2.630</td>
</tr>
<tr>
<td>Overijssel</td>
<td>(6.857)</td>
<td>(2.196)</td>
<td>(7.869)</td>
<td>(2.339)</td>
</tr>
<tr>
<td>South Holland</td>
<td>(11.455)</td>
<td>(1.896)</td>
<td>(12.254)</td>
<td>(1.956)</td>
</tr>
<tr>
<td>North Holland</td>
<td>43.725***</td>
<td>33.000***</td>
<td>32.038***</td>
<td>23.775***</td>
</tr>
<tr>
<td>1670s</td>
<td>(12.012)</td>
<td>(10.328)</td>
<td>(10.628)</td>
<td>(9.730)</td>
</tr>
<tr>
<td>1740s</td>
<td>−28.821***</td>
<td>−8.290***</td>
<td>−28.078***</td>
<td>−7.331***</td>
</tr>
<tr>
<td>Retail guild</td>
<td>−2.471</td>
<td>−1.104</td>
<td>−4.424</td>
<td>−1.668</td>
</tr>
<tr>
<td>Constant</td>
<td>(3.552)</td>
<td>(1.467)</td>
<td>(3.913)</td>
<td>(1.240)</td>
</tr>
<tr>
<td>Pseudo R-sq</td>
<td>0.1117</td>
<td>0.1132</td>
<td>0.1113</td>
<td>0.1106</td>
</tr>
</tbody>
</table>

Notes:
Table presents results of Tobit regression of the maximal retail ratio on the variables specified in column 1.
Variable definitions: see Table 1 and text. Standard errors in parentheses.
Marginal effect is effect on the mean value of the dependent variable conditional on the dependent variable being either strictly positive or zero. For dummy variables, marginal effect (dy/dx) is for discrete change of dummy variable from 0 to 1.
• Significant at 1%.
•• Significant at 5%.
••• Significant at 10%.

under-estimation of retail ratios, the pre-1795 ones because of the possibility of incomplete recording of households or occupations, the post-1795 ones (particularly the Patent Tax registers) because of the motivation to evade occupation-based taxes through false reporting or suborning the officials.29 There were also a few specific observations for both the pre- and post-1795 periods where our experience with the documentary source suggested that there was some potential for inaccuracy or over-estimation of retail ratios. We therefore coded all questionable observations (13.87% of the total) according to whether they were potential over-estimates, under-estimates, or ambiguous measures of the retail ratio. We tested for robustness by re-estimating all models on a dataset in which 1, 3, 5, and 10 points were progressively added to retail ratios suspected of being under-estimates and analogously subtracted from retail ratios suspected of being over-estimates. Neither separately nor in combination did this alter the models estimated or the results of hypothesis tests.30

Because the distribution of settlement sizes was skewed, we used a logarithmic transformation to generate a more symmetric distribution. Given the chronological clustering of our data, we measured time in terms of four ‘decades’ — the 1670s (1673–1680), the

29 For additional discussion of these sources, particularly the post-1800 ones, and of their reliability as sources for Dutch occupational structure, see Van den Heuvel and Ogilvie (2012), 4–7.
30 On these robustness tests, see Van den Heuvel and Ogilvie (2012), 7, 27.
1740s (1735–49), the 1790s (1795–7), and the 1800s (1803–13). We measured spatial patterns both by the precise latitude and longitude of the settlement and – motivated by recent studies emphasizing economic and institutional variation across Dutch regions\textsuperscript{31}, by the province in which the settlement was located (Friesland, Gelderland, Limburg, Overijssel, South Holland, and North Holland).\textsuperscript{32} We measured female economic autonomy using the most widely employed indicator for pre-modern societies, the percentage of independent households in the settlement headed by women.\textsuperscript{33} Female headship was fully recorded for only 751 observations, so the model including that variable could only be estimated for this smaller data subset (Table 3 Regression 3, Table 4 Regression 2). The effect of guilds proved extremely difficult to register econometrically, both because guild activities are difficult to measure rigorously and because institutions typically have two-way causal links with economic outcomes, creating serious econometric issues. With considerable reservations, discussed in detail below, we included a dummy variable registering the presence (1) or absence (0) of a retailers’ guild in the settlement at that date.

4. Retailing and women’s economic autonomy

We start by discussing the relationship between gender and retailing since it provides the sole motivation for analyzing the smallest data subset of 751 observations. Since not just inclusion of female headship but also differing sample size could affect the results, we estimated the model on this data subset both with and without the female headship variable (Table 3 Regressions 3–4, Table 4 Regressions 2–3). The estimated coefficients for all other variables turned out to be very similar, justifying shifting focus to

### Table 4

Determinants of ‘minimal’ retail ratio in the Netherlands, 1673–1813.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression 1 (n = 873)</th>
<th>Regression 2 (n = 751)</th>
<th>Regression 3 (n = 751)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (std err.)</td>
<td>Coefficient (std err.)</td>
<td>Coefficient (std err.)</td>
</tr>
<tr>
<td></td>
<td>Marg. eff. (std err.)</td>
<td>Marg. eff. (std err.)</td>
<td>Marg. eff. (std err.)</td>
</tr>
<tr>
<td>Female headship</td>
<td>n/a</td>
<td>0.328**</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.122**)</td>
<td>(n/a)</td>
</tr>
<tr>
<td>Log size Friesl.</td>
<td>9.133***</td>
<td>8.557***</td>
<td>n/a</td>
</tr>
<tr>
<td>Gelderl., Limb.</td>
<td>(0.265)</td>
<td>(0.261)</td>
<td>(n/a)</td>
</tr>
<tr>
<td>Log size</td>
<td>12.701***</td>
<td>11.911***</td>
<td>n/a</td>
</tr>
<tr>
<td>Overijssel</td>
<td>(0.521)</td>
<td>(0.477)</td>
<td>(n/a)</td>
</tr>
<tr>
<td>Log size</td>
<td>5.263***</td>
<td>6.017***</td>
<td>12.679***</td>
</tr>
<tr>
<td>South Holland</td>
<td>(0.391)</td>
<td>(0.458)</td>
<td>(4.94)**</td>
</tr>
<tr>
<td>Log size</td>
<td>0.159</td>
<td>0.513</td>
<td>(0.478)</td>
</tr>
<tr>
<td>North Holland</td>
<td>(0.854)</td>
<td>0.906</td>
<td>(0.474)</td>
</tr>
<tr>
<td>Gelderland</td>
<td>4.789***</td>
<td>-4.311**</td>
<td>-4.861***</td>
</tr>
<tr>
<td>(1.796)</td>
<td>(1.402)</td>
<td>(1.064)</td>
<td>(1.563)</td>
</tr>
<tr>
<td>Limburg</td>
<td>-10.076*</td>
<td>-2.556</td>
<td>1.418</td>
</tr>
<tr>
<td>(5.972)</td>
<td>(2.122)</td>
<td>(0.508)</td>
<td>(0.405)</td>
</tr>
<tr>
<td>South Holland</td>
<td>19.485***</td>
<td>3.221</td>
<td>10.530</td>
</tr>
<tr>
<td>(9.603)</td>
<td>(7.996)</td>
<td>(1.217)</td>
<td>(5.428)</td>
</tr>
<tr>
<td>North Holland</td>
<td>68.062***</td>
<td>62.277***</td>
<td>62.491***</td>
</tr>
<tr>
<td>(14.441)</td>
<td>(13.605)</td>
<td>(17.924)</td>
<td>(11.345)</td>
</tr>
<tr>
<td>(3.595)</td>
<td>(4.413)</td>
<td>(4.026)</td>
<td>(4.991)</td>
</tr>
<tr>
<td>1740 s</td>
<td>-10.111***</td>
<td>-18.555***</td>
<td>-15.571**</td>
</tr>
<tr>
<td>(4.213)</td>
<td>(7.545)</td>
<td>(4.058)</td>
<td>(7.524)</td>
</tr>
<tr>
<td>1790 s</td>
<td>-9.539*</td>
<td>-15.873</td>
<td>-16.617</td>
</tr>
<tr>
<td>(5.89)</td>
<td>(9.854)</td>
<td>(4.546)</td>
<td>(7.394)</td>
</tr>
<tr>
<td>Retail guild</td>
<td>-2.735</td>
<td>-3.842</td>
<td>-3.134</td>
</tr>
<tr>
<td>(3.649)</td>
<td>(9.771)</td>
<td>(1.218)</td>
<td>(1.408)</td>
</tr>
<tr>
<td>Constant</td>
<td>-41.201***</td>
<td>-33.956***</td>
<td>-36.259***</td>
</tr>
<tr>
<td>(6.738)</td>
<td>(9.143)</td>
<td>(1.484)</td>
<td>(9.148)</td>
</tr>
</tbody>
</table>

Notes:
Table presents results of Tobit regression of the minimal retail ratio on the variables specified in column 1. Otherwise, see notes to Table 3.


\textsuperscript{32} Cf. Van den Heuvel and Ogilvie (2012), 20 with n. 66. As explained in Table 1 of the present paper, our full dataset included a handful of observations for the provinces of Brabant and Zeeland which were too narrowly clustered by settlement or time-period to be suitable for inclusion in the econometric analysis.

\textsuperscript{33} On this measure, see Ogilvie and Edwards (2000), 965–6.
the regressions on the larger datasets when we discuss the other independent variables, though distinctive findings from the female headship model are discussed when they appear.

Many studies suggest a positive link between the Retail Revolution and women's economic autonomy. But they are less clear about the causal relationship. On the one hand, high female autonomy may have increased retail density. Contemporaries commonly advocated retailing as particularly suited for women. Female household heads may have been relatively productive in retailing because it could be combined more easily with household production (especially child care) and required communication and calculation skills rather than upper-body strength, an effect intensified in the Netherlands by high female education levels. Early modern women may also have favored retailing because although retail guilds discriminated against females their entry barriers were lower than those of craft guilds. For these reasons, if female headship was high for exogenous reasons, it might have raised the retail ratio. But causation might also go in the opposite direction. If retailing was dense for exogenous reasons, it might have raised the female headship rate by enabling more women to support families independently. Or exogenous factors might have facilitated both female headship and retailing: more flexible institutions could have enabled women to support themselves independently in all occupations (not just retailing) and could have made it easier for all economic agents (not just women) to set up retail establishments.

The econometric problems created by these two-way causal links could not be solved using an instrumental variable (one correlated with female headship but not with the retail ratio) because the determinants of female headship rates in pre-industrial societies are still not fully understood. Our alternative solution was to run our regressions with and without the female headship variable in order to establish whether female headship was significantly related to the retail ratio and whether any relationship was positive or negative. Taking female headship into account hardly ever altered the estimated coefficients on other variables; where it did, as with the retail guild variable, we discuss the implications.

The average female headship rate across the 751 observations in our dataset for which information on this variable was available was just over 12%, which is in the range to be expected for a sample of predominantly rural western European settlements. But there was also very wide variation: in some of these early modern Dutch settlements over one-third of households were headed by women, while in others no households had female heads.

The econometric analysis established that female headship was indeed positively related to retail density, in both its maximal and minimal measures. As Table 3 Regression 3 shows, even controlling for settlement size, date, location, and the presence of guilds, higher female headship was associated with a significantly higher maximal retail ratio. Assessed at the sample means of all variables, the elasticity of the retail ratio with respect to the female headship rate was 0.20 — i.e., a 1% increase in the female headship rate was associated with a 0.20% rise in the retail ratio. Female headship was also positively and significantly associated with the minimal retail ratio, as Table 4 Regression 2 shows. This finding indicates that it was not just retailing as a subsidiary occupation but also retailing as a main occupation that favored, or was favored by, the existence of a larger proportion of households headed by females. Although the elasticity of the minimal retail ratio with respect to female headship was smaller, at 0.12, it was nonetheless statistically significant.

Our quantitative analysis thus confirms previous qualitative evidence suggesting a positive association between female headship and retail density. Indeed, it strengthens the finding by confirming that it holds even controlling for settlement size, time-period, geographical location, and the presence of retailers' guilds. The larger size of the association between female headship and the maximal definition of the retail ratio supports the idea that females may have disproportionately adopted retailing as an ancillary rather than a main occupation. This opens up perspectives for deeper micro-level analyses to investigate gender-specific patterns of retailing at the household level. This in turn may help resolve the endogeneity between the two variables — i.e., whether female headship increases retail density or vice versa. In any case, there is now little doubt that there was a significant, systematic, and pervasive association between the early modern Retail Revolution and women's economic autonomy, even controlling for other factors.

5. Retailing and urbanization

The early modern Retail Revolution is often portrayed as resulting partly from the urbanization of European societies in this period. Intuitively appealing though this idea is, it still lacks theoretical underpinning or quantitative confirmation. In theory, urbanization could have created economies of agglomeration — positive externalities in the form of improved information flow, specialization, division of labor, or the ability to attract more suppliers and customers — which encouraged retail density in cities. But in theory the early modern Industrious Revolution saw a shift towards market participation by social groups who had previously provisioned themselves through household production: this would tend to increase retail density in rural areas, where

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40 Ogilvie and Edwards (2000), 571 (Table 2); Ogilvie (2003), 217–24.
41 Here and throughout, 'significant' means that a result is statistically significant at or below the 0.05 level; it does not refer to the magnitude of any effect.
43 Roessingh (1965), 232; Slicher van Bath (1977b), 181; De Vries and Van der Woude (1997), 602.
a larger share of inhabitants had traditionally engaged in self-provisioning because of access to land and livestock. Our data on the Netherlands, one of the most highly urbanized parts of the continent, provide a good way of exploring these hypotheses.

To this end, our regressions included the population size of each settlement in which retail density was observed. To allow for the possibility of geographical and chronological variation, we also included interaction terms between that variable and both time-period and province. None of the interaction terms between settlement size and time were significant, implying that the effect of settlement size on retail density did not differ between the 1670s, 1740s, 1790s and 1800s, and hence these variables are not included in Tables 3 and 4. But the interaction terms between settlement size and province were significant, showing that urbanization affected retail density in different ways in different parts of the country.

The most powerful effect was in Overijssel, which (as Table 1 shows) had the lowest average density of retailing of any province. Here, settlement size had a statistically significant effect, and one that was quantitatively large: the elasticity of the maximal retail ratio with respect to settlement size was 1.16, and the elasticity of the minimal retail ratio was even higher, at 1.42. In so far as there were substantial concentrations of retailing in Overijssel, they were found predominantly in towns and cities.

The next most powerful effect was found in a group of intermediate provinces – Friesland, Gelderland, and Limburg – which Table 1 shows were characterized by intermediate average retail ratios. These provinces were grouped together on the basis of post-regression hypothesis tests showing that the effect of settlement size on the retail ratio did not differ significantly within the group. In these provinces, settlement size still had a statistically significant effect on retail density but one that was significantly smaller than in Overijssel and significantly larger than in North or South Holland. In these intermediate provinces, the elasticity of the minimal retail ratio with respect to settlement size was only 0.86, while the elasticity of the maximal retail ratio was only slightly higher, at 1.02.

Settlement size also had a significant effect on the retail ratio in South Holland, which had the second-highest average retail ratio of all provinces. Here, the elasticity of the maximal retail ratio with respect to settlement size was only 0.33; the elasticity of the minimal retail ratio was not much higher, at 0.59. These effects were significantly smaller than in the ‘intermediate’ provinces.

It was North Holland, with by far the highest average retail density of any Dutch province, where settlement size had no significant effect. This finding is the more striking in that the 51 North Holland settlements in the dataset ranged from less than 30 inhabitants to nearly 9000. Despite this wide variation, settlement size exerted no significant effect on retail density in the province. In highly commercialized North Holland, dense concentrations of retailers had arisen even in small rural localities, to an extent not observed anywhere else. The zone of very high retail densities found in Holland, therefore, was characterized by much greater similarity in ratios between villages, towns and cities. Retailing here was not an urban phenomenon, but rather was diffused throughout the countryside.

This large and significant effect of urbanization on retail density in some but not all early modern Dutch provinces sheds light on whether urbanization had positive or negative externalities for rural retailing. The small or non-existent effect of settlement size on retail density in the most highly urbanized provinces, North and South Holland, suggests that in these provinces urbanization did not stifle village retailing but stimulated it. By contrast, the substantial effect of settlement size on retail density in the least urbanized provinces suggests that towns in these provinces did substitute for village retailing. At the lower levels of urbanization in those provinces, economic differences between town and country – at least as reflected in retail density – were wider, not narrower, than in more highly urbanized regions. But whether the wider town-country gap in the east was caused by the lower degree of urbanization, or whether both were caused by underlying variables – such as institutional differences – remains an important avenue for future research.

This finding also sheds light on the circumstances under which early modern urbanization might have generated agglomeration economies. In so far as the positive effect of settlement size on retail density was caused by economies of agglomeration, these appear to have been more important in less commercialized regions. In more highly commercialized provinces, there was little or no difference in retail density between towns and villages. There are two possible interpretations of these findings. The first is that economies of agglomeration, in which a larger number and range of producers and consumers in a particular location gave rise to enhanced opportunities to exploit the division of labor and gains from trade, were important at lower levels of urbanization but ceased to be so important at high urbanization levels such as those attained by the western Netherlands from the later seventeenth century onwards. The second is that such economies of agglomeration did still exist in highly urbanized areas but that they were partly (or in the case of North Holland wholly) counteracted by other factors encouraging retail density in small rural settlements. What these factors may have been emerges in detail in the next section, where we discuss pure spatial effects on retail density.

6. Spatial variation in retail density

The urbanization-retailing link clearly varied across the Netherlands. But did retail density itself also vary spatially? To answer this question, the regressions included latitude, longitude and province as explanatory variables. When the province variables were not included, longitude but not latitude had a negative effect – i.e., retail ratios declined significantly as one moved from west to east though not from north to south. But once the province variables were included, longitude and latitude became insignificant – i.e., all the information they contained was encompassed by the province variables. So Tables 3 and 4 include only the five province dummies (Gelderland, Limburg, Overijssel, South Holland, and North Holland), with Friesland as the omitted category. The ‘pure’ effect of province on retail density is measured by combining the effect of the province-dummy with the effect of the interaction term between province and settlement size. These pure province effects are presented in Tables 5 and 6,
which show the predicted effect of province on the retail ratio assessed at various settlement sizes and setting all other independent variables at their sample mean values.

For the maximal retail ratio (i.e., including retail by-employments) Table 5 and Fig. 1 show that these pure province effects were quite clear at the level of small villages but progressively less evident as settlements increased in size. Thus for villages of 100 inhabitants (at the 20th percentile of our dataset) and those of 200 inhabitants (at the 39th percentile), North Holland had a significantly higher retail ratio than all other provinces and South Holland had a higher retail ratio than all other provinces except for North Holland, although its difference compared to Friesland and Gelderland was of borderline significance. There was no significant difference between Friesland, Gelderland and Limburg. For settlements of 100 inhabitants Overijssel had significantly lower retail density than North Holland, South Holland, and (with borderline significance) Friesland. But as settlements increased in size, these pure province differences became progressively less significant. Once settlements reached 500 inhabitants (at the 67th percentile), some pure province effects were still evident but they were much less significant. Only North Holland still differed significantly and substantially from all other provinces at this settlement size, even though – unlike all other provinces – its retail density actually declined slightly with settlement size. Once settlements reached 750 inhabitants (the 77th percentile) or 1000 (the 84th percentile), the difference between North and South Holland was only of borderline significance, although North Holland still had significantly and substantially higher retail ratios than all other provinces.

For the minimal retail ratio, Table 6 and Fig. 2 show that the pecking order among provinces at small settlement sizes was almost identical to the maximal ratio. But there were major changes as settlement size increased. First, Friesland pulled ahead of the other intermediate provinces, to such effect that once it reached settlements of 750 or 1000 inhabitants its predicted pure province effect was not significantly different from that of the front-runner North Holland. The other deviation was for Overijssel, where for small settlements of 100 or 200 inhabitants retail density was significantly lower not just than North Holland but also

![Fig. 1. Predicted ‘maximal’ retail ratio, by province.](image)

### Table 5
Predicted effect of province on ‘maximal’ retail ratio at different settlement sizes.

<table>
<thead>
<tr>
<th>Province</th>
<th>Settlement size = 100</th>
<th>Settlement size = 200</th>
<th>Settlement size = 500</th>
<th>Settlement size = 750</th>
<th>Settlement size = 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(20th percentile)</td>
<td>(39th percentile)</td>
<td>(67th percentile)</td>
<td>(77th percentile)</td>
<td>(84th percentile)</td>
</tr>
<tr>
<td>Friesland</td>
<td>2.12 0.82 3.43</td>
<td>4.34 2.21 6.47</td>
<td>9.18 5.69 12.67</td>
<td>12.02 7.86 16.17</td>
<td>14.25 9.61 18.89</td>
</tr>
<tr>
<td>Gelderland</td>
<td>1.80 0.36 3.25</td>
<td>3.80 1.36 6.23</td>
<td>8.29 4.21 12.37</td>
<td>10.99 6.13 15.85</td>
<td>13.14 7.71 18.56</td>
</tr>
<tr>
<td>Limburg</td>
<td>0.75 −0.24 1.74</td>
<td>1.83 −0.12 3.78</td>
<td>4.73 0.95 8.51</td>
<td>6.70 1.99 11.40</td>
<td>8.36 3.00 13.72</td>
</tr>
<tr>
<td>Overijssel</td>
<td>0.45 −0.20 1.11</td>
<td>1.62 −0.14 3.38</td>
<td>5.78 1.46 10.11</td>
<td>8.90 3.20 14.60</td>
<td>11.59 4.92 18.26</td>
</tr>
</tbody>
</table>

Note:
Based on Table 3, Regression 1.
Assessed at the sample mean of all other independent variables and at the value of the log of settlement size corresponding to the given settlement size.
than Friesland, although this may testify more to Friesland’s distinctively high retail ratios (in the minimal definition) than to Overijssel’s distinctively low ones.

These pure province effects raise three puzzles. First, what kept Overijssel out of the Dutch Retail Revolution? To a greater extent than any other Dutch province, it had a wide gap in retail density between town and country and a distinctively low retail density in its smallest communities. One possible explanation is the low productivity and rural character of early modern Overijssel, where agriculture and textile proto-industry produced very poor living standards for the population. But rural poverty did not prevent the expansion of retailing everywhere: one of the distinctive features of the early modern Retail Revolution was that it lowered transaction costs for poorer strata of wage-dependent workers in both town and countryside, enabling them to purchase cheap food, drink and clothing in shops rather than producing them at home. It is possible that certain aspects of agrarian institutions in rural Overijssel prevented the rural poor from participating in these developments.

The second puzzle is why Friesland was so highly commercialized, at least according to the conventional minimal definition of retailing? Friesland was even more rural than Overijssel: in our database, its mean settlement had only 350 inhabitants, significantly lower than any other province even including Gelderland (at c. 450) and Overijssel (at c. 620), and strikingly lower than Limburg (c. 1000), North Holland (c. 1300), and South Holland (c. 2700). Why did a predominantly rural economy in Friesland give rise to such an unusual density of retailers that the province came next after North and South Holland in its retail ratio? Part of the answer may reside in the high degree of specialization in the Friesland countryside, where retailing and agriculture were less likely to be combined than in other Dutch provinces, giving rise to full-time rather than by-employed shopkeepers — and hence a very high minimal retail ratio but only an intermediate maximal one. More fundamentally, the entire rural economy in Friesland was highly commercialized, with a pronounced division of labor between specialized agriculture and non-agricultural occupations — precisely the specialization in market-oriented production and consumption most likely to give rise to productivity growth, gains from trade, and a Retail Revolution.

The third question is why North Holland was so distinctive? It had a much higher retail density than all other provinces; it was the only province to show no significant difference in retail ratios between town and country; and it was the only province where the maximal (though not the minimal) retail ratio actually fell rather than rose as settlement size increased.

A first possible explanation is that the dense network of waterways in North Holland might have lowered costs for retailers to transport wares from towns to village shops. But cheap transportation could also stifle rural retailing by making it easier for villagers to go shopping in towns. More fundamentally, other Dutch provinces, including South Holland and Friesland, also had highly developed networks of canals and rivers but significantly lower retail ratios than North Holland, and a larger gap between town and country.

A second possible explanation is that North Holland had high real incomes, creating high demand for retailers’ wares. But although North Holland was undoubtedly one of the richest regions in the Netherlands, there is no evidence suggesting any large differentials in income levels compared to South Holland, which had lower retail ratios and a larger rural–urban gap. Moreover, the distinctive characteristic of the early modern Retail Revolution was that it saw a proliferation not so much of large-scale,
expensive shops focusing on well-off consumers, but of small-scale, low-cost retailers catering to poorer customers.\(^5\) Retailing did not develop only in the presence of a rich customer base, but also in places where poorer strata specialized in market production and needed retailers from whom they could buy the necessities of life at low cost.

A more promising explanation resides in distinctive characteristics of the rural economy. Many North Holland farmers were highly specialized in market-oriented dairy production.\(^5\) This not only made them highly reliant on the market for other consumer goods, but also bound all household members into a labor-intensive work schedule which increased the opportunity costs of traveling to town to shop for necessities.\(^5\) In the northeast of the province, moreover, many rural households combined farming with seafaring: husbands and older sons were often absent, leaving the remaining household members to tend the farm on a labor-intensive work schedule which imposed high opportunity costs on non-local shopping.\(^3\) Furthermore, substantial regions of rural North Holland, especially the Zaanstreek north of Amsterdam, specialized in shipbuilding, ropemaking, sailmaking, and textile production, employing a large labor force of male and female wage-workers whose industrial jobs left them little time to produce goods for home consumption and also earned them the cash wages needed to purchase consumer goods from retailers.\(^6\) This very pronounced specialization and commercialization of the North Holland rural economy combined to increase the demand for retail services even in the smallest rural settlements.

The rural economy in South Holland shared many of these features, but to a lesser degree, since it had more mixed farming involving lower work-intensity and more self-provisioning,\(^5\) fewer households combining seafaring and farming, and fewer industries outside urban centers.\(^5\) South Holland still had a highly commercialized and market-oriented rural economy even by Dutch standards – hence its high retail density relative to most other provinces – but these had not developed to the same extreme degree as in North Holland, accounting for the slightly lower retail density in South Holland and the survival of a certain rural–urban gap.

The most striking differences in retail density between Dutch provinces emerge specifically for the smallest settlements – i.e. for rural communities. This makes it the more probable that the explanation for these differences may lie in characteristics of the rural economy in different provinces. This may seem paradoxical, both because retailing is traditionally seen as an urban phenomenon and because the Netherlands itself was one of the most highly urbanized economies in early modern Europe. Yet the most distinctive feature of the Retail Revolution may have been not so much the intensification of traditional urban retail practices as the expansion of retailing into the countryside, contributing to (as well as benefiting from) increases in specialization and productivity in the rural economy. This pattern would be consistent with the central role played by the rural sector in successful early modern economies, not just in the Netherlands but in other parts of Europe.\(^5\)

### 7. Change over time

The development of the Dutch economy across the early modern period is one of the central issues of pre-modern European economic history. From the mid sixteenth to the late seventeenth century, the Netherlands was the miracle economy of Europe. But then something went wrong. With the highest per capita GDP in Europe, the Dutch economy stagnated in the eighteenth century, resumed growth only hesitantly in the nineteenth, and industrialized very late. This Dutch economic implosion is one of

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51 Bieleman (2008), 76.
54 Van der Woude (1972), 462–7.
55 Bieleman (2008), 80, 230.
56 De Vries and Van der Woude (1997), 270–2.
57 De Vries (1974); De Vries (1975); Slicher van Bath (1977a); Overton (1996); Van Bavel (2010).
the great puzzles of economic history, and its degree and causes are still a matter of lively debate. The time-path of Dutch retail density sheds light on one aspect of this great conundrum, and also has wider implications for theories about the growth-enhancing impact of an early modern revolution in retailing and market consumption.

To this end, we included time as an independent variable in our regressions, measuring it because of data-clustering in terms of four ‘decades’ — the 1670s (1673–1680), the 1740s (1735–49), the 1790s (1795–7), and the 1800s (1803–13). Since time effects might also differ across the country, we also included interaction terms between decade and province. In the regressions, the coefficients on those interaction terms were not statistically significant, providing us with a basis for concluding that there was no evidence that the effect of time on the retail ratio differed from one province to another and thus for not including these terms in Tables 3 and 4. But time-effects did differ between the maximal retail ratio including retail by-employments (in Table 3) and the minimal definition focusing only on full-time retailers (in Table 4).

For the maximal retail ratio, the regression estimated for the largest data subset (Table 3 Regression 1) shows that the retail ratio was significantly lower in the 1670s than in 1803–13, but did not follow a clear upward trend across the eighteenth century. It rose significantly between the 1670s and the 1740s and then stagnated between the 1740s and the 1790s and rose (but not significantly) between then and 1803–13. Between the 1670s and the early nineteenth century, the maximal retail ratio increased significantly, but most of the rise took place between the 1670s and the 1740s. The model estimated for the smaller data subset (Table 3 Regression 2, estimated for comparability with Table 4 Regression 1) shows a similar chronological development, except that the rise between the 1670s and the 1740s is only of borderline statistical significance, strengthening the picture of long-term stagnation between the 1670s and the 1790s. This impression is reinforced by the analysis of the female-headship data subset (Table 3 Regressions 3 and 4), which shows no significant difference between the seventeenth century and any part of the eighteenth century, although the nineteenth century emerges as distinctively higher — not just than the 1760s but also than the 1740s and the 1790s.

For the minimal retail ratio, by contrast, all regressions in Table 4 show the same time-pattern: long-term stagnation between the 1670s and the 1790s, regardless of whether female headship is taken into account. This was followed by a remarkable upturn in the 1803–13 period, when retail density was significantly higher than all three preceding periods.

Two salient findings emerge from this chronological analysis. The first relates to eighteenth-century stagnation. Retailing as a main occupation – the focus of most previous studies – reveals long-term stagnation in retail density between the 1670s and the mid-1790s, followed by a significant upturn in the 1803–13 decade. Retailing encompassing the by-employed – which we argue deserves equal attention – shows an increase between the 1670s and the 1740s, before stagnation sets in. This suggests that the transformation of the Dutch retail sector between c. 1670 and c. 1750, which is emphasized in the historiography, was predominantly a growth in retail by-employment. Case-studies suggest that many of the new practitioners entering retailing in this period were not household heads but wives or other family members. This mobilization of other household members into market activities, together with our evidence that by-employed but not fulltime retailing expanded in this period, would support the idea that the Industrious Revolution may have been continuing, at least in some sectors, even while the Dutch economy at large stagnated.

The second salient finding is that retail density was significantly higher by 1803–13 than in any preceding period. Little change in retail density occurred between then and the mid-nineteenth century, as shown by the nearly identical retail ratios in 1807 and the 1849 census (approximately 28 per 1000). So what explains the significant discontinuity in retail density between the 1790s and 1800s?

The Netherlands did not experience any rapid upsurge in economic growth between 1795–7 and 1803–13 that might have encouraged a retail boom by fueling consumer spending. On the contrary, it experienced a series of negative shocks, an industrial collapse, and a general economic depression which reached a nadir in 1809–11. What Dutch society did experience between our 1790 observations and our 1803–13 observations was institutional liberalization, specifically the forced dissolution of the guilds under French rule. Initially, for nearly a decade after 1798, previously guilded occupations were increasingly opened up to entry: guilds were compelled to grant more equal access to Jews, women, migrants and non-citizens against whom they had previously discriminated, to relax their demarcations against other occupations, and to abandon prohibitions against non-members retailing craft wares. Then, from 1806 onwards, the French Patent Tax system was introduced, with the aim of undermining surviving guild powers and raising government revenues by permitting anyone to practice a secondary- or tertiary-sector occupation upon payment of a low and standardized fee to the state. There is some uncertainty about the impact of guild abolition and the Patent Tax system, since on the one hand historians have found that the institutional change stimulated internal trade and industry, but on the other it might be argued that the Patent Tax introduced a license (albeit an egalitarian and relatively inexpensive one) to many localities that had previously lacked guilds.

A full understanding of the uneven transition from guild regulation to Patent Tax licensing must await more thorough investigation. But in the retail sector it seems clear that this institutional change removed two constraints on growth. First, by gradually abolishing craft guilds, it removed the monopolies master craftsmen traditionally exercised over retailing the products
(and often the raw materials) of their crafts. Now, after centuries of conflict, retailers could expand legitimately into these prohibited, and quantitatively important, craft wares, semi-finished products, and raw materials. Second, by also gradually abolishing guilds of shopkeepers, the liberalization lowered entry barriers in retailing itself. In starting a retail business initial set-up costs were crucial. Guilds demanded high entrance fees up front, required entrants to purchase local citizenship as well, and then also often charged members annual dues (jaargelden) and other periodic fees. The Patent Tax, although it had to be paid annually, applied the same requirements to all entrants without discriminating against particular groups such as Jews and migrants, was lower than guild admission fees for most entrants, and could be paid out of cash flow. Comparison of retail entrance fees in Arnhem and the Hague shows that before 1798 non-citizens had to pay high combined fees for guild membership and town citizenship while citizens paid much lower fees for guild membership alone; after 1806 the differential between non-citizens and citizens was abolished, with immigrants paying much less and locals paying either slightly less (in Arnhem) or slightly more (in the Hague). In the context of the Dutch industrial downturn, the institutional liberalization may have facilitated occupational mobility, enabling households to shift from their collapsing industrial activities into full-time retailing.

The net effect of replacing the guilds by the Patent Tax, according to a number of studies, was to facilitate entry by outsiders and poor individuals to previously guilded occupations and to break down occupational demarcations between retailing and crafts, bringing more wares into the retail sector. In France, from which the Dutch Patent Tax system was imported, contemporaries acknowledged that the shift from guild regulation to a Patent Tax caused an enormous proliferation of retailers. A Metz magistrate, for instance, wrote to the General Council on Trade in Paris in 1813 that because of the modest price of the Patent license anybody could set himself up as a retailer and that the only way to put a stop to this was to ‘re-establish the guilds’. In the context of the Netherlands, Klep describes how the demise of the Arnhem guilds enabled more offspring of poor laborers to enter crafts. Van Lottum shows how the dissolution of the Utrecht guilds drastically lowered entry barriers for migrants, attracting an extraordinary influx of German shopkeepers and bakers. Schrover and Oberpenning describe how German retailers, who had previously been excluded from retail guilds and prohibited from setting up retail shops, and had consequently been compelled to remain itinerant traders permitted only to operate for limited periods in particular locations, now established settled businesses, became prominent in the Dutch retail sector, introduced innovative retail practices, and ultimately set up the first Dutch department stores.

The finding that retail density was significantly higher by 1803–13 than it had been in any earlier period is consistent with what is known about Dutch institutional reform after 1798. This complex of interlinked changes consisted not just in the abolition of guilds in the retail sector itself, but in the emergence of a more liberal general framework of occupational and geographical mobility. Although the Patent Tax did involve a license fee, it created a level playing field among entrants to secondary- and tertiary-sector occupations. This enabled wider social groups to move into the retailing of wares previously reserved to craft masters and to engage in low-cost ambulatory selling whose costs and risks had previously been inflated by restrictions on ‘strangers’ (nonlocals) and ‘non-citizens’ (those without community citizenship rights). Incomplete though the post-1798 institutional reforms were, they saw the first significant and substantial expansion in Dutch retail densities since the end of the seventeenth-century Golden Age.

8. Retailers’ guilds

The striking discontinuity in retail density between the 1790s and 1800s provides suggestive indirect evidence that the old institutional regime in the Netherlands constrained retail expansion. This motivated our search for a more direct measure of these constraints. The result of this quest was the construction of a variable registering the presence or absence of a guild of retailers in a settlement at the date the retail ratio was recorded. However, although this was the best available quantitative measure of pre-1798 institutional constraints on retailing, it raised three serious problems.

The first is caused by the general difficulty of measuring institutional rules quantitatively. The precise ways in which guilds regulated the retail sector and the powers they had to enforce these regulations in practice differed widely among Dutch provinces, with much stronger guild regulation in the east than the west of the country. Guild regulations and enforcement powers also differed significantly among towns within the same province, and even among guilds within the same town. The degree to which guilds restricted entry, regulated expansion by existing practitioners, or sought to control retailing in the surrounding region varied enormously from one guild to the next. A variable registering the mere presence or absence of an organization that called itself a retailers’ guild may obscure more than it reveals about its actual economic impact.

The second problem is that, as discussed in the preceding section, guilds of craftsmen also constrained the expansion of retailing. Craft guilds typically reserved for their members sole rights to retail the output of that branch of manufacturing. Craft guilds also reserved prerogative rights for their members to trade in many of the raw materials, semi-finished products and other inputs into that branch of industry. These prerogative rights could extend well beyond the locality in which the craft guild was
located, depending on the nature of the input supply chain. A variable registering the presence of a shopkeepers’ guild is unable to measure this component of the wider impact of guilds on the retail sector.

The final problem with this variable is that the presence of a retailers’ guild has a two-way relationship with the retail ratio. On the one hand, retailers’ guilds could affect retail density by restricting permission to practice the occupation. But conversely, retail density could also affect guild formation, since establishment of a retailers’ guild was more likely if the number of local shopkeepers passed a threshold level and if their density relative to potential customers created incentives to exclude further competition.

The presence of a shopkeepers’ guild turned out to be negatively related to retail density in all regressions. In most cases, the coefficient was not significantly different from zero, although its inclusion had no effect on the coefficients or standard errors of any other variables so it was retained in the regressions reported in Tables 3 and 4. The negative coefficient on retail guild presence did become statistically significant at the 0.10 level in Table 3 Regression 3, in which female headship was also included in the model. We know guilds disproportionately constrained women’s economic participation, including in retailing, so this may be why, once the relationship between female headship and retail density is taken into account, the negative effect of guilds on retail density becomes marginally significant. But the significance is only borderline, and we do not place great weight on it.

The fact that the coefficient is not significantly different from zero is not significantly different from zero in almost all regressions probably reflects its inadequacy as an empirical measure of guild constraints on retailing, for the reasons discussed above. But it may also indicate that the two-way influences between guild presence and retail density operated in opposing rather than mutually reinforcing directions. The causal link running from retail density to guilds can only have been positive, since guilds would only be formed when retail density became high enough to create incentives for existing retailers to establish protective organizations. The insignificant coefficient on this variable indicates that the positive density-guild link must have been counteracted by the guild-density link, which must therefore have been negative. This would imply that retail guilds were restricting rather encouraging retail density, a finding that would be consistent with the significant upsurge in retail density with the abolition of Dutch guilds after 1798.

9. Conclusion

An expansion in the retail sector is widely regarded as central to the Consumer and Industrious Revolutions between 1650 and 1800 – as the final link in the chain of commercial practices reducing the transaction costs of bringing market goods into ordinary households. The Netherlands is supposed to have pioneered this Retail Revolution, as smaller-scale shopkeepers, stallholders and itinerant traders proliferated alongside established merchants, and the number of retailers expanded relative to the population of potential customers. But we still know very little about the quantitative side of the Retail Revolution — how retail density changed over time, differed geographically, or varied with demographic, economic and institutional factors. This paper addresses these open questions using a richer body of evidence than any previous study. It brings to light a surprisingly differentiated picture of both the early modern Retail Revolution and the Dutch economy as its pioneer.

First, we show that to understand the early modern Retail Revolution it is important to use a measure of retail density that takes into account not just the full-time retailers included in the conventional minimal measure, but also those practicing retailing as a subsidiary occupation. Multiple occupations were common in the early modern economy, often included retailing, and were particularly widespread among females, poor people, and villagers — precisely those groups thought to be most acutely affected by the Consumer and Industrious Revolutions. In the early modern Netherlands, the maximal measure of retail density differed from the conventional minimal measure not only in its higher values, but also in its covariates: the gap between maximal and minimal retail density was important in some provinces but not in others; the two measures followed different time-paths between the 1670s and the 1800s; and the maximal retail ratio contrasted with the minimal ratio in being more strongly associated with female headship and less strongly associated with settlement size. The latter findings in particular suggest that the maximal retail ratio may indeed better register the marginal social groups likely to be affected by the Consumer and Industrious Revolutions, and that future studies should adopt the maximal definition alongside the more conventional minimal measure.

A second finding is that retail density varied strikingly across space, even within such a small and closely integrated economy as the Netherlands. At first sight retail density appears to have followed the west–east gradient of declining commercialization and increasingly restrictive institutions identified in previous studies of Dutch regional differentiation. But our econometric analysis showed definitively that the west–east gradient was less important than provincial affiliation, which significantly affected both retail density itself and the difference in this density between town and country. Our econometric analysis of a large national dataset thus provides quantitative reinforcement to qualitative accounts emphasizing the vital role of provincial autonomy in Dutch economic development.

The high retail densities previously ascribed to the Netherlands as a whole were characteristic only of North Holland, South Holland, and to a lesser extent Friesland. North Holland in particular had retail ratios that were markedly higher than all other provinces and showed no difference between town and country. The remaining provinces showed significantly lower retail densities and wider rural–urban gaps. Our assessment of alternative explanations for this pattern suggests that high retail densities in small communities were related to the degree of specialization and labor-intensity in the rural economy, which varied widely across Dutch provinces. The most striking provincial differences in retail density emerge specifically for smaller

74 As suggested by De Munck et al. (2006), 65–6.
75 Lourens and Lucassen (2000).
settlements, reinforcing the idea that the distinctive feature of the Retail Revolution was not the intensification of traditional city-based shops but the expansion of retailing in small towns and villages.

This wide geographical divergence in the link between retail density and settlement size sharpens our understanding of agglomeration economies in the pre-modern world. While in the least commercialized Dutch provinces, settlement size had a large effect on retail density, in highly commercialized Holland it had almost no effect. Agglomeration economies created by urban centers were evidently more powerful – or less strongly counteracted by countervailing forces – in zones of low commercialization and urbanization. At the high urbanization level characterizing Holland by the later seventeenth century, retail density was high even in small settlements. In this highly commercialized early modern economy, the Retail Revolution succeeded in extending market consumption far into the rural economy in the teeth of urban agglomeration economies.

Time, unlike space, had little quantitative effect on Dutch retailing between the Golden Age and the end of the Ancien Regime. Retail ratios, like other economic indicators, were already quite high in the Dutch Republic by the 1670s, but stayed frozen at much the same level to the end of the eighteenth century. The maximal retail ratio (including by-employed retailers) rose marginally up to the 1740s but then stagnated for fifty years, while the minimal ratio (measuring full-time shopkeepers only) stagnated or even declined straight through from the 1670s to the 1790s. These five generations of stagnation throw into striking relief the substantial and significant rise in retail density between the 1790s and the 1803–13 period. This quantitative discontinuity cannot have been fueled by a rise in consumer spending, since it coincided rather with a severe economic downturn. Rather, it seems likely that the upsurge in retail density was unleashed by the French-mandated abolition of the Dutch guilds which lowered barriers to entry and relaxed occupational demarcations, permitting outsiders to become retailers and retailers to expand into craft wares. The positive and significant upsurge in retailing after guilds were abolished suggests that guilds were one factor contributing to the long stagnation in retail density between the Dutch Golden Age and the end of the Ancien Regime.

Our large Dutch dataset also provides quantitative confirmation of earlier qualitative studies suggesting a positive association between female autonomy and the Retail Revolution. Indeed, it strengthens the previous literature by confirming that the link between women’s economic independence and retail density holds even controlling for settlement size, geographical location, and time-period. Female headship was even more strongly linked to the maximal than the minimal measure of the retail ratio, providing further support for our argument that future studies should adopt the maximal definition. Our results provide definitive confirmation of a significant, systematic, and pervasive association between the early modern Retail Revolution and women’s economic autonomy, even controlling for other factors.

What can we say in conclusion about the Retail Revolution? In so far as the retail ratio can be interpreted as a quantitative benchmark of the Consumer and Industrious Revolutions, this large Dutch dataset casts doubt on any optimistic notion that once these ‘revolutions’ were set in motion, they constituted an unstoppable virtuous circle leading to continuous increases in industriousness, consumption and growth. Even in such an advanced economy as the early modern Netherlands, retail density was not high everywhere. There were large tracts of the country with strikingly low retail ratios, and retail density hardly increased in most places between the Golden Age and the end of the Ancien Regime. Moreover, where the retail ratio was high – in the highly commercialized regions of Holland and Friesland, in larger towns in other provinces, and after the institutional reforms of 1798 – it did not lead ineluctably to self-sustaining economic growth. Even in the pioneering case of the Netherlands, the early modern Retail Revolution – and any Consumer Revolution with which it was associated – prevailed only in some times and places and varied strongly with external constraints.

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