# Urban investment, rural development, and inequality in early modern Holland*

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This paper investigates the relationship between urban investment and rural inequality by assessing the effects of direct burgher investment in land on wealth in nineteen towns in rural Holland. It does so using the *kapitale lening* from 1599/1600, a forced loan that was levied based on household wealth. As the tax concerned households with wealth over 2,000 guilders and only local village elites are captured directly (on average 16.2 percent of village households), lognormal projections are used to approximate the total wealth distributions on the local level. Combining wealth estimates with land registers containing burgher investments, the paper shows that places with higher burgher investment in the sixteenth century had richer local residents on average in the late sixteenth century, while not necessarily showing higher levels of wealth inequality. The suggestion is made that in Holland, burgher investment pre-dating pre-industrial economic growth spurred urban credit provision in the countryside, allowing rural residents to accumulate wealth more effectively.

## Introduction

The growing literature on historical inequality has emphasized the role of urban-rural income and wealth differences in widening regional disparities (Kuznets 1955; van Zanden 1995; Alfani 2021, 29–30; Alfani, Gierok, and Schaff 2022). This is hypothesized to be case, because urban economic growth ensures that cities pull away from the country, urban growth attracts population, leading to an expansion of poor households at the bottom (Morley and Williamson 1977; Alfani 2010). Additionally, urban growth can lead to encroachment of wealthy urban elites on resources in the countryside, leading to higher differences between urban elites and large farmers, on the one hand, and peasants on the other (Soens 2009; van Bavel 2009; Curtis

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2012). The latter argument has been particularly strong for early modern Holland, for which it has been argued that growing urban fortunes led to investment by urban dwellers in the countryside, leading to rural development but in the process transforming the historically strong peasant landownership structure into consolidation of land in the hands of large tenant farmers. This development is argued to have started in the sixteenth century and intensifying in the seventeenth century (van Bavel 2002, 2004, 2009).

The relation between rural development and urban investment in early modern Holland therefore seems to have been one of an equality-efficiency trade-off. Private burgher investment was seen as crucial for rural economic development at the cost of local commoner landownership. Recent scholarship, however, has shown that burgher investment—while high in the sixteenth century (van Bavel 2009)—declined during what is commonly known as the Dutch 'Golden Age' (ca. 1580-1650), only to take up again in the form of a new aristocracy as the economy contracted (Hilkens 2026). This leads us to reconsider the role of wealthy urban dwellers in the rural economy, from both the view of efficiency and inequality. The current paper does so by assessing the effects of direct burgher investment in land on wealth in nineteen towns in rural Holland. It does so using the *kapitale lening* from 1599/1600, a forced loan that was levied based on household wealth. As the tax concerned households with wealth over 2,000 guilders and only local village elites are observed directly (on average 16.2 percent of village households), lognormal projections are used to approximate the total wealth distributions on the local level. Combining wealth estimates with land registers containing burger investments, the paper the paper shows that places with higher burgher investment in the sixteenth century had richer local residents on average in at the turn of the seventeenth century, while not necessarily showing higher levels of wealth inequality.

## Sources and methodology

The empirics of this paper are largely dependent on two measures: (i) burgher share of landownership, and (ii) household wealth, both on the local level. The former come from *morgenboeken*, land registers kept by the water boards for taxation purposes. These registers held all landowners and their landholding in *morgen* since the 1540s until 1848, recurring every leap year in summarized form (ideally) (van Amstel-Horák 2001; Hilkens 2026).[1] Additionally, numbers from van Bavel (2009, pp. 194-6) will be used. For local wealth distributions, a formerly underutilized source by the name of *kapitale lening* will be used. These were forced loans used for financing the continued war effort against Habsburg Spain in 1599/1600 and was levied on every household with wealth assessed over 2,000 guilders. Thus far, it has only been used in reconstructing Leiden's wealth distribution (van Maanen 1978), while registers existed for the entirety of Holland. Registers for 37 rural villages surrounding Leiden were transcribed in the 1990s and are available online (Werkgroep Oud Schrift 1993), but have not been used systematically in research. This paper will be the first do so. Wealth data could be estimated for 35 rural villages, while as of now, urban investment data has been gathered for only nineteen villages. The sample shall thus be expanded in future versions of this paper.

[1] One *morgen* equates to 0.85 hectares.

The selected region (central Holland, or more accurately: Rijnland) is a good testing ground for our hypotheses for several reasons. Firstly, the source material is very rich and consistent, which allows us to test the relation between burgher landownership and local wealth outcomes in the first place. Secondly, if we would find a strong effect of burgher involvement in the countryside in Holland, it would be this region. Rijnland, being the water board authority of the central Holland region, is affectionately referred to as '*waterstaat in stedenland*', or a 'state of water in the land of cities' (van Tielhof and van Dam 2006). The region was highly urbanized, centering around the city of Leiden, but it also bordered on Amsterdam and Haarlem. The Hague, Gouda, and Dordrecht were other important urban centers for the region. Notoriously, economic elites emerged in all these cities across the Middle Ages (van Bavel and van Zanden 2004), who also took important roles in local and regional governments (Prak 1985; Noordam 1994). If we would expect wealthy town dwellers in early modern Holland to invest in the countryside, Rijnland would be an obvious place to look. Yet, here too, burgher ownership shares were diffuse (van Bavel 2009; Hilkens 2026).

Because the *kapitale lening* only recorded households with wealth of 2,000 guilders or higher, the wealth of households below the threshold were imputed using lognormal projections.[2] Creating aggregate inequality figures from incomplete data requires estimating the full spread of wealth-holders. There are two main ways of doing this which both utilize an estimated mean ($\mu$) and standard deviation ($\sigma$) for an assumed lognormal distribution. The first method assumes that the data is left-truncated with a threshold of 2,000 guilders, imputing all households in a village with wealth-holding below the threshold (Potharst 2022; Toussaint et al. 2025). Another method uses these estimated means and standard deviations for assessing the spread of household wealth (Aitchison and Brown 1954; Alfani and García Montero 2022). Since both estimates rely on the assumption of lognormality and use the same parameters to estimate disparities within local distributions, the Gini coefficients resulting from these methods are highly correlated.[3] Since these estimates relate to each other so closely, the preference is given to the interpolation method (Potharst 2022), since this allows for reconstructing several measures beyond the Gini coefficient, such as top shares and, more importantly for this paper, mean and median wealth.

After creating distribution on the local level, an aggregate distribution should be made. This is done in three ways. The first method simply creates a Gini for the total imputed distribution, ignoring local borders. The second method takes the mean of all Gini coefficients at the local level. These means can then be weighted by population, as to more accurately portray disparities at the regional level. The third method requires the creating of a fictitious distribution, calculating quantile shares for each locality and weighting these by population (Alfani 2015; Alfani and Ryckbosch 2016; Alfani and Di Tullio 2019; Alfani, Gierok, and Schaff 2022). The top shares are often modelled in higher detailed at the top one and five percent level, but for simplicity, the current estimation uses only vigintiles (Hilkens 2026, 122–24). Confidence intervals at the 95 percent level are created by bootstrapping 200 times (Alfani,

[2] I thank Auke Rijpma for his help in creating these imputations.

[3] The correlation coefficient is 0.976 and is statistically significant with a $p$-value of 0.000, while adjusted $R^2$ is 0.970.

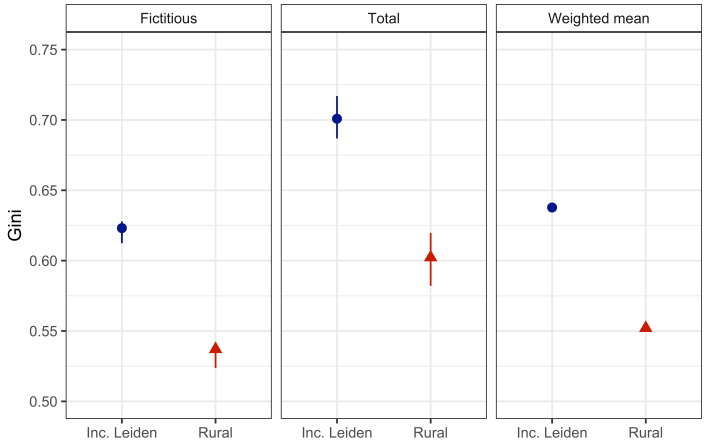


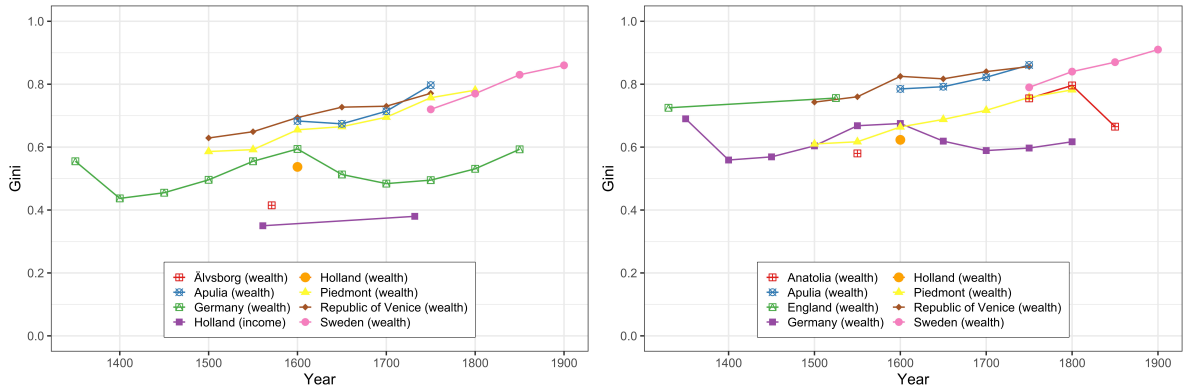

Figure 1: Gini coefficients for central Holland ca. 1600. Sources: *Kapitale lening Rijnland* (Werkgroep Oud Schrift (1993); van Maanen (1978)).

Gierok, and Schaff 2022).

The fictitious method is often used because of issues with currencies and values across localities—it foregoes strenuous (and sometimes impossible) standardization of currencies. But for our source in Holland, where currency was standardized and markets well-integrated (Dijkman 2011), this issue does not exist. Therefore, the total Gini is the most accurate, showing precisely the aggregate disparities in wealth-holding for the selected villages. However, the fictitious distribution allows for better comparison with other regions, as this method is commonly used in the literature. As can be seen from Figure 1, the fictitious distribution is consistently lowest, thus underestimating inequality. The above methods are used for assessing rural wealth inequality in Rijnland in 1600, as well as overall inequality using Leiden as the central urban point to contrast rural and urban inequality with. The results can be seen in Figure 1, preliminarily suggesting that wealth inequality lay between 0.537 and 0.602 in the countryside, but was much higher when adding the city of Leiden (between 0.623 and 0.701). As with income (van Zanden 1995), urban-rural disparities thus indeed contributed to overall wealth inequality. Future versions of this paper may include additional urban estimates to create a more integral picture of overall wealth inequality.

Although the level of inequality differed quite substantially between localities (varying between 0.268 and 0.875), wealth disparities were relatively low in central Holland compared to other regions in the preindustrial period. As Figure 2 shows, both rural and overall wealth inequality lie below most other wealth inequality estimates for industrial Europe. This is particularly interesting, since Holland was at the time probably the wealthiest region per capita (van Zanden and van Leeuwen 2012; Fouquet and Broadberry 2015), corroborating previous findings that sustained economic growth did not create an exceptionally unequal society in Holland (Alfani and Ryckbosch 2016; Alfani 2021; Hilkens 2026). The differences between urban and rural wealth were large, however, which indicates that urban-rural wealth differen-

tials did indeed contribute to overall wealth disparities. The relation between urban and rural wealth will be further examined below.




(a) Rural (excl. cities and propertyless)

(b) Overall (incl. cities and propertyless)

Figure 2: Wealth inequality in international context, rural and overall. Sources: Andersson, Enflo, and Karsvall (2025) (Älvsborg); Alfani and Sardone (2025) (Apulia); Alfani, Gierok, and Schaff (2022) (Germany); van Zanden (1995) (Holland income); Alfani and Di Tullio (2019) (Piedmont and Republic of Venice); Bengtsson et al. (2018) (Sweden); Canbakal and Filiztekin (2025) (Anatolia); Alfani and García Montero (2022) (England); *Kapitale lening Rijnland* (Holland).

## Estimating the effect of burgher investment on wealth levels and inequality

The core of this paper is to estimate the effect of direct burgher investment in rural land on wealth formation at the local level over time. The literature has emphasized the prevalence of burgher landownership, and indeed, this was high in sixteenth-century central Holland (on average, 25 percent of land was held by private urban investors: van Bavel (2009)). But the large variation of burgher landownership at the local level has been underappreciated, and as such, its effects on development and distribution are largely unassessed. This paper attempts to exploit the variation in burgher landownership (van Bavel 2009) to assess the effects of urban investment on economic development and inequality, as proxied by average wealth levels and various distributional measures. The direct descriptive question at hand here is 'did localities with higher levels of burgher investment have richer local elites over the medium-long run'?

The intuition behind the model is as follows. It assumes that burgher investment pre-dating economic growth (which is usually dated ca. 1580: van Zanden and van Leeuwen (2012)) affected the opportunities for rural residents to acquire wealth. Early wealth concentration among absentee owners may have spurred development by increasing investment and productivity. Therefore, we would expect places with higher burgher landownership shares in 1550 to have higher wealth inequality in 1600, but also higher average wealth. This is tested by a simple regression equation:

$$y_{i,t} = \alpha + \beta Z_{i,t-1} + \gamma' X_{i,t} + \epsilon$$

where $y$ reflects various wealth outcomes of locality $i$ at time $t$. The idea of taking multiple wealth measures is to capture wealth inequality robustly through multiple inequality measures (Gini coefficients, share of households holding over 2,000 guilders, top wealth shares, etc.), as well as wealth formation (expressed through average wealth), which may serve as a proxy for economic development, at least as exercised through the wealth-holding population. Time $t$ is standard at the year 1600, as this is the only year for which wealth data is available (see the section above). $Z$ is the share of total land owned by private urban investors in locality $i$ at time $t-1$. For $t-1$, the year 1550 is chosen, as this seems to be the height of urban investment in rural Holland (Hilkens 2026, 142–45). The coefficient $\gamma$ captures the cumulative effect of vector of control variables $X$ for locality $i$ at time $t$, including distance from the nearest city, means of subsistence (including soil type), and population density. These control variables have been omitted in the regression table above, as they are still in the process of being collected. The only control variable available at the moment is rental value of land, and those coefficients are reported in the regression table.

The first preliminary results can be seen in Table 1. It shows that higher shares of burgher landownership in 1550 were positively but insignificantly associated with wealth inequality measures in 1600. Wealth inequality was better explained by differences in the rental value of land.[4] Higher levels of burgher landownership were, however, significantly and positively associated with higher levels of average wealth, even when controlling for rental values. The same was true the average wealth-holding of local elites (defined as the top 5 and top 10 percent wealth owners in the imputed distribution). These findings suggests that early burgher investment did not necessarily lead to higher inequality over time, nor did it impact wealth accumulation negatively at the local level. Early burgher investment may have led to more wealthy households, as well as richer local elites. This need not imply that early burgher ownership did not allow for the wealthy to accumulate—but the results do suggest that knock-on effects of economic growth may have largely off-set potential tendencies of burgher investment to hamper local wealth accumulation.

The above should not be taken to mean that burgher investment did not reflect a form of inequality, nor that inequality dynamics should be neglected—it simply shows that the direct involvement of urban investors in rural land did not affect aggregate distributional outcomes, while it may have led to heightened average wealth levels, as well as wealthier local elites. While these proxies are no perfect reflections of economic development or inequality, the outcomes do suggest that the equality-efficiency trade-off was relatively beneficial and short-lived, if there was one at all. Burgher investment may have strengthened bonds between town and countryside, allowing rural residents access to urban credit, spurring investment and accumulation during the period of early sustained economic growth—but these hypotheses must be tested before they can be ascertained. Additionally, since the importance of wealthy

[4] Land values were gathered from the *Informacie*, a document from 1514 elaborating the state of Holland localities, including estimations of rental values (Fruin 1866; Stapel 2017). The coefficient of the relation between land value and wealth Gini was 0.067 and was statistically significant with a $p$-value of 0.023.

Table 1: Relation of burgher landownership ($t$=1550) with wealth outcomes ($t$=1600).

| | Gini | Top 5% share | Top 10% share | Share 2,000 | Mean wealth | Top 5% avg | Top 10% avg |
|---|---|---|---|---|---|---|---|
| Burgher share of land | 0.312 | 0.410 | 0.423 | 0.423** | 28.24* | 35.167** | 21.340** |
| Land value | 0.047 | 0.024 | 0.025 | -0.000 | 93.36 | 26.610 | 14.340 |
| Controls | N | N | N | N | N | N | N |
| Observations | 19 | 19 | 19 | 20 | 19 | 19 | 19 |
| Adjusted $R^2$ | 0.055 | 0.029 | 0.026 | 0.185 | 0.145 | 0.306 | 0.3214 |

*Note:* * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Sources: see main text.

elites in the Holland economy cannot be denied, the above may lead us to question whether other social actors like ecclesiastical institutions or nobility (although they were not fully disentangled from urban elites either: Hilkens (2026), Ch.2) played a more significant role in wealth inequality dynamics.

## Conclusion

This paper has preliminarily investigated the effects of direct urban investment in land on rural wealth outcomes at the local level in early modern central Holland. It has demonstrated that wealth inequality on the regional level was affected by urban-rural wealth differences, while wealth inequality was not very high relative to other European regions at the time, especially given its level of economic development. Secondly, it has (very crudely) assessed that early burgher investment in land did not have a significant effect on rural wealth distributions at the local level at a later stage. It did, however, have a positive and significant effect on average household wealth at the local level . The reasons behind these relations are still under investigation, but the suggestion is made that in Holland, burgher investment pre-dating pre-industrial economic growth spurred urban credit provision in the countryside, allowing rural residents to accumulate wealth more effectively.

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