

The Decline of a Fully Matured Economy: Rural and Urban Real Wages in the Republic of Venice, 1390–1790

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Tancredi Buscemi¹ , Leonardo Ridolfi^{2,*}

¹*Department of Law, Economics and Communication, LUMSA University, Palermo, Italy*

²*Department of Economics and Statistics, University of Siena, Siena, Italy*

*Corresponding author: Department of Economics and Statistics, University of Siena, Siena, Italy. Email: leonardo.ridolfi@unisi.it.

We investigate the relationship between rural and urban pre-industrial labor markets building a new series of real wages of building and agricultural workers for Venice and the *Terraferma* from 1390 to 1790. We measure the size of the rural–urban real wage gap and discuss its determinants, including rural–urban price, consumption, and fertility differences. We also relate the gap to building cycles and the asymmetric effects of plagues. Our findings have implications not only for measuring the size of the rural–urban wage gap, but also for the construction of real wage series more broadly.

1. Introduction

The economic history of the Republic of Venice over the course of a millennium has commonly been framed in terms of ascent and decline, stretching from its medieval and early modern “Golden Age” to its collapse in 1797. These categories have extended well beyond the *Serenissima*, shaping influential interpretations of the rise and fall of north–central Italy and of the country as a whole (Cipolla 1952; Sella 1997).

A crucial aspect of these narratives is that the economic development of center–north Italy has been largely analyzed through its major cities and their socioeconomic responses to competition from Atlantic powers, demographic shocks, and political instability (D’Amico 2004). The prevailing argument held that prosperous urban societies based on trade and manufacturing were unable to restructure their economies, leading to a drastic collapse that dragged down the entire region from the seventeenth century onwards. This interpretation, originally advanced by Cipolla (1952), has been challenged by recent studies that posit a spatially differentiated relative decline: urban economies contracted, whereas rural areas expanded through proto-industrial activities and the renewed involvement of elites in landholding (Lanaro 2006; Sella 1979). Complicating the issue further, other studies suggest that cities such as Bologna, Milan, Florence, and Venice were able to adapt to this crisis period (D’Amico 2000; Malanima 1982; Poni 1990). In his seminal work, for instance, Richard T. Rapp coined the term “gentle transition” to describe Venice’s transition from world leader to regional power (Rapp 1976).

Recently, the real wage literature has prompted a reappraisal, through new evidence, of the timing of the Italian decline looking at building laborers' real wages (Allen 2001; Buscemi 2025; Malanima 2013; Rota and Weisdorf 2020; Rota and Weisdorf 2021) but one of the main states, the Republic of Venice, is still missing in this story.¹

This paper fills this gap by analyzing the evolution of real wages in the Republic of Venice from a rural–urban perspective. We construct the first series of real wages for skilled and unskilled building and agricultural workers in Venice and its mainland (*Terraferma*) from 1390 to 1790, focusing on rural cities and villages in today's provinces of Venice and Padua.

The Republic of Venice provides a unique testing ground for rural–urban wage dynamics due to several factors. It was a complex and heterogeneous state that included overseas domains (*Stato da Mar*) and provinces in the *Terraferma*. The latter was composed of fifteen districts extending from eastern Lombardy to Friuli. With about 1.59 million inhabitants in 1548 and about 2.35 in 1790 (Beltrami 1961), the *Terraferma* was one of the most densely populated and prosperous areas in Europe (Fusaro 2015; Zannini 1999). Despite the high level of urbanization for its time, the weight of the countryside was still preponderant (Alfani and Di Tullio 2019; Zannini 1999).

The balance between Venice and its mainland evolved dramatically. Initially a maritime power, by the mid-fourteenth century, Venice turned inland to secure food and protect against rival cities, marking the beginning of a dual policy, characterized by attention to both maritime possessions and inland expansion (Lane 1991) (figure 1). This process shifted the barycenter of the Republic from the overseas domains to the provinces of the *Terraferma* (Demo 2013) and lasted about two centuries, from 1338, when Treviso was annexed, to about 1516.

Venice and the *Terraferma* experienced distinct transformations driven by demography, such as plague impacts and recoveries (Alfani 2013b), changing consumption patterns with the unequal spread of maize (Fornasin 1999; Messedaglia 1927), production shifts from urban to rural manufacturing (Demo 2013; Lane 1991; Pezzolo 2010; Rapp 1976; Sella 1997), and differences in building activity cycles. All these factors had the potential to affect urban and rural labor markets and wages differently.

The main goal of this paper is to understand how these factors shaped the course of urban and rural wages and, more broadly, discuss the implications for the estimation of real wages.

This focus poses some methodological challenges. The standard approach to building welfare ratios proposed by Allen (2001) was tailored to workers' living standards of leading European cities, and thus, it does not necessarily fit the rural context given the large rural–urban differences in demographic and consumption patterns. Based on this, in an attempt to measure rural–urban differences in real wages as accurately as possible, we introduce some refinements to build welfare ratios. While urban and rural nominal wages are usually deflated using the same (urban) consumer price index, we measure both wages and prices separately for urban and rural areas. This allows us to relax the assumption of perfectly integrated commodity markets. Differences in household composition between Venice and the *Terraferma* are also considered to accommodate changes in fertility behavior over time. Moreover, changes in housing costs and consumption patterns between urban and rural areas, particularly the spread of maize, are incorporated into dynamic consumption baskets. In what follows, we show that these refinements can affect the estimates of the rural–urban wage gap and average real wages (given the importance of rural to average earnings).

¹ For a reappraisal of the timing of Italy's decline based on GDP per capita, see the recent work by Chilosi and Ciccarelli (2025) and Federico et al. (2025).

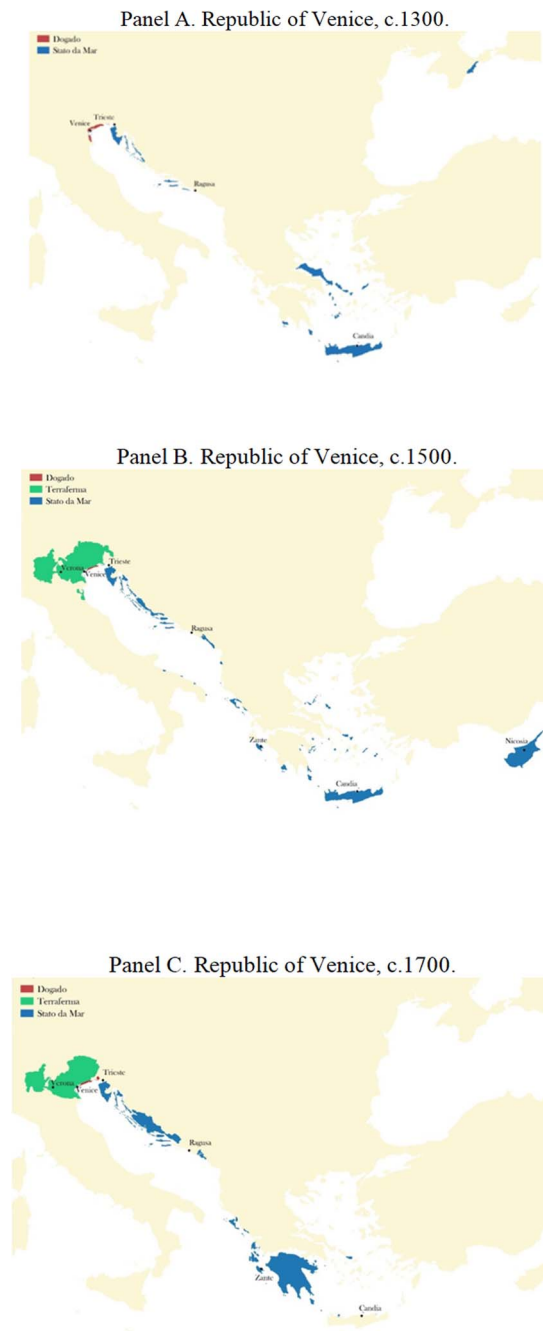


Figure 1. Expansion of the Republic of Venice, fourteenth to the early eighteenth century. Panel A. Republic of Venice, c. 1300. Panel B. Republic of Venice, c. 1500. Panel C. Republic of Venice, c. 1700. Source: Authors' elaboration from (EurAtlas-Nüssli 2010) data (<https://www.euratlas.com/>).

Venetian real wages followed broadly similar cycles as the mainland up to the mid-sixteenth century, but after the 1575–1577 epidemic, a significant real wage gap between Venice and the *Terraferma* opened up. This consolidated in the ensuing decades, peaked around 1650, and declined thereafter. We show that this pattern was largely due to demographic factors, particularly the asymmetric effects of the two early modern waves of plague on rural and urban labor markets.

The rest of the paper is structured as follows. First, we review the literature on real wages in Italy. Next, we present the wage and price data and the real wage series. We continue by exploring the determinants of the rural and urban real wages and then conclude.

2. Literature review

Since the seminal contributions by Allen (2001) and Malanima (2002), real wages have been used to quantify workers' living standards in a global comparative perspective with a large body of quantitative research in the last two decades. In the context of pre-unification Italy, series for casual building workers' real wages are now available for Florence up to the sixteenth century, Milan since 1600 (Allen 2001; Malanima 2002), Rome from 1540 to 1810 (Rota and Weisdorf 2021), and Sicily from 1540 to 1850 (Buscemi 2025). Series for agricultural workers' real wages covers just few places, including Florence (Malanima 2013), Montaldeo, and Vercelli in Piedmont (based on data from Doria 1968 and Pugliese 1908), Naples (Malanima 2002, 2013; Romano 1965), and Sicily (Buscemi 2025). Following Humphries and Weisdorf (2019), recent studies have also shed light on the evolution of stable rural workers' wages in Tuscany since the sixteenth century (Rota and Weisdorf 2021) and the Southern mainland in the nineteenth century (Fiore Melacrinis 2024).

What emerges is that between the fourteenth and the eighteenth century there were two high real wage urban economies in the center and the south (Rome and Sicily), while the rest of the country was a low-wage economy with declining real earnings. These heterogeneous urban real wage cycles are reflected in multiple Little Divergences in real wages between the principal southern European urban centers and their counterparts in the North Sea region (Allen 2001; López Losa and Piquero Zarauz 2021; Ridolfi 2019; Rota and Weisdorf 2021).

These series have helped probe key developments in the evolution of real wages in pre-industrial Italy, but they have been made from an urban perspective, so that no systematic attempts to measure and explain changes in real wages in pre-unification Italy on a rural–urban dimension exist. Precise knowledge of rural and urban dynamics, however, is crucial to understanding pre-industrial workers' living standards. Furthermore, while some attention has been paid to the study of workers' remunerations in the city of Venice (Pullan 1964; Zannini 1999), there have been no comparable attempts to relate them to prices or in other terms to investigate the long-run evolution of real wages in Venice and the other areas of the Republic insofar.²

² One exception is Mueller (1997, p.656), who provides six benchmark years in the Middle Ages, using just wheat prices to deflate nominal wages.

3. The estimation of real wages

3.1. Nominal wages

We construct a novel dataset of nominal daily wages of casual workers in the building and agricultural sectors. Construction workers' wages are relatively homogeneous over time and space, allowing us to push our series back to the Middle Ages, while day laborers in agriculture accounted for a large share of the workforce in pre-industrial societies. Data are retrieved from a large body of secondary sources and new archival evidence, including balance sheets of religious institutions and their account books of countryside possessions (Appendix A). None of the wage sources covers the entire period under scrutiny. Thus, one of the goals of this analysis is to collate this sparse published evidence and harmonize and combine it with archival data to form a new continuous series for Venice spanning from the fourteenth century to the end of the Republic.³ We begin by considering the classic sources underlying Allen and Malanima's series. These include the seminal work by Susan Connell (1988) on building workers' wages in Venice from 1370 to 1540. The second classic source is Brian Pullan's (1964) series of wages paid to workers employed at the Scuola Grande di S. Rocco, a large owner of house property in Venice, over the years 1550–1630. Lastly, for the more recent period, new evidence has been assembled by Andrea Zannini (1999) based on three religious bodies: the convent of Carmelitani Scalzi (years 1671–1672) and the churches of Padri Filippini (years 1710–1714) and S. Maria del Rosario (years 1737–1741 and 1767–1771). While these sources provide a solid starting point, the information is still too heterogeneous and fragmented to provide a long-term picture of the evolution of building wages in Venice. In particular, existing series present several time gaps and crucially do not provide information on skilled construction workers' wages after the key turning point of 1630 either. For these reasons, we collect new archival data from a sample of sixteen Venetian building sites (figure 2 Panel A). Some construction sites, such as those of San Zaccaria and the Scuola Grande di S. Rocco, were selected to compare and extend the series already compiled by Connell and Pullan. Others, like the building sites of Palazzo Ducale and Ponte di Rialto, were included because of their importance in the building activity of the time.

The second sampling area is the Venetian *Terraferma* (figure 2 Panel B). To the best of our knowledge, there are no systematic series of wages available for this area, so this study represents the first attempt to shed some light on pre-industrial wages in the Venetian mainland. The information is drawn from a sample of villages (Campolongo, Monselice, Pianiga, Piove di Sacco, and Portogruaro) located in the current-day provinces of Padua and Venice. To be sure, these localities are not representative of the *Terraferma* as a whole. Yet, the inclusion of these minor urban agglomerates, most of them below the conventional threshold of 5,000 inhabitants that distinguish cities from villages, allows us to identify some of the main differences in wages between the *Dominante* and the *Terraferma*. We also draw some evidence from other cities, namely Bergamo, Udine, and Verona, to check the plausibility of our results (Appendix B).

The dataset encompasses 5,702 observations of male casual workers' wages corresponding to 15,542 workdays (Table 1). We classify occupations in terms of skill and convert wages

³ The time span covered is determined by archival constraints. Specifically, we were unable to locate consistent archival sources reporting wages and prices for the periods before the 1390s and after the 1780s.

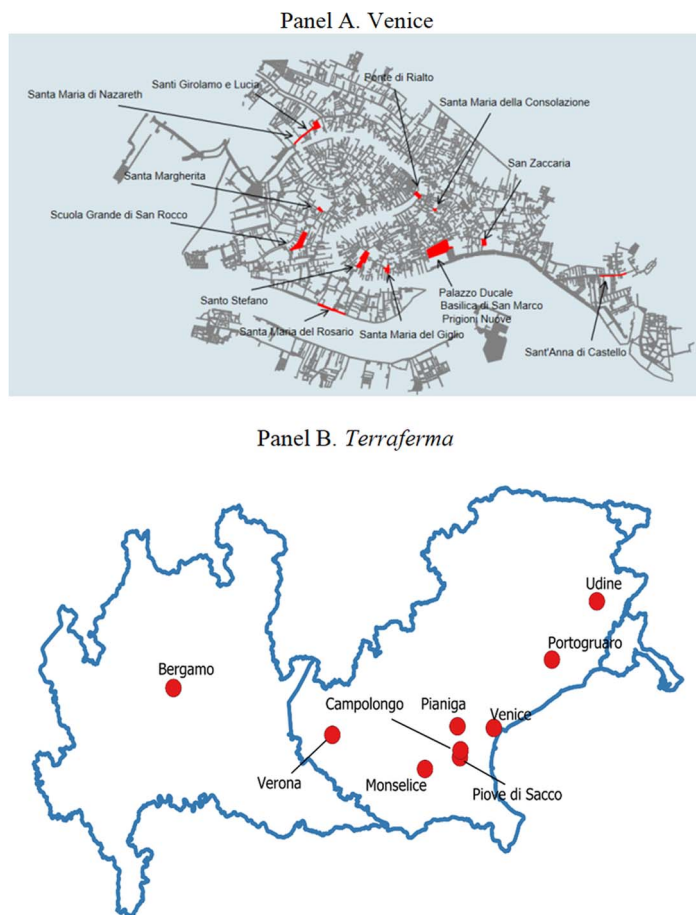


Figure 2. Sampling areas. Panel A. Venice. Panel B. *Terraferma*. Sources: Authors' own elaborations.

in grams of silver to set Venetian nominal wages in international comparative perspective.⁴ The database comprises 1,906 observations of unskilled building workers, 201 of agricultural workers, and 3,595 of skilled building workers. Among the formers, there is a neat prevalence of unskilled building laborers (*manovali*) and just a handful of observations of apprentices (*garzoni*), while in agriculture the most common tasks are reapers and grape harvesters. Master masons, stonecutters, and joiners together account for about 89 percent of skilled workers (Table 2). As shown in Table 3, most wage data refer to the summer season, accounting for approximately 30 percent of observations across occupations.

We estimate five series of nominal day wages for casual workers using a regression framework à la Clark (2007). For each of our five reference categories (building craftsmen, building and agricultural laborers in the *Terraferma*, building craftsmen and building laborers

⁴ The silver content of the liras are taken from Lane and Mueller (1985, p.623–24), Mueller (1997) and Federico, Schulze, and Volckart (2021).

Table 1. *Sample size.*

Daily wage	Obs	Mean	SD	Min	Max
Building craftsmen	3,595	9.318	3.101	1.896	35.91
Building laborers	1,906	5.671	1.72	1.691	21.46
Agricultural laborers	201	4.051	1.615	0.982	9.182

Sources: see online [Appendix A](#). Wages are expressed in grams of silver per day.

Table 2. *Wages by occupation.*

Building craftsmen	Freq.	Percent
Carpenter	30	0.83
Carver	14	0.39
Master carpenter	69	1.92
Master mason	1,405	39.08
Master stonemason	70	1.95
Joiner	431	11.99
Master cooper	6	0.17
Master joiner	2	0.06
Mason	184	5.12
Stonemason	27	0.75
Sawyer	2	0.06
Stonecutter	1,355	37.69
Total	3,595	100.00
Building laborers	Freq.	Percent
Apprentice	7	0.37
Building laborer	1,899	99.63
Total	1,906	100.00
Agricultural laborers	Freq.	Percent
Agricultural laborer	76	37.81
Binder	11	5.47
Cutter	2	1.00
Digger	4	1.99
Grape harvester	32	15.92
Laborer	14	6.97
Reaper	41	20.40
Ripper	12	5.97
Sower	9	4.48
Total	201	100.00

in Venice), we fit a pooled ordinary least squares (OLS) regression of the following form where w_{it} is the nominal wage in location i and time t expressed in grams of silver per day:

$$\ln(w_{it}) = (\alpha + \beta_t \text{Year}_t) + (\gamma_k \text{Occupation}_k) + (\theta_i \text{Place}_i + \rho_j \text{Season}_j) + (\delta_l \text{Joint}) + \varepsilon_{it} \quad (1)$$

Table 3. *Wages by season.*

Season	Building craftsmen		Building laborers		Agricultural laborers	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
NA	583	16.22	410	21.51	62	30.85
Autumn	526	14.63	282	14.80	42	20.90
Spring	728	20.25	380	19.94	25	12.44
Summer	1,236	34.38	606	31.79	55	27.36
Winter	522	14.52	228	11.96	17	8.46
Total	3,595	100.00	1,906	100.00	201	100.00

Our wage equation has four components (each of them in round brackets). The first corresponds to the unconditional mean, or the raw average wage, where α is the constant and Year_t is a set of year dummies for each year in which we observe a wage payment. The second term (in round brackets) can be regarded as the job component of remunerations. The variable *Occupation* is a set of dummies for the k -th occupation or task whose detailed description is reported in Table 2. This term captures all job-related characteristics that can affect the wages of workers with the same level of skill. The third component considers context-specific wage determinants, such as place and season. Place dummies capture wage differences across worksites, reflecting institutional variations. For instance, the Scuola Grande di San Rocco, one of the wealthiest institutions in Venice, likely paid above-average wages. Seasonal dummies account for wage fluctuations due to seasonal labor demand, such as higher summer wages driven by harvest premiums and lower winter rates due to slower construction activities. Historical sources suggest winter wages were about a sixth lower than summer wages after 1570 (Pullan 1964, p.425). Most wage observations in our dataset (33 percent) are from summer months when construction was at its peak (Table 3).

The last component in brackets captures differences in type of employment. Pre-industrial workers were hired in several ways. Some institutions used direct hiring. In other instances, subcontracting was the preferred solution as it allowed for the reduction of administrative, recruitment, and supervision costs. Lastly, there were cases in which wages were paid to the master, but the sum also included the helper's wage. In these cases, the average wage rate was between 50 and 100 percent higher than normal.⁵ In most of the cases, our data refer to direct payments made to the worker expressed in the local unit of account (*lira veneziana* or its subunits). Joint payments are accounted for by including a dummy labeled "Joint" when we know, or we presume, the payment was made to a master with a helper. The presence of subcontracting instead requires a case-by-case analysis. In the rural context, the organization of the building activity usually was more primitive and we do not find any evidence of subcontracting. In Venice, construction activity was regulated more by guilds, workers were hierarchically organized, and subcontracting was already common since the Renaissance (Connell 1988; Goy 2006). These workers did not usually appear in the account books as they depended directly on the master.

Another key issue is the remuneration structure, which included cash, in-kind payments, or a combination. In-kind payments were more prevalent in rural areas, where food formed a

⁵ See also Mueller (1997).

significant part of total compensation. Between the sixteenth and eighteenth centuries, nourished agricultural laborers earned 50–60 percent less than their unnourished counterparts. To address this issue, we separate wages paid in cash from those paid in kind. The former are usually identified with the expression “without expenditure (*senza spesa*)” while the latter with the term “with expenditure (*con la spesa*).” We take cash wages as they are, while we add the monetary value of in-kind supplements to mixed wages. At times there is no clear information on the provision of food. In such cases we infer (and impute) the presence of unrecorded in-kind payments by comparing nourished and unnourished worker rates using the closest observation available (in time and space) keeping all else equal (occupation, task, season, and year). The provision of unrecorded in-kind supplements is signaled by the unusual low level of wages compared to normal rates. The share of food in many cases was set by custom and usually accounted for about a half of total pay in the countryside and about 25 percent in the cities (Ridolfi 2023, 2026). This procedure has the advantage of adjusting the share of food based on the information contained in the account books themselves.

3.2. Prices

To deflate wages we build new consumer price indices for Venice and the *Terraferma*, spanning across four centuries. The overwhelming majority of prices for the *Terraferma* come from fresh archival evidence and only for wheat, we use a combination of both archival and printed primary material. Prices are based on two sources: account books of religious institutions and price lists reporting the average price of some goods (cereals mostly) as they appeared in the main city markets. A detailed review of the sources is offered in Appendix A, while some further details can be found in Appendix C.

We estimate the individual component price series of the consumer price indices for Venice and the *Terraferma* by regressing the price of the generic item i (except bread) at time t on a set of year dummies—one for each year in which the price is available—and a set of indicators for sales location. Importantly, we also account for quality differences to create a homogeneous price series. This is important for such items as wine, meat, and textiles for which quality differences were reflected in major price differences.

$$\ln(p_{ijt}) = \alpha + \beta \text{Year}_t + \gamma \text{Place}_{it} + \delta \text{Quality}_{jt} + \varepsilon_{ijt} \quad (2)$$

Bread prices were treated differently. The system governing bread prices was quite complex. In general, the price of retailed bread remained stable, while the weight of a loaf varied according to the price of wheat (Demo 2013; Fornasin 1999; Mueller 1997). Unfortunately, pre-industrial accounting records rarely report bread prices. An important exception is Udine, for which some of the best European price series are available, spanning from 1564 to 1788 on a yearly—and sometimes monthly—basis (Mantica 1888). Using these data, we estimate the relationship between bread prices (per kilogram) and wheat prices (per liter) (Appendix C2, Table C1, specification in column (1)). The estimated coefficients are then used to extrapolate bread prices in Venice and the *Terraferma* based on their corresponding local wheat price series. Model 1 serves as our baseline specification. Given that prices in Udine may be influenced by specific local conditions, Appendix C2 tests this approach against alternative model specifications and shows that these alternatives are consistent. In particular, we combine bread prices from Veneto with those from other north-central Italian cities (Milan, Montaldeo in Piedmont, and Rome) to construct a panel of 835 observations spanning

Table 4. *Consumption basket.*

Consumer price index	Unit	Calories per unit	Baseline
Bread	Kg	2,450	225.2
Legumes	Lt	1,125	20
Meat	Kg	2,500	5
Olive oil	Lt	9,000	5
Wine	Lt	850	90
Textile	M	—	5
Candles	Kg	—	2.6
Lamp oil	Lt	—	2.6
Firewood	MBTU	—	2
Rent	% of total cost	—	5
Total calories	Per person/day	1,940	—

four regions over the period 1564–1860. We match bread prices with wheat prices from the same source, year, and location, and use this dataset to estimate two additional regression models. The first ([Appendix C2](#), [Table C1](#), specification in column (2)) regresses bread prices on wheat prices while controlling for regional fixed effects. The second ([Appendix C2](#), [Table C1](#), specification in column (3)) further includes time dummies representing 50-year periods.

The price series are used to estimate consumer price indices necessary to deflate nominal wages. We begin by considering a standard Laspeyres consumer price index whose composition and calorie consumption reflects a basic consumption diet, where white bread and cereals take the lion's shares while the consumption of meat is limited ([Table 4](#)). The bundle also includes some expenditure on food and lodging and, following [Allen \(2001\)](#), provides about 1,940 calories per person per day. Importantly, this basket does not distinguish between urban and rural consumption. This means that all price differences between Venice and the *Terraferma* are given by differences in price levels. This is our baseline specification because it clearly indicates the purchasing power of urban and rural wages and it is the standard in the real wage literature.⁶ [Figure 3](#) shows the resulting yearly price series for a household of three components ([Allen 2001](#)). What emerges is that, on average, the price level in Venice was 13 percent higher than in *Terraferma*. Both series are highly correlated with a pairwise correlation coefficient of 0.94 and prominent peaks in inflation occurring in the late sixteenth and the late eighteenth centuries.

Building price series for the pre-industrial period poses several challenges, including incomplete information, uncertainties in the construction of the basket, and difficulties in the conversion of local measures into metric units. In [Appendix C](#), we show that our price index is robust to the interpolation ([Tables C4](#) and [C5](#)), changes in the caloric content of the overall basket, as well as adjustments to the caloric value of wine ([Mocarelli, Ongaro, and Prosperi 2024](#)) (Section C7).

⁶ Prices are also converted in grams of silver using the same sources as in footnote 4. Local units of measurement for different goods are converted into the metric system following [Martini \(1883\)](#).

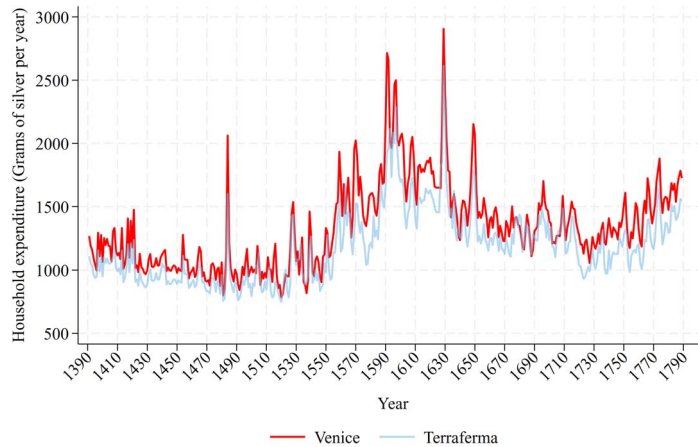


Figure 3. The evolution of prices in Venice and the *Terraferma*, 1390–1790.

3.3. Welfare ratios

Annual labor earnings and prices are used to construct welfare ratios using classic [Allen's \(2001\)](#) approach.

We convert daily wages into annual labor earnings multiplying daily wages by 250 days divided by the cost of maintaining a household of four components (corresponding to three consumption units) at subsistence level ([Table 4](#)). In [Appendix B3 \(Working days\)](#) we show that, for Venice, the assumption of 250 working days is quite plausible for the early modern period, but probably overestimates working time in the Middle Ages. Since the focus of this paper is on differences between Venice and the *Terraferma*, in the absence of precise evidence for the *Terraferma*, we keep the assumption of 250 days and assume no differences in working time between the two.

[Figure 4](#) shows the real wages of skilled and unskilled workers in Venice and the *Terraferma* from 1390 to c. 1790. The series are presented as 25-year moving averages.⁷ This approach is intended to capture broad patterns while preserving the readability of the figure. It should be stressed, however, that this emphasis on long-term trends may come at the expense of precision in year-to-year changes. In terms of level of real wages, agricultural laborers stand at the bottom followed by building laborers in the *Terraferma* (23 percent higher on average) and their counterparts in Venice (about 60 percent higher on average). Unsurprisingly, Venetian building craftsmen enjoyed the highest living standards with a premium of about 20 percent over their counterparts in the *Terraferma* and an average skill premium of 64 percent over building laborers in Venice. Venetian real wages were higher than in the *Terraferma* and followed broadly similar cycles as the mainland up to the mid-sixteenth century. However, by the end of the sixteenth century, the fall in real wages was more severe in the *Terraferma* than in Venice and a divergence between the two areas emerged. In the ensuing decades the gap consolidated, peaked around 1650, and declined thereafter.⁸

⁷ For the sake of consistency, we apply the same smoothing procedure in all figures presenting historical series. As shown in [Appendix D, figure D1](#), different smoothing procedures yield similar results.

⁸ The Bai–Perron structural breaks tests show discontinuities in the series of real wages in Venice and the *Terraferma* around the big demographic crises of 1575–1577 and 1629–1630 ([Appendix D, fig. D2](#)).

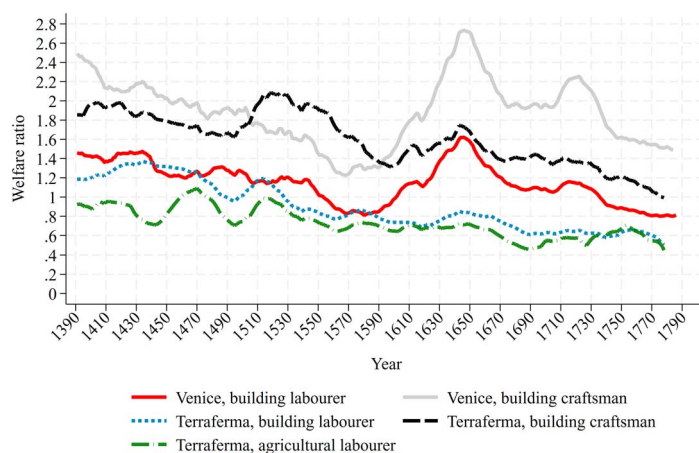


Figure 4. Welfare ratios in Venice and the *Terraferma*, 1390s–1790s: building and agricultural laborers. *Notes:* series are smoothed with a 25-year-centered moving averages. All series are estimated using the baseline basket of Table 4.

Which factors can account for the different course of real wages in Venice and the *Terraferma*?

In the following section, we aim to provide an answer to this question.

4. The rural–urban real wage gap and its explanations

In this section, we explore three potential explanations for the differences in real wages in Venice and the *Terraferma*: measurement error in the estimation of the consumer price index; proximate determinants (prices and wages); demand and supply side factors.⁹

4.1. Measurement error

In the previous section we have estimated real wages in Venice and the *Terraferma* using the basket of Table 4. This has the advantage of indicating the purchasing power of urban and rural wages clearly, but does not distinguish between urban and rural consumption so that all differences in the cost of living are due to prices only. Here we consider four alternative weighting schemes that aim to capture some important differences between Venice and the *Terraferma*: the spread of maize, household size composition, the cost of housing, and the combination of all these factors.

The introduction of maize was one of the main innovations of the time. Various sources allow us to reconstruct its diffusion in the Republic in some detail: in the mid-sixteenth century, the consumption of the new cereal is attested in the provinces of Rovigo and Padua

⁹ To be sure, there were other differences between Venice and the *Terraferma*. For instance, over the period considered, the Republic moved from a fiscal system centered on Venice to a structure that increasingly involved the Italian mainland. Despite that, this study does concentrate on pre-tax labor income as there is not enough information about the fiscal burden borne by urban and rural taxpayers (Alfani and Di Tullio 2019). Similarly, we limit our study to the introduction of maize, but other consumption differences existed as well (Berengo 1956).

Table 5. *Diffusion of maize in Venice and the Terraferma.*

Year	% of maize in cereal consumption: Venice	% of maize in cereal consumption: <i>Terraferma</i>
1390–1580	0	0
1631	—	17
1635	—	33
1644	—	42
1650	—	50
1764	17	70
1764–1790	17	70

Sources: see text. We fill the gaps between benchmarks by linear interpolation.

(Cazzola 1991, p.112; Fassina 1982 p.36 and ss.). Maize then spread rapidly in the provinces of Treviso and Verona during the famine of the 1590s (Alfani 2013a) and reached the province of Belluno in the seventeenth century (Mocarelli 2020, pp. 26–27). At its peak, maize consumption was higher in the eastern (Friuli, Treviso, Polesine, Padua) than in the Western (Bresciana, Bergamasca) provinces of the Republic (Georgelin 1978, p.222 ss). Importantly, the diffusion process unfolded on a rural–urban gradient. Maize led to a radical change in peasants’ diet but did not significantly alter the consumption habits of Venetian dwellers.

To proxy the spread of maize in rural and urban diets, we build new consumption baskets (“maize scenario”) for Venice and the *Terraferma*, keeping all else as in the baseline specification. To make this, we rely on three assumptions. First, following the pioneering work by Messedaglia (1927) and more recent evidence, we assume that maize was introduced around 1580 in Venice and the *Terraferma* (area of Padua).¹⁰ Second, we proxy the diffusion process of maize, namely, the time between the first appearance and maximum consumption, using indications on the share of maize in cereal consumption (*provvisione delle biade*) in Friuli at various points in time (Fornasin 1999, p.16). While these sources are specific to Friuli, the process of diffusion of maize and the level of consumption in the province of Friuli are likely similar to those of the province of Padua from which most of our rural wage sample draws. Based on this, the share of maize was 17 percent in 1631, 33 percent in 1635, 42 percent in 1644, and 50 percent in 1650 (Table 5). Lastly, following Georgelin (1978, p.1040), we find that when maize reached the apex its proportion in cereal consumption was around 70 percent in the *Terraferma* (Province of Padua), but only 17 percent in Venice.¹¹

As a second step, we adjust the rural and urban consumption bundles for changes in household size keeping all else as in the baseline specification (“household size scenario”). We get precise information on the number of households across the *districts* (“*sestieri*”) of Venice at several benchmark years (from 1581 to 1790) from Beltrami (1954, p.188) which uses census

¹⁰ Consistent sowing of maize is attested in the province of Padua by the 1580s (Fassina 1982, pp. 36–37). Maize consumption and production are also known from the 1585 expense book of the *Mensa Patriarcale* where the farmer Antonio Bragato claimed to have sown and hoed maize in Piove di Sacco. Maize was also present close to Rovigo by 1588. For a review of the evidence see also Mocarelli (2020 p. 26).

¹¹ This is also consistent with a document written by the “*Magistrato alle biave*” Iseppo Longo to calculate cereal consumption in Venice and the *Terraferma* in the second half of the seventeenth century. The requirements of the *Dominante* were valued at seven-eighth in wheat and only one-eighth in maize while the proportions were one-third wheat and two-thirds maize for the *Terraferma* (Fornasin 1999, p.10).

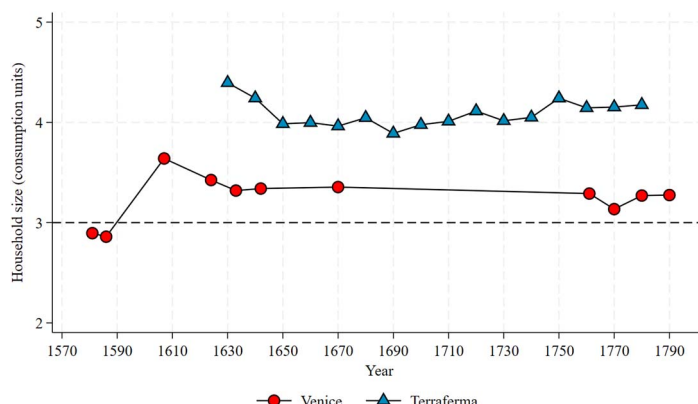


Figure 5. Household size in Venice and the *Terraferma*. Sources: see text.

data and birth registers. We adjust census data to account for the uneven coverage of the districts across different census years (Appendix C4, Table C2).

The analysis shows that the average Venetian family passed from 3.79 members in 1581, equivalent to 2.90 consumption units to 4.55 in 1790, equivalent to 3.28 consumption units (figure 5).¹² There are no analogous data for the *Terraferma*. Thus, we estimate them from net natality, namely, new births per thousand corrected for infant mortality (age range 0–1) from Beltrami (1954, p.158 and p.165), which were likely correlated to the trend in average household size (Beltrami 1954, p.186). To convert changes in net natality in the average children per couple, we use the coefficient of 4.29 indicating the number of children per marriage in some parishes of the *Terraferma* in 1760 (Beltrami 1954, p.186).

As shown in figure 5, the assumption of three consumption units (four members) would underestimate family size in Venice as households averaged above this threshold. Furthermore, this assumption would underrate the size of rural families, which was usually above four consumption units. Lastly, it should be stressed that changes in family size were not uncommon. For instance, one can observe a declining pattern in Venice and the mainland after the 1629–1630 epidemics and a gradual recovery in the *Terraferma* thereafter.

Lastly, we tentatively adjust the consumption bundles for differences in the cost of housing between Venice and the countryside. The cost of renting a house depended on many factors including location, square footage of the property, type of employment as well as general market and non-market conditions (Barbot 2007). Census data for 1661, 1712, and 1740 show that the average cost of housing varied quite a lot across the six districts (“*sestieri*”) of Venice (Appendix C4). The *sestiere* of Dorsoduro (where most heads of families employed in the construction sector resided) was the cheapest one with an average of about 20 ducati per year in the three census years, while San Marco stands at the top with a housing cost of more than twice as much. On average, the nominal cost of housing in Venice declined by about 6–7 percent between 1661 and 1740 passing from 35 to 32 ducati per year. Importantly, these values correspond to a constant share of about 30 percent of the total cost of living of an individual in Venice. Yet, this (average) value likely overestimates the true cost of housing

¹² Following Allen (2001), we assume that children consume half as much as adults. In Appendix C5 Tab. C3, we also show that this result is similar when average household size is obtained as an average of district household sizes weighted by the shares of workers in building by district.

of a Venetian construction worker who was at the bottom of the social ladder. From the fourteenth century, Venice's building workers experienced a progressive deterioration of their real earnings both in absolute and relative terms. In fact they gained at least 20 percent less than workers employed in manufacturing and services and the gap with the top incomes widened over time (Appendix B4, Table B1).

In terms of rents, four main groups can be distinguished in Venice. Rents below 12 ducati per year were paid by really poor people; between 13 and 30 ducati by slightly better off individuals, between 31 and 50 by wealthy families, and above 50 ducati by the richer strata of the society. For instance, skilled workers of the Arsenal were paid between 10 and 20 ducati per year (Beltrami 1954, p.220ss). Our findings imply that 10 ducati per year correspond to a share of 10 percent of the total cost of living of an individual in Venice, which is twice as much as the value assumed by Allen (2001). Thus, for the large majority of workers, housing should have accounted for about 10–15 percent of the family budget at least between the mid-seventeenth century and the mid-eighteenth century. The information is more scattered for the *Terraferma*. Georgelin (1968, p.509) reports the cost of housing in 1757 in Anguillara, a small village in the province of Padua. This corresponds to 15 lire venete per year (2.3 ducati).¹³ Compared to the assumption of 5 percent this would amount to about 3 percent of the cost of the basket and should be considered a lower bound.¹⁴ All in all, in the absence of more precise information, we assume that housing was 5 percent in the *Terraferma* and 10 percent in Venice.

Lastly, we build a “historical scenario” that incorporates all these differences. Thus, we obtain five scenarios (baseline, maize, household size, rent, and historical) that we employ to estimate welfare ratios as well as the Venice-over-*Terraferma* welfare-ratio measure (with Venice as the numerator and the *Terraferma* as the denominator).

Figure 6 plots the series. Several results stand out. First, the level of the real wage gap changes a lot depending on the model specification (Panel A). From 1550 to 1780 the average gap in welfare ratios is 54 percent in the baseline scenario, 24 percent in the maize scenario, 90 percent in the household size scenario, and 47 percent in the rent scenario. Importantly, in the historical scenario, the gap is about 47 percent.

This implies that just 13 percent of the average gap can be explained by measurement error. Nevertheless, different model specifications predict very different trends in the ratio of building laborers' welfare ratios between the 1550s and the 1780s: the baseline and the rent scenarios suggest an increase of about 20 percent, the household size of about 25, while the maize scenario points to a much more pessimistic (for Venice) reading with a decline of about 16 percent, close to the 14 percent fall of the historical approach.

These results underline important differences in the evolution of real wages in Venice and the *Terraferma*. The differences between the baseline and the historical scenario tend to be low for Venice (Panel B). Both the baseline and the historical scenario indicate a decrease in welfare ratios between the 1550s and the 1780s (by 18 and 13 percent, respectively). This reflects the fact that the standard approach (Allen 2001) is designed to capture the consumption patterns of leading European cities, of which Venice was undoubtedly a part. In contrast, greater differences emerge between the baseline and the historical scenarios when

¹³ This should be considered as a lower bound as, according to Georgelin, the accommodation was not in good condition. In the text the contract is dated 1767 while in the footnote this is dated March 11, 1757 (Georgelin 1968, p.509). We keep the latter date.

¹⁴ This result is obtained using the cost of the basket in 1757 (baseline specification), 454 lire veneziane (about 70 ducati).

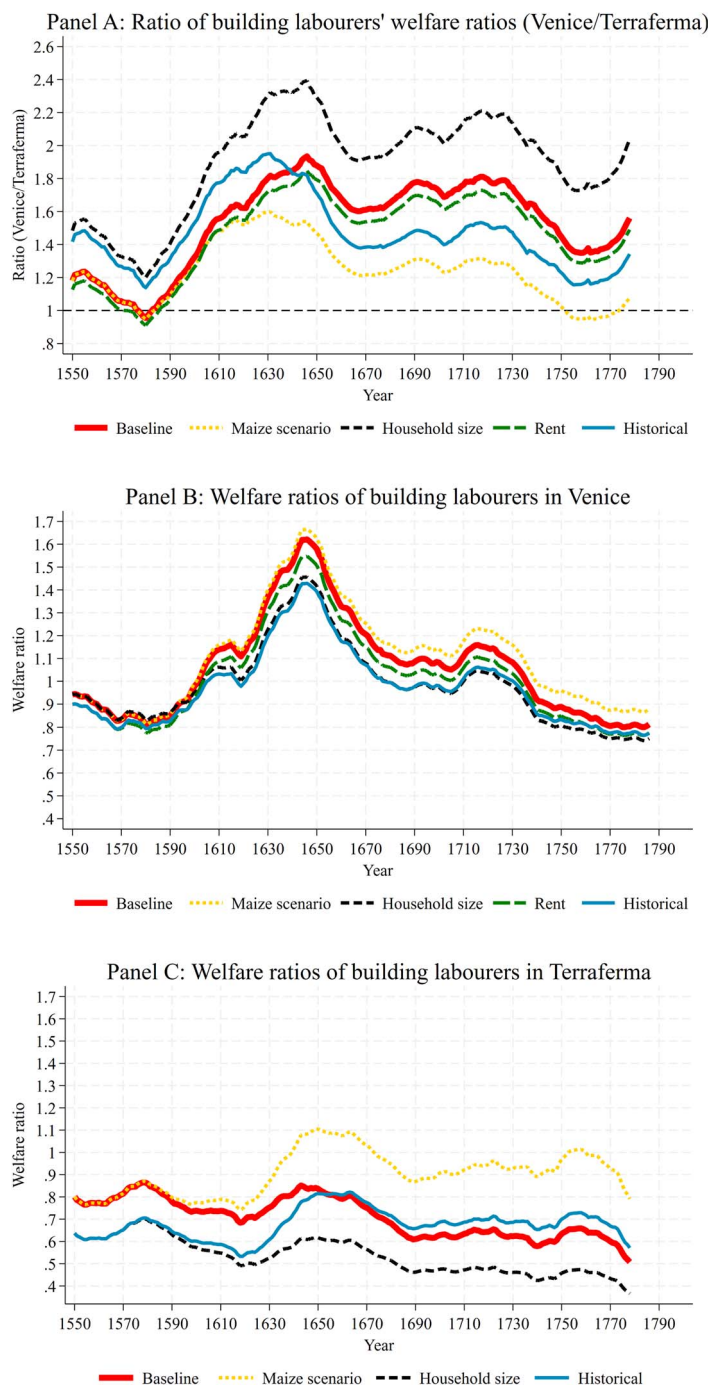


Figure 6. Building laborers' welfare ratios: gap Venice/Terraferma (Panel A), welfare ratios in Venice (Panel B), and welfare ratios in the *Terraferma* (Panel C). Notes: series are 25-year-centered moving averages.

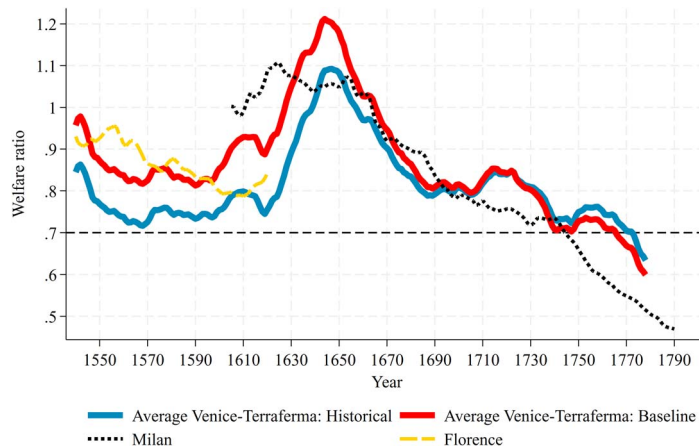


Figure 7. Building laborers' welfare ratio: Veneto, Florence, and Milan. *Sources:* Veneto, see the text. Florence and Milan, Allen (2001). *Notes:* Series are 25-year-centered moving averages.

welfare ratios in the *Terraferma* are considered (Panel C). The baseline approach predicts a 40 percent fall in the welfare ratios in the *Terraferma*, while the historical scenario suggests a real wage growth of about 2 percent over the years 1550–1780. Much of this difference lies in the introduction of a dynamic basket accounting for the spread of maize in the *Terraferma*.

Importantly, this result has implications for current estimates of average real wages. To the extent that rural and urban real wages did not follow the same trajectories, estimates based solely on urban markets overlook a significant part of the picture and should be used with caution when inferring the evolution of regional or national real wages. Figure 7 illustrates this point by plotting the average real wages of building laborers in Veneto (calculated as a weighted average of the real wage in Venice and the *Terraferma*) under both the baseline and historical scenarios, alongside the series for center-north Italy (Florence and Milan).¹⁵ The historical approach paints a picture of mild decline (c. 9 percent) with fluctuations from 1550 to the 1780s, which contrasts with the decline (c. 25 percent) of the baseline approach and with the sharp drop of real wages in Florence and Milan. This suggests that methodological refinements and a broader view than just the urban context can provide a more optimistic reading of the evolution of real wages in center-north Italy.

Lastly, figure 8 provides a comprehensive overview of the evolution of real wages in Venice and the *Terraferma* by sector and skill level, based on the historical scenario. Once again, the dominant pattern is one of stability, in contrast to the more pessimistic account presented by the conventional approach, as shown in the companion figure (figure 4). This reinforces the

¹⁵ Allen's wage series have been the subject of criticism. Mocarelli (2019), for instance, has raised concerns about the inclusion of contractor margins, while Malanima (2013) has pointed to discrepancies in the data for the late fourteenth and fifteenth centuries, although broad agreement emerges from 1600 onwards. One could therefore argue that the observed real wage gap between Venice and Milan may, in part, stem from these biases. However, later evidence from MAIC (n.d.) confirms that the gap remained substantial. In 1862, nominal wages for building laborers in the province of Venice were 67 percent higher than in Milan (with differences of 22.5 and 78 percent for first- and second-class masons, respectively). At the same time, the cost of living was higher in Milan than in Venice (Federico, Nuvolari, and Vasta 2019), resulting in a real wage gap of 84 percent in favor of Venice.

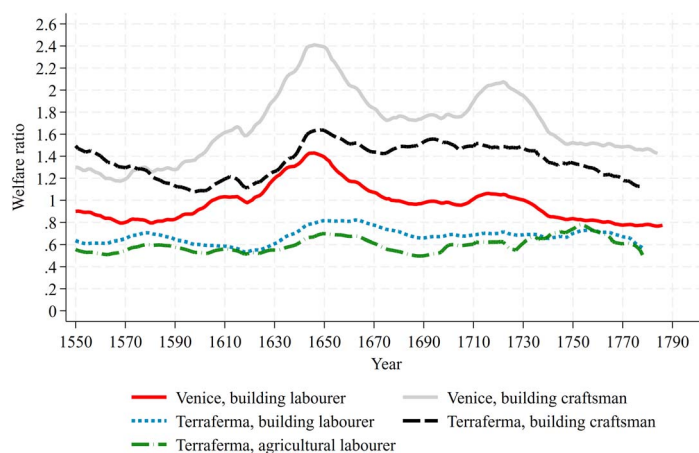


Figure 8. Welfare ratios in the Republic of Venice, historical scenario. *Notes:* Series are 25-year-centered moving averages.

notion that special care must be taken when constructing consumption baskets for different regions—particularly when such estimates are used in studies of the Little Divergence.

4.2. Explaining the gap: The role of prices, wages, and population

We further investigate the evolution of real wages in Venice and the *Terraferma* by comparing them to nominal wages, prices, and population changes. We estimate new yearly population series for Venice and the *Terraferma* (Padua's province) building upon Beltrami (1954) and complement this analysis with some indication of rural–urban differences in church-building activity in order to capture differences in the construction cycle (see Appendix E for details).

We focus on the period after 1550 as explanatory variables are not available before. It should be noticed, however, that the gap in real wages produced after that date so that this restricted view should not alter the substance of our analysis. We split our data into various sub-periods to simplify the exposition and provide some insights on the short- and medium-term effects of the two great early modern waves of plague on the gap. All variables are expressed in index 1550–1574 (henceforth our reference period) equal to 0 and the results are shown in figure 9.

We begin with unskilled workers' real wages in Venice (Panel A) and the *Terraferma* (Panel B).

The period considered is characterized by two major mortality shocks, the 1575–1577 and the 1629–1631 plagues. These two plague waves differed substantially (Alfani 2013b). The 1575–1577 plague was an asymmetric shock that hit Venice heavily, where mortality peaked at 265 per thousand (Alfani and Percoco 2019), but it almost spared the countryside. Compared to the reference period, Venice's population decreased by about 20 percent, while the decline in the *Terraferma* was just 10 percent. The asymmetric nature of this shock has important implications for the size of the real wage gap.

In Venice (figure 9, Panel A), nominal wages of unskilled workers slightly decreased over the crises and recovered in the next decade, while real wages slightly increased due to mild deflation. Two forces contained the rise of real wages. First, immigration from the countryside remedied the dearth of workers in the lower grades of the building industry very rapidly

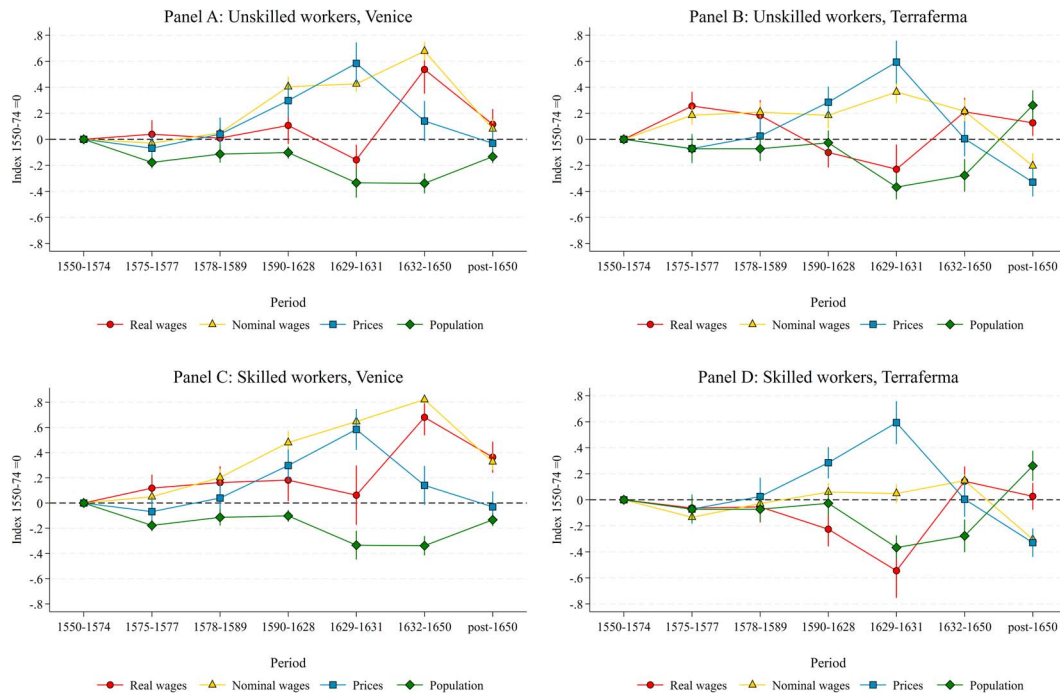


Figure 9. The dynamics of population, prices and building workers' real wages in Venice and the *Terraferma*. *Notes:* The scatter points are the coefficients of a simple regression model where the log of real wage (historical scenario) is regressed on an interaction term (Period X *Terraferma*). Period is a dummy for each of the above mentioned periods while *Terraferma* takes value 1 when the real wage is from this area and 0 otherwise. Real wages are calculated using Allen's welfare ratio approach.

(Beltrami 1954, Pullan 1964, Rapp 1976). Second, the decline in building activity substantially reduced the demand for labor. For instance, our index of building activity passed from 0.51 to 0.29 (Appendix E2, Table E1). The situation was rather different in the *Terraferma* (figure 9, Panel B), where nominal wages increased by about 20 percent and real wages by c. 30 percent. The slow decline of population, coupled with substantial migration toward Venice, likely reinforced the decrease in labor supply. This factor and the deflationary trend explain why real wages soared despite the decline of building activity.¹⁶ The real wage gap between Venice and the *Terraferma* diminished touching a minimum of about 10 percent in this phase.

The 1629–1631 epidemic was another crucial turning point, but the response of rural and urban labor markets was different than before. Unlike the 1575–1577 wave of plague, this epidemic was pervasive and hit both Venice and the *Terraferma* reducing population by about 30–40 percent compared to the initial levels. In the short run, real wages decreased, and the main explanation for this was a combination of falling demand for labor and sharp price increases.

¹⁶ This result should be interpreted with care given the limited number of work projects in this sub-period.

Venice's building activity probably collapsed during the worst phases of the epidemic (Alfani and Percoco 2019). As shown in Appendix E2, our index of new building projects sinks. At the same time, there were some attempts, particularly in the public sector, to restore some forms of activity. These included the work for the construction of the Basilica di Santa Maria della Salute in 1631, led by the famous architect Baldassarre Longhena as a votive offering to the Madonna for the end of the plague, as well as the restoration works on the church of San Lorenzo and San Marco. Some continuity in the building process and various attempts to limit expenses emerge from the increase in subcontracting of various institutions.¹⁷ Overall, public building work compensated, but only partly, the loss in private construction (Perini 2010). This is confirmed by the rigidity of nominal wages despite the sharp rise in prices, a clear indication of the difficulties of the economy at the time (Alfani and Percoco 2019).

In the ensuing decades, real wages increased in both areas, but crucially, for very different reasons and at very different paces. In Venice, population stagnated in the two decades following the epidemic. At the same time, the symmetric nature of the demographic shock rendered the effects of migration less important, compared to the first wave of plague when the influx of migrants from the countryside contributed to filling the voids of the city (Alfani and Percoco 2019; Pullan 1964). After the worst period of mortality, building activity also started to recover and this trend anticipated the demographic recovery, reinforcing the situation of excess labor demand. This would explain the sharp increase in nominal and real wages in a phase of deflation. Overall, in Venice, in the two decades after the crisis, building laborers' real wages peaked c. 50 percent above the reference period (Panel A).

Importantly, after the 1629–1631 epidemic, real wages in the *Terraferma* experienced a modest growth that brought them to their pre-crisis levels (Panel B). Unlike Venice, deflation was the key driver of real wage growth in the *Terraferma* as the decline in nominal wages would have pushed rural real wages down. There were two factors that put downward pressure on real wages in the *Terraferma*. First, population started to recover faster than in Venice, implying a relative increase in the labor supply. At the same time, building activity in the *Terraferma* was probably weaker than in Venice explaining why nominal wages in the *Terraferma* soon returned back to their pre-crisis levels. One possible explanation is that public building was less important here than in Venice (Preto 1979).

The period after 1650 reveals other important differences in the dynamics of rural–urban unskilled wages. First, what emerges is the sharp difference in population growth. Venice's population returned to its pre 1629–31 plague levels but never reached the peaks of the mid-sixteenth century. Mortality, particularly that of children, was high and increasing, while natality was slightly decreasing, leading to negative net birth rates and an aging population (Beltrami 1954, p.192; Rapp 1976). In contrast, the *Terraferma* experienced a true population boom in the second half of the eighteenth century. Much of this growth was the result of a demographic regime characterized by high and growing natality (compared to Venice), low mortality, and a relatively large share of young males (Beltrami 1961; Zannini and Fornasin 1999). On average, the population was c. 20 percent higher than in the initial period.

The second important difference relates to the building cycles. In Venice, building activity languished as shown by the reduction in the number of private and religious building projects (Georgelin 1978), while in the *Terraferma* a sharp increase in construction took place and

¹⁷ For instance, the account books of the Scuola Grande di San Rocco become consolidated by the 1630s (A.S.V. Scuola Grande di S. Rocco, Donà, busta 613).

several churches were built anew or restored following the eighteenth century population boom.¹⁸ The church of Cartura—a small village of the *Terraferma*—stands as a case in point as it was rebuilt and enlarged in 1696 because space was not enough to contain all the faithful after the population growth of the previous decades. This was a very common situation during the eighteenth century in the *Terraferma* that can be read in the stories of several rural churches (Appendix E2).

These differences in the demographic and building cycles have effects on the evolution of real wages. In Venice, after the peaks of the 1629–1631 epidemic, real wages declined sharply, regaining pre-crisis levels, while in the *Terraferma*, despite the population boom, real wages decreased at a lower rate as the rightward shift of the labor supply curve was at least partly compensated by the growing demand for work sustained by an intense building activity as well as by the introduction of maize.

Previous results refer to unskilled workers only. Do these dynamics differ in terms of skill?

Panels C and D provide an answer. The first epidemic had virtually no effect on skilled workers' real wages in the *Terraferma*, but a positive one in Venice. This contrasts with the experience of unskilled workers for which, as we have seen, there was stagnation in Venice, but an increase in the *Terraferma*. Migration is a likely candidate to account for these differences as the voids left by the plague among the ranks of the skilled workforce could be filled much less quickly by immigration from the countryside, as could the vacancies opened for the less skilled (Alfani and Percoco 2019; Pullan 1964). Proof of this is the fact that the Venetian government issued various measures to facilitate the arrival of artisans from the territories of the mainland, including provisions to guarantee an easier path to entry into the trade guilds or the amnesty for those who had been banned in the past due to civil or criminal convictions.¹⁹

Skilled workers' real wages trended downward in the *Terraferma* since the 1590 famine, when growing inflation and sticky wages curbed real wages down. By the end of the sixteenth century, real wages in the *Terraferma* were 20 percent lower than the reference period. The 1629–1631 epidemic accentuated the fall of skilled workers' real wages and this decline was greater than for unskilled workers. In Venice, during the 1629–1631 epidemic, skilled workers' real wages declined less than unskilled ones, and in the ensuing decades, their growth outpaced that of unskilled workers' real wages. Overall, there is no doubt that Venetian building craftsmen emerged better from the crises than unskilled laborers, while in the *Terraferma*, it was rather the opposite.

The astounding rigidity of nominal wages in the *Terraferma*, the almost continuous increase of Venice's nominal wages (about 80 percent compared to the reference period) reflecting the shortage of skilled labor and the difficulties to replace it, as well as the above-mentioned skill level differences in the migratory flows, were driving forces of these asymmetries.

4.3. Population and real wages

Previous results have highlighted the key role played by demography in shaping the course of real wages. Here we test more closely the real wage–population nexus in a rural–urban perspective. We begin by considering the (unconditional) long-run relationship between

¹⁸ As shown in Appendix E2, Table E1, from 1650 to the end of the eighteenth century our indices of new building projects display different patterns. The index increases from 0.62 to 1.55 in the *Terraferma*, but decreases from 1.24 to 1.10 in Venice.

¹⁹ ASV, Senato Terra, reg. 51, c. 193r

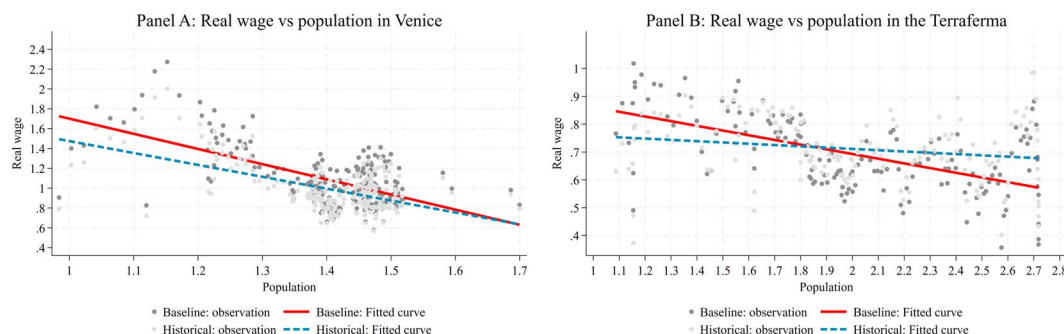


Figure 10. Building laborers' real wages and population, 1550–1790. *Sources:* see text. *Notes:* Real wages are calculated using Allen's welfare ratio approach.

population and real wages.²⁰ Figure 10 plots the results for Venice (Panel A) and the *Terraferma* (Panel B). It shows that, in Venice, a strong negative relationship links the two variables, consistent with the predictions of the Malthusian model and with previous studies focusing on pre-industrial center-north Italy (Fochesato 2018). This result is robust to the model specification as shown by the small increase in the slope of the fitted curve in the baseline scenario. The situation changes for the *Terraferma*, where the baseline model predicts a negatively sloped Malthusian trade-off, while the historical scenario implies a much flatter relationship between the two variables.

We further investigate the issue using a simple regression framework that allows us to control for some confounding factors. Specifically, we fit an autoregressive distributed lag model (ARDL) where the log of real wages is regressed on its lag and the log of population. We test the relationship over the full sample and across two sub-periods, pre- and post-1670 using the historical and the baseline models.²¹

Table 6 shows the regression coefficients. In the case of Venice, the coefficient is negative in the whole period (-0.374), but the size of the effect tends to be lower over time. After 1670 the coefficient on population is not statistically significant. Importantly, there are no differences between the baseline and historical scenarios. In the case of the *Terraferma*, what emerges is a very different picture as figure 10 already hinted at. According to the historical approach, the relationship is negative but never statistically significant, and the size of the effect is very low. In contrast, the baseline points to a strong and statistically significant Malthusian negative trade-off in the whole period and prior to 1670. While a full analysis of the drivers of these dynamics is beyond the scope of this paper, these preliminary results suggest that a better measuring of rural wages can affect our understanding of the Malthusian dynamics of which the real wage–population relationship is one of the key tenets.

5. Conclusions

Current explanations of the Little Divergence in real wages are largely informed by large samples of leading European cities. The evidence on rural wages, in contrast, is surprisingly

²⁰ We use building laborers' real wages. Building craftsmen's real wages provide similar results.

²¹ We test with alternative thresholds, but we find similar results. See Appendix E3, Table E2 for unit root and stationary tests of real wages and population.

Table 6. *Real wages and population.*

	Venice, historical			Venice, baseline		
	Full sample	Pre-1670	Post-1670	Full sample	Pre-1670	Post-1670
Population $t-1$ (log form)	-0.374*** (0.072)	-0.428** (0.065)	-0.050 (0.065)	-0.393*** (0.076)	-0.463*** (0.077)	-0.097 (0.063)
Constant	4.430*** (0.856)	5.080** (0.769)	0.580 (0.787)	4.664*** (0.897)	5.506*** (0.914)	1.141 (0.760)
Real wage $t-1$ (log form)	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.81	0.81	0.73	0.84	0.84	0.78
N	211	94	117	212	95	117
	<i>Terraferma</i> , historical			<i>Terraferma</i> , baseline		
	Full sample	Pre-1670	Post-1670	Full sample	Pre-1670	Post-1670
Population $t-1$ (log form)	-0.059 (0.034)	-0.008 (0.072)	-0.040 (0.077)	-0.151** (0.054)	-0.071** (0.022)	-0.082 (0.095)
Constant	0.628 (0.410)	0.031 (0.837)	0.376 (0.914)	1.727** (0.633)	0.766* (0.252)	0.876 (1.121)
Real wage $t-1$ (log form)	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.57	0.65	0.48	0.69	0.43	0.53
N	150	48	102	151	49	102

Clustered standard errors in parentheses, * $P < .10$, ** $P < .05$, *** $P < .010$.

scant, and rarely used to measure and explain changes in real wages on a rural–urban perspective. Using urban wages to proxy average wages, however, implies a certain degree of integration between urban and rural labor markets, an assumption that does not necessarily hold true.

This paper draws from the experience of the Republic of Venice to investigate the relationship between rural and urban pre-industrial labor markets.

In an attempt to measure rural–urban differences in real wages as accurate as possible, we introduce some refinements in the construction of welfare ratios. These include new estimates of rural and urban prices, dynamic baskets accounting for the spread of maize, changes in household composition, and some preliminary indications about differences in housing costs. To be sure, other aspects have been neglected due to lack of compelling evidence. Despite that, we find that the incorporation of demographic and consumption differences can improve our understanding of pre-industrial workers' living standards. Our methodology produces similar estimates as the classic approach for Venice, but it tells a very different story when rural real wages are considered. The standard approach implies about 40 percent decrease of building laborers' real wages in the *Terraferma* from 1550 to 1800, while our new series indicates a mild increase over the same period.

In the second part of the manuscript, we investigate more closely the evolution of rural and urban real wages.

We find that Venetian real wages followed broadly similar cycles as the mainland up to the mid-sixteenth century, but diverged after the demographic crises of 1575–1577 and 1629–1631. Both epidemics constituted significant breaks in the integration of rural and urban labor markets and the evolution of real wages was largely affected by the different pervasiveness of the two waves of plague and the ability of rural and urban labor markets to recover from them.

The first crisis, an asymmetric shock that hit Venice but spared the countryside, favored the *Terraferma* and led to the reduction of the rural–urban real wage gap. The second epidemic, instead, was a symmetric shock that fueled urban real wage growth but depressed rural wages widening the scope of the gap with a peak around 1650. After that date, the real wage gap diminished mostly as a result of the sharp differences in demographic growth, consumption attitudes, and construction cycles.

These findings call for a deeper investigation of the evolution of rural real wages and have implications not just for the assessment of the size of the rural–urban wage gaps, but also for the evolution of average real wages (given the importance of rural to average earnings) and our understanding of the real wage–population nexus, one of the key tenets of the Malthusian model.

Conflicts of interest

None declared.

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Supplementary material

[Supplementary material](#) is available at *European Review of Economic History* online.

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Data availability

The data and methods underlying this article are available in the article and in the journal online repository.

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