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JEL Classification: J3, J4, J8, I3, N33

Keywords: Stable Employment, economic growth, industrial revolution, Great Divergence, living standards, prices, wages, Wage premia

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Italy and the Industrial Revolution:
Evidence from Stable Employment in Rural Areas

Abstract

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1. Introduction

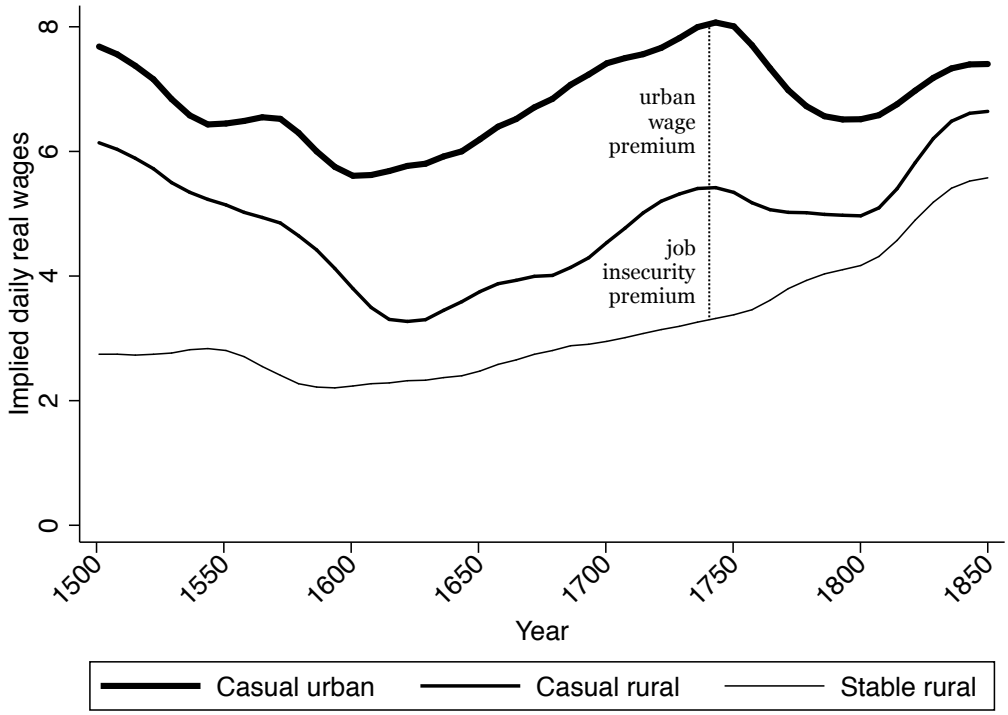
Italian economic historian Carlo Cipolla more than half a century ago advocated that early-modern Italy suffered a prolonged economic downturn (Cipolla 1952). Some four decades later, Cipolla's view was challenged by his native colleague Domenico Sella, who contended that Italy's downturn was mainly an *urban* experience, with the countryside witnessing both rising agricultural productivity and growing proto-industry at the time (Sella 1997). Sella's view implies that Italy's early-modern decline was a *relative* one in which the urban economy worsened, both compared to its rural counterpart and to the emerging economies in Northwest Europe. Sella did not present long-run wage indices to support his views. But if his *relative-decline* thesis is correct, then it is no longer clear if rural Italy performed different than its rural counterparts further to the north. This potentially implicates how to think about the causes of the Industrial Revolution.

A key explanation for why the Industrial Revolution was English is that expensive factory labour prompted early industrialists to substitute labour with machines (Allen 2009). A comparable, yet competing thesis is that English workers were more *expensive* because they were more *productive*, and that it was their higher productivity that implicitly helped facilitate England's industrial innovations (Kelly et al 2014). Supporting evidence comes in part from daily wages paid to casual labour and shows that eighteenth-century London workers were considerably more costly to hire than workers in other leading European cities (Allen 2001). The underlying assumption is that casual wages paid to urban workers serve as a proxy for the cost of hiring early factory workers. But early industrialists located their factories in rural rather than urban areas (e.g. Berg 1986). They also employed their labour on stable rather than casual terms (e.g. Pollard 1963). The facts that early factories emerged in the countryside and that their workers where hired on a stable basis highlights two potential problems with the use of urban casual wages as an empirical foundation for the grand narratives about industrialisation – problems that link back to Cipolla and Sella's debate above.

Indeed, there are two important reasons why casual urban wages might overstate the costs of hiring early factory workers. The first problem with casual urban wages is that urban workers received a wage premium to cover their urban living expenses – a premium that rural workers, and hence early factory labour, did not obtain. The second problem is that casual workers usually received a wage premium for job insecurity that stable workers, and thus early factory employees, also did not achieve. Because both compensating wage premia do not necessarily vary in proportion to how productive workers were, the premia need to be eliminated for a better assessment of how productive and thus expensive historical factory workers *actually* were, and whether or not the cost and productivity of rural English labour was indeed higher than elsewhere, as the grand narratives about what prompted the Industrial Revolution suggest.

The size of the two compensating wage premia can be approximated by comparing the daily wages of casual workers in urban locations with those of stable workers in rural areas. Figure 1 below indicates how the two premia evolved for unskilled English workers between 1500 and 1850. The thick and medium-thick lines show the day wages of urban and rural casual workers, respectively, and the vertical distance between them suggests the size of the urban wage premium. The thin line beneath them shows the implied day wages of stable rural workers – the wages we argue proxy best for the cost and hence for the labour productivity of early factory labour. The compensating wage premium for casual employment is thus indicated by the gap between casual and stable rural workers' wages. Combined, the two wage premia indicate the size of the potential measurement error of using casual urban wages rather than stable rural wages to determine the cost and productivity of early factory labour. The magnitude of the measurement error implied by Figure 1 proposes that early industrial workers in England might have been substantially *less* costly and thus *less* productive than casual urban wages suggests. This warrants a further investigation.

Figure 1: Real wage rates of unskilled casual and stable labourers in England, 1500-1850



Note: Nominal wages are turned into real wages by deflating them with Allen's daily cost of a 'respectable' living. The daily wage rate of stable farm workers is calculated on Allen's assumption that the working year was 250 days long. All three lines are smoothed using the *lpoly* function in Stata/IC15. *Sources*: Urban (London) and rural (Southern England) casual labours: Allen (2001). Rural stable labour: Humphries and Weisdorf (2019). Cost-of-living index: Allen (2015).

This paper takes steps in the direction of providing a more complete picture of early-modern wage developments in rural areas. This has two main aims. One is to inform the longstanding debate concerning whether Italy's early modern downturn was an urban phenomenon only or an all-embracing one (Cipolla 1952; Sella 1997). The other aim is to assess whether an empirical basis for sustaining the *high-wage*/*high-productivity* arguments (Allen 2009; Kelly et al 2014) still exists after we correct for the wage premia described above. To this end, we present wage data for Italian workers employed on manors and farm estates in a region known as the 'Manchester of Tuscany' (Balbi 1845). Using wages from this region for the purpose at hand is advantageous for three reasons. The first reason is that the original urban-wage evidence used to underpin the grand narratives outlined above also build on Tuscan wages (Allen 2001). The second reason links to the occurrence of seventeenth-

century plagues, which afflicted most of Italy and displaced the affected areas to a lower growth path. Yet, similar to rural England, the region of Tuscany was largely untouched by these plagues (Alfani 2013; Alfani and Percoco 2019). The third reason is that manufactures and proto-industry in Tuscany, especially the textile industries near Pistoia and Prato, grew in importance to later gain status as 'little Manchester' (Baldi 1845; Belfanti 1993; Sella 1997; Petracchi 2002), but without developing the full-scale industries later observed in Northern Italy.

Our rural wage index lends strong support to Sella's *relative-decline* hypothesis. Pre-existing wage indices concerning the cities of Florence, Milan, and Rome show that urban workers experienced sustained depression in their real earnings during the early modern period (Rota and Weisdorf 2020). Our sampled rural workers, by contrast, witnessed stable real earnings across the centuries that we are able to observe them, 1500-1850. The radically different developments in early-modern rural and urban wages, also observed in England and France (e.g. Ridolfi 2019), emphasises the importance of considering whether the 'little divergence' in urban European wages applies to rural areas more broadly.

Indeed, by comparing our rural Italian wages to those of similar workers in rural England, reported in Humphries and Weisdorf (2019), two main insights emerge. The first insight concerns *timing*. The original wage evidence used to underpin existing hypotheses about why the Industrial Revolution was English was based on casual urban wages and showed that England and Italy grew apart as early as the late middle ages. Our study suggests that this conclusion is contingent on considering casual urban wages, which remained stable in England but declined in Italy during the early-modern era (Allen 2001). By shifting focus to stable rural workers instead, we observe that English wages were only mildly higher than those in Italy until c. 1650, when an unskilled English worker cost as little as 10 per cent more than an Italian worker. However, by 1800, a stable rural worker in England cost an astonishing 150 per cent more than his Italian equivalent. This not only

suggests that labour productivity in rural England rose dramatically in the run-up to the Industrial Revolution – an observation that is particularly supportive of the *high-productivity* hypothesis proposed in Kelly et al (2014). It also implies that the 'little divergence' within Europe happened later in rural areas than in urban ones – a point also observed in the case of France (Ridolfi 2019). Finally, the later timing of the emergence of the wage and productivity differential raises an important identification problem. Did high wages and productivity encourage mechanisation, or did mechanisation boost wages and productivity?

The second insight from our new rural wages concerns the *shape* of the 'little divergence' within rural Europe. The original wage evidence based on casual urban payments showed – consistent with Cipolla's supposition of Italy's early-modern downturn – that Italian workers became increasingly cheaper in the run-up to the Industrial Revolution, while English workers continued to cost more or less the same as in earlier periods (Allen 2001). Our new wages – collected from rural areas and concerning stable employees – suggest instead that English labour became increasingly more expensive and thus more productive, whereas wages and labour productivities in Italy remained roughly constant during the same period. Coming back to the dispute between Cipolla and Sella, this not only re-emphasises the importance of distinguishing between rural and urban wages when trying to assess long-run developments in pre-industrial societies (Ridolfi 2019). Our rural-wage comparison also offers much more intuitive evidence than earlier for why English but not Italian workers might have stimulated industrial innovations, as predicted by the grand narratives.

We proceed as follows. Section 2 summarises ongoing debates about Italy's early-modern downturn and the existing wage data used as supporting evidence. Section 2 also lists the key arguments for and against the *high-wage* and *high-productivity* hypotheses and the problems with using casual urban wages to underpin them. Section 3 describes our newly-collected rural wages for

Italy and explains how they are transformed into real wages. Section 4 compares our stable rural Italian wages with pre-existing ones for Italy and England. Finally, Section 5 draws conclusions.

2. Background

This section revisits earlier debates concerning the long-run developments of historical wages in Italy and England, and how these were used to underpin the grand narratives about the road to riches and why England industrialised before Italy.

Italy's early-modern downturn

Italy was among the leading economies in Europe and worldwide until the early seventeenth century. Then, the country entered a prolonged phase of decline of more than two centuries. Economic historians have long debated about the nature and causes of the downturn, but without reaching consensus regarding when and why the decline began, or the extent and causes of its severity. Carlo Cipolla (1952) located the onset of decline to the early seventeenth century, the nature of which he held was an *absolute* one in that it affected the entire economy. Cipolla contended that a rising international demand for the goods in which Italy was a market leader was increasingly satisfied by foreign goods produced at lower prices. Adding to this, episodes of epidemics in seventeenth-century Italy were said to reinforce the downturn, as the fall in population and ensuing drop in the supply of labour allegedly boosted labour wages and so amplified Italy's competitive disadvantage.

The idea that economic *downturn* coincided with *rising* wages has not escaped criticism. Indeed, recent research, paying specific attention to the role of epidemics, contrasted that premise. Alfani (2013) and Alfani and Percoco (2019) argued instead that plagues debased human and physical capital, which in turn depressed the *demand* for labour and hence its wages – a view that has gained

empirical support in Rota and Weisdorf (2020)'s demonstration that regional differences in epidemic outbreaks coincided with regional variation in the onset of falling wages. This idea is consistent with the argument made by Capasso and Malanima (2007) that the severity of the downturn was reinforced by eighteenth-century population growth, which drove wages down via an increased *supply* of labour. The role of plague on wages has, however, so far been confined to the use of urban wage rates and remains to be considered also for the case of rural wages – something we return to below.

Cipolla's *absolute decline* hypothesis was also challenged by other scholars. Most notably, Domenico Sella (1997) transformed Cipolla's view of an *absolute* decline into a *relative* one. Sella agreed with Cipolla that the loss of competitiveness vis-à-vis foreign producers surely worsened the economic conditions of Italy's manufacturing cities. However, Sella held that this decline was partly offset by a thriving manufacturing sector in the countryside, with rural areas from the latter half of the seventeenth century slowly beginning to overtake the role that manufacturing cities had had since the middle ages. In tandem with improving agricultural productivity, this counterbalancing driving force of the Italian economy meant, according to Sella, that rural areas, especially those in Central and Northern Italy, followed a different development path than their urban counterparts. Sella, however, did not provide any long-term economic indices to validate his claims.

Leonardo Ridolfi, in his detailed account of long-run wage developments in France, found indirect support for Sella's view. Ridolfi (2019) pointed out that the evolution in wages of urban construction workers might not be representative of national trends, since pre-industrial economies were mostly rural. Therefore, agricultural workers make a more sensible unit of analysis of the pre-modern economy. Ridolfi's numbers showed that, while construction workers in Paris and London saw huge divergence during the early-modern period in favour of London, it was only as late as in the latter half of the eighteenth century that the wages of rural workers in France fell behind those of

their English counterparts. The urban-rural differences observed in the French case thus suggest that Sella's hypothesis for Italy deserves further attention.

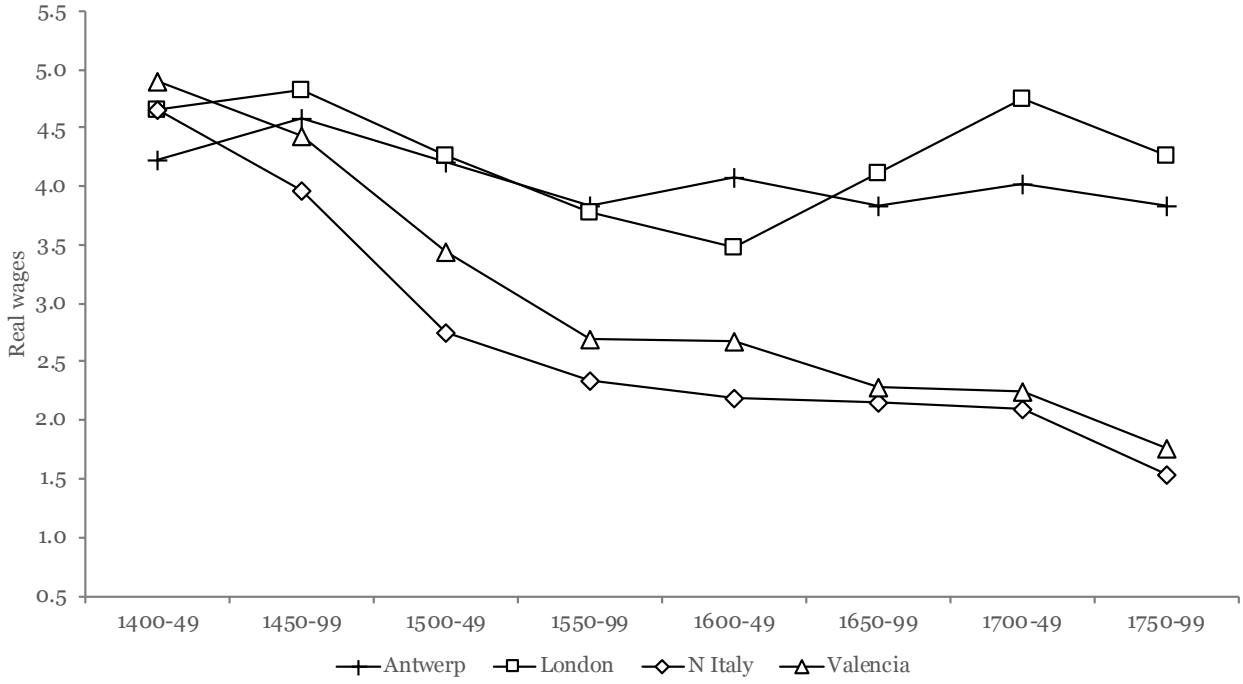
Pre-modern wage evidence from the Italian countryside is, however, remarkably scarce. Federico and Malanima (2004) provided data on daily agricultural wage-rates covering 1320-1860. But their index is a composite of wages drawn from Tuscany in Central Italy (until 1620) and Piedmont in Northern Italy (thereafter) – regions located some 430 kilometres apart. This creates a compositional jump that makes it difficult to fully consider the validity of Sella's *relative decline* hypothesis. Rural workers in Piedmont did appear to suffer some decline in their real earnings during the latter half of the eighteenth century. But since changes in daily wage rates could come from changes in the risk premium for job insecurity as explained above, premia- and composite-free rural wage data are needed in order to consider whether Italy's early-modern downturn was an urban only or also a rural one. The wage data presented in the next section provide headway in this regard.

Italy in the 'little divergence'

Allen's seminal comparison of casual urban construction wages (Allen 2001) showed that building workers in some of Europe's richest cities – London, Florence, Madrid, Naples, and Valencia – received roughly the same level of real wages during the fifteenth century. However, while other European cities saw falling real wages in the centuries leading up to the Industrial Revolution, daily wage rates in London remained consistently high. Hence, by the late seventeenth and early eighteenth century, building workers in London were paid more than twice as much as their European peers. These contrasting developments in casual urban construction wages, which Allen referred to as the 'great divergence within Europe' (Allen 2001, title), are replicated in Figure 2 below. Inspired by John Habakkuk's thesis that labour scarcity led to high wages, which resulted in the search for labour-saving innovations (Habakkuk 1962), Allen used this 'great divergence' to explain England's position

as a frontrunner in the Industrial Revolution, arguing that expensive English workers motivated English industrialists to replace factory labour with machines (Allen 2001, 2009, 2015, 2019). Allen's *high-wage* argument is widely accepted as one of the leading explanation for why England industrialised first.

Figure 2: Allen's cross-European daily construction wage comparison, 1400-1800



Note: The real wages express the number of consumption baskets that an unskilled building labourer is able to afford on the assumption of 250 days of work per year. *Source*: Allen (2001).

The *high-wage* hypothesis has, however, not escaped scepticism. A key concern was expressed in Morgan Kelly, Joel Mokyr, and Cormac Ó Gráda's comparison of England and France around the time of the Industrial Revolution (Kelly et al 2014). The authors argued that English workers were better paid than their French counterparts, because the English workers were more productive. If labour markets were neoclassical and workers thus paid according to their marginal product, then there would be no incentive for English producers to substitute labour with machines. Instead, and

consistent with the wage evidence provided by Allen (2001), Kelly et al propose that the superior productivity of English workers owed to their better health and education, which they contended made up the real reason why the adoption of industrial innovations happened 'earlier, faster, and on a larger scale' than elsewhere (ibid., p. 363). We return to this *high-productivity* hypothesis when we compare our new rural wages to those in England further below.

Other follow-up works to Allen's seminal article (Allen 2001) divides into three main categories: (i) those that question Allen's nominal wage evidence (e.g. Malanima 2013; Malinowski 2016; Garcia-Zuniga and Lopez-Losa 2018a; Geloso 2018; Stephenson 2018b; Humphries and Schneider 2019); (ii) those that question the inadequacies of the consumption basket used by Allen to transform nominal wages into real wages (e.g. Humphries 2013; García-Zúñiga and López-Losa 2018b); and (iii) those that question the idea that historical workers could always find 250 days of work each year at the wage rates reported in Allen's study (e.g. Stephenson 2018a; Hatcher and Stephenson 2019; Humphries and Weisdorf 2019).

The issues raised in the first two categories have so far not presented any serious challenge to the *high-wage* argument. Subsequent revisions of the nominal wages paid to daily construction workers still confirm that these were considerably higher in London in 1800 than in any of Allen's other sampled cities (Allen 2019). Jane Humphries and Benjamin Schneider's shift in focus towards the roles played and wages earned by women and children in specific industries, such as hand spinning, is an area that may receive more attention in future research (Humphries and Schneider 2019; Allen 2019). Moreover, raising the number of calories included in his original consumption basket did not create any threats to Allen's previous conclusions (Allen 2014). However, the issue raised in the last category – how much work casual workers were actually able to find each year – is a growing subject of debate. The rest of this section highlights the scholarly concerns linked to the assumption that finding 250 days of work per year was always possible for casual workers. In turn,

these concerns emphasise the problems associated with the use of casual wages as an empirical foundation for the *high-wage*/*high-productivity* hypotheses, as we explain below.

Historical labour inputs and their discontents

The length of the historical working year is vital for assessing both workers' annual earnings and employers' annual cost of labour. Historical workers are normally divided into two types: casual and stable workers. Stable workers were secured continuing employment across the year. Casual workers on the other hand, especially those employed in seasonal trades such as construction work, usually – as indicated in Figure 1 above – received a compensating wage premium in order to cover the risk of underemployment, a wage premium that stable workers did not receive. This means that daily wage rates were not just reflecting casual workers' labour productivity. They also depended on how much work casual labourers were able to find – something that varied from year to year and place to place – and in turn influenced the size of the compensating wage premium (see Figure 1 above).

Since very little knowledge exists about casual workers' annual employment possibilities, previous studies – Allen (2001) included – had to make conjectures. The common assumption is that casual workers always found 250 days of work each year. This amount of working days is not far from the numbers observed in more recent historical times. For example, late nineteenth-century Italian workers, according to Federico et al (2019), are estimated to have worked for 253 days per year on average. While this number would suggest that workers were always able to find some 250 days of work each year, this was not the case in the pre-modern period.

Sporadic evidence suggests that annual labour inputs varied greatly during pre-modern times (Allen and Weisdorf 2011). In particular, the English working year appears to have been relatively short during the Middle Ages, when as little as 150 days of work a year were observed (Blanchard 1978). Inspections of the patterns of employment on early-modern construction sites – from which

Allen's London wages were drawn – showed that the figure of 250 days of work per year was unattainable for most building workers. On the major construction projects in London, such as St Paul's Cathedral, an average labourer could not expect to find more than 100 days of employment per year (Stephenson 2018a).

Construction work elsewhere in Europe followed similar patterns. In Malmö, Sweden, even during some of the busiest construction years, workers had less than 85 working days per year on average (Gary 2019). Construction workers in Florence and Milan were more fortunate and seem to have found some 180-200 days each year (Mocarelli 2019). Since these numbers were normally not enough to sustain an average family, construction workers either had to supplement their income from other sources or work as part of a building team that moved from site to site in order to make an adequate income (Lucassen 1987). For example, by tracking construction workers across time and space in historical France, Ridolfi (2016) concluded that around 250 days was roughly correct, although French workers had to seek employment on several building sites and take unskilled jobs – even in agriculture – in order to achieve that number of days each year.

A compensating wage premium for underemployment

These employment patterns problematise the use of casual construction wages as empirical support for the *high-wage*/*high-productivity* hypotheses. A main issue is that construction workers might not have found 250 days of work each year or – if they did – they might not have found 250 days at the superior wage rates reported by Allen (Allen 2001, 2009, 2019). This presents a problem to the extent that casual workers received a compensating wage premium for underemployment (e.g. Hatton and Williamson 1991).

Scholarly awareness of such a risk premium has deep roots. Adam Smith, in *The Wealth of Nations*, alluded to the issue more than two centuries ago, pointing out that: 'Employment is much

more constant in some trades than in others. In the greater part of manufactures, a journeyman may be pretty sure of employment almost every day in the year that he is able to work. A mason or bricklayer, on the contrary, can work neither in hard frost nor in foul weather, and his employment at all other times depends on the occasional calls of his customers. He is liable, in consequence, to be frequently without any. What he earns, therefore, while he is employed must not only maintain him while he is idle, but make him some compensation for those anxious and desponding moments which the thought of so precarious a situation must sometimes occasion [...]. The high wages of those workmen, therefore, are not so much the recompense of their skill as the compensation for the inconstancy of their employment' (Smith 1776, pp. 115-116).

Price Fishback, in a survey article of American studies, found the compensating wage premium to be universal across the nineteenth-century US job market, with up to 80 per cent additional pay made to casual as oppose to stable workers (Fishback 1998). If the wage premium for job insecurity was widespread also in pre-industrial Europe, and if the size of the premium depended on factors such as weather conditions (e.g. Swenson 1991), then the eighteenth-century construction wage-gap observed between the northwest and the south of Europe (see Figure 2 above) could potentially be explained by differences in the length of the construction seasons. Specifically, if the construction season was shorter in the northwest and the compensating wage premium therefore higher than in the south, a simple multiplication of Allen's daily London wages by 250 days might therefore overestimate the historical cost of hiring stable workers in England, but not in Italy.

The cost of early factory labour

The use of urban casual construction wages as an empirical foundation for the cost of early factory workers thus suffers two drawbacks. First, it is well-known that early factories emerged in the countryside near smaller towns or villages and not in cities. This was the case in England as well as

in Italy (e.g. Berg 1986; Belfanti 1993). Hence, early factory workers therefore did not obtain an urban wage premium. Second, and perhaps less well-known, while construction workers were frequently employed on a casual basis, early factories sought to hire workers on *stable* terms. Factory employees therefore did not receive a compensating wage premium for job insecurity.

Indeed, Sidney Pollard, in his survey based on the writings by various authors about the nature of employment in early factories, wrote at length about how 'it was not necessarily the better labourer, but the stable one who was worth the most to the manufacturer' (Pollard 1963, p. 255). The competition for labour alongside the factory's capital investments and the requirement of knowledge of the new methods of production meant that factory workers were employed for longer periods of time or even continuously, with the one-year binding contract becoming 'almost universal since the beginning of the eighteenth century' (*ibid.*, pp. 265-266). Studies similar to Pollard's have not been conducted concerning early industry in Italy. But we see no reason why patterns of employment would have been any different than in England. In France, for example, labour scarcity led nineteenth-century cotton mills to hire even very young workers on stable contracts (Heywood 2002).

Our next section will argue that the stable wages of rural farm workers and servants can proxy for the cost of early factory labour. Crucial to that argument is the idea that early factory managers competed in the section of the labour market where stable workers were employed. This idea is nourished by Andrew Gritt's demonstration that early industrialists' appetite for stable labour in a labour-scarce economy had spill-over effects on agricultural patterns of employment (Gritt 2002). As Alun Howkins and Nicole Verdon summarises it, 'a tightening labour market, with industry and agriculture competing for workers, led farmers to use servants in increasing numbers in order to guarantee their labour supply' (Howkins and Verdon 2008, p. 473).

Hence, the alternative to early factory work was not urban construction work, but countryside employment, such as agricultural work or domestic service. The wages that early factory managers

competed with was not those of hiring urban daily building labour or casual farm hands – factory managers had to consider the wages in the labour market for stable employees. Not that they necessarily recruited from the pool of stable farm workers and domestic servants. But the workers they employed, some of which might previously have worked for casual wages, were employed in the early factories on stable terms and for stable wages, as Pollard (1963) described it. An appropriate empirical basis for considering the *high-wage*/*high-productivity* hypotheses would thus rely on payments made to *rural stable* workers, which will serve as a reservation wage for early factor workers. This is what we intend to provide below.

3. Data

Our wage rates of stable rural workers presented below were collected from historical account books of manorial estates in the hinterlands of Florence and Pistoia in Tuscany for the period 1500 to 1850. Florence and Pistoia both belonged to the Grand Duchy of Tuscany before the Unification of Italy, in 1861, and to the Province of Florence thereafter. Today's road distance between the centres of the cities is some 35 km – equivalent to a (long) day's walk – and with the later textile industry of Prato located somewhere in-between. As one would expect, the wages observed in the two areas were very similar, both in levels and trends, as we show later on.

The wage data we present below are far from perfect. The sample size is relatively modest, and the sources occasionally deprived when it comes to revealing workers' ages, managerial responsibilities, and payments in kind. Nonetheless, they offer an interesting starting point for considering Italy's early-modern rural economy. Moreover, the sampled wages are not from the most industrialised parts of today's Italy. Still, there are many good reasons to focus on Tuscany rather than other Italian regions. The first and most obvious reason is that Allen's original study of historical

Europe also used Tuscan wages, at least up until the mid-seventeenth century (Allen 2001). This made sense since parts of historical Tuscany later earned the etiquette 'piccola Manchester' because of its industrial achievements (e.g. Petracchi 2002).

Another important reason links to the occurrence of seventeenth-century plagues. According to Guido Alfani, epidemic outbreaks afflicted most of Italy between 1629 and 1631 and again in the 1650s (Alfani 2013). Mortality rates of 250-500 deaths per thousand were observed in Naples and Milan – two additional cities included in Allen's original study (*ibid.*, p. 417). Meanwhile, the city of Florence was hit only lightly by the plagues, with mortality rates around 140 deaths per thousand, close to the death rates observed in plague-spared England at the time. According to Alfani and Percoco (2019), the plagues reversed the process of urbanisation in the affected Italian regions and displaced the touched cities to lower growth paths. However, since Tuscany, like most of rural England, was not severely impacted by seventeenth-century plagues and indeed witnessed growing urbanization rates during the seventeenth century (*ibid*., Table 5), this region offers an appropriate Italian setting for comparison with historical England.

The sampled wage rates used in our comparisons below – all of which concern male labour – are those paid to stable farm workers and domestic servants. When it comes to farm work, historical Tuscany had three types of employment arrangements: casual contracts, stable contracts, and sharecropping contracts. Under the sharecropping arrangement, the landowner provided the *mezzadro* (the sharecropper) with a plot of land as well as a house (Alfani and Ammannati 2017). In return, the sharecropper agreed to cultivate the land and share the final product of the land with the owner. Although sharecropping is said to have been rather uncommon in England, known as 'farming to halves' (Griffiths 2004), some actually consider it to be merely a variation of the more well-known English system of tenant farmers (e.g. Christopher 1985). The extensive work responsibilities and skill requirements meant that the Tuscan sharecroppers were usually paid significantly more for their

services than their unskilled stable counterparts (see Rota and Weisdorf 2019). Since they were not unskilled workers, sharecroppers are not included in our sample.

Sharecropping was the most common form of farm employment in Tuscany, comprising some 60 per cent of the agricultural workforce (Italy's Population Census of 1881). Casual farm workers made up 20 per cent, while stable farm workers – one of our two focus groups – made up another 20 per cent. The Census of 1881 does not break labour down by contract in the service sector, so we are unable to say how many servants – our second focus group – were employed on a stable versus casual basis. But we suspect – due to the nature of domestic service work – that casual contracts were rather unusual in this sector. Unskilled annual workers in England used for our international comparison below made up some 20-50 per cent of the total male workforce depending on the period in question (Humphries and Weisdorf 2019, p. 22). There is no information about the Italian shares prior to 1881.

Sample restrictions

Our main goal is to build an index of wages paid to unskilled rural male workers. The focus on unskilled work allows us to compare with the wages of similar male workers in England (Humphries and Weisdorf 2019). Separating skilled from unskilled work among our sampled workers was not always straightforward. Even though the occupational titles recorded in the account books suggested that the work was unskilled, there were examples that some workers, especially servants, were paid considerably better than their occupational peers, even on the same estate.

For example, Pietro Gargani, a servant at a manor near Florence (Conti Ginori 155), received a total of 456 *lire* per year in 1823. His colleague Giuseppe Lattari, another servant employed during the same year, was paid less than half that amount – 204 *lire*. Even if we added the monetary value of board and lodging privileges to Lattari's cash wage (see below), Lattari would still be more than a hundred lire short of Gargani's salary. Such large differences in payments for the same occupation

are not unique to our Italian sources – many English cases were similar in this regard (Humphries and Weisdorf 2019, pp. 8-9). On closer inspection of the records, it becomes clear that Gargani was a superior to the female servants employed on the manor, which justified his higher earnings. In order to keep the sampled wages unskilled and free of wage premia for such responsibilities, we proceeded to remove Gargani from the sample while keeping Lattari, who unlike Gargani did not hold a superior position. All workers were evaluated this way, leaving us with the lower end of the wage distribution for unskilled occupations, as was also done for the comparable English workers (*ibid*.). The qualitative nature of our conclusions below is robust to including workers identified as receiving a skill-premium (Rota and Weisdorf 2019).

Our restricted sample counts a total of 439 annual wage rates paid to unskilled Tuscan farm employees and domestic servants hired on stable contracts. Although this may not sound like a great deal of observations, it must be remembered that our wage data of stable rural workers come from the archives of noble families and small private institutions, which of course survived more rarely than the account books of public institutions or large religious bodies from which most of the wage data on casual urban labour originate (e.g. Mocarelli 2019; Rota and Weisdorf 2020).

For our sampled wage rates, 70 per cent concerns employees in the region near Florence. The rest were found in the vicinity of Pistoia (see Table 1). Of the sampled workers, 56 per cent were recorded as farm labourers and 21 per cent as domestic servants. The remaining 23 per cent – a group we refer to as 'men and helpers' – consists of coachmen, gatekeepers, grooms, shepherds, woodcutters, as well as regular labourers and workmen, all of which are considered to be unskilled professions (Maas and van der Leeuwen 2011) and hence can be expected to be paid roughly identical levels of wages. Since workers were not always mentioned by name, we can also not be certain how often re-entry of the same worker occurs. The common problem with historical wage indices that sources often do not distinguish between minor and adult workers also applied in our case.

Table 1: Occupations and Regions

Job title	*Freq.*	*Per cent*	*Cum.*
Farm labourers	244	56	56
Domestic servants	101	23	79
Men and helpers	94	21	100
Total	439	100	100
Region			
Florence	308	70	70
Pistoia	130	30	100
Total	439	100	100

Payments in kind

There are always uncertainties linked with building historical wage indices. A central problem is that both stable and casual workers often received some or all of their payments in kind. Casual workers normally received food and drink as part of their daily pay, whereas stable workers usually received board and lodging privileges as part of their remunerations. The latter arrangement not only cut the transaction costs of workers and landlords alike – it also resulted from the pre-modern shortage of coins (Palma 2016). Regardless, as is tradition, payments in kind need to be monetised and added to the workers' cash payments in order to determine their overall remuneration.

Although board and lodging privileges were not usually mentioned explicitly in the account books, it was clear from the size of the cash payments that these alone were generally insufficient for the workers to survive on (see Figure A3 in Appendix 3). In order to monetise these board and lodging privileges, we followed previous studies and imputed the relevant workers with the value of a standardised consumption basket, as we explain below.

For example, the annual cash payment made to Antonio Giorgetti, a farm labourer in the region of Florence in 1724 (MSL 66), was 40 *lire*, 3 *crazie*, and 4 *soldi*. The estimated cost of living of an adult worker that year was 60 *lire* (see below). So Giorgetti was one-third short of sustaining himself on the cash payment recorded in the account book. As with our comparable English workers, we thus assumed that board and lodging were an implicit part of Giorgetti's contract and proceeded to impute him with the monetary value of a typical consumption basket.

To this end, we used the amended version of Allen's so-called *respectability* consumption basket presented in Malanima (2013). Malanima's consumption basket has the advantage over Allen's in that it complies with Humphries' criticism that Allen's original basket was (among other things mentioned by Humphries) too meagre in terms of calories for workers to subsist on (Humphries 2013). Allen's original basket offered a male worker 1,941 calories per day, which Humphries felt was too few calories for a worker to survive on given that he had to be physically active. Malanima's version of Allen's basket includes 2,500 calories per day, which is not only a 'respectable' level of nourishment for an adult male, but also sufficient to deal with Humphries' concern (Allen 2014). In addition to food and drink, the consumption basket also contains linen for clothes, candles and lamp oil for light, fuel for heat, and a rent allowance making up five per cent of the total cost of the basket's commodities. Table A2 in Appendix 2 lists the commodities included in the baskets for Italy and England, alongside their volumes. Butter in the Italian basket has been replaced by oil and beer by wine. English workers are also assumed to consume somewhat more energy for heating than Italians. Otherwise, the English and Italian baskets are identical and similar to those presented in Malanima (2013).

There are two reasons why we believe that a *respectability* consumption level is appropriate for our imputation exercise below. First, although poor relief existed at the time and could in principle have served as a supplement for workers who earned *less* than enough to achieve a *respectable* living

standard, poor relief was normally targeted at casual and disabled workers as well as the elderly (e.g. Goose 2006). Hence, we do not believe our permanent employees were expected to availed themselves of such reliefs. Second, an alternative to the *respectability* basket used in the literature is the so-called *bare bones* basket. The *bare bones* basket is meagre by any measure, offering an active male worker barely enough calories to survive on (Humphries 2013). We find it unlikely that employers would offer their permanent workers (i.e. our sampled workers) barely more than needed to stay alive. It should be kept in mind that the *respectable* basket is not luxurious by any means – it simply offers an active male worker a decent amount of calories each day plus some basic necessities (see Table A2).

Coming back to Giorgetti's case discussed above, his total (cash and kind) payment was then made up of the amount recorded in the account book (some 40 *lire*) plus the monetary value of the payments in kind that we imputed, i.e. the value of the consumption basket, which in 1724 was worth 60 *lire*. The monetary value of the basket was achieved by multiplying the items in the Italian basket with the prices reported in Malanima (2003). Giorgetti's total annual remuneration this way came to some 100 *lire*. We checked that the imputed payment was in line with payments made to workers whose cash payments were more than enough to subsist on (see Figure A3). For example, Jacopo Picciuoli, another farm labourer in the region of Florence in 1724, received an annual cash payment of 91 *lire*. This was twice the amount of cash paid to Giorgetti (some 40 *lire*), yet it was in same range as Giorgetti's implied total remuneration (the 100 *lire*). Hence, Picciuoli was not imputed with the value of a consumption basket. We demonstrate further below that our main conclusions are robust to using different versions of the imputing procedure described above.

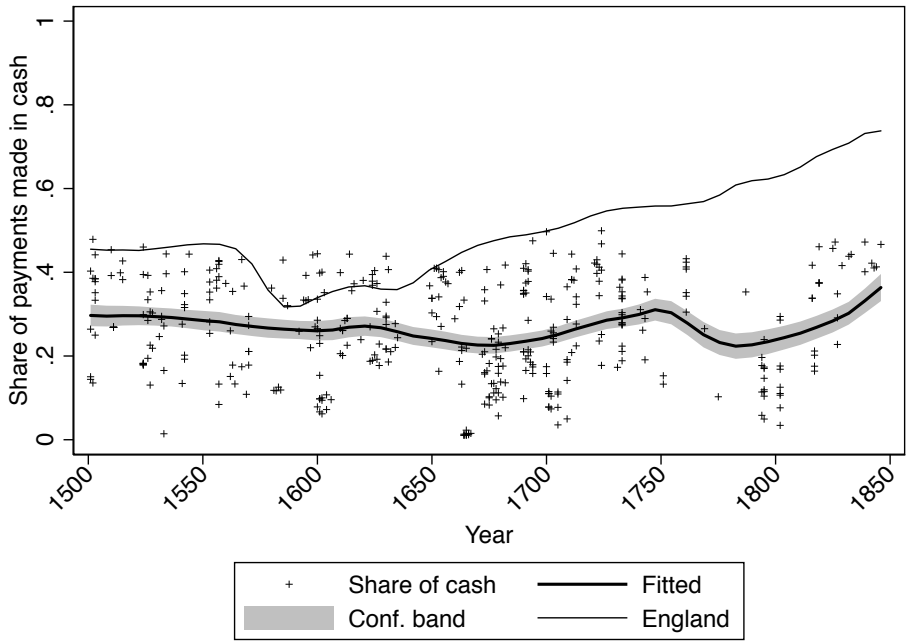
Conveniently, non-pecuniary payments were sometimes detailed directly in the account books. These enabled us to check that our imputed values matched workers' actual payments in kind. Non-pecuniary payments – when specified – included agricultural commodities, such as various grains

(primarily wheat, sorghum, rye, and millet), beans, wine, and olive oil. These commodities and their volumes allowed us – in combination with the historical prices reported in Malanima (2003) – to compute the value of the workers' payments in kind. Indeed, on some occasions the account books even specified the employer's pecuniary assessment of the non-pecuniary benefits given, making them easy for us to add to any cash remuneration.

For example, Simone Panicci, a farm labourer in the region of Florence in 1674 (Guidi 247), received an annual payment of 7.5 *stadere* of wheat (one *stadere* is 25 litres), which according to his employer were worth 26 *lire*. In order to check that the monetary value recorded by the employer was not out of touch with reality, we multiplied the historical price of wheat reported in Malanima (2003) – that is, 3.485 *lire* per *stadere* in 1674 – by the 7.5 *stadere* that Panicci received, obtaining exactly 26 *lire*. None of the cases where we were able to calculate the monetary value of the workers' payments in kind raised any suspicion about the fairness of the employer's pecuniary assessment. Figure A3 in Appendix 3 shows that the cases where we were able to observe and monetise the payments in kind (red marks in the graph) align well with the cases where we imputed the payments in kind (blue marks) as we described above.

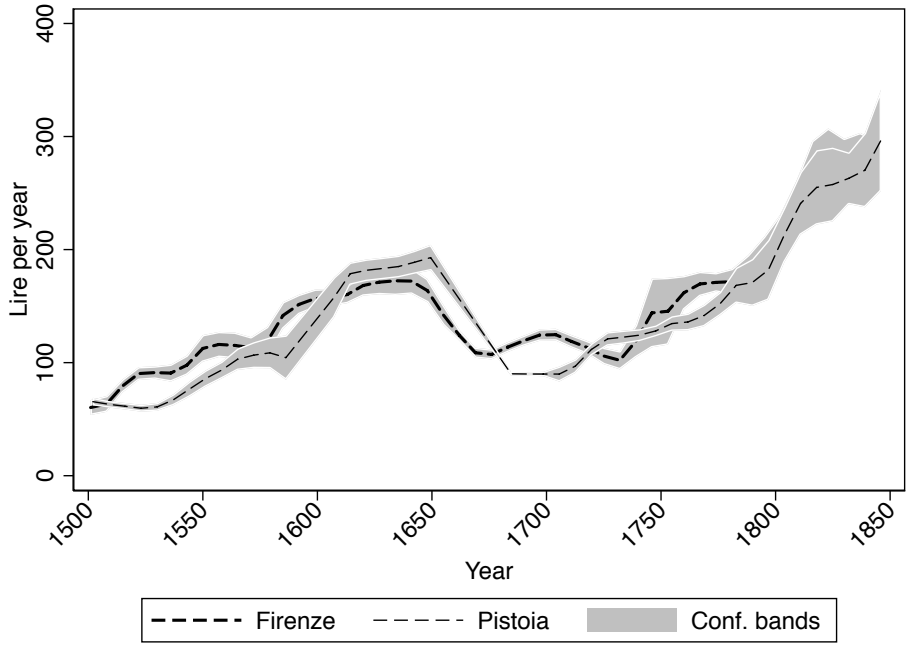
One of the key features of the early-modern English labour market was that the cash component grew as a share of workers' total payments (Humphries and Weisdorf 2019, p. 13). The comparable shares of payments in cash and kind among our Italian workers are illustrated in Figure 3. The Italian share of cash to total payments ranged from between 20 and 40 per cent and with no apparent trend. This share is somewhat less compared to the share of cash paid to the English equivalents. That is, cash in England made up some 40 to 50 per cent of annual workers' full payment during the sixteenth and seventeenth centuries, after which the share rose steadily during the eighteenth and nineteenth centuries to reach some 80 per cent in 1850 (Figure 3).

Figure 3: The share of cash to total annual payments in Italy and England, 1500-1850



Notes: The symbol '+' represents individual shares of cash to total payments. The polynomial fitted line is made using *lpolyci* in Stata/IC15. *Source*: Data for Italy: see Appendix 1. Data for England: Humphries and Weisdorf (2019).

Figure 4: Nominal annual payments in the areas of Florence and Pistoia, 1500-1850



Note: Polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Source*: see Appendix 1.

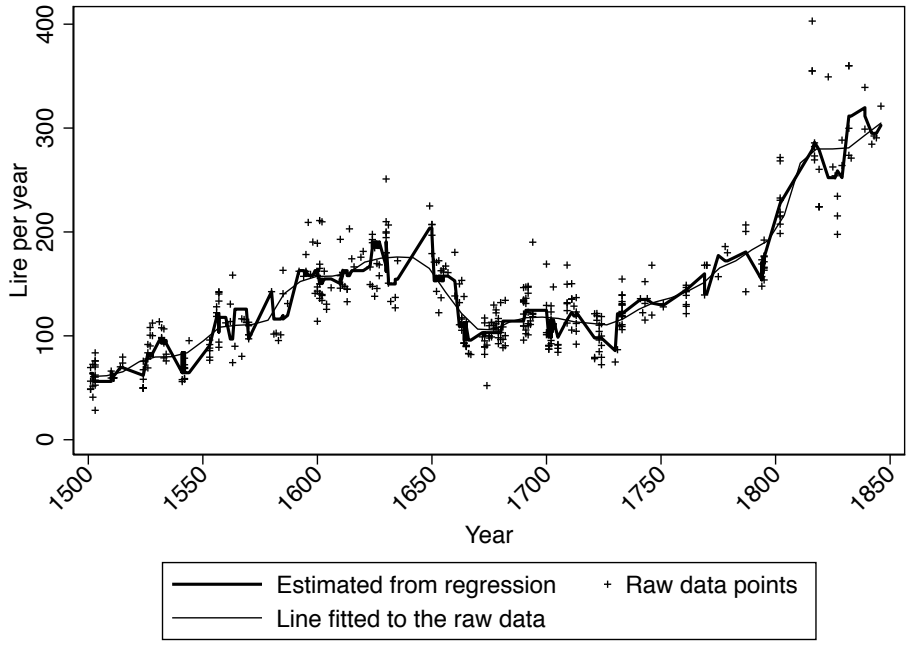
A few more things are pertinent to consider before we turn to the comparisons with pre-existing wage indices. One concerns any regional or occupational differences in the observed payments. Figure 4 shows that nominal annual payments in the surrounding areas of Florence and Pistoia, respectively, were roughly identical in terms of levels and trends. Periodic deviations – such as the mildly better payments made in the region near Pistoia during the greater part of the seventeenth century – could potentially be explained by compositional effects due to shifts in the type of workers included in the wage index, e.g. farm work versus domestic servants.

To find out whether or not compositional effects plague the wage series presented below, we compared a model that fits a polynomial line to the raw data against a model that connects the decadal wages predicted by a regression model that accounts for the spatial differences illustrated by Figure 4 and the occupational heterogeneities reported in Table 1. The check was done by running an OLS model of the following form:

$$\ln(Wage_{it}) = \alpha_i + \Sigma_j \gamma_j Job_j + \Sigma \eta_k Region_k + \Sigma \varphi_l Decade_l + e_{it},$$

where $Wage_{it}$ is a wage payment made to individual *i* at year *t*; Job_j is a dummy for each of our three categories of workers (men and helpers, farm labourers, and domestic servants) reported in Table 1 above; $Region_k$ is a dummy for each of the two regional areas (Florence and Pistoia); $Decade_l$ is a dummy capturing the decade when the payment was observed; and e_{it} is the error term. Table A4 in Appendix 4 reports the results of the regression exercise, while Table A5 in Appendix 5 reports the predicted average annual payments made to unskilled stable rural workers between 1500 and 1850, by decade.

Figure 5: Estimated nominal annual payments using regression, 1500-1850



Notes: The line estimated from regression is representing a farm labourer in the region of Florence. The line fitted to the raw data is made using *lpoly* in Stata/IC15. *Sources*: see Appendix 1.

Figure 5 shows that the wages predicted by the regression model align very well with the polynomial model fitted to the raw data. Since the wage index fitted to the raw data is clearly not plagued by compositional effects, and because we wish to conduct our comparative analysis by fitting a polynomial model to the individual wage observations (the thin line in Figure 5) rather than one that arbitrarily groups observations in decadal bins (the solid line in Figure 5), we proceeded to use the raw data and polynomial model in our comparison below. The qualitative nature of our findings described in the next section are robust to using the decadal averages predicted by the regression model instead. Also noteworthy, although our wage series is a composite index made up of different unskilled job categories, Figure A4 in Appendix 4 does not give reason to believe that the various job groups were paid markedly dissimilar salaries.

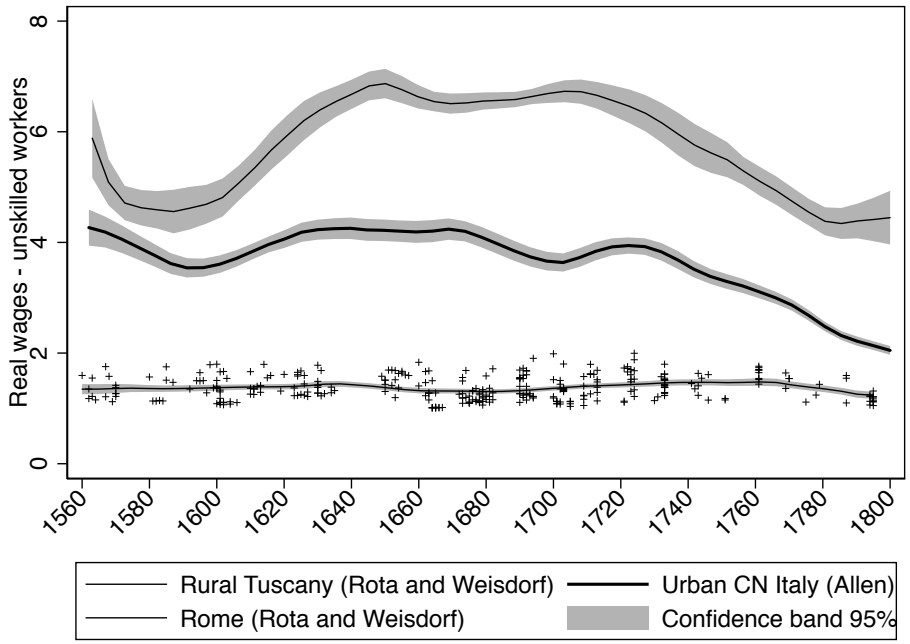
4. Results

We can now present the novel series of annual wages paid to stable rural workers in Tuscany employed between 1500 and 1850. We present our new wages in two comparative perspectives: (i) in light of earlier indices of day payments made to rural and urban Italian workers, and (ii) against the annual wages of stable rural workers in England reported in Humphries and Weisdorf (2019). The overarching goal is to re-examine two main debates in economic history: whether Italy's early modern downturn was only an urban or also a rural one, and, linked to this question, whether there was a 'little divergence' also in rural European wages as exemplified by Italy and England.

Comparison: rural versus urban Italy

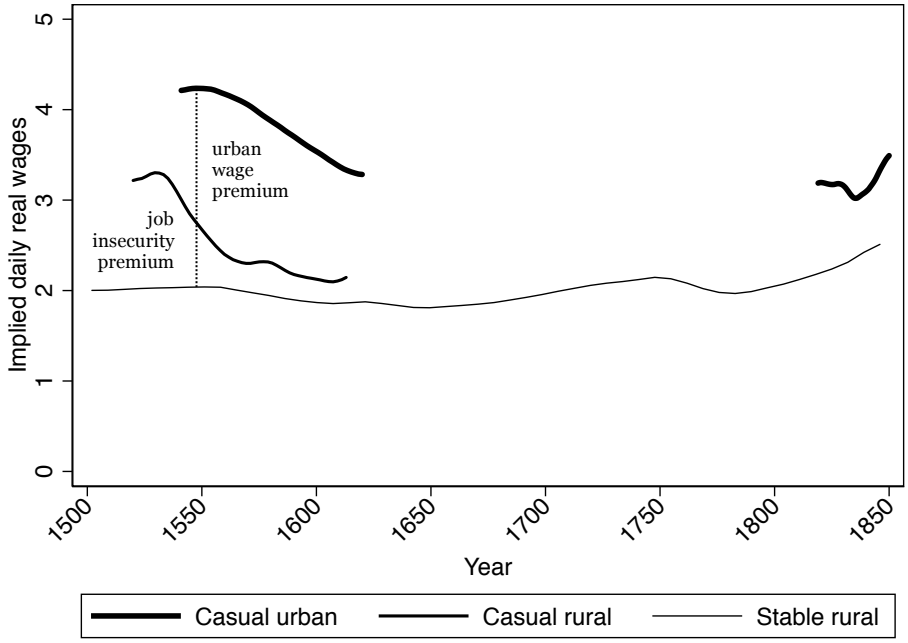
Our new wage index of rural workers enables us to shed light on Sella's *relative-decline* hypothesis. Sella contented that only urban Italian workers saw their purchasing power decline during the early-modern period, whereas rural areas, because of rising agricultural productivity and growing proto-industry, did not endure the same decline (Sella 1997). By placing our wage index of stable rural workers in the context of pre-existing indices concerning casual urban workers in Rome (Rota and Weisdorf 2020) and Central-Northern Italy (Allen 2001), two things emerge (see Figure 6). The first is that the downturn was certainly an urban one, with stable rural workers able to largely maintain their real annual income across the early-modern period. The second is that the urban decline came from a pedestal of unprecedented high wages, possibly the highest in early-modern Europe (Rota and Weisdorf 2020), and certainly at heights that suggests that urban casual unskilled workers were paid considerable wage premia, e.g. to cover urban penalties alongside the risk of underemployment – something we look further into below.

Figure 6: The implied daily real wages of unskilled urban and rural workers in Italy, 1500-1850



Notes: The lines are fitted to data using *lpolyci* in Stata/IC15. The daily wage rate of stable workers is calculated on Allen's assumption that the working year was 250 days long. *Sources*: Casual urban wages for Central-Northern (CN) Italy: Allen (2001). Casual urban wages and prices for Rome: Rota and Weisdorf (2020). Stable rural wages: see Appendix 1. Prices for Malanima's *respectability* basket: Malanima (2013, Statistical Appendix).

Figure 7: The real wages of unskilled casual and stable workers in Tuscany, 1500-1850



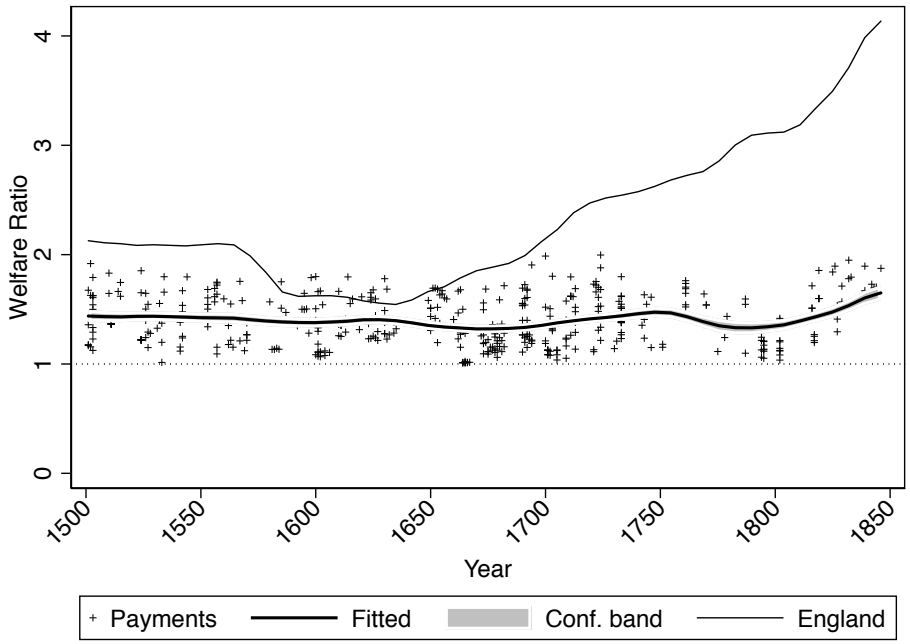
Notes: The lines are fitted to data using *lpoly* in Stata/IC15. The daily wage rate of stable workers is calculated on Allen's assumption that the working year was 250 days long. *Sources*: Casual urban and rural wages until 1620: Parenti (1939, Table 6 and 7). Casual urban wages after 1820: Bandettini (1960, Table VIII). Stable rural wages: see Appendix 1. Prices for Malanima's *respectability* basket: Malanima (2013, Statistical Appendix).

It is clear that Figure 6 above does not compare apples with apples. Most of the urban wages displayed concern cities outside of Tuscany, namely Rome and Milan. There is, however, a short window of opportunity during the late sixteenth and early seventeenth centuries, when urban and rural casual wages are available for Tuscany thanks to payments reported in Parenti (1969). Similarly, the casual payments reported in Bandettini (1960) allow us to compare to urban Tuscan wages during the early nineteenth century. Those wages together enable us to make a graph that – while incomplete – is comparable to the one presented for England in Figure 1 above. The resulting Figure 7 suggests similar to England that – unlike stable work – casual work entitled a premium for job insecurity, and urban worker earned an urban wage premium. Figure A6 in Appendix 6 further shows that our implied daily wage rates for stable rural employment are on par with those reported for the early post-unification period (Federico et al 2019).

Comparison: England versus Italy

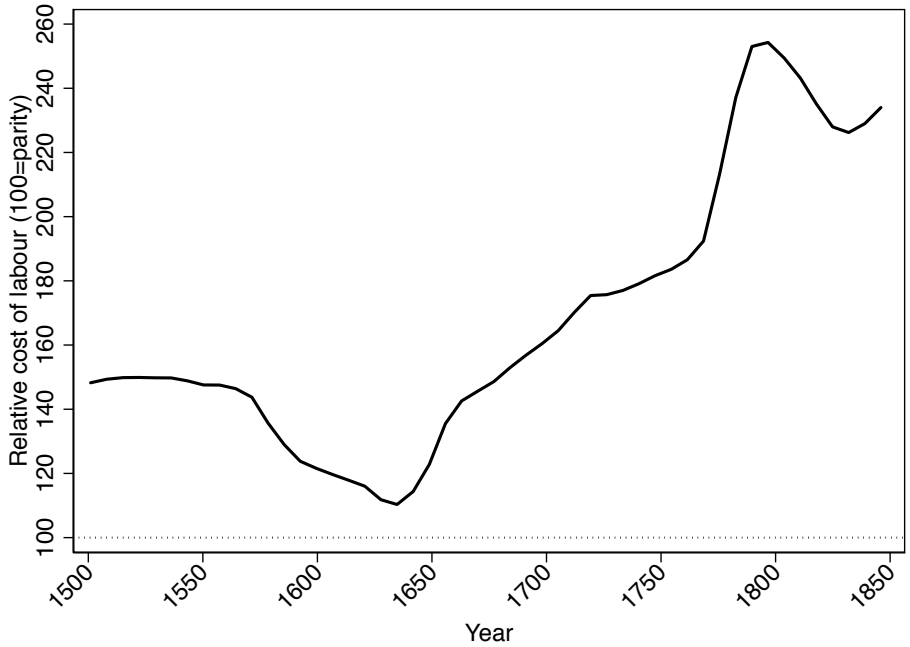
Figure 8 shows the real annual wage rates of our sampled Italian workers against the annual wage rates of comparable English workers. The real wages are obtained by dividing the annual nominal wage rates by the annual costs of Malanima's consumption basket reported in Table A2. Figure 9 shows the size of the pay gap between the two countries. Table A5 reports the average real annual wage rates representing Italy and England, by decade. Together, Figures 8 and 9 contain a set of messages that speak directly to ongoing debates about the timing of the 'little divergence' between the southern and north-western parts of Europe and, by implication, to the relevance of the *high-wage*/*high-productivity* hypotheses about why the first Industrial Revolution happened in England and not in Italy.

Figure 8: Real annual income in Italy and England, 1500-1850



Notes: Real wages (welfare ratios) are computed by dividing the annual nominal wage rates by the annual costs of Malanima's *respectability* basket. The symbol '+' represents individual payments. The polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Sources*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019). Annual costs of Malanima's *respectability* basket for Italy: Malanima (2013).

Figure 9: The cost of labour in England relative to Italy, 1500-1850



Note: The polynomial fitted line is made using *lpoly* in Stata/IC15. *Source*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019).

The first observation is that stable rural English workers were only moderately more expensive than their Italian counterparts during the sixteenth and seventeenth centuries, with English workers being paid between 10 and 50 per cent more than their Italian peers (Figure 9). In terms of workers' so-called *welfare ratios* – informing how many times a worker's annual income could buy the consumption basket described above – an average Italian worker earned the equivalent of one and a half baskets in 1500 (Figure 8). That level of income remained fairly constant until the mid-nineteenth century. It never surpassed two consumption baskets, showing how relatively poor our sampled unskilled Italian workers were in early-modern times, barely able to support a wife and certainly not any children without the additional contribution of those other family members. The so-called *male breadwinner model* would not hold up for the lower working-classes in Tuscany before 1850, even though they has stable employment.

By contrast, an average English worker earned slightly more than the equivalence of two consumption baskets during most of the sixteenth century (Figure 8), which was also not enough to keep a typical English family fed at the time (Horrell et al 2019). Real annual earnings in England then dropped somewhat below two baskets during the first half of the seventeenth century. But then, from less than two baskets in 1650, an English worker's welfare ratio rose considerably during the long eighteenth-century, reaching well over four consumption baskets in 1850. It is clear from this that even the lowest segments of the English society at the time were significantly better off in terms of real income than their Italian peers. Not only was an average English unskilled worker able to support a wife and a few children, which meant that the *male breadwinner model* was actually relevant for England in the early nineteenth century, but even a modest contribution from the wife would allow a typical lower-class family to take part in a 'consumer revolution' along the lines of what Jan de Vries describes in his book about the 'industrious revolution' (de Vries 2008).

Coming back to the *high-wage*/*high-productivity* arguments, it is also visually clear from Figure 9 that a 'little divergence' in the costs of a hiring stable rural labour and thus their respective productivity levels materialised between the sampled workers in England and Italy during the long eighteenth century. From the mid-seventeenth century on, when an unskilled stable rural English worker cost as little as 10 per cent more than a comparable Italian worker, the surge in English real annual wages meant that an English worker was an astonishing 150 per cent more expensive at the turn of the nineteenth century than his Italian counterpart, with English wages reaching an all-time high after c. 1700. The development in the cost and productivity of eighteenth-century English labour thus showed a stark contrast to Italy, where little or no change occurred across more than three centuries, with an unskilled stable rural Italian worker in 1850 barely more expensive and thus productive than his counterpart in 1500 (Figure 8).

Strikingly different from the 'little divergence' depicted in Allen's original study of urban construction wages (Figure 2), the rising price and productivity of stable rural labour in England coincides with Britain's early mechanisation (Figures 8 and 9). For example, the first steam engine – a cornerstone of the Industrial Revolution – was installed in England in 1712. Although steam engines were initially used in the mining sector, they quickly spread after the 1740s and during the second half of the eighteenth century to the most innovative branches of the economy, including the cotton industries, alongside the rising cost and productivity of workers (Nuvolari et al 2011). By 1800 – when the pay- and productivity-gap between England and Italy was close to a peak – some 2,207 steam engines had been erected in England. Italy in 1800 had only one steam engine in operation (Tann and Breckin 1978). Our new and improved empirical evidence – stable wages paid to rural workers rather than casual wages paid to urban workers – are certainly consistent with the idea that mechanisation on the one hand and rising wages and productivity on the other co-evolved. But the direction of causality is now an open question and the main topic of our concluding remarks.

Robustness

How robust are our conclusions to our procedure of dealing with payments in kind described in Section 3 above? The graphs presented in Appendix 7 speaks directly to this question. One possibility is that employers paid workers exactly enough in terms of cash and kind that they each reach a *respectable* living. Figure A7, panel A, shows what happens if we simply top-up workers cash payments just enough for them to reach one *respectability* basket, thus helping those workers whose cash fell below that level to meet a welfare ratio of exactly one. We believe, however, that this is an unlikely scenario. It was common in England – and presumably also in Italy – that unmarried workers saved part of their income up for marriage, and, equally, that married workers were able, at least to some degree, to support more than just themselves (see Humphries and Weisdorf 2015, 2019). The scenario depicted in Panel A for most workers allowed neither saving up for marriage nor supporting other family members later during the lifecycle.

Panel B instead entertains the possibility that the sampled workers received nothing but their cash pay, upon which very few of them were able to obtain a *respectable* living (motivating the basket methodology in the first place). Panel C goes to the opposite extreme and impute *all* workers with the value of the *respectability* basket. Finally, Panel D shows that our conclusions also remain robust to assuming that the rural cost of obtaining the consumption basket is 25 per cent lower than the urban prices reported by Malanima (2013). Regardless of the chosen scenario, the important lesson from this robustness exercise is that none of the cases challenge our two main conclusions: that the sampled stable rural wages in Italy were roughly trendless between 1500 and 1850, and that the wages of the sampled English workers pulled away from those in Italy after c. 1650.

5. Conclusion

This article has argued that urban and rural wages did not necessarily co-evolve and, concurrently, that the daily wage rates paid to casual urban construction workers might not be a suitable empirical basis for considering the relevance of the *high-wage*/*high-productivity* hypotheses. We reasoned that casual urban construction wages might include two compensating wage premia – one for shouldering job insecurity and one for compensating the higher costs of urban living. We argued that these premia were irrelevant for early factory managers who relied on rural workers and hired them for stable employment. Stable rural wages would therefore better capture the reservation wage that factory managers paid attention to when calculating their wage bill and making decisions about whether or not to replace labour with machines, as the *high-wage* thesis contends.

Is there still an empirical basis for considering the *high-wage*/*high-productivity* hypotheses once the premia for urban and casual employment are eliminated? To find out, we built and presented a novel wage index based on payments made to stable rural workers in Italy (Tuscany). We established that our sampled rural workers did not partake in the prolonged downturn that defined urban Italy during the seven- and eighteenth centuries, in support of Sella's *relative-decline* hypothesis. We also compared our stable rural wages to the payments made to similar workers in England. Our comparison showed that English rural workers were only mildly costlier during the six- and seventeenth centuries than their Italian counterparts, but that the wage and hence productivity gap between England and Italy grew markedly wider during the eighteenth century, when the cost and productivity of English labour rose to unprecedented heights. By 1800, an unskilled stable worker in rural England was more than twice as expensive and thus productive as his Italian counterpart. The rising pay and productivity gap coincided with Britain's early mechanisation – something that Allen envisioned would happen once early industrialists found it profitable to replace the pricy English

workers with machines. Or, equally, something Kelly et al saw happening because more productive workers were better nourished and educated, helping to facilitate the adoption of new machines.

However, although our empirical evidence showed that the precondition for the grand narratives is still in place — English workers *were* indeed more expensive and thus productive than their Italian peers at the time of industrialisation also after correcting for the misguiding wage premia described above – the chain of events is no longer evident. Allen's original wage data suggested that English labour was relatively more expensive and thus more productive than Italian labour in the period *leading up* to the Industrial Revolution. This fostered the ideas that high wages (Allen 2009) and high productivity (Kelly et al 2014) were the motors of mechanisation. Our new and improved stable rural wages showed, however, that the rising cost and productivity of English workers and early industrialisation *coincided*. This means it is no longer clear whether it was high wages and high productivity that incited innovations or the other way around – a subject of further research.

References

Alfani, G. (2013), "Plague in seventeenth-century Europe and the decline of Italy: an epidemiological hypothesis", *European Review of Economic History* 17, 408–430.

Alfani, G. and F. Ammannati (2017), "Long-term trends in economic inequality: the case of the Florentine state, c. 1300–1800", *Economic History Review* 70:4, pp. 1072–1102.

Alfani, G., and M. Percoco (2019), "Plague and long-term development: the lasting effects of the 1629–30 epidemic on the Italian cities", *Economic History Review* 72:4, pp. 1175-1201.

Allen, R.C. (2001), "The Great Divergence in European Wages and Prices from the Middle Ages to the First World War", *Explorations in Economic History* 38, pp. 411-447. Wages and prices retrieved online on 11 July 2019 from: https://www.nuffield.ox.ac.uk/people/sites/allen-research-pages/.

Allen, R.C. (2009), *The British Industrial Revolution in Global Perspective*. Cambridge: Cambridge University Press.

Allen, R.C. (2014), "The high wage economy and the industrial revolution: a restatement", *Economic History Review* 68, pp. 1-22.

Allen, R.C. (2019), "Real wages once more: a response to Judy Stephenson," *Economic History Review* (early view).

Allen, R.C. (2019), "Spinning their wheels: a reply to Jane Humphries and Benjamin Schneider," *Economic History Review* (early view).

Allen, R.C., and J. Weisdorf (2011), "Was there an Industrious Revolution before the Industrial Revolution: An Empirical Exercise for England, c. 1300-1830", *Economic History Review* 64, pp. 715-29.

Balbi, E. (1845), *Di alcune ultime opere di statistica e geografia patria e di alcuni recenti lavori di geodesia e cartografia italiana memoria di Eugon Balbi*, Milano: Stabilimento Civelli e co.

Belfanti, C. M. (1993), "Rural manufactures and rural proto-industries in the 'Italy of the cities' from the sixteenth through the eighteenth century," Continuity and Change, 8(2), 253-280.

Berg, M. (1986), *The Age of Manufactures: Industry, Innovation, and Work in Britain, 1700-1820*, New York: Oxford University Press.

Blanchard, I. (1978), "Labour productivity and work psychology in the English mining industry, 1400-1600," *Economic History Review* XXXI, pp. 1-24.

Broadberry, S.N., B.M.S. Campbell, A. Klein, M. Overton, B. van Leeuwen (2015), *British Economic Growth 1270-1870*. Cambridge: Cambridge University Press.

Broadberry, S.N.; S. Ghosal; and E. Proto (2017), "Anonymity, Efficiency Wages and Technological Progress," *Journal of Development Economics* 127, pp. 379–394.

Clark, G. (2001), "The secret history of the industrial revolution," unpublished U.C. David manuscript, retrieved online on 5 May 2019: faculty.econ.ucdavis.edu/faculty/gclark.

Clark, G., and Van der Werf, Y. (1998). 'Work in Progress? The Industrious Revolution', *Journal of Economic History* 58, pp. 830-843.

Christopher, C. (1985), "Types of Tenancy,", in Thirsk, J. (ed.), *The Agrarian History of England and Wales*, Volume 5, 1640–1750, Cambridge: Cambridge University Press. pp. 198-229.

De Vries, J. (1994), "The Industrial Revolution and the Industrious Revolution", *Journal of Economic History* 54, pp. 249-270.

De Vries, J. (2008), *The Industrious Revolution: Consumer Behavior and the Household Economy*, New Work: Cambridge University Press.

Engerman, S. and C. Goldin (1991), "Seasonality in Nineteenth Century Labor Markets," NBER Working Paper No 20.

Federico, G, and P. Malanima (2004), "Progress, decline, growth: product and productivity in Italian agriculture, 1000-2000," *Economic History Review* 3, pp. 437-64.

Federico, G.; A. Nuvolari; and M. Vasta (2019), "The Origins of the Italian Regional Divide: Evidence from Real Wages, 1861–1913," *Journal of Economic History* 79:1, pp. 63-98.

Fishback, Price V. (1998), 'Operations of "Unfettered" Labor Markets: Exit and Voice in American Labor Markets at the Turn of the Century', *Journal of Economic Literature* 36:2, pp. 722-765.

Floud, R., Fogel, R.W., Harris, B. and Hong, S.C. (2011). *The Changing Body: Health Nutrition, and Human Development since 1700*, Cambridge: Cambridge University Press.

Fogel, R. (1992). "Second thoughts on the European escape from hunger: famines, chronic malnutrition and mortality rates," in (S. Osmani, ed.), *Nutrition and Poverty*, pp. 243–86, Oxford: Oxford University Press.

Garcia-Zúñiga, M. and E. Lopez-Losa (2018a), "Building Workers in 18th-century Madrid Skills and Wages," University of País Vasco unpublished manuscript.

García-Zúñiga, M., and E. López-Losa (2018b), "Building Workers in Madrid (1737-1805). New Wage Series and Some Methodological Issues," University of País Vasco unpublished manuscript.

Gary, K.E. (2019), "The distinct seasonality of early modern casual labor and the short durations of individual working years: Sweden 1500-1800", Lund Papers in Economic History No 2019:189.

Geloso, V. (2018), "Were Wages That Low? Real Wages in the Strasbourg Region Before 1775," *Journal of Interdisciplinary History* 48, pp. 511-522.

Goldthwaite, R.A. (1982), *The Building of Renaissance Florence: An Economic and Social History*, Baltimore: Johns Hopkins University Press.

Goose, N. (2006), "Farm service, seasonal unemployment and casual labour in mid nineteenth-century England", *Agricultural History Review* 54, II, pp. 274-303.

Griffiths, L. (2004), “Farming to the Halves: A new perspective on an absurd and miserable system,” Rural History Today 6, p. 5-6.

Gritt, A.J. (2002), “The ‘Survival’ of Service in the English Agricultural Labour Force: Lessons from Lancashire, C. 1650-1851,” Agricultural History Review 50, pp. 25-50.

Habakkuk, H.J. (1962), *American and British Technology in the Nineteenth Century*. London: Cambridge University Press.

Hatcher, J. (2019), “Seven Centuries of Unreal Wages,” in J. Hatcher and J.Z. Stephenson (eds.): *Seven Centuries of Unreal Wages: The Unreliable Data, Sources and Methods that have been used for Measuring Standards of Living in the Past*, Basingstoke: Palgrave Macmillan, pp. 15-69.

Hatcher, J., and J.Z. Stephenson (2019): *Seven Centuries of Unreal Wages: The Unreliable Data, Sources and Methods that have been used for Measuring Standards of Living in the Past*, Basingstoke: Palgrave Macmillan, pp. 15-69.

Hatton, Timothy, and Jeffrey Williamson (1991), “Unemployment, employment contracts, and compensating wage differentials: Michigan in the 1890s,” *Journal of Economic History* 51, pp. 605-632.

Heywood, C. (2002), *Childhood in Nineteenth-Century France: Work, Health and Education Among the 'Classes Populaires'*, Cambridge: Cambridge University Press.

Howkins, A., and N. Verdon (2008), “Adaptable and Sustainable? Male Farm Service and the Agricultural Labour Force in Midland and Southern England, c.1850-1925,” *Economic History Review* 61, pp. 467-495.

Horrell, S.; J. Humphries; and J. Weisdorf (2019), “Working for a living? Women and children's labour inputs in England, 1260-1850,” Oxford Economic and Social History Working Paper No 172.

Humphries, J. (2013), "The lure of aggregates and the pitfalls of the patriarchal perspective: a critique of the high wage economy interpretation of the British industrial revolution," *Economic History Review* 66, pp. 693-714.

Humphries, J., and J. Weisdorf (2015), "The Wages of Women in England, 1260-1850," *Journal of Economic History* 75, pp. 405-447.

Humphries, J., and B. Schneider (2019), "Spinning the Industrial Revolution," *Economic History Review* 72, pp. 126-155.

Humphries, J., and J. Weisdorf (2019), "Unreal Wages? Real Income and Economic Growth in England, 1260-1850," *Economic Journal* 129, pp. 2867-2887.

Kelly, M.; J. Mokyr; and C. Ó Gráda (2014), "Precocious Albion: A New Interpretation of the British Industrial Revolution," *Annual Review of Economics* 6, pp. 363-389.

Maas, I., and M. H. D. van Leeuwen (2011), *HISCLASS: a historical international social class scheme*, Leuven: Leuven University Press.

Malanima, P. (2003), "Measuring the Italian economy. 1300-1861," *Rivista di Storia Economica* 19, 265-296. Price data were retrieved online on 11 July 2019 from: http://www.paolomalanima.it/.

Malanima, P. (2013), "When did England overtake Italy? Medieval and Early Modern Divergence in Wages and Prices," *European Economic History Review* 17, pp. 45-70.

Malinowski, M. (2016), "Little Divergence revisited: Polish weighted real wages in a European perspective, 1500–1800," *European Review of Economic History* 20, pp. 345-367.

Mocarelli L. (2019), "What Is Wrong with the History of Wages: Or the Divide in Economic History—A Reappraisal Suggested by Eighteenth-Century Milan", in J. Hatcher and J. Stephenson (eds.): *Seven Centuries of Unreal Wages*, Palgrave Studies in Economic History. Palgrave Macmillan, Cham.

Mokyr, J. (2001), "The rise and fall of the factory system: technology, firms, and households since the industrial revolution," *Carnegie-Rochester Conference Series on Public Policy* 55, pp. 1-45.

Nuvolari, A.; B. Verspagen, and N. von Tunzelmann (2011). "The Early Diffusion of the Steam Engine in Britain, 1700-1800. A Reappraisal." *Cliometrica* 5, pp. 291-321.

Petracchi, G. (2002), *Storia di Pistoia: Nell'età delle rivoluzioni, 1777-1940*, Volume 4, Firenze: Le Monnier.

Ridolfi, L. (2016), "Working Time," in *The French economy in the longue durée. A study on real wages, working days and economic performance from Louis IX to the Revolution (1250-1789),* Lucca: IMT School for Advanced Studies PhD Thesis (http://etheses.imtlucca.it/id/eprint/211).

Ridolfi, L. (2019), "Six Centuries of Real Wages in France from Louis IX to Napoleon III: 1250–1860," *Journal of Economic History* 79, pp. 589-627.

Rota, M, and J. Weisdorf (2019), "Expensive Labour and the Industrial Revolution: Evidence from Stable Employment in Rural Areas," Centre for Competitive Advantage in the Global Economy (CAGE) Working Paper No 442.

Rota, M, and J. Weisdorf (2020), "Italy and the *Little Divergence* in Wages and Prices: New Data, New Results," CEPR Discussion Paper DP14295.

Palma, N. (2016), "Money and modernization: Liquidity, specialization, and structural change in early modern England," EUI Working Papers MWP 2016/11.

Pollard, S. (1963), "Factory discipline in the industrial revolution," *Economic History Review* 16, pp. 254-271.

Santi, R. "Who are Servants? Defining Domestic Service in Western Europe (16th-21th Centuries)," in S. Pasleau and I. Schopp (eds.): *Proceedings of the 'Servant Project'*, vol. II, Liege: Editions de l'Universite de Liege, 2006, pp. 3-59.

Sella, D. (1997), *Italy in the seventeenth century,* London: Routledge.

Smith, A. (1776), *An Inquiry into the Nature and Causes of the Wealth of Nations*, London: W. Strahan and T. Cadell, London (reprinted in 1976).

Stephenson, J. (2018a), "Looking for work? Or looking for workers," *University of Oxford Discussion Papers in Economic and Social History* No 162.

Stephenson, J. (2018b), "'Real' wages? Contractors, workers, and pay in London building trades, 1650–1800," *Economic History Review* 71, pp. 106–132.

Strulik, H.; P. Sharp; and J. Weisdorf (2012), 'The determinants of Income in a Malthusian Equilibrium,' *Journal of Development Economics* 97, pp. 112-117.

Swenson, P. (1991), "Bringing Capital Back in, or Social Democracy Reconsidered: Employer Power, Cross-Class Alliances, and Centralization of Industrial Relations in Denmark and Sweden," *World Politics* 43, pp. 513-544.

Tann, J., and M. J. Breckin, (1978), "The International Diffusion of the Watt Engine, 1775-1825," *Economic History Review*, 31, pp. 541-564.

Voth, H.-J. (2000), *Time and Work in England 1750-1830*, Oxford: Oxford University Press.

Voth, H.-J. (2001), "The Longest years: new estimates of labour input in England, 1760-1830," *Journal of Economic History* 61, pp. 1065-82.

Appendix 1: Data Sources

The State Archives of Florence:

Canigiani: 191, 204, 206, 212, 223

Conti Ginori: 141, 143, 153, 154, 155, 156, 157, 159, 162, 164

Guidi: 202, 247

MSL: 32, 33, 35, 36, 38, 41, 42, 61, 64, 66, 81, 82, 84, 85, 89, 90

The State and Commune Archives of Pistoia:

Amati Cellesi: 294, 297, 318, 405

CG Rinuccini: 126, 249, 258

Ganucci Cancellieri: 191, 212, 223, 238, 242, 254, 256

Gherardi Badioli: 70

OC SR: XXIV 5

OC: 67, 356, 365, 377, 392, 393, 435, 388, 398

Appendix 2: The Consumption Basket

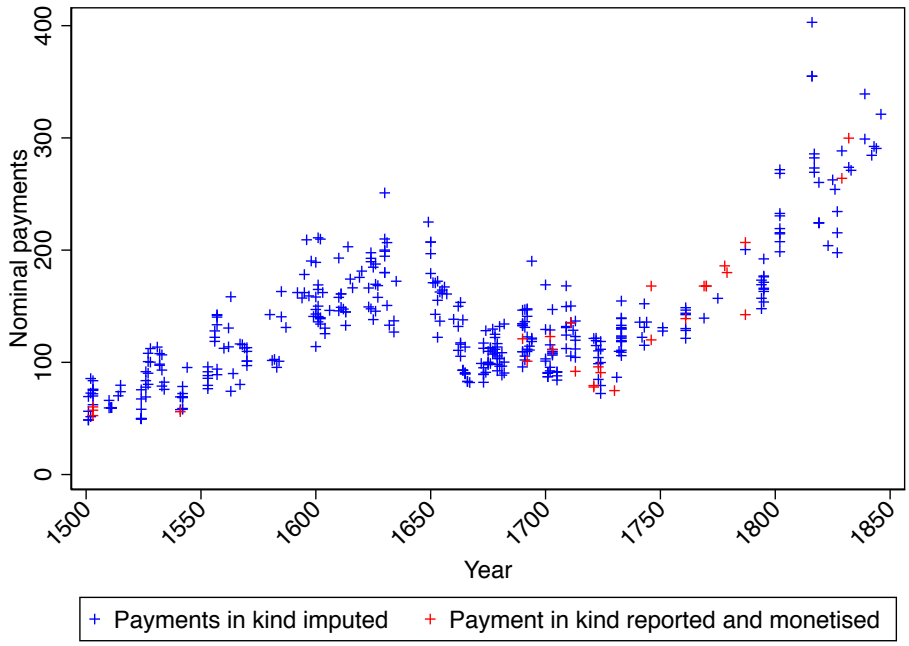
Table A2: The *respectability* basket for England and Italy

	England			Italy		
Food:	*Amount*	*Unit*	*Calories/day*	*Amount*	*Unit*	*Calories/day*
Bread	*200*	*kg*	*1,315*	*200*	*kg*	*1,315*
Rye	130	litres	784	26	kg	784
Maize				(120)	(litres)	(789)
Meat	15	kg	82	15	Kg	82
Eggs	40	units	7	40	Units	7
Butter	6	kg	123			
Oil				5	Kg	123
Wine				150	litres	288
Beer	210	litres	230			
Total calories			2,541			2,599
Non-food:	*Amount*	*Unit*	*Mill. BTU/year*	*Amount*	*Unit*	*Mill. BTU/year*
Linen	5	meters		5	meters	
Firewood						3,000
Charcoal			6,000			

Note: Maize, according to Malanima (2013), replaces rye in the Italian basket from 1700 onwards. MBTU is million British thermal units. *Source*: Malanima (2013, Table 2).

Appendix 3: Monetisation of Payments in Kind

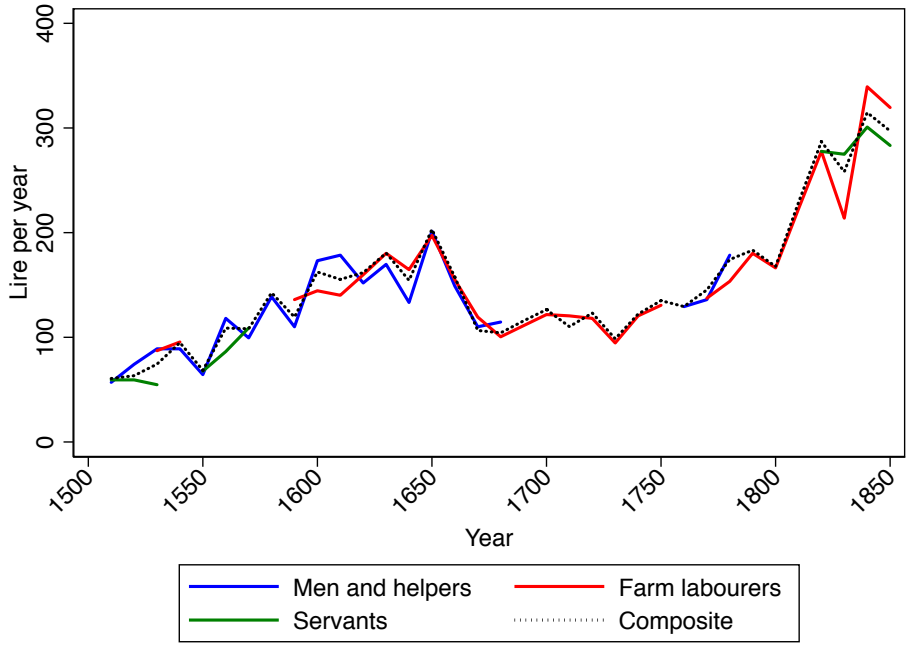
Figure A3: Nominal payments with in-kinds either imputed or observed and monetised



Notes: The symbol '+' represents individual nominal payments. Red marks concern remunerations in the cases where the account books specified the payments in kind, which meant they could be monetized either by us using historical prices or they were monetised by the employer in the source. *Sources*: see the text and Appendix 1. Historical prices: Allen (2001) and Malanima (2003).

Appendix 4: Incomes Estimated by Regression

Figure A4: Annual nominal incomes of servants, farm labour, and men and helpers, 1500-1850



Notes: The lines connect incomes predicted by the regression exercise explained in the text. *Sources*: see Appendix 1.

Table A4: Regression coefficients

Man or helper	0.13***	Florence area	0.12***
	-0.03		-0.03
Farm labourer	0.16***	Pistoia area	REF
	-0.03		
Domestic serv.	REF		
1500-10	-1.52***	1680-90	-1.10***
	-0.09		-0.09
1510-20	-1.44***	1690-1700	-1.02***
	-0.10		-0.09
1520-30	-1.42***	1700-10	-1.09***
	-0.09		-0.09
1530-40	-1.284***	1710-20	-1.03***
	-0.10		-0.10
1540-50	-1.38***	1720-30	-1.26***
	-0.10		-0.09
1550-60	-1.04***	1730-40	-0.92***
	-0.09		-0.09
1560-70	0.00	1740-50	-0.81***
	0.00		-0.10
1570-80	-0.98***	1750-60	-0.82***
	-0.09		-0.15
1580-90	-0.85***	1760-70	-0.74***
	-0.18		-0.09
1590-1600	-0.93***	1770-80	-0.67***
	-0.11		-0.12
1600-10	-0.75***	1780-90	-0.52***
	-0.09		-0.13
1610-20	-0.80***	1790-1800	-0.68***
	-0.09		-0.10
1620-30	-0.75***	1800-10	-0.42***
	-0.10		-0.10
1630-40	-0.60***	1810-20	-0.06***
	-0.09		-0.09
1640-50	-0.80***	1820-30	-0.22**
	-0.11		-0.10
1650-60	-0.53***	1830-40	0.06
	-0.11		-0.10
1660-70	-0.78***	1840-50	REF
	-0.09		
Constant	5.56	Observations	439
	-0.08	R^2	0.86

Robust standard errors in parentheses:
*** p<0.01, ** p<0.05, * p<0.1

Appendix 5: Income by Decade

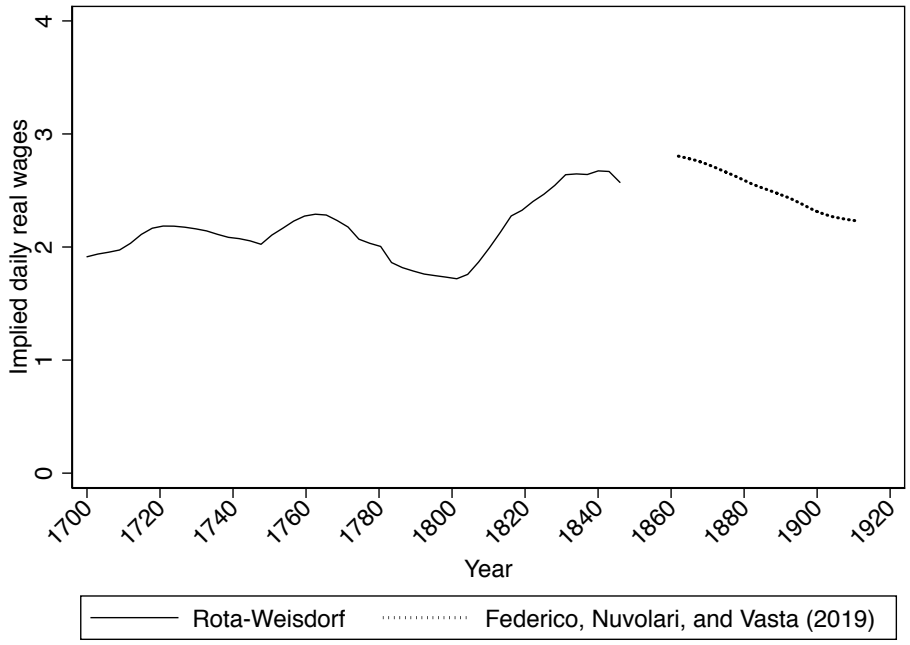
Table A5: Nominal and real income, by decade, 1500-1850

	Nominal income			*Real income*		
Decade	*Total*	*Cash*	*Kind*	*Italy*	*England*	*Freq*
1500-10	65	21	44	1.48	2.20	19
1510-20	63	20	44	1.45	1.96	12
1520-30	74	20	54	1.38	2.14	19
1530-40	95	26	69	1.38	2.07	9
1540-50	68	20	48	1.41	2.02	11
1550-60	109	38	71	1.54	2.14	16
1560-70	108	27	81	1.33	2.07	14
1570-80	143	52	91	1.57	1.67	1
1580-90	119	30	90	1.33	1.61	7
1590-1600	162	52	111	1.47	1.57	13
1600-10	155	33	123	1.27	1.67	18
1610-20	162	50	112	1.44	1.61	12
1620-30	181	53	127	1.42	1.56	20
1630-40	154	41	113	1.37	1.48	6
1640-50	203	65	138	1.47	1.49	5
1650-60	156	55	101	1.55	1.73	13
1660-70	107	17	89	1.20	1.72	19
1670-80	107	21	86	1.24	1.95	32
1680-90	116	32	83	1.39	1.87	15
1690-1700	126	37	89	1.42	1.87	22
1700-10	110	23	88	1.26	2.33	27
1710-20	123	41	82	1.50	2.50	12
1720-30	99	34	65	1.53	2.48	18
1730-40	122	38	84	1.45	2.57	19
1740-50	135	40	95	1.42	2.59	8
1750-60	129	19	111	1.17	2.81	2
1760-70	145	54	92	1.59	2.71	12
1770-80	174	36	139	1.26	2.93	3
1780-90	183	54	130	1.41	3.25	3
1790-1800	168	24	144	1.17	3.02	12
1800-10	229	37	192	1.19	3.21	9
1810-20	287	90	197	1.46	3.13	11
1820-30	258	106	152	1.70	3.70	8
1830-40	297	133	163	1.82	3.98	5
1840-50	297	127	170	1.75	4.32	4

Sources: Italian nominal data: see Appendix 1. Annual costs of the *respectability* basket for Italy based on: Malanima (2013, Statistical Appendix). English real annual payments: Humphries and Weisdorf (2019, Table A1).

Appendix 6: Tuscan wages before and after Italy's unification

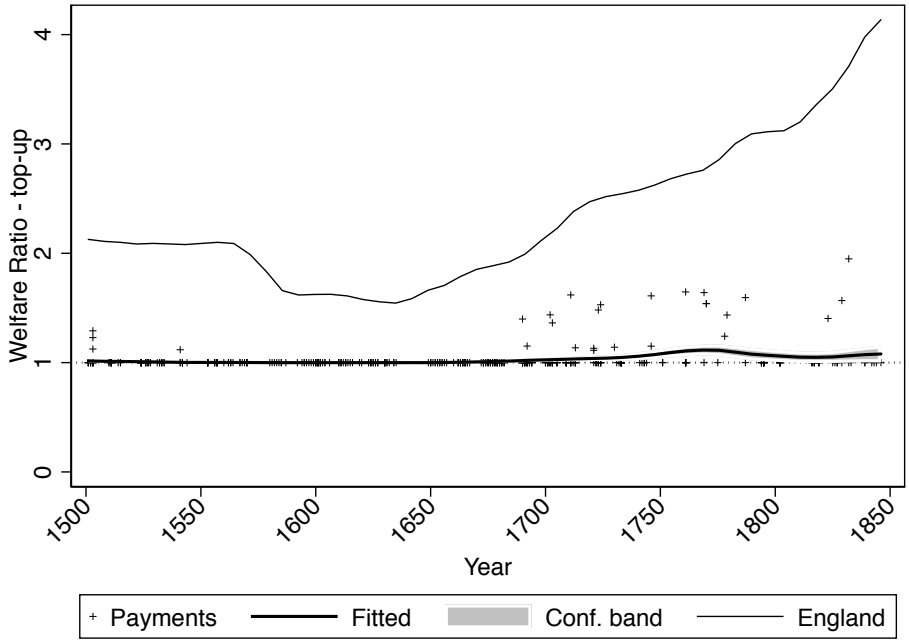
Figure A6: Tuscan real wages before and after Italy's unification, 1700-1913



Notes: Polynomial fitted lines made using *lpoly* in Stata/IC15. *Sources*: Before the unification: see Appendix 1. After the unification: Federico, Nuvolari, and Vasta (2019, supplementary material: Firenze).

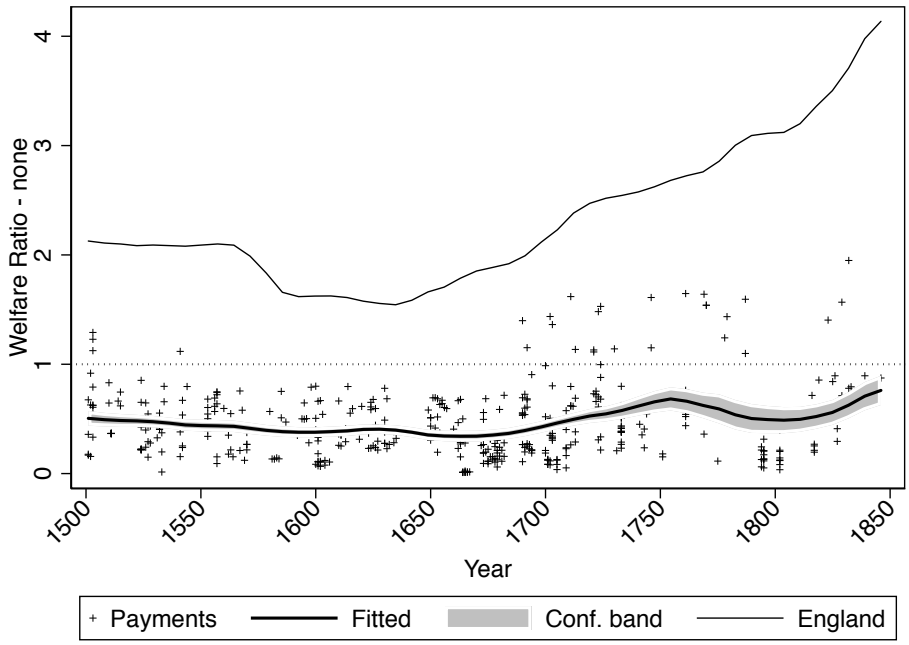
Appendix 7: Robustness Checks

Figure A7, Panel A: Topping workers' wages up to reach the *respectability* standard, 1500-1850



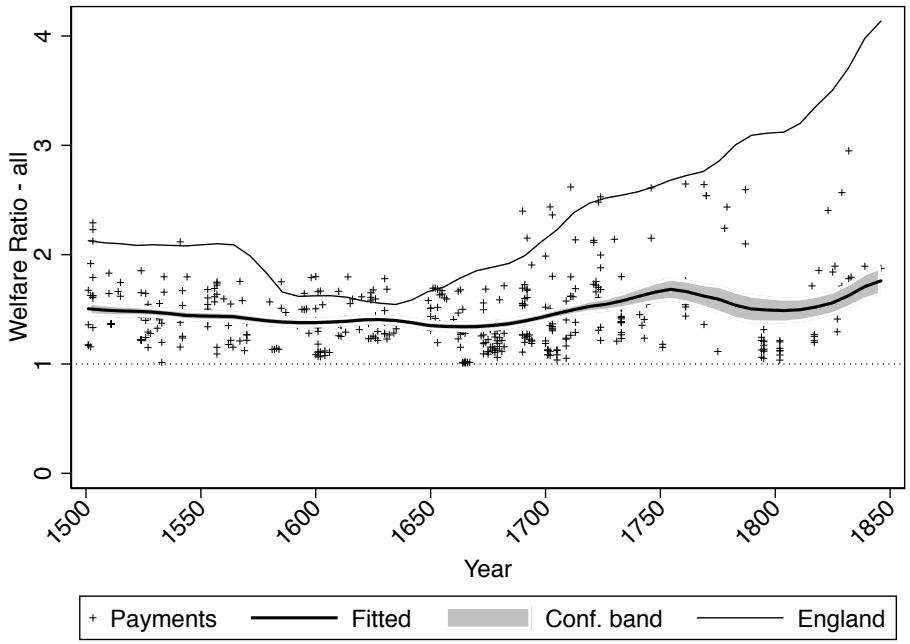
Notes: Welfare ratios are computed by dividing the annual nominal wage rates by the annual costs of Malanima's *respectability* basket. The symbol '+' represents individual payments. The polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Sources*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019).

Figure A7, Panel B: Real annual earnings *without* imputing workers, 1500-1850



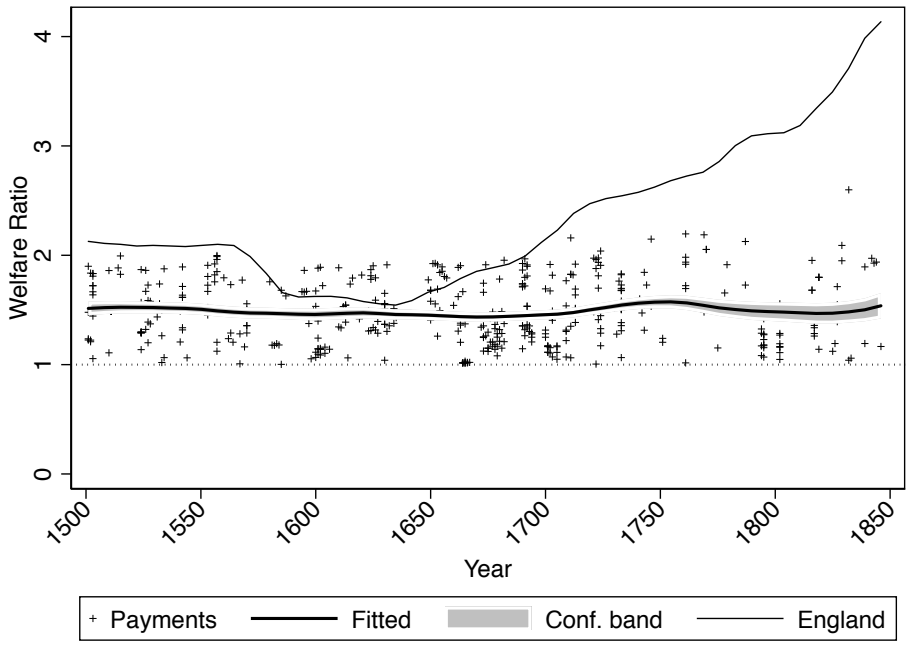
Notes: Welfare ratios are computed by dividing the annual nominal wage rates by the annual costs of Malanima's *respectability* basket. The symbol '+' represents individual payments. The polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Sources*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019).

Figure A7, Panel C: Real annual earnings imputing *all* workers, 1500-1850



Notes: Welfare ratios are computed by dividing the annual nominal wage rates by the annual costs of Malanima's *respectability* basket. The symbol '+' represents individual payments. The polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Sources*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019).

Figure A7, Panel D: Cutting Malanima's urban cost-of-living by 25 per cent, 1500-1850



Notes: Welfare ratios are computed by dividing the annual nominal wage rates by 75 per cent of the annual costs of Malanima's *respectability* basket. The symbol '+' represents individual payments. The polynomial fitted lines are made using *lpolyci* in Stata/IC15. *Sources*: Italian wage rates: see Appendix 1. English wage rates: Humphries and Weisdorf (2019). Annual costs of Malanima's *respectability* basket for Italy: Malanima (2013).costs of Malanima's *respectability* basket for Italy: Malanima (2013).