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Italy's long-term economic performance: GDP estimates from 1300 to 1861

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Twitter: We estimate GDP per capita for Italy and its main areas from 1328 to 1861 with a demand-side approach. Italy remained relatively rich until the early nineteenth century. We find a slow motion long-term divergence between Centre-North and South.

Two sentence summary: We estimate Italian GDP per capita from 1328 to 1861 with a demand-side approach. We find a long-term slow decline, with wide fluctuations and a growing North–South gap.

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Abstract

We present new demand-side estimates of gross domestic product (GDP) per capita for Italy and its two macro-areas, Centre-North and South, for the pre-industrial period (1328–1861) on the basis of a novel dataset including almost 100,000 observations from 169 different locations. Our estimates confirm the chronology of the 'Little Divergence' relative to the Netherlands and England. Italy maintained its leading position relative to the other European countries and was overtaken by France and Germany only in the first half of the nineteenth century. GDP per capita trends differed between Centre-North and South determining a 'slow-motion' divergence of the South from the fifteenth century to political unification.

KEYWORDS
Demand-side approach, GDP per capita, Italy, regional divergence

JEL CLASSIFICATION
N13, E01

In the last 20 years, economic historians have been pushing their quantitative gaze in the previously uncharted territories of medieval and early modern estimations of GDP per capita. The seminal paper by Allen[1] argued that Europe from 1500 to 1750 experienced a 'Little Divergence', with the North Sea region 'forging ahead' vis-à-vis Southern Europe.[2] Centre-North Italy plays a key role in this narrative, as the prime example of divergence. It is deemed to have been the richest European region, and most likely of the world, during the Middle Ages, although constituted by different polities. By the early nineteenth century, it had slid well down in the European ranking of development.

The relative decline of Centre-North, after its 'golden age' stretching from the Middle Ages to the Renaissance, has been a subject of a lively debate amongst economic historians even before the concept of the 'Little Divergence' emerged. In the literature, it is possible to distinguish four major interpretations as to the causes of the Italian divergence, related respectively to: (i) the opening of the new trade routes in the Atlantic;[3] (ii) institutional rigidities coupled with the increasing competition from North-Western Europe;[4] (iii) the epidemic waves of the seventeenth century;[5] and (iv) the tighter Malthusian pressures of the eighteenth century.[6]

In the debate on the economic decline of the peninsula, less attention has been devoted to the historical experience of Southern Italy. In this case, one can single out two main interpretative strands. Long-lived conventional wisdom considered the Southern economy as characterized by stagnation or decline since the Middle Ages. This poor performance has been ascribed to a combination of institutional factors and exploitative trade links with the Centre-North of Italy.[7] This view has been challenged by revisionist accounts pointing to a positive economic performance driven by market integration and institutional reforms during the fourteenth and fifteenth centuries, both in Sicily and in the Kingdom of Naples.[8]

In most of this literature, economic performance was typically gauged by means of qualitative evidence, and when possible, supplemented by limited quantitative indicators on the basis of fragmented sectoral data and other proxies such as demographic movements.

The game-changer in this long debate has been the publication of the pioneering demand-side estimates of GDP by Malanima for the Centre-North of Italy from 1310 to 1861.[9] These estimates do not cover the South of Italy, which accounted for about two-fifths of the Italian population and are obtained by splicing together price and wage series for Florence before the 1600s and Milan thereafter. Recently, Malanima has extended the geographical coverage of his GDP per capita estimates to the entire Italian peninsula, although for a shorter span of time (1660–1861), confirming his

[1] Allen, 'The great divergence'.

[2] Fouquet and Broadberry, 'Seven centuries'; de Pleijt and Van Zanden, 'Accounting for the "Little Divergence"'. Allen originally used the term 'Great Divergence', but in the subsequent literature it has become common to use the term 'Little Divergence' to distinguish the different patterns of growth of the European countries from the notion of 'Great Divergence' between Europe and China introduced by Pomeranz, *The Great Divergence*.

[3] See Rapp, *Industry and economic decline* for a survey; Acemoglu, Johnson, and Robinson, 'The rise of Europe'.

[4] Cipolla, 'The decline of Italy'; Cipolla, 'The economic decline of Italy'.

[5] Alfani, *Calamities and the Economy*; Alfani and Percoco, 'Plague and long-term development'.

[6] Malanima 'The long decline'; Malanima, *The Economy of Renaissance*.

[7] Doren, *Storia economica dell'Italia*; Luzzatto, *Storia economica d'Italia*; Galasso, 'Considerazioni intorno'; Galasso, *Mezzogiorno medievale e moderno*; Bresc, *Un monde méditerranéen*; Aymard, 'La transizione'; Aymard, 'La fragilità'.

[8] Epstein, *An island for itself*; Sakellariou, *Southern Italy*.

[9] Malanima 'The long decline'.

previous results.[10] Chilosi and Ciccarelli get different results.[11] According to their estimates, Italian GDP per capita rose, rather than decreased, in the fifteenth century and stagnated from 1500 to the unification in 1861, as the outcome of a combination of a slight decline in the Centre-North and of an unexpected convergence of the Southern regions towards the Centre-North beginning in the early 1700s.

We deem that these new estimates are not sufficient to settle the issue of the Italian performance in the long run. The most recent Malanima series covers only two centuries and does not consider the Black Death and the phase of Italian economic leadership during the fourteenth and fifteenth centuries.[12] Chilosi and Ciccarelli estimate gross domestic product (GDP) per capita for selected benchmark years, and thus can identify only long-term trends.[13] They implement, with modifications, the general equilibrium model by Groth and Persson, which does not give any role to relative prices in shaping demand and supply and does not consider short-term adjustments in the labour markets between agricultural, industry, and services.[14]

This paper presents a new series of GDP per capita for Italy from 1328 to 1861 as a population-weighted average of 11 regional series, 7 in the Centre-North and 4 in the South.[15] This detailed regional coverage represents a substantial improvement in comparison with previous works. In the case of Italy, there are no suitable data on output (for a production-side estimate), nor on rents/profits (for an income-side estimate). Therefore, we adopt the demand-side approach, which allows us to produce fine-grained annual estimates.[16] We have collected price and wage observations from extensive archival research in Firenze, Napoli, Venezia, Milano, and several other locations in Sicilia, Piemonte, Veneto, and Sardegna. We have complemented missing data with a wide-ranging sifting of the secondary literature for local price and wage series, and we have filled the remaining gaps with a regression-based method, maximizing coverage in time and space. We have also introduced some relevant methodological improvements in the estimate of real wages, considering variations in working days and possible differences in trends between city and countryside and between skilled and unskilled workers. Finally, by means of a comprehensive purchasing power parity (PPP) comparison with England in 1850, we have converted our output indexes into 1990 Geary–Khamis dollars.

Our estimates allow us to provide a new original characterization of the long-term evolution of the Italian economy before industrialization. First, we find that, after its historical peak in the

[10] Malanima, *The Economy of Renaissance*.

[11] Chilosi and Ciccarelli, 'Smithian growth'.

[12] Malanima, *The Economy of Renaissance*.

[13] Chilosi and Ciccarelli, 'Smithian growth'.

[14] Groth and Persson, 'Growth or stagnation'.

[15] The seven Centre-North regions are Piemonte, Lombardia, Liguria, Veneto, Toscana, Emilia, and Lazio, whilst the Southern regions are Campania, Puglia, Sicilia, and Sardegna.

[16] The demand-side approach has been effectively adopted for constructing estimates of GDP per capita in different historical contexts: Centre-North Italy by Malanima, 'The long decline'; England by Nuvolari and Ricci, 'Economic Growth'; France by Ridolfi and Nuvolari, 'L'histoire immobile?'; Germany by Pfister, 'Economic growth'; India by Broadberry, Custodis, and Gupta, 'India and the great divergence'; Latin America by Arroyo Abad and van Zanden, 'Growth under extractive institutions'; Portugal by Palma and Reis, 'From convergence to divergence'; Spain by Alvarez Nogal and Prados de la Escosura, 'The rise and fall of Spain' and by Prados de la Escosura, Álvarez-Nogal, and Santiago-Caballero, 'Growth recurring'; Sweden by Schön and Krantz, 'The Swedish economy' and by Krantz, 'Swedish GDP'. For a methodological appraisal of historical GDP estimates, see van Zanden and Bolt, 'Two concerns' and Bolt and van Zanden, 'Maddison style estimates … 2023'.

early fifteenth century, GDP per capita in Italy featured a slow decline until the unification of the country in 1861. Second, we show that this aggregate outcome is the result of different behaviours of the two macro-areas of the peninsula, with the Centre-North generally faring better than the South, determining an increasing 'slow-motion' divergence over a period of more than 500 years. In particular, our estimates point to a Malthusian cycle following the Black Death, which is common to both macro-areas. Thereafter, the Centre-North experienced a phase of growth or 'resilience', stretching from the mid-sixteenth century to the beginning of the eighteenth century, whilst the South stagnated and declined. Afterwards, both macro-areas experienced a lasting downward trend up to the political unification.

We introduce our enhanced version of the demand-side approach in the next section, and we discuss its implementation with the available sources in section 3. In section 4, we present our new series of GDP per capita for Italy, Centre-North, and South, and we single out the main turning points with an econometric approach. Then, in section 5 we compare the results with the previous estimates of the Italian GDP per capita and with the available series for other European countries, dating more precisely the 'Little Divergence'. Finally, in section 6, we use our series to assess the plausibility of the alternative interpretations of Italian economic performance. Section 7 concludes.

I | COMPUTING GDP FROM THE DEMAND SIDE: A METHODOLOGICAL OVERVIEW

The key building block of the demand-side approach is the estimate of agricultural production by means of a consumption function, where income is proxied by an index of real wages.[17] Whilst most GDP estimates carried out using the demand-side method adopt a coarse representation of the labour market using only one or two types of workers, in this paper, following Federico, Nuvolari, and Vasta, we provide a more sophisticated characterization distinguishing workers by sectors and skills.[18] We start from nominal daily wages in grams of silver for male urban unskilled workers W_u^N, and we assume that skilled workers received a skill premium (τ), whilst countryside workers earned ψ times the urban ones, with $\psi < 1$– that is, they were paid less than urban ones. This urban/rural gap was the combination of three factors. First, urban and farmgate prices for agricultural commodities could differ by the amount of transaction costs even if the commodity market was perfectly integrated. Second, urban wages had to be higher to compensate for the disamenities of urban life, including the risk of unemployment à la Harris–Todaro,[19] and third, the labour market might have been poorly integrated (e.g. for imperfect information or restriction to access to some occupations), implying a welfare penalty for countryside inhabitants.

We assume that the skill premium and the urban/rural gap were independent – that is, that τ was equal for city and countryside and that ψ applied to all countryside workers. Under these

[17] For two early contributions estimating agricultural output using the demand-side approach, see Allen, 'Economic structure' and Federico and Malanima, 'Progress, decline, growth'. For a general overview of historical national accounting methods, see Broadberry, 'The Industrial Revolution'. A crucial assumption of the demand-side approach is that the dynamics of real wages is a plausible proxy for overall income. In the literature, the contributions by Alvarez Nogal and Prados de la Escosura, 'The rise and fall of Spain', Palma and Reis, 'From convergence to divergence' and Pfister, 'Economic growth' adopt a more sophisticated approach by proxying income using a fixed weighted average of wages (0.75) and rents (0.25). Unfortunately, for Italy there are not suitable estimates for rents, neither at national nor a regional level, that can be used for this purpose.

[18] Federico, Nuvolari, and Vasta, 'Inequality in pre-industrial Europe'.

[19] Harris and Todaro, 'Migration'.

assumptions, workers can be divided into four categories: urban unskilled (accounting for a share α of the total workforce), urban skilled (β), rural skilled (γ), and rural unskilled (ω), computing the last one as residual ($\omega = 1 - \alpha - \beta - \gamma$). It would be straightforward to add other categories of workers, each with a specific adjustment coefficient. For instance, one could add women with a gender wage gap or annual workers, with a discount relative to casual workers, reflecting the lower risk of unemployment.[20] We avoid multiplying categories for practical reasons. We have very few data on wages for these further categories and on their share on the workforce. Thus, we implicitly assume that the wage gaps between the covered and omitted categories and the share of these latter on total workforce remained constant over time.[21] With these hypotheses, the economy-wide daily nominal wage (W^N) is the weighted average of wages of the four categories of workers:

$$W^N = \alpha \cdot W_u^N + \beta \cdot W_u^N \cdot \tau + \gamma \cdot W_u^N \cdot \tau \cdot \psi + \omega \cdot W_u^N \cdot \psi \tag{1}$$

From Equation (1) it is possible to extract three aggregate series which will be useful for computation and interpretation: the economy-wide returns to skills (τ^{TOT}), the total urban/rural gap (ψ^{TOT}), and the average wage for agricultural workers (W_A^N). The returns to skills can be computed as the ratio of the total wages of skilled workers, in cities and in the countryside, to the total wages of unskilled workers:

$$\tau^{TOT} = \left[\frac{W_u^N \cdot \tau \cdot (\beta + \gamma \cdot \psi)}{W_u^N \cdot (\alpha + \omega \cdot \psi)}\right] = \frac{\tau \cdot (\beta + \gamma \cdot \psi)}{(\alpha + \omega \cdot \psi)} \tag{2}$$

Likewise, the aggregate urban/rural gap is:

$$\psi^{TOT} = \left[\frac{W_u^N \cdot \psi \cdot (\omega + \gamma \cdot \tau)}{W_u^N + (\alpha + \beta \cdot \tau)}\right] = \frac{\psi \cdot (\omega + \gamma \cdot \tau)}{(\alpha + \beta \cdot \tau)} \tag{3}$$

Notably, the average wage for agricultural workers differs from the average wage in the countryside. On the one hand, a share ε of urban workforce was occupied in agricultural jobs, such as tending vegetable gardens or raising cows for milk. On the other hand, a percentage δ of unskilled countryside-dwellers worked in industry and services besides the skilled ones (γ). Thus, the total agricultural workforce can be written as the sum of its urban (first term) and rural (second term) component:

$$S_L^A = (\alpha + \beta) \cdot \varepsilon + \omega \cdot (1 - \delta) \tag{4}$$

We denote the shares of the two components on agricultural workforce as $\rho = (\alpha + \beta) \cdot \frac{\varepsilon}{S_L^A}$ and $(1 - \rho) = \omega \cdot \frac{(1-\delta)}{S_L^A}$, respectively, and we use them as weights to compute the wage in agricultural sector W_A^N:

$$W_A^N = \rho \cdot W_U^N + (1 - \rho) \cdot W_U^N \cdot \psi \tag{5}$$

[20] Federico, Nuvolari, and Vasta, 'Inequality in pre-industrial Europe'.

[21] de Pleijt and van Zanden, 'Two worlds' suggested a marked stability of the gender gap, with a 'Mediterranean norm' of 50%. Likewise, Rota and Weisdorf, 'Italy and the little divergence' argued that wages for annual workers in Tuscany were stable in the long run.

Note that Equation (5) does not feature the skill premium τ. In fact, we assume that all agricultural workers were unskilled because the concentration of main agricultural tasks (ploughing, harvesting, etc.) in short periods of time prevented specialization in any of them.

The next step is to convert the nominal daily wages into yearly real ones. To this aim, we multiply the daily wages by the average number of days of work, and we deflate the result with a consumer price index P:

$$W_R = \frac{W^N \cdot d}{P} \tag{6}$$

Then we estimate real agricultural consumption C_A as follows:

$$C_A = {W_R}^{\phi} \cdot {P_A}^{\eta} \cdot {P_M}^{\xi} \tag{7}$$

where ϕ is the income elasticity, P_A an index of food prices (with elasticity η), and P_M an index of manufactures prices (with cross elasticity ξ). Next, we transform consumption into agricultural value added (VA; Y_A) as:

$$Y_A = C_A + (X_A - M_A) + R_A - T_A \tag{8}$$

where $(X_A - M_A)$ is the net export of agricultural products, R_A is the production of agricultural raw materials, and T_A is the purchases from other sectors.

Economic historians have used different methods to compute total GDP given agricultural VA.[22] Here, following Ridolfi and Nuvolari, we divide the agricultural VA by the share of agriculture on GDP (S_A):[23]

$$Y = \frac{Y_A}{S_A} = \frac{Y_A}{\left(\frac{L_A}{L_{TOT}}\right) \cdot \left(\frac{\pi_A}{\pi_{TOT}}\right)} \tag{9}$$

This latter is obtained by adjusting trends in the share of employment (L) with changes in relative productivity (π), proxied by wages.

II | DATA AND METHODS

II.a | The database

We have collected information on wages and prices from new archival research and printed sources, respectively, for 169 and 186 locations (see appendix A 'Sources'). Figure 1 shows the geographical locations of our wage and price dataset as well as the boundaries of our regional coverage, which is a simplified version of the current Nomenclature of Territorial Units for

[22] For instance, Malanima, 'Before Modern Growth' uses the coefficient of a regression relating urbanization rate and GDP in Italy from 1861 to 1913, whilst Pfister, 'Economic growth' provides an estimate of the share of non-agriculture in GDP on the basis of estimates of the sectoral employment share.

[23] Ridolfi and Nuvolari, 'L'histoire immobile?'.

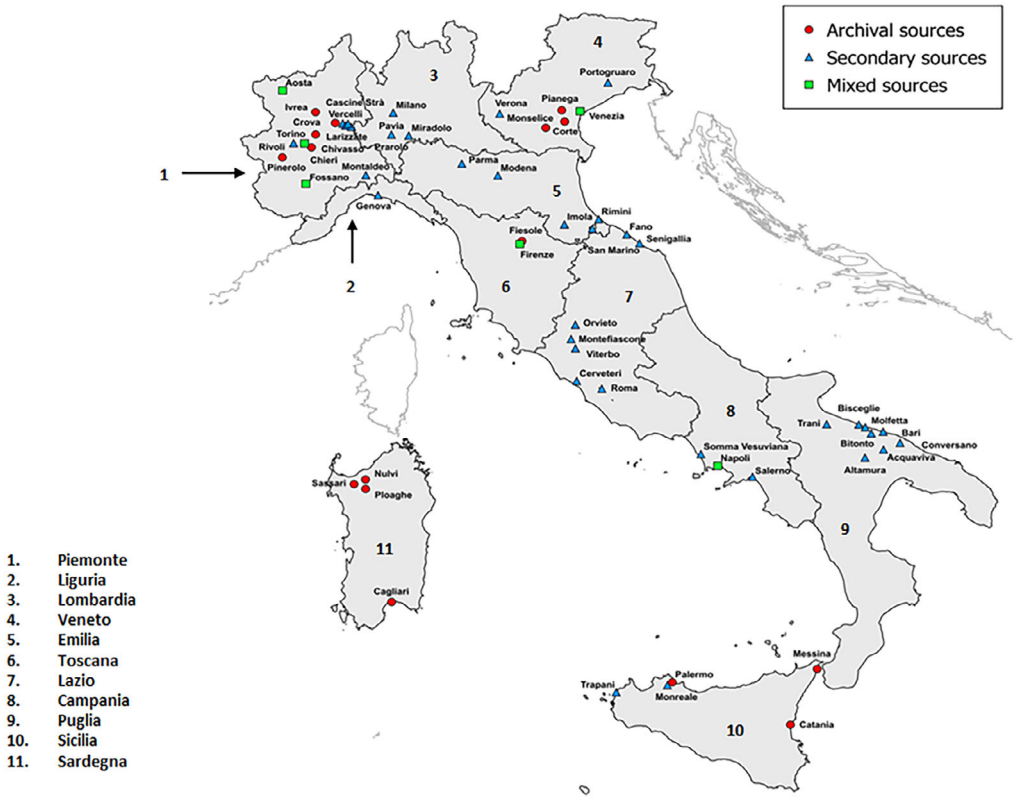

FIGURE 1 Geographical coverage of the wage and price dataset.

Note: The 11 regions are a simplified version of the current NUTS2 disaggregation. Piemonte includes Val d'Aosta, Veneto includes Friuli Venezia Giulia, Lazio includes Marche and Umbria, Campania includes Abruzzo and Molise, and Puglia includes Basilicata and Calabria. We omit Trentino-Alto Adige because our estimates are at 1911 borders. Regions 1–7 comprises the Centre-North macro-area and regions 8–11 the South macro-area.

Statistics (NUTS)2 disaggregation and comprises 11 regions, which are the basis for our estimates of the two macro-areas of the Centre-North and South.

The shapes and colours specify the type of sources: red circles for original archival research, blue triangles for secondary literature, and green squares for a mix of the two. The database has very good geographical coverage, which represents a significant improvement on previous works by Malanima.[24] As expected, most price and wage data were collected in cities (here defined as agglomerations of more than 5,000 inhabitants) but we have been able to find quite a few series of wages in the countryside from records of institutions such as the *Badia Fiesolana*, a medieval monastery located in the town of Fiesole close to Firenze. We have used a total of 43,950 observations for wages and 55,946 observations for series of prices of 14 commodities for the estimation.[25]

[24] Malanima 'The long decline'; Malanima, *The Economy of Renaissance*. In the former work on Centre-North, Malanima pieced together wage and price data for Firenze (1310–1605) and Milano (1605–1861), whilst in the latter, he used an unweighted average of series for Milano, Vercelli (Piemonte), Genova, Firenze, Napoli, and Bari from 1660 onwards.

[25] The database includes 10,965 observations for agricultural wages, 21,329 for building skilled wages, and 11,656 for building unskilled wages. We have collected 1,083 price observations for bread (plus 10,554 for wheat, which we convert in bread prices with an equation – see app. B 'Estimation of price and wage series'), 514 for maize, 3,007 for legumes (beans, etc.),

Table A1 in the appendix provides a detailed overview of the regional coverage of our sample both for prices and wages.

II.b | Wages

We estimate regional series of wages by aggregating the available observations with a regression approach pioneered by Autor and Katz and used in historical settings by Clark.[26] We run three separate wage regressions (Equation 10) for rural unskilled, urban unskilled, and skilled workers.

$$W_{it}^{N} = \alpha + \beta\, Year + \gamma\, Location + \delta\, Job + \theta\, Season + \varepsilon_{it} \quad (10)$$

where *Job* is a set of dummy variables that identify the specific occupation or task to which the wage quote refers (mason is the reference category for skilled urban workers, building labourer is the reference for unskilled urban workers, and agricultural labourer is the reference for unskilled rural workers) whilst *Location* and *Season* are sets of location and seasonal dummies (autumn, spring, summer, winter, NA). We interpolate the remaining gaps with a three-step procedure on the basis of neighbouring observations within the same macro-area (see appendix B 'Estimation of price and wages series' for details).

II.c | Prices

We estimate regional price series for 14 goods: wheat, bread, maize, legumes, meat, olive oil, butter, wine, textiles, candles, lamp oil, firewood, cheese, and eggs, for a total of 110 regressions.

$$P_{it} = \alpha + \beta\, Year + \gamma\, Location + \delta\, Quality + \varepsilon_{it} \quad (11)$$

where *Quality* is again a vector of dummy variables that identify the different types of goods (e.g. beef versus mutton for meat). When bread prices are not available, we estimate them from the coefficients of a bread equation, which we run for a panel of more than 1,000 matched pairs of wheat and bread prices. In appendix B 'Estimation of price and wages series', we show the results as well as comparisons of this model with alternative specifications and the standard bread equation by Allen.[27]

We estimate separate price indexes for all goods (P), agricultural goods (P_A), and manufactures (P_M). As standard in the literature on pre-industrial wages since the seminal paper by Allen (2001), we use a fixed-quantity Laspeyres price index, with a revised version of the barebones basket introduced by Federico, Nuvolari, and Vasta.[28] Following Allen, this basket provides 1,940 daily calories, and includes a minimum expenditure for heating, manufactures, and housing.[29] The basket features different items by regions and time (table 1 and appendix E '1850 benchmark').

6,782 for meat, 5,915 for olive oil, 952 for butter, 5,987 for wine, 3,385 for textiles products, 2,460 for candles, 5,915 for lamp oil, 2,527 for firewood, 3,828 for cheese, and 3,037 for eggs.

[26] Autor and Katz, 'Changes in the wage structure'; Clark, 'The condition'.

[27] Allen, 'The great divergence'.

[28] Federico, Nuvolari and Vasta, 'The origins'.

[29] Allen, 'The great divergence'.

TABLE 1 The structure of the consumer price index.

Consumer price index	Unit	Calories per unit	Quantity per person per year		
			No maize regions	Maize regions	High maize regions
Bread pre-maize	kg	2450	225.2	225.2	225.2
Bread post-maize (50 years after maize introduction)	kg	2450	225.2	112.6	43.7
Maize (50 years after its introduction)†	kg	3200	0	86.2	139
Legumes (beans, etc.)	Lt	1225	35	35	35
Meat	kg	2500	5	5	5
Olive oil	Lt	9000	5	0	0
Butter	kg	7286	0	6	6
Wine	Lt	850	70	70	70
Textile	M		5	5	5
Candles	kg		1.3	1.3	1.3
Lamp oil	Lt		1.41	1.41	1.41
Firewood	kg		365	547.5	547.5
Rent	% of total cost		5	5	5
Total calories	Per person/day	1940			

Notes: High maize regions: Lombardia and Veneto; maize regions: Piemonte and Emilia; no maize regions: Liguria, Toscana, Lazio, Campania, Puglia, and Sicilia. †On the basis of qualitative evidence, we assume that maize was introduced in Veneto around 1590, in Lombardia around 1630, in Piemonte *c*. 1680 and in Emilia around 1700. We assume that the consumption of maize increased linearly between the year of the introduction and 100 years after.
Sources: Author creation for basket based on Federico, Nuvolari and Vasta, 'The origins' and for calories per unit on Malanima, 'Cibo e povertà'.

People in the North consumed butter rather than olive oil as a source of fat and used more firewood than in the South, whilst maize partially replaced wheat as the staple cereal for workers in the North from the late sixteenth century onwards.[30] We model the maize diffusion as a linear increase lasting 100 years from the first available evidence of its introduction in the ordinary diet to the final levels of table 1. At the end of this process, maize accounted for 62.8 per cent of total calories in the 'high maize' regions and 39.0 per cent in the 'maize' regions.

Humphries argued that Allen's 1,940 calories basket was insufficient to meet the caloric needs of manual workers and suggests 2,500 as a more realistic figure.[31] Later, Allen seemed to concur. Thus, we have considered this issue in our estimate of the level of agricultural consumption (and hence of GDP per capita) in 1850 by using richer baskets for relatively more affluent social categories, such as farmers and skilled workers (see appendix E '1850 Benchmark').[32] In any case, the price indexes computed with different baskets are strongly correlated, and thus changing baskets would not affect sizeably the estimate of yearly series.[33]

[30] Messedaglia, *Il mais*; Cazzola, *L'introduzione del mais*.

[31] Humphries, 'The lure of aggregates'.

[32] Allen, 'The high wage economy'.

[33] For the ratio between manufacturing and agriculture prices, see fig. B3 in app. B 'Estimation of price and wage series'). For a full analysis of the real wages, see Cappelli, Ridolfi, and Vasta, 'Unveiling the Roots'.

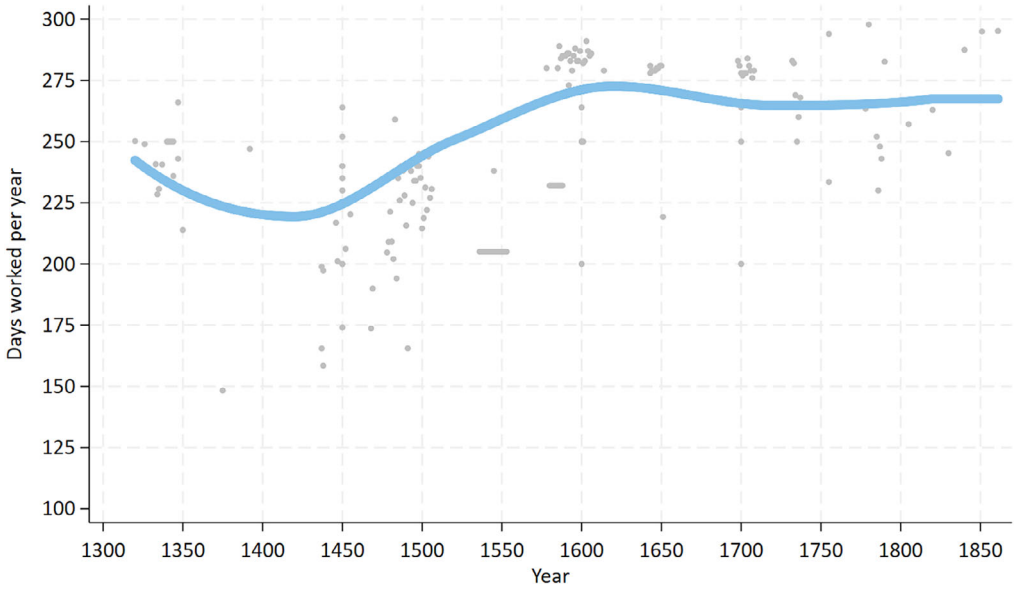

FIGURE 2 Working days in Italy.
Sources: See app. C 'Working days'.

II.d | Working days and occupational structure

The estimate of real wages (Equation 6) requires data on days worked per year (d) as well as the shares of skilled workers and agricultural workers in total employment. Information on working time is rare and often raises issues of interpretation and representativeness (Ridolfi 2023). Despite this paucity of evidence, we have been able to gather an original extensive database on working days, relying on archival data for construction workers employed in various building sites across the entire peninsula.[34] Notably, the sources used belong to institutions that typically did not allow workers to be active in more than one construction site. We obtain a panel of 183 observations, and we fit a pooled ordinary least squares (OLS) regression model:

$$d_{it} = \alpha + \beta\, PER + \gamma\, AREA + \varepsilon_{it} \tag{12}$$

where d indicates days worked per year, PER is a set of period dummies (100-year), and *AREA* stands for macro-area dummies (see appendix C 'Working days').

In figure 2, we plot the single observations and the resulting series of the number of working days, which seems consistent with the evolution in other countries such as France and England.[35]

[34] The most important archival sources that we used are the *Opera del Duomo* of Firenze from the fifteenth up to the nineteenth century (Ridolfi and Vasta, 'Reffici debet!') and the *Opera del Duomo* of Siena (Giorgi and Moscadelli, *Costruire una cattedrale*), and data from official sources of the 1870s (MAIC-DGA, *Relazione intorno alle condizioni*). We thank Franco Franceschi for providing us with data on this issue. For a critical discussion of the working days amongst construction workers in eighteenth-century London, see Stephenson, 'Working days in a London'.

[35] For France, see Ridolfi, 'The days they worked'; Maneuvrier-Hervieu and Chambru, 'Working Time', for England, Humphries and Weisdorf, 'Unreal Wages?'.

The computation of the aggregate index of real wages (Equation 1) needs yearly shares of the four categories of workers. As a preliminary step, we compute the regional shares of agricultural workers on urban (ε) and rural ($1-\delta$) workforce (Equation 4) with a population-weighted panel logit regression for three benchmark years (1800, *c*. 1850, and 1861):

$$S_L^A = \alpha + \beta\, U + \gamma\, Year + \delta\, Location + \varepsilon \tag{13}$$

where S_L^A is the share of agricultural employment by region and U is the urbanization rate. We retrieve the dependent variable from the collection of provincial censuses by Chilosi and Ciccarelli,[36] whilst we estimate the urbanization rates for the three benchmark years (see appendix D 'Population'). We retrieve the denominator (total population) from Alfani and Schifano and Mariella, Postigliola and Rota and the numerator (urban population) from the list of urban centres with populations of more than 5,000 inhabitants by Chilosi and Ciccarelli.[37] For the South, we exclude from the count of urban population the 'agro-towns' – that is, the quite common agglomerations of agricultural workers with little or no industrial and mercantile activities (Curtis 2013).[38] Then, we produce a series of urbanization rate over the whole period by interpolating and extrapolating backwards these benchmark estimates. Finally, we obtain a yearly regional series of the share of agricultural population by combining this series of the urbanization rate with the coefficients of the panel regression according to Equation (13). We then allocate the manpower in the four categories of Equation (1). As the first step, we estimate the shares of total skilled workers ($\beta+\gamma$) and the share of urban ones (β) from data by occupational categories in the 1861 Italian Census (MAIC 1864–5).[39] Then, we obtain by difference the share of rural skilled workers (γ), and we compute the share of urban unskilled workers (α) by subtracting the share of urban skilled workers from the total urban workforce. We thus can compute the share of rural unskilled workers (ω) as a residual. We also can calculate the parameters δ (share of agricultural workers in cities), ε (share of non-agricultural workers on unskilled countryside workforce), and ultimately the share of urban workers on agricultural manpower (ρ), which we need as weight in the computation of agricultural wages (Equation 5). This procedure yields regional occupational structures, in the city and the countryside, in the 1850s. We extrapolate them backwards to 1328 according to changes in the urbanization rate, as weights for our calculation of the real wages. Thus, our approach assumes that the relationship between urbanization rates and

[36] Chilosi and Ciccarelli, 'Smithian growth'.

[37] Alfani and Schifano, 'Population and Urbanization'; Mariella, Postigliola, and Rota, 'A reconstruction'; Chilosi and Ciccarelli, 'Smithian growth'.

[38] The inclusion of agro-towns in the numerator would bias upwards the share of industrial and services occupations. Thus, we classify as agro-towns agglomerations without significant manufacturing activities. We retrieve this information from late-eighteenth/early nineteenth-century dictionaries of cities in the Continental South (Giustiniani, *Dizionario Geografico*), in Sicilia (Sacco, *Dizionario Geografico*), and in Sardegna (Casalis, *Appendice. Dizionario geografico*). These sources distinguish cities (major urban centres with administrative tasks) from 'terre' (smaller centres without administrative tasks). We drop from the numerator a 'terra' if the source does not mention any industrial activity. For an alternative definition of agro-towns based on population size, see Alfani and Sardone, 'Long-term trends in income'.

[39] We compute the total skilled workforce as the sum of the 1861 Census categories '*possidenti*' (landowners and capitalists), liberal profession, civil service (including army and police), and '*culto*' (religious) plus a fifth of employees in industry and commerce (see Rapp, *Industry and economic decline*, p. 26 for the share of skilled workers in the whole industry in Venice around 1597). We get the number of urban skilled workers from the Census relative to the occupation in cities with more than 6,000 inhabitants. Thus, the resulting shares are not perfectly consistent with our estimate of agricultural workforce (S_L^A), which used a 5,000 threshold.

occupational structure in the nineteenth century holds for the entire period. Indeed, our method has a potential downward bias related to the diffusion of proto-industry in the seventeenth and eighteenth centuries. However, evidence on this phenomenon is largely anecdotal, suggesting different patterns across regions. Additionally, the bias on our estimate would be reduced (i) if rural workers substituted urban ones rather than increasing the total manufacturing workforce and/or (ii) if their skill premium was lower than the urban one.

II.e | GDP estimates

We start by assuming no purchase of inputs outside the agricultural sector, balanced trade in agricultural products, and implicitly, no production of raw materials and no purchase of inputs outside agriculture. In this way, agricultural output is equal to agricultural consumption ($Y_A = C_A$). However, when we estimate agricultural production in 1850, we explicitly consider the use of intermediate inputs, trade, and the production of raw materials (appendix E '1850 benchmark'). The difference between this more detailed estimate and our simplified one is rather small in 1850 and it is likely to have been even smaller in the early modern period, especially before the diffusion of silk production.[40] Accordingly, we can compute regional GDP per capita as agricultural VA divided by the share of agricultural VA (Equation 9). In our estimate of agricultural consumption (Equation 7), following Allen (2000), we assume the income elasticity (ϕ) to have been 0.5, the price elasticity for food (η) to be −0.6 and cross elasticity with manufactures (ξ) 0.1.[41]

The denominator in our estimation of Equation (9) is the product of the share of agricultural workers in the total workforce (appendix D 'Population') and their relative labour productivity (i.e. the ratio between labour productivity in agriculture and that of the entire economy). We obtain regional series of this latter by extrapolating backwards the levels of labour productivity in 1871 from Chiaiese (2024), with the movement of wages in building and agriculture from the MAIC-DGS (n.d.) for 1861–71, and from our wage series prior to 1861.

Finally, we aggregate our 11 series of regional GDP per capita in an 'Italian' estimate by weighting with the shares on total population (appendix D 'Population'), covering the period from 1328 to 1861 when the nationwide series of GDP per capita for unified Italy start (Baffigi 2011, Fenoaltea 2021).

II.f | Benchmark estimates of GDP in 1850 in 1990$

For international comparisons, we need to express our series in 1990 Geary–Khamis dollars, still the standard in economic history. In principle, we could link our nationwide series with the series for Italy in the Maddison project and compute the regional GDP by multiplying the regional ratios

[40] Federico, 'Le nuove stime'. Available estimates of trade of agricultural goods suggest that their weight on total GDP was very limited throughout the pre-industrial period. Indeed, according to Epstein, *An island for itself*, the share of exported grain in 1501 on total output for Sicily, the most export-oriented region in Italy in its historical peak, was less than 15%. Thus, considering that the share of cereals on gross output in 1891 was 24% (Federico, 'Una stima del valore aggiunto'), we can assume as an upper bound for the pre-industrial period a share of 40%. Following our estimates for 1850, agriculture accounted for 60% of the total GDP in Sicily. Hence, the contribution of agricultural export to GDP was about 3.6% ($0.15 \times 0.40 \times 0.60$).

[41] Reassuringly, fig. 7a shows that alternative sets of assumptions concerning the elasticities do not alter our results.

to the national one by Felice or Chiaiese for 1871.[42] However, we find this procedure not convincing for two reasons. First, the various releases of the Maddison project for the mid-nineteenth century report widely different estimates of GDP per capita for Italy according to the reference PPPs (1990$ or 2011$) and to the different regions covered.[43] Moreover, in all releases, the ratios of Italian to United States GDP are substantially higher than the estimates in 1872 prices by Ward and Deveraux.[44] (2021, table 4). This is not surprising since, as demonstrated by Prados de la Escosura, this method is affected by a severe index number problem arising from projecting a PPP-adjusted GDP level for 1990 backwards using quantity series calculated at constant domestic prices.[45] Second, the regional differences in 1871 might not be representative of the situation in 1861, as the post-unification policies might have affected differently the economies of pre-unification states.[46] Accordingly, we prefer to estimate Italian GDP in 1850 in 1990 Geary–Khamis dollars by linking it to the English one via a PPP comparison. First, we estimate nominal regional GDP per capita in 1849–51 in grams of silver (see appendix E '1850 Benchmark'). Second, we compute agricultural consumption as the sum of consumption of 11 social classes,[47] we add raw materials, we adjust for purchased inputs, and finally we divide by the agricultural share on GDP as in Equation (9). Then, following Broadberry and Korchmina, we compute a set of PPP exchange rates between Italian regional currencies and British pounds, using English price data from Clark, and consumption shares for working classes from Feinstein.[48] In this way, as presented in table 2, we obtain 11 regional ratios to England in 1850, which we can convert in Geary–Khamis 1990 dollars using the estimates of English GDP per capita in 1850.[49] On the one hand, this link once again raises concerns about the use of a 1990 PPP, but on the other hand, it is the most straightforward way for comparing our estimates in the international context. However, as a robustness check, we compare our 1850 PPP estimates in 1990 dollars with an alternative regression method introduced by Ridolfi and Nuvolari (2021), which is less affected by the previous issue since it simply aims to find a 'plausible' level for our estimate considering all the available estimates of other countries in the Maddison project. The intuition is that, in pre-industrial Europe, levels of economic development depended on the sectoral composition of the workforce (Allen 2009, pp. 16–21). Specifically, we run a panel fixed-effects regression model relating GDP per capita in 1990 dollars to the share of agricultural workers (S_L^A) from 1500 to 1850 for seven European countries (Belgium, England,

[42] Felice, 'Il Mezzogiorno fra storia'; Felice, 'The roots of a dual equilibrium'; Chiaiese, 'Provincial estimates'.

[43] The 2020 release of the Maddison project refers to the Centre-North only until 1871, using the yearly series by Malanima, 'The long decline', and to the whole of Italy afterwards, with data from Baffigi, 'Italian national accounts'. The 2023 release contains the new estimates by Chilosi and Ciccarelli, 'Smithian growth' for the whole country, featuring point estimates at 50-year intervals from 1451 to 1801 and a yearly series for 1801–61.

[44] Ward and Devereux, 'New income comparisons', tab. 4.

[45] Prados de la Escosura, 'International Comparisons'.

[46] Federico, 'The economics of Italian'.

[47] These are: urban unskilled non-agricultural workers, urban agricultural workers, rural agricultural workers, rural unskilled non-agricultural workers, farmers (sharecroppers, tenants, and small owners), skilled urban workers, skilled rural workers, urban middle-class, rural middle-class, landowners, and capitalists. See app. E '1850 Benchmark' for further details.

[48] Broadberry and Korchmina, 'Catching-up'; Clark, 'The price history'; Feinstein, 'Changes in nominal wages'.

[49] Bolt and Van Zanden, 'The Maddison project'. Our estimate of GDP per capita in Italian lire for 1850 corresponds to 85% and 88% of the estimates by Baffigi, 'Italian national accounts' and Fenoaltea, *Reconstructing the past*, respectively. For further discussion and robustness checks, see app. E '1850 Benchmark'.

TABLE 2 Estimates of Italian pre-unitary states as ratio to England in 1850.

Region	Currency	Nominal GDP per capita in grams of silver	Market exchange rate (*/£)	PPP exchange rate (*/£)	Ratio (PPP/ market rate)	GDP per capita in 1990$	Ratio regional GDP per capita to UK
Piemonte	*Lira piemontese*	1460	25.5	26.2	1.03	1364	0.48
Liguria	*Lira piemontese*	1979	25.5	25.7	1.01	1884	0.66
Lombardia	*Lira Milanese*	1588	36.0	36.7	1.02	1500	0.53
Veneto	*Lira veneziana*	1337	51.6	44.1	0.85	1502	0.53
Emilia	*Lira parmense*	1071	127.3	107.5	0.84	1220	0.43
Toscana	*Lira Fiorentina*	1347	30.1	26.3	0.87	1486	0.52
Lazio	*Baiocco*	1191	473.2	370.1	0.78	1464	0.52
Campania	*Carlino*	818	59.9	40.6	0.68	1161	0.41
Puglia	*Carlino*	593	59.9	36.1	0.60	946	0.33
Sicilia	*Tarì*	819	59.9	40.0	0.67	1181	0.42
Sardegna	*Lira piemontese*	665	25.5	15.9	0.62	1022	0.36
Italy		1134	–	–	–	1310	0.46

Sources: See text and app. E '1850 benchmark'. *Notes*: Since there was no common currency in Italy before 1861, the table does not contain PPP comparisons at the level of the whole country. The 11 regions are a simplified version of the current NUTS2 disaggregation. Piemonte includes Val d'Aosta, Veneto includes Friuli Venezia Giulia, Lazio includes Marche and Umbria, Campania includes Abruzzo and Molise, and Puglia includes Basilicata and Calabria. We omit Trentino-Alto Adige because our estimates are at 1911 borders.

France, Germany, the Netherlands, Portugal, and Spain):

$$Y = \alpha + \beta S_L^A + \gamma D_t + \varepsilon \tag{14}$$

where D_t is a year dummy for each cross section. As expected, we find a significant negative correlation between GDP per capita and the shares of workers employed in agriculture (appendix E '1850 Benchmark'). We then use the coefficients of this regression to estimate the GDP per capita in 1850 for each of the 11 regions using their shares of agricultural occupation. Encouragingly, the difference between the two methods is only 3 per cent for the entire peninsula (appendix E '1850 benchmark', table E12), exceeds 20 per cent only for Sardegna, and is below 5 per cent in 5 regions out of 11 (figure 3).

III | RESULTS

Figure 4 plots our yearly estimates of Italian GDP per capita and the corresponding series, smoothed with an Epanechnikov kernel.[50] The figure also shows the structural breaks identified by using the Bai–Perron test (see table 1,2 and the text below).[51] The series features an all-time peak in the early decades of the fifteenth century, a decline until the mid-sixteenth century, possibly exacerbated by the Italian wars (1494–1559), followed by a recovery in the seventeenth century and then a stagnation until around 1720. Thereafter, there is a sharp decline for the rest of the eighteenth century and trendless fluctuations during the first decades of the nineteenth century.

[50] Our yearly series are presented in the app. F 'GDP per capita and population series'.

[51] Bai and Perron, 'Critical values'.

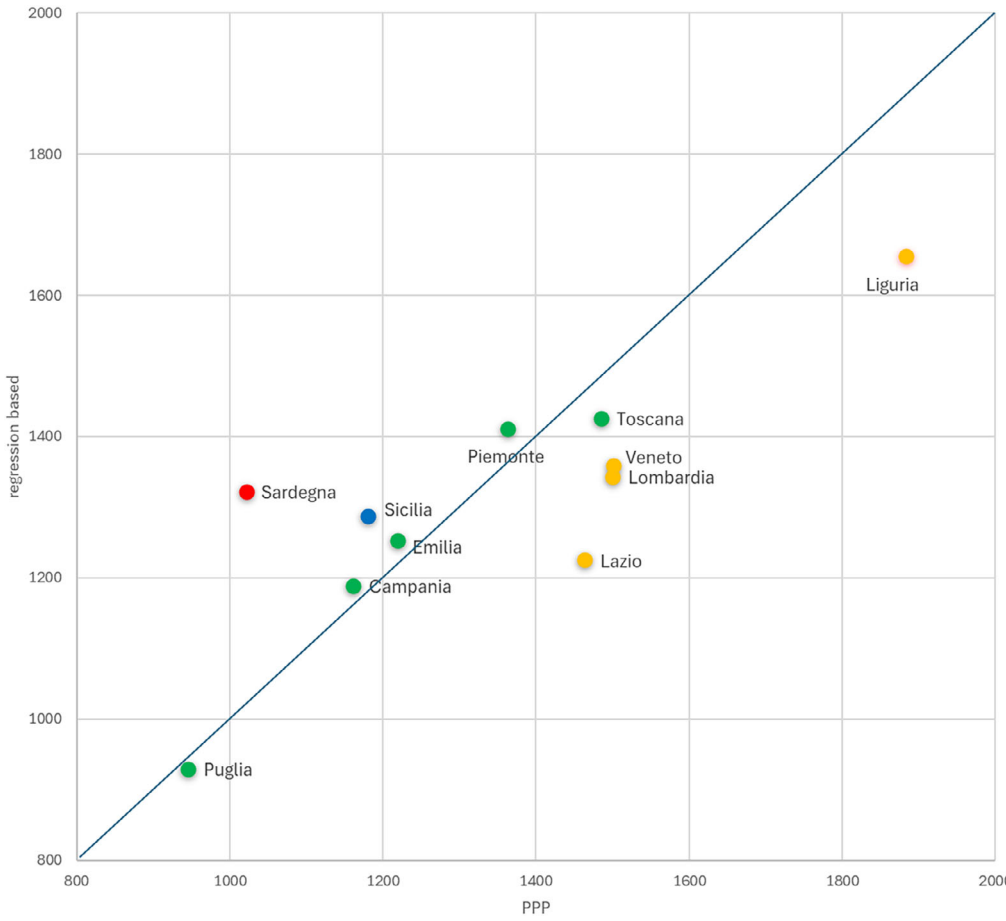

FIGURE 3 Comparison of benchmark estimates.

Notes: Colours illustrate differences between the two benchmarks. Green is when differences are below 5%, blue is when differences are between 5% and 10%, orange is when differences are between 10% and 20%, and red is when differences are between 20% and 25%.

The series for Central-Northern and Southern Italy (figure 5) show a similar pattern, albeit the recovery phase of the seventeenth century seems to be weaker in the South. Notably, the Southern GDP at its 1800 trough was extremely low, being one-third lower than the level of the Middle Ages.

We confirm these hypotheses from visual inspection with a simple econometric assessment. We search for structural breaks with a Bai–Perron (2003) test and then we compute the rates of change between break points with the Razzaque, Osafa-Kwaako, and Grynberg specification.[52] We find

[52] Bai and Perron, 'Critical values'; Razzaque, Osafa-Kwaako, and Grynberg, 'Secular decline'. We use the Stata *XTBREAK* command (Ditzen, Karavias, and Westerlund, 'Testing and Estimating'), which adopts a sequential approach. It tests progressively from the null of one break versus zero breaks until the test cannot reject the null for the n-th break, under the constraint that the length of segments between the breaks does not exceed a pre-determined proportion of the length of the series (or 'trimming'). After some testing, we have settled for the standard 0.15 threshold, which corresponds to a minimum length of each period of 80 years. Razzaque, Osafa-Kwaako, and Grynberg, 'Secular decline' suggest running a joint TS/DS model $\Delta lnGDP = \alpha + \beta TIME + \psi lnGDP_{t-1} + \phi \Delta lnGDP_{t-1} + \varepsilon$, where the growth rates can be computed as $-\beta/\psi$.

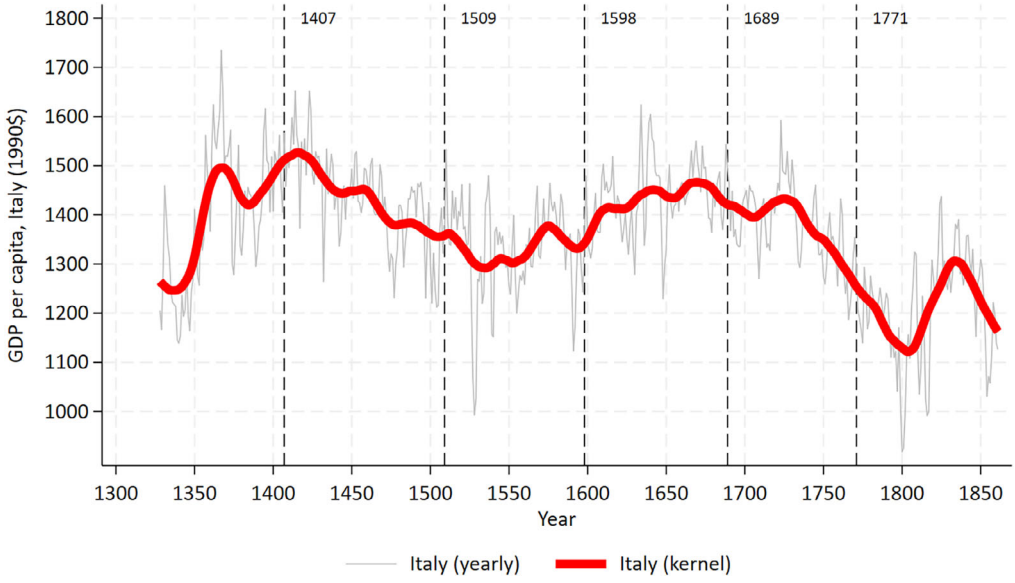

FIGURE 4 Italian GDP per capita (1328–1861).

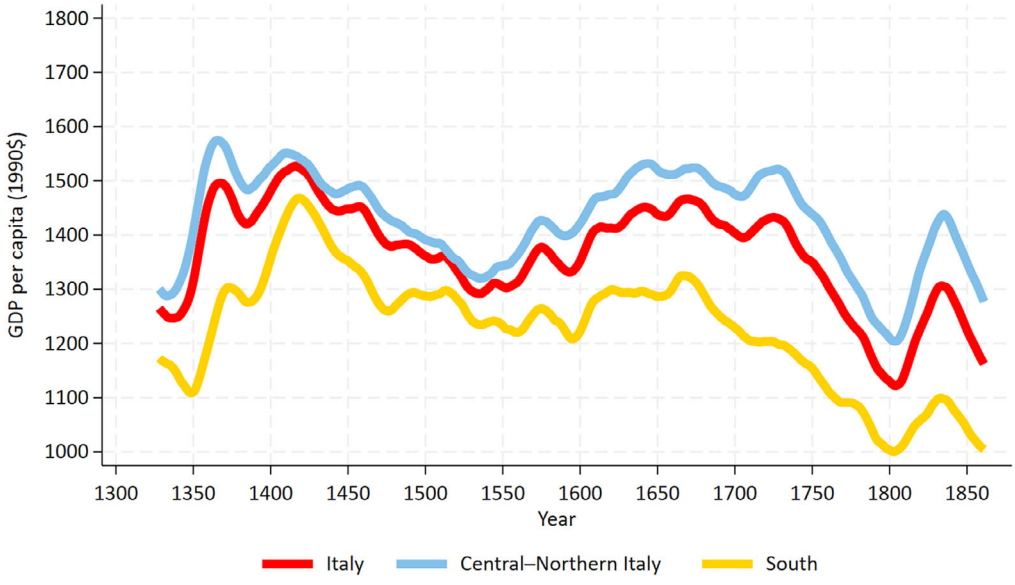

FIGURE 5 GDP per capita: Italy, Centre-North, and South (1328–1861).

four break points, dividing the whole series into five sub-periods.[53] We report the corresponding rates of change in table 3 panel a): each of them is statistically significantly different from the previous one – that is, the detected breaks capture clear changes in historical trends.

[53] In some cases, structural breaks do not coincide with peaks in the kernel-adjusted series (figs. 4 and 5). For instance, the structural break in 1407 is earlier than the peak of Malthusian cycle according to the kernel in 1414. This latter considers all observations, whilst the Bai–Perron test might discard some outliers.

TABLE 3 Trends in GDP per capita (1328–1861).

	Italy		Centre-North		South	
Periods[a]	Annual rate (%)	Cumulated change (%)	Annual rate (%)	Cumulated change (%)	Annual rate (%)	Cumulated change (%)
1328–1407	0.24*	21.1	0.17	15.1	0.31***	27.5
1408–1509	−0.15***	−13.6	−0.15***	−13.6	−0.19***	−17.6
1510–1598	0.01	1.0	0.02	2.1	−0.09*	−8.3
1599–1689	0.06	0.6	0.04	3.9	−0.08	−6.8
1690–1771	−0.17**	−13.0	−0.07	−5.7	−0.18***	−13.1
1772–1861	0.07	6.5	0.13	12.4	0.00	0.2
1328–1861	−0.03***	−14.4	−0.02**	−8.9	−0.04***	−20.5

Notes: ***Significant at 1%, **significant at 5%, *significant at 10%.

Source: Appendix F, GDP per capita and population series.

[a]The break points that differ from the series of Italy are for the Centre-North in 1410, 1506, and 1597, whilst for the South in 1608, 1697, and 1777.

The results highlight five stylized facts:

(i) even if the underlying series are extremely volatile, the procedure detects a significant, albeit slow downward trend for Italy in the whole period, which cumulates to a small but not trivial absolute decline of 14.4 per cent. In the long run, the Centre-North clearly fared better than the South. Both macro-areas declined, with the South's rate being twice that of the Centre-North. Thus, the decline of the South dragged down the whole economy, even if accounting for only about a third of the Italian population.

(ii) the five break points tend to coincide for the different macro-areas and the directions of change are the same in all periods except for the two central periods (1510–98 and 1599–1689).

(iii) The dynamics of the two first sub-periods (1328–1407 and 1408–1509) can be interpreted, in a broad sense, as a Malthusian cycle related to the Black Death.[54] Both the upward and downward legs are significant in the South and Italy, whilst the upward leg in the Centre-North is not significant (for further details, see section 6).

(iv) during the sixteenth and the seventeenth centuries (1510–98 and 1599–1689) there are significant differences in economic performance between Centre-North and South, with the former characterized by a stagnation or a slow growth and the latter declining in the sixteenth century and stagnating during the seventeenth century.

(v) in the eighteenth century there is a clearly different behaviour of the two macro-areas with the South characterized by a steady decline (−13.1 per cent in 1697–1777), whilst the Centre-North stagnated.

In table 4, we focus on the dynamics of the South/Centre-North gap using the same method as in table 3. We still find six sub-periods, with slightly different break points. The story is quite

[54] Here and in the following discussion, we use the term Malthusian simply to indicate an inverse relationship between population trends and GDP per capita. For econometric tests of Malthusian models with demographic data and wages with mixed results, see Chiarini, 'Was Malthus right?'; Fernihough, 'Malthusian Dynamics'; Pedersen, Riani, and Sharp, 'Malthus in pre-industrial Italy'.

TABLE 4 South/Centre-North gap in GDP per capita (1328–1861).

Periods	South/Centre-North gap		
	Annual rate (%)	Cumulated change (%)	Gap at the end of the period (9-year moving average)
1328–1407	0.09	7.5	0.95
1408–1498	−0.10***	−8.6	0.94
1499–1608	−0.14***	−13.9	0.81
1609–1694	−0.08*	−6.5	0.85
1695–1779	−0.00	−0.3	0.85
1780–1861	−0.13*	−9.9	0.80#
1328–1861	−0.03***	−12.7	

Notes: ***Significant at 1%, **significant at 5%, *significant at 10%.
Source: Appendix F, GDP per capita and population series.
#This value is computed for the period 1857–61.

clear: in the long run the two series sizably diverged, and the gap increased in all sub-periods but in the first, corresponding to the upward leg of the Malthusian cycle. In 1408, the GDP per capita of the South was close to that of the Centre-North, whilst in 1608 it was 19 per cent lower. The gap fluctuated around that level, without significant trend, until unification, reaching a level of 80 per cent, and it may have shrunk afterwards: in 1871, according to the independent estimates by Felice and Chiaiese, the GDP per capita in the South was about 85 per cent of the Centre-North.[55]

Our method provides estimates of the structure of the economy both in terms of output (figure 6a) and employment (figure 6b). The ratio of output share to employment share offers a synthetic, though rough, indicator of relative labour productivity, since it does not take hours worked into account. Our series shows that the structure of the economy differed quite substantially between the two macro-areas. Agriculture, on average, accounted for 48 per cent of the GDP in the Centre-North (64.2 per cent for the workforce), 61.4 per cent in the South (73.2 per cent), and 52 per cent for Italy as a whole (67.0 per cent). As expected, industries and services were more productive than agriculture by about 50 per cent, with some differences between Centre-North and South and modest changes in time. There was no deindustrialization in the Centre-North, and in reality the share of industry and services on total GDP was slightly higher during the crisis of the eighteenth century than in the fourteenth and fifteenth centuries. In contrast, in the fifteenth century, both series show a phase of industrialization in the South. Given trends in GDP per capita (see tables 3 and 4 and figure 4), this might suggest a relative decline in Southern agriculture.

Finally, figure 7 shows how robust our results are to different assumptions on sets of elasticities (a), number of working days (b), population levels (c), and methods to compute non-agricultural production (d). The patterns are broadly similar and the short-term deviations between our baseline and the alternative ones are in general small, with all root mean square errors (RMSE) below 5 per cent, but for the hypothesis of 250 working days, it is slightly higher (5.3 per cent).[56]

[55] Felice, 'The roots of a dual equilibrium'; Chiaiese, 'Provincial estimates'.

[56] The RMSE are 1.6% and 3.3% for elasticities in panel *a*); 5.3% for 250 working days and 4.6% for the 'industrious revolution' scenario in panel *b*); 1.8%, 1.2%, and 1.4% for population in panel *c*), (respectively an unweighted mean, and weighted averages with shares on Italian population in 1774 and in 1861); and 3.0%, 2.6%, and 4.4% for the three methods of com-

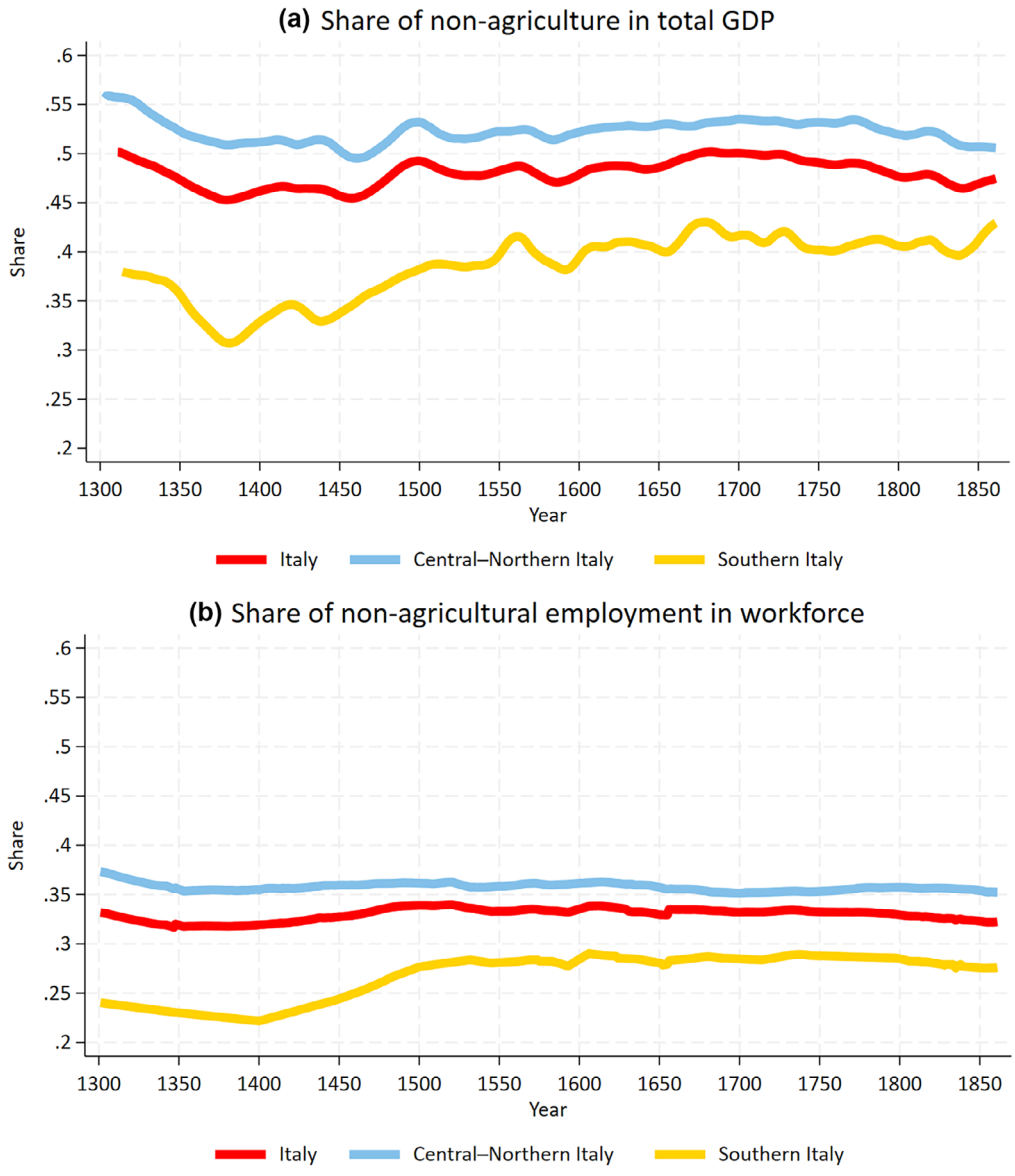

FIGURE 6 The non-agriculture shares in GDP and employment (1328–1861).

IV | REGIONAL AND INTERNATIONAL COMPARISONS

How does our estimate compare with the seminal work by Malanima, the most recent works by Chilosi and Ciccarelli, and by Malanima since 1660?[57]

First of all, we must consider that these series use different methodologies. In both papers, Malanima adopts a demand-side approach similar to ours, with some differences in the

puting the non-agricultural VA in panel *d*), (respectively for urbanization adjusted, constant relative productivity, and wheat-textile sectoral adjustment).

[57] Malanima 'The long decline'; Chilosi and Ciccarelli, 'Smithian growth'; Malanima, *The Economy of Renaissance.*

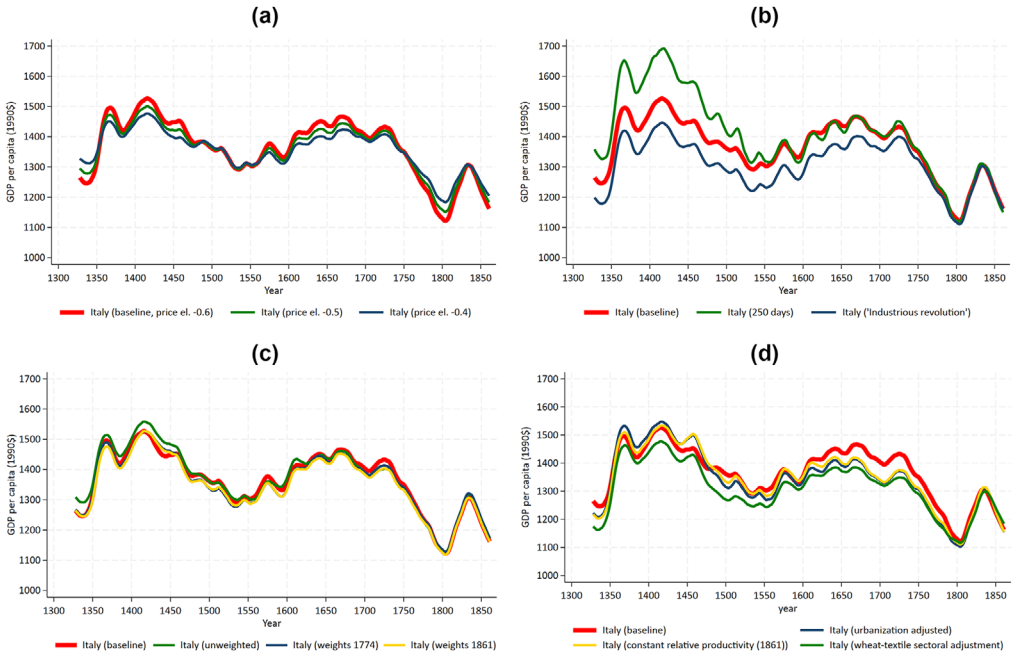

FIGURE 7 GDP per capita: Italy (1328–1861): robustness checks.

Notes: In panel (a), the comparisons are with these sets of elasticities: baseline (price = −0.6, income = 0.5 and cross = 0.1) versus (−0.5, 0.4, 0.1) and (−0.4, 0.3, 0.1); in panel (b) our series is compared with the standard assumption of 250 working days per year and the counterfactual hypothesis of an Italian 'Industrious Revolution' of 271 working days in 1650 increasing linearly up to 300 in 1861; in panel (c) our baseline, constructed as a weighted average of the population share of 11 regions, is compared with an unweighted average of regional series, a weighted average with fixed population shares for 1774 according to Mariella, Postigliola, and Rota, 'A reconstruction', and a weighted average with fixed population shares of 1861 based on Census data (Mariella, Postigliola and Rota, 'A reconstruction'); in panel (d), we compare our baseline, constructed estimating sectoral productivity using real wages, with three alternative measures of relative productivity: (1) the adjusted urbanization rate by Malanima, 'Before Modern Growth', who uses the coefficients of the estimated equation relating agricultural share and urbanization rate; (2) the time invariant relative productivity approach by Palma and Reis, 'From convergence to divergence' assuming a ratio equal to one; and (3) the sectoral productivity estimated by computing, for agricultural productivity, the ratio between agriculture wages and wheat prices, and for manufacturing productivity the ratio between manufacturing wages and textile prices (Pfister, 'Economic growth').

classification of workers and in the methods to estimate the number of working days and the share of non-agricultural production.[58] The general equilibrium approach by Chilosi and Ciccarelli (2025) is completely different.[59] It is extremely parsimonious in terms of data because it relies on seven fixed parameters, four from Groth and Persson and three assumed by the authors.[60] In Chilosi and Ciccarelli's modified version of the model, the GDP dynamics depend on the agricultural share of the labour force, which they proxy with changes in the urbanization

[58] In both works, Malanima distinguishes only between urban and rural workers, rather than the four categories used in this paper (see sect. III.II). Additionally, Malanima does not adjust explicitly for working days, arguing that his choice of a low-income elasticity (0.3 or 0.4) deals with this issue. Finally, he estimates the non-agricultural production by using a regression between GDP per capita and urbanization rates after 1861.

[59] Chilosi and Ciccarelli, 'Smithian growth'.

[60] Groth and Persson, 'Growth or stagnation'.

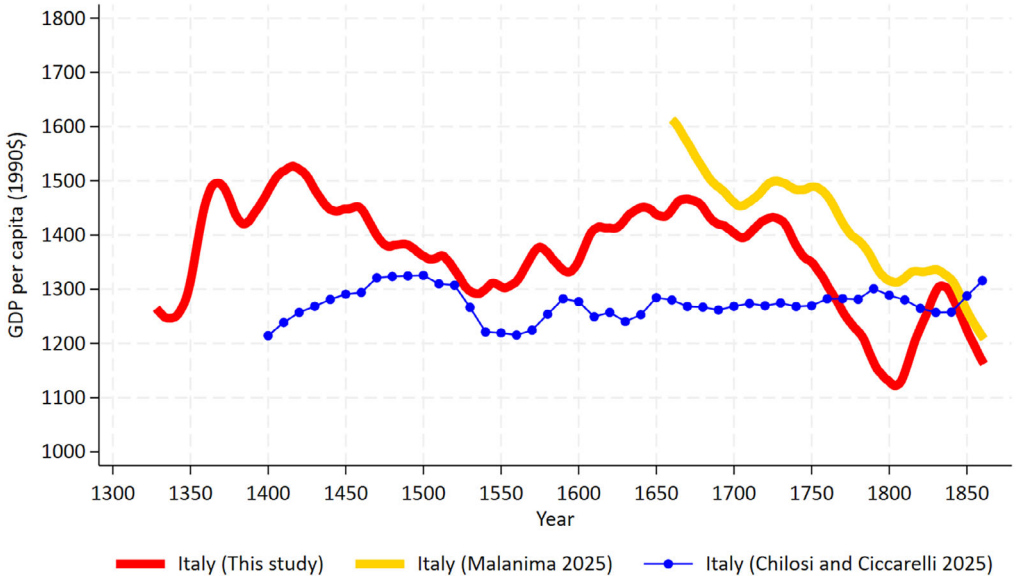

FIGURE 8 Italian GDP per capita: comparisons.

Note: Since Malanima, 'Before Modern Growth', does not provide his series in dollars, to make the two series comparable, we have linked the Malanima series to our 1850 benchmark in 1990$ (1310). Then, we have converted the Chilosi and Ciccarelli, 'Smithian growth' series, which are expressed in 2011$, to 1990$ by applying a coefficient of conversion of 0.568, equal to the average ratio between Italian GDP in 1990 dollars in the period 1861–1913 from the Maddison Project, release 2013 (Bolt and Van Zanden, 'The Maddison project'), and the Maddison Project, release 2020 (Bolt and van Zanden, 'Maddison-style estimates … 2020').

rates and on movements in relative prices, according to a non-microfounded, 'pragmatic solution', agricultural consumption function.

Figure 8 compares our estimates with the Italian series by Malanima since 1660, and with the benchmark estimates by Chilosi and Ciccarelli from 1400 to 1800 and their yearly series since 1801.[61] We have expressed the former in 1990 dollars by linking it to our 1850 benchmark. Malanima's trend is quite similar to ours, whilst yearly fluctuations are somewhat different ($r = 0.83$) and Malanima's series declines almost steadily rather than only in the eighteenth century like ours. The series by Chilosi and Ciccarelli fluctuates in a very limited range of about 10 per cent, with the minimum in 1400 and maximum in 1528 – so that GDP per capita, on the eve of unification, turns out to be 10 per cent higher than in 1400.[62] This long-term stability reflects the small changes in the urbanization rate, the only driver of historical change in their approach. Thus, their series cannot capture many political and economic changes and major exogenous shocks (plagues and climate) that characterized a period of 450 years.

Figure 9 compares the series available for the Centre-North. Chilosi and Ciccarelli's is essentially flat, and thus the comparison does not alter our previous conclusions.[63] In contrast, the Malanima series shows a sharp increase with 'two peaks' until 1450, and a significant long-term

[61] Malanima, *The Economy of Renaissance*; Chilosi and Ciccarelli, 'Smithian growth'.

[62] For the sake of comparison, the range of variation of our estimates is slightly more than 50% and that of Malanima for the period 1661–1861, is 32%.

[63] Chilosi and Ciccarelli, 'Smithian growth'.

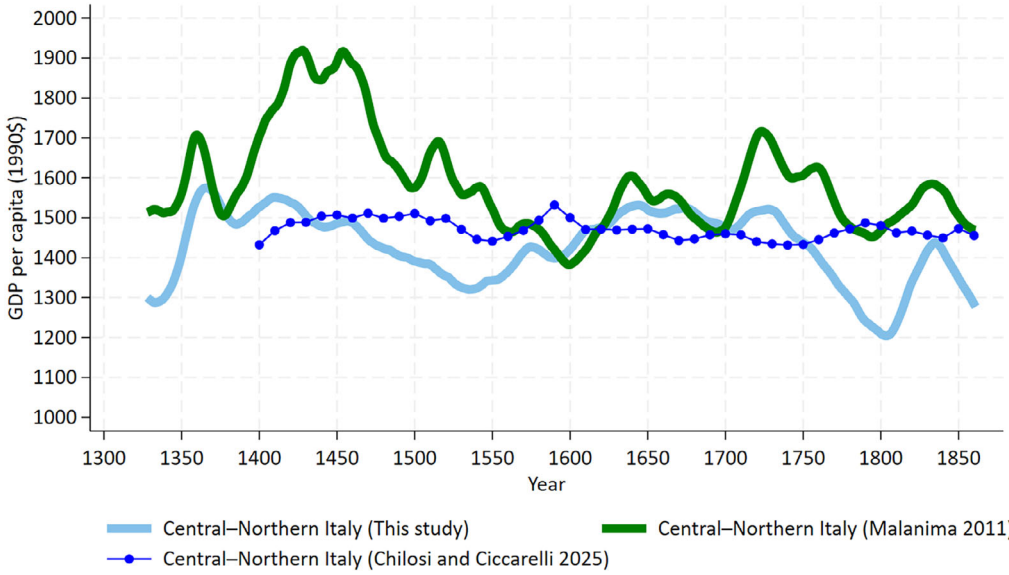

FIGURE 9 Centre-North GDP per capita: comparisons.

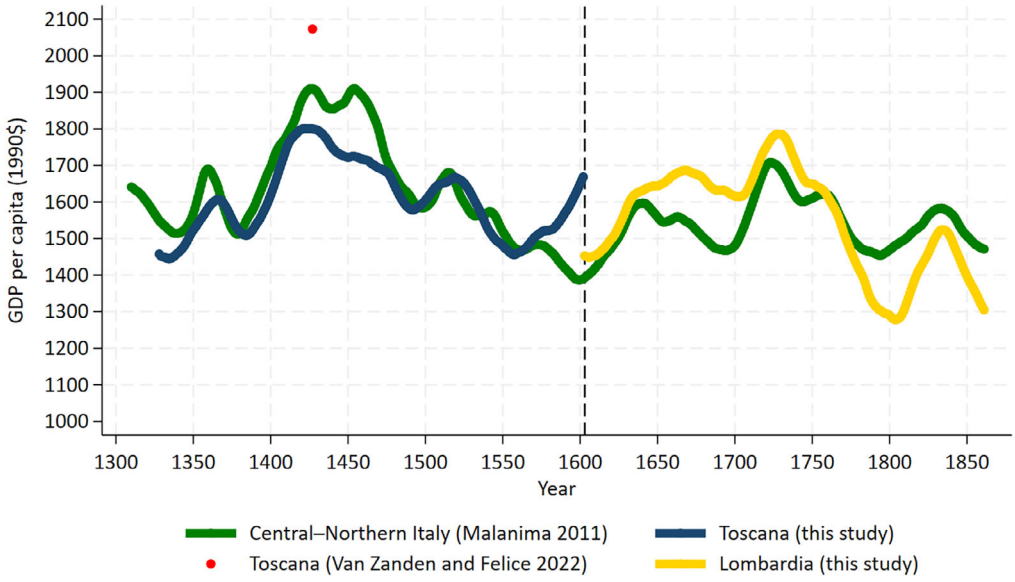

FIGURE 10 Centre-North GDP per capita: this study versus Malanima (2011).

decline until 1600.[64] Thereafter, the series fluctuates without a clear trend. The differences, in particular those in levels, between Malanima and our series, reflect to some extent geographical coverage, as figure 10 shows by comparing the series of Malanima with ours for Toscana and Lombardia.[65] In this case the difference between the series is much more limited. In the figure, we also

[64] Malanima, 'The long decline'.

[65] Malanima, 'The long decline'.

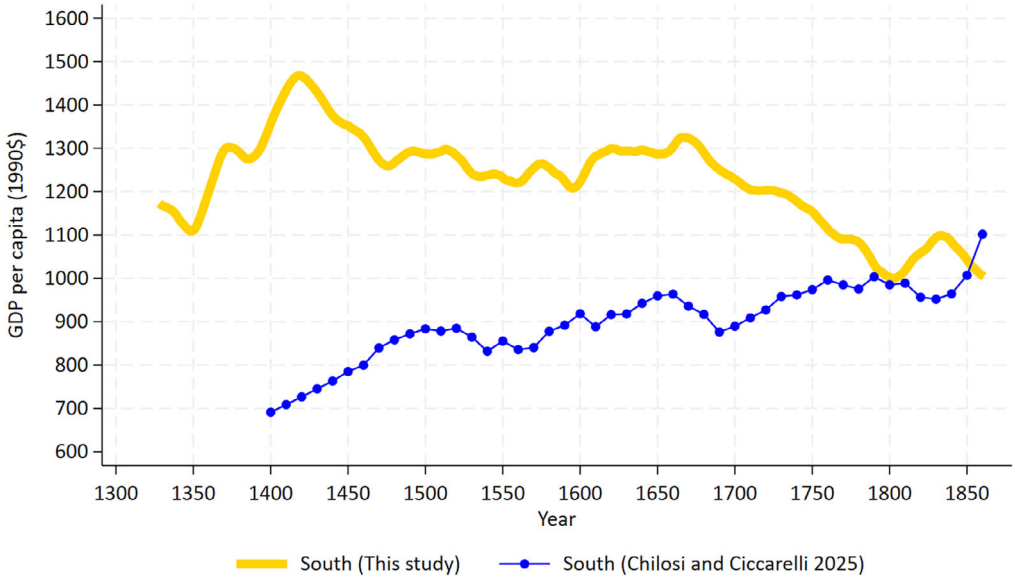

FIGURE 11 South GDP per capita: comparisons.

report a recent benchmark estimate on the basis of the 1427 *Catasto Fiorentino* for Toscana by van Zanden and Felice, which is close (9 per cent higher) to Malanima estimate.[66]

Figure 11 compares our series with the one by Chilosi and Ciccarelli for the South.[67] Our series, as previously shown in figure 5 and presented in table 3, is characterized by a phase of growth until 1407, the end of the upward leg of the Malthusian cycle, followed by more than four centuries of stagnation and decline. In contrast, the series by Chilosi and Ciccarelli shows growth, with some fluctuations, since 1400. According to their estimates, GDP per capita in the South increased by 63 per cent over the entire period, starting from a very low level ($684).[68] In relative terms, it rose from 48.7 per cent of their Centre-North figure in 1400 to 76.8 per cent in 1861. Their convergence of the South towards the Centre-North after 1700 is driven by the growth of their estimated urbanization rate – a cumulated 58 per cent increase over 160 years. In contrast, our estimates of urbanization rates, which adjusts explicitly for 'agro-towns' (see appendix D 'Population'), suggests a mild decline (a cumulated −7 per cent).[69]

In the following, we contrast our new series with the recent available estimates of GDP per capita of some European countries. Figure 12 compares our estimates, with the two 'winners' of the 'Little Divergence': the Netherlands and England.[70] Up to 1500, Italian GDP per capita was

[66] van Zanden and Felice, 'Benchmarking the Middle Ages'.

[67] Chilosi and Ciccarelli, 'Smithian growth'.

[68] Since this period should correspond to the expansionary phase of the post-Black Death Malthusian cycle, such a low level appears particularly puzzling.

[69] Chilosi and Ciccarelli, 'Evolving gaps' tackle the phenomenon of 'agro-towns' by adopting a higher threshold for the urbanization rate in the South (10,000 inhabitants) instead of 5,000 in the Centre-North.

[70] Figure 12 compares homogenous geographical entities considering border changes following the indications of the Maddison project release 2013 with constant coefficients of adjustment. Clearly, Holland was a smaller and significantly richer region than the entire Netherlands. The same goes, obviously to a minor extent, for England, which was smaller and richer than the UK. The coefficient of adjustment for the Dutch case refers to the year 1807. In that historical phase, during the

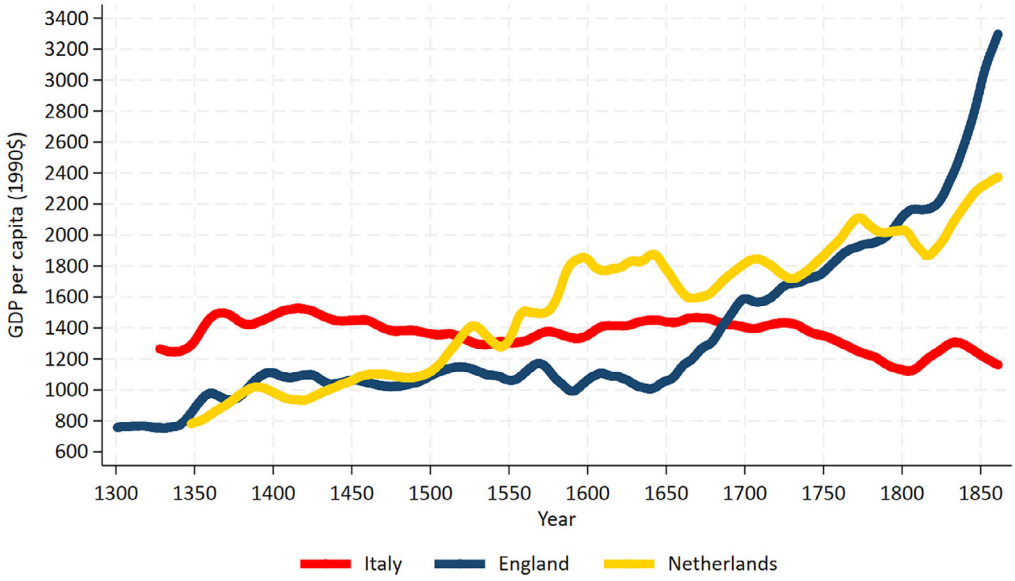

FIGURE 12 GDP per capita international comparisons: Italy versus the winners of the 'Little Divergence' (1328–1861).

Sources: Italy: author estimates; England: we have used the real output index of Broadberry et al., British economic growth, adjusting for border changes in 1701 and 1850 as indicated in the release 2013 of the Maddison project; the estimate for the Netherlands before 1807 is obtained by dividing the estimate of Holland by van Zanden and van Leeuwen, 'Persistent but not consistent' for the coefficient 1.3087 as suggested by the Maddison project (release 2013), Netherlands: 1807–61 from Smits, Horlings, and van Zanden, 'Dutch GNP'.

significantly higher than that of the two North Sea countries. The Netherlands overtook the GDP levels of the Italian peninsula around the mid-sixteenth century, that is, somewhat before the 'Golden Age' of the Dutch economy.[71] England forged ahead around the end of the seventeenth century and then further accelerated during the eighteenth century, driven by industrialization. In 1861, Italian GDP per capita was slightly more than one-third (32.4 per cent) compared with the English one.[72]

These results confirm that the timing of the Little Divergence in real wages does not necessarily tally with trends in GDP per capita, which were affected also by other factors such as income distribution, movements of the relative prices, and working days (Angeles 2008),[73] as also shown by recent estimates of the evolution of the labour share in some major European countries and GDP and wages in China.[74]

French domination, the economy of Holland was in crisis. It is therefore likely that during the sixteenth and seventeenth centuries the ratio between the GDP per capita of Holland and the Netherlands was higher. For a reinterpretation of the 'Smithian growth' in these two countries after 1500, see Chilosi and Ciccarelli, 'Smithian growth'.

[71] de Vries, *The Dutch Rural Economy*; de Vries and van der Woude, *The First Modern Economy*.

[72] Table 2 reports a ratio Italy/England in 1850 of 0.46. The gap in 1861 is therefore significantly higher, which can be explained by the combined effect of the decline of the Italian economy and the continuing industrialization of England throughout the 1850s.

[73] Allen, 'The great divergence'; Angeles, 'GDP Per Capita'.

[74] Federico, Nuvolari and Vasta, 'Inequality in pre-industrial Europe'; Liu, 'Wages, labour markets'. According to Allen, 'The great divergence', the divergence between England (London) and Italy (Florence) started already in the early sixteenth

Figure 13 compares Italian economic performance with that of other European countries. Italy's GDP per capita was significantly higher from the Middle Ages until around 1800. Only in the first half of the nineteenth century, with the beginning of modern economic growth, did France decidedly overtake Italy, whilst Germany was still catching up (figure 13a). As expected, latecomer countries remained distant from the Italian GDP per capita levels up to the first decades of the eighteenth century. Afterwards, Portugal and Russia experienced a period of sustained economic growth (around 35–40 per cent of cumulated change), which lasted until mid-eighteenth century, before falling back to their seventeenth century levels. In contrast, Spain started its slow convergence from 1700, almost reaching the Italian level in 1861.

V | DISCUSSION AND INTERPRETATIONS OF ITALIAN ECONOMIC PERFORMANCE

In this section, we contrast our estimates with a compact survey of the main interpretations of the performance of the Italian economy in the long run. Centre-North and South were undoubtedly influenced by similar demographic shocks and broader economic forces, whilst political history, institutions, and factor endowments were different. Indeed, the historiography concerning the long-term development of the Centre-North and the South has been evolving unrelatedly, sketching different causes of growth and decline.

As a broad reference framework, we start from the augmented Malthusian model, following Møller and Sharp (2014). In this model, given the fixed amount of land, income per capita (y_t) is negatively related to labour force, and thus population (N_t), and positively related to the level of efficiency of economy A_t, as determined by technology, institutions, culture, etc.:

$$\ln(y_t) = A_t + b \ \ln\ (N_t) \text{ with } b < 0 \tag{15}$$

The 'pure' Malthusian case assumes A_t constant: in this setting any shock from exogenous determinants (e.g. a pandemic) would be re-absorbed and the steady state population and income would be constant, as long as there is a binding land constraint ($b < 0$). This case implies a negative relation between population and GDP per capital. In contrast, if $b = 0$, changes in population do not affect income per capita, whilst if $b > 0$ population positively affects efficiency as posited for 'post-Malthusian' stages of development. The 'augmented' Malthusian case adds the possibility of changes in efficiency A in both directions. Negative institutional change (e.g. a loss of market integration) would reduce income per capita for any given level of population, whilst efficiency-enhancing innovations (e.g. the discovery of crop rotations) would raise income per capita.

In table 5, we present a simple econometric exercise estimating equation (15) using OLS. The column 1328–1861 refers to the whole period and suggests a significant, although not very strong, Malthusian regime. This seems to be consistent with the pseudo-Marxist stagnationist interpretation by Romano.[75] The other columns (2–7) report the results when the variables are interacted with time dummies for the sub-periods we have identified with the time series analysis (see table 3). The first row in the table reports the sum of the coefficients of the reference period

century, about 100 years before the overtaking of England in terms of GDP per capita. For two further assessments of divergence based on real wages, see Malanima, 'When did England overtake Italy' for Centre-North Italy and England, and Rota and Weisdorf, 'Italy and the Little Divergence' for Roma and London.

[75] Romano, 'Una tipologia economica'.

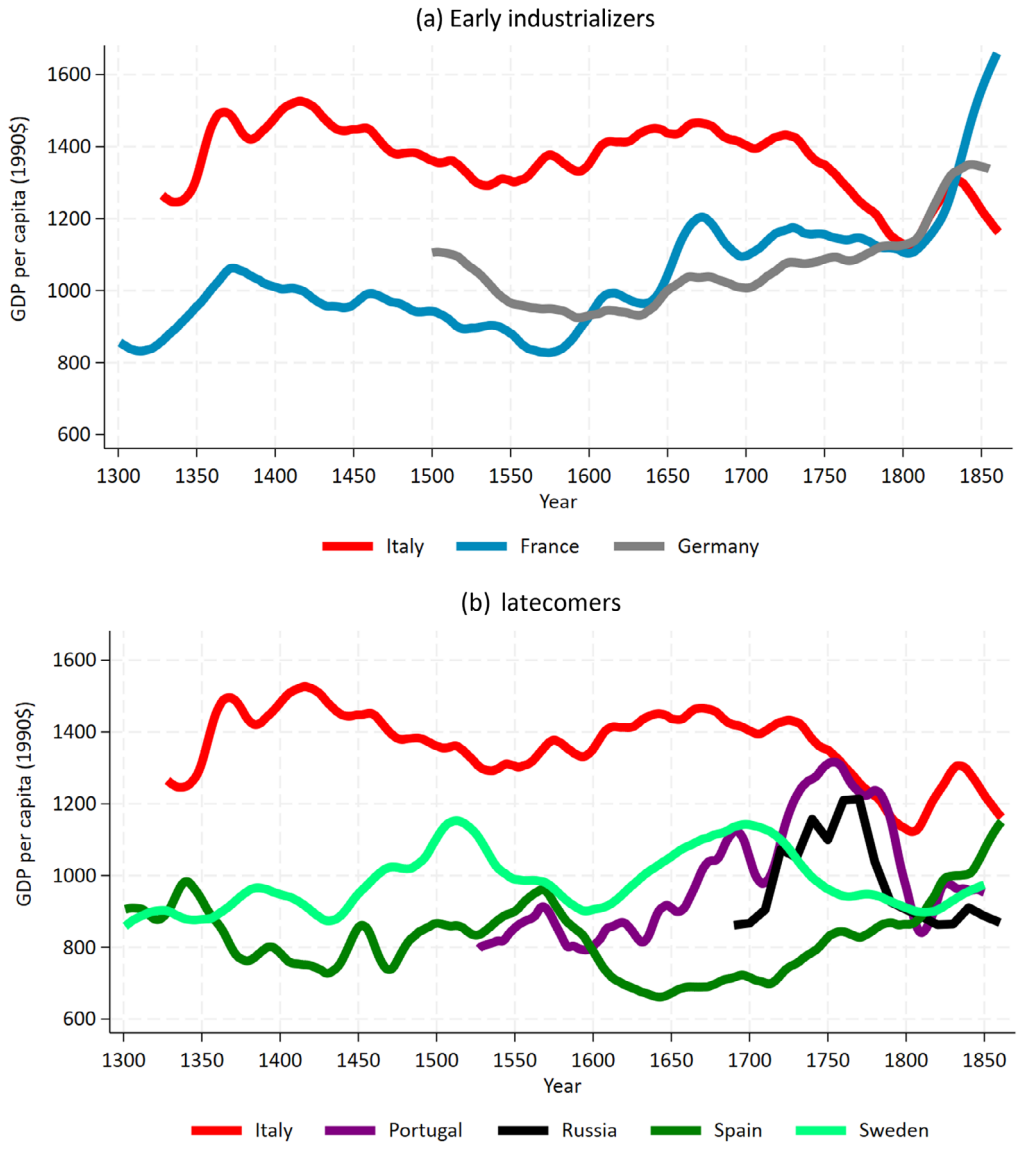

FIGURE 13 GDP per capita international comparisons: Italy versus the others (1328–1861). *Sources*: Italy: author estimates; France: Ridolfi and Nuvolari, 'L'histoire immobile?'; Germany: Pfister, 'Economic growth'; Portugal: Palma and Reis, 'From convergence to divergence'; Russia: Broadberry, and Korchmina, 'Catching-up'; Spain: Prados de la Escosura, Álvarez-Nogal, and Santiago-Caballero, 'Growth recurring'; Sweden: 1300–1560, Krantz, 'Swedish GDP'; 1560–1850, Schön and Krantz, 'The Swedish economy'. *Notes*: values in 1990$ are those reported by the authors except for Germany and Sweden. In these cases, we convert the following benchmarks drawn from the 2013 release of the Maddison Project (Bolt and Van Zanden, 'The Maddison project'): Germany, $1,428 in 1850 and Sweden, $1,076 in 1850.

TABLE 5 Augmented Malthusian model: Italy and macro-areas.

					Italy		
	(1328–1407)	(1408–1509)	(1510–98)	(1599–1689)	(1690–1771)	(1772–1861)	(1328–1861)
Population (log)	−0.280***	−0.420***	0.018	−0.223	−0.310***	0.123**	−0.131***
	(0.000)	(0.000)	(0.792)	(0.134)	(0.000)	(0.011)	(0.000)
Constant	11.640***	13.853***	6.905***	10.887***	12.305***	5.031***	9.321***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
					Centre-North		
	(1328–1410)	(1411–1506)	(1507–97)	(1598–1689)	(1690–1771)	(1772–1861)	(1328–1861)
Population (log)	−0.334***	−0.406***	0.164	−0.140	−0.243*	0.254***	−0.098***
	(0.000)	(0.000)	(0.143)	(0.245)	(0.060)	(0.000)	(0.000)
Constant	12.425***	13.531***	4.645***	9.522***	11.187***	3.029***	8.811***
	(0.000)	(0.000)	(0.008)	(0.000)	(0.000)	(0.004)	(0.000)
					South		
	(1328–1407)	(1408–1509)	(1510–1608)	(1609–97)	(1698–1777)	(1778–1861)	(1328–1861)
Population (log)	−0.145***	−0.589***	−0.116***	0.011	−0.266***	0.013	−0.145***
	(0.000)	(0.000)	(0.003)	(0.891)	(0.000)	(0.792)	(0.000)
Constant	9.222***	15.677***	8.854***	6.997***	11.115***	6.751***	9.279***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Notes: Standard errors in parentheses $*p < 0.10$, $**p < 0.05$, $***p < 0.010$. The dependent variable is the log of GDP per capita. The sample size is $N = 534$ observations in all model specifications. The adjusted R^2 of the regression models with time interactions are: 0.52, 0.39, and 0.58, for Italy, Centre-North, and South, respectively. The adjusted R^2 for the full-period models (first column) are: 0.29, 0.12, and 0.42, for Italy, Centre-North, and South, respectively. Residual-based Dickey–Fuller tests confirm stationarity in all models, and thus all series are cointegrated.
Source: Appendix F, GDP per capita and population series.

and the interactions.[76] Not surprisingly, the first two sub-periods are characterized by a standard Malthusian behaviour for Italy as a whole, Centre-North, and South (with similar levels of the intercept). The Malthusian forces seem to play a role in the South in the sixteenth century but not in the seventeenth century, whilst the Malthusian behaviour remerges in the eighteenth century. The results for the last period suggest an escape from the Malthusian world, especially in the Centre-North.

Table 5 suggests a pattern of behaviour that is decidedly more complex than what can be captured by a standard Malthusian model. Therefore, it seems useful to discuss the historiography for Centre-North and South separately, considering Malthusian forces in interaction with other possible drivers of economic growth.

V.a | Centre-North

There is a substantial agreement that, in the mid-fourteenth century, as a result of the Commercial Revolution,[77] the Centre-North of Italy was the undisputed European (and possibly world)

[76] The original regression coefficients are shown in app. F 'GDP per capita and population series'.

[77] Lopez, *The commercial revolution*; Greif, *Institutions*; Wickham, *The Donkey and the Boat*.

leader in economic development. This is confirmed by international comparisons: around 1350, the Centre-North, according to our data, had an income per capita of $1,407, whilst England was at $880, the Netherlands $790, France $960, Spain $932, and Sweden $880 (data from figures 12 and 13). The most comprehensive interpretation of the trends of the next two centuries is the classic Malthusian account by Malanima.[78] In this view, the population collapse of the Black Death triggered a phase of economic expansion, lasting until the demographic recovery in the early fifteenth century, which prompted a downward trend. During the 1960s and 1970s, this latter phase had been the subject of a lively debate on the 'Renaissance economy' between Lopez and Miskimin, Cipolla and others.[79] Lopez and Miskimin maintained that this period of splendour of culture was characterized by economic depression or stagnation, whilst Cipolla suggested that their account was based on fragile and fragmented evidence and that this historical phase featured more of a transformation rather than a crisis.[80]

For the Middle Ages our results appear rather consistent with the Malthusian interpretation. After the Black Death and the collapse of population, GDP per capita increased by about 40 per cent in 20 years.[81] Afterwards, GDP per capita in the Centre-North fluctuated slightly below this historical maximum level for about 60 years, whilst population was still slowly declining (figure 9). The downward leg of the Malthusian cycle, associated with a substantial recovery of population, is much steadier. This decline in our series tallies well with the view of Lopez and Miskimin, who argue for an 'economic depression of the Renaissance', a perspective that was recently revisited by Alfani.[82]

Historians have been also spiritedly debating, without reaching a consensus, the causes of decline of the Centre-North, and particularly of Venice, after the sixteenth century, long before the concept of the 'Little Divergence' emerged. Within this historiographical discussion, we can distinguish four main major interpretations:

(i) *Atlantic trade*: according to this view, the Italian decline started in the sixteenth century as the outcome of the opening of the new trade routes in the Atlantic. Italy, without direct access to the Atlantic, was gradually forced into a peripheral position. This interpretation was discussed and discarded in the mid-twentieth century amongst American historians by Rapp and the references cited therein, whilst it has been recently rekindled by Acemoglu, Johnson, and Robinson.[83] In their account, Atlantic trade interacts with the institutional set-up in determining long-run growth performance. Atlantic traders, endowed with favourable political institutions (limited government), such as the Netherlands and England, embarked on a trajectory of successful economic and political modernization. On the contrary, Atlantic traders with absolutist political institutions, such as Spain and Portugal, experienced only limited growth without any lasting effect.[84] In this narrative, the Italian

[78] Malanima, *L'economia italiana*; Malanima, *The Economy of Renaissance*.

[79] Lopez and Miskimin, 'The Economic Depression'; Cipolla, 'Economic depression of the Renaissance?'.

[80] For an overview, see Franceschi, 'The economy'; Alfani, 'Plague in seventeenth-century'; Malanima, *The Economy of Renaissance*.

[81] By way of comparison, in the English case, the initial shock of the plague prompted an increase of 25% of GDP per capita over the same period (Broadberry et al., *British economic growth*).

[82] Lopez and Miskimin, 'The Economic Depression'; Alfani, 'Plague in seventeenth-century'.

[83] Rapp, *Industry and economic decline*; Acemoglu, Johnson, and Robinson, 'The rise of Europe'.

[84] For a recent criticism of the conventional wisdom of the backwardness of the institutional set-ups of Portugal and Spain compared with England on the basis of a detailed comparative analysis of state capacity and political systems, see Henriques and Palma, 'Comparative European institutions'.

states of the Centre-North feature as examples of polities with efficient, or in the jargon of Acemoglu, Johnson, and Robinson, 'inclusive' political institutions, at least initially, that could not further advance its political and economic modernization due to the lack of direct access to the Atlantic routes.[85]

(ii) *Trade and institutional rigidity*: in a seminal article, Cipolla drew attention to the deteriorating competitiveness of Italian textiles in the markets of Europe, North Africa, and the Near East during the seventeenth century. English, Dutch, and French merchants were able to oust Italian competitors by selling medium–low quality products ('new draperies'), which were prettier and cheaper in comparison with the Italian ones.[86] Furthermore, they were also able to provide more efficient banking facilities and streamlined navigation services due to the better design of their ships and cheaper freights.[87] As a result, the seventeenth century was a period of substantial de-industrialization for the Centre-North regions. According to Cipolla, the institutional rigidity of the Italian city states prevented a successful response to the challenge mounted by this new competition. In particular, guilds stifled innovation by staunchly defending traditional methods in the production of high-quality products (e.g. the *pannina veneziana d'antica formalità*).[88] Moreover, they tended to keep wages high, further damaging the competitiveness of the Italian products. Finally, the high level of taxation also had a negative impact on the trade performance of Italian merchants.[89] A slightly more optimistic perspective for the last four decades of the seventeenth century is put forward by Sella, who pointed to the resilience of the rural industries, suggesting a relative rather than an absolute decline in GDP per capita.[90]

(iii) *Epidemics*: Alfani and Alfani and Percoco have argued that the Italian decline, exacerbated by the competition from Northern European countries, was mainly due to the 1629–30 plague.[91] In this respect, Alfani argues that the intensity of seventeenth-centuries plagues was much higher in Italy that in all other European countries. Unlike in the case of the Black Death, this 'epidemic catastrophe' did not result in a 'classical' Malthusian rebound of GDP per capita, because it hit the most dynamic and economically advanced Italian cities, such as Milan and Venice, hard. The loss of irreplaceable skilled workers in the cities led to a significant decrease in productivity, which was further deteriorated by the 'ruralization' of manufacturing production. This process was coupled with a shift of investment from manufacturing to agriculture. As a result, the plague was not a temporary shock, but a permanent derailment of the trajectory of economic modernization, allowing for the Netherlands and England to forge ahead.

(iv) *Malthusian constraints*: in several works, Malanima adopts a standard Malthusian model to provide an interpretation not only of the Black Death, but also of the post-Renaissance

[85] Acemoglu, Johnson, and Robinson, 'Institutions as the fundamental'.

[86] Cipolla, 'The decline of Italy'.

[87] Cipolla, 'The economic decline of Italy'; Sella, *Italy in the Seventeenth Century*.

[88] For an overview of the Venetian economy in the long-run perspective, see Lanaro, *At the Centre of the Old World*.

[89] Cipolla's interpretation deprecating high wages and taxation is in contrast with more recent views of the evolution of the European pre-industrial economy, which have instead emphasized the possible positive effect of high wages in prompting mechanization (Allen, *The British Industrial Revolution*) and that of taxation in building state capacity (Dincecco, 'Fiscal centralization').

[90] Sella, *Italy in the Seventeenth Century*, pp. 47–50.

[91] Alfani, *Calamities and the Economy*; Alfani and Percoco, 'Plague and long-term development'.

crisis.[92] In his view, the entire Italian peninsula was a land-scarce economy and thus GDP per capita was inversely related to population movements. Accordingly, Malanima and Capasso and Malanima maintained that the seventeenth-century plagues had positive impacts on GDP per capita.[93] Malanima argues that, by the end of the seventeenth century, even if the Centre-North had lost its manufacturing and commercial leadership, it still maintained a level of GDP per capita roughly similar to that of England and the Netherlands.[94] In his view, the long-term decline of the Centre-North started only in the early eighteenth century. By then, the end of recurring waves of plague and the introduction of new agricultural products (maize, rice, and mulberry for silkworms) caused the population to permanently exceed the pre-Black Death maximum and to double by the eve of unification. This unchecked population growth resulted in a steady decline of income per capita throughout the eighteenth and the first half of the nineteenth centuries.

How do these major interpretations feature in light of our GDP per capita estimates?

The Atlantic trade interpretation suggests a relative, and possible absolute, decline of the Centre-North following the 'voyages of discovery', that is, since the first half of the sixteenth century. In fact, our series of GDP per capita shows a phase of stagnation, with some modest growth, from the early sixteenth century which lasts until the end of the seventeenth century (table 3 and figure 9). Thus, in this simple version, the hypothesis of a long-term crisis of the Italian economy induced by the rise of Atlantic trade does not seem to find corroboration.[95]

The hypothesis of a decline due to foreign competition coupled with institutional rigidity suggests a downward trend starting in the seventeenth century. In fact, table 3 presents a broad stability and 'resilience' of GDP per capita until 1690. Furthermore, the acute phase of deindustrialisation emphasized by Cipolla is not confirmed by our estimates, which show an overall stability of the non-agricultural share, both in employment and output, throughout the entire seventeenth century (see figure 6). In this respect, Cipolla's view has been inspired by the pessimistic accounts of the decline of the production of manufacturing goods in major towns, especially on the basis of the Venetian experience.[96] In fact, in this historical phase, manufacturing activities did not disappear but were increasingly 'delocalized' in the countryside.[97] In comparison with traditional accounts, our GDP per capita series points to a process of economic adaptation or to a 'gentle transition', as already suggested by Rapp for the Venetian case, rather than a fatal decline.[98]

[92] Malanima, *L'economia italiana*; Malanima 'The long decline'; Malanima, 'Italy in the Renaissance'; Malanima, *The Economy of Renaissance*; Malanima, 'Before Modern Growth'.

[93] Malanima, *L'economia italiana*; Capasso and Malanima, 'Economy and population'.

[94] Malanima, *L'economia italiana*.

[95] The Venetian spice trade remained substantial until the beginning of the seventeenth century, with the arrival of the Dutch competition on the Asian market (O' Rourke and Williamson, 'Did Vasco da Gama').

[96] Cipolla, 'The decline of Italy' (p. 180), was aware of the partial nature of the evidence he was using and of the delocalization of manufacturing in the countryside: 'It must be admitted that the figures and data I have cited tend slightly to exaggerate the dimension of Italy's economic decline. […] We know in many cases that although industry suffered a drastic decline in the larger cities, there was on the other hand a tendency towards expansion in many rural and semi-rural centres'. For a recent appraisal of the 'ruralization' of industry in Venice in this historical phase, see Buscemi and Ridolfi, 'Venice and the Terraferma'.

[97] Sella, *Crises and continuity*; Sella, *Italy in the Seventeenth Century*, pp. 41–6; Panciera, *L'arte matrice*.

[98] Rapp, *Industry and economic decline*, p. 167.

Our estimates can be seen as somewhat consistent with the epidemic interpretation. The mid-seventeenth century plagues were preceded by a few decades of economic expansion (figure 9), and were followed, with some delay, by about 50 years of prolonged stagnation or slight decline (table 3). The share of manufacturing on GDP in the Centre-North did not decrease until the last decades of the eighteenth century (figure 6). However, this might be consistent with the work of Alfani and co-authors if one assumes that rural workers were less skilled and produced lower-quality goods for local markets, and thereby were less productive than their urban counterparts.[99]

Overall, the strong decline of our series of GDP per capita from the late 1720s to the end of the century, suggested by a visual inspection of figure 9, seems in line with the Malthusian interpretation by Malanima. This is also confirmed by the econometric exercise of table 4, which presents the reappearance of a standard Malthusian relation in the period 1690–1771. However, other forces, such as the turmoil of the Napoleonic wars or the increasing foreign competition following the British Industrial Revolution, in addition to population pressure, might have played a role in the decline.

In the first half of the nineteenth century, our series shows a phase of rebound, despite continuing population pressure. After the end of the Napoleonic wars, the renewed political stability, the end of the Continental blockade, and the increase of European demand from primary products inaugurated a phase of economic recovery.[100] This recovery ended in the early 1840s, concomitantly with the 'hungry forties' described by Berger and Spoerer and the outbreak of agricultural diseases (pebrine for silk and oidium for vineyards) in the 1850s.[101]

V.b | South

The historiography on the South has been couched according to a periodization in two main historical phases: the Middle Ages and the early modern period, with a turning point situated in the early sixteenth century. As for the first period, it is possible to distinguish between two major interpretations, which can be evocatively labelled as 'pessimist' and 'optimist'. The pessimist view, which is the conventional wisdom, argued that the Southern regions were characterized by an enduring long-term stagnation. However, this poor economic performance has been variously attributed to a plurality of factors. The first culprit identified in the literature is the institutional changes introduced by the Norman kings (eleventh and twelfth centuries), and in particular, the strong administrative centralization which stifled the emergence and development of 'dynamic' independent communes as in the Centre-North.[102] The second perspective ascribes the stagnation of the South to the emergence and progressive consolidation of exploitative trade links between the South and the Centre-North, echoing the insights of the 'dependency' theories of Latin American development economists. In this view, the South progressively became an economy exploited

[99] Alfani, *Calamities and the Economy*; Alfani and Percoco, 'Plague and long-term development'; Sella, *Crises and continuity*.

[100] Federico and Tena-Junguito, 'The ripples'.

[101] Berger and Spoerer, 'Economic crises'; Romani, *Storia economica*; Federico, *An Economic History of the Silk Industry*.

[102] Doren, *Storia economica dell'Italia*; Luzzatto, *Storia economica d'Italia*; Galasso, 'Considerazioni intorno'. This view has been subsequently rekindled by Putnam, *Making democracy work*, who argued that the roots of social capital, a crucial factor in determining the economic development of the Centre-North, can be traced back to the historical experience of the communes of the Middle Ages, whilst the lack of social capital in the South reflects the centralizing policies of the Norman domination.

by 'quasi' colonial commerce, forced to export agricultural goods and to import manufactures from the Centre-North.[103] The third version of the pessimistic interpretation can be traced back to Croce (1925), who maintained that the negative turning point for the South was the political separation between Sicily and the Continental South after the so-called rebellion of the Sicilian 'Vespri' in 1282.[104] This fragmentation prevented the formation of an economically integrated macro-area whose constituting components were highly complementary.

This pessimistic historiography was challenged by a revisionist perspective that put forward an alternative optimist view of the Southern economy during the Middle Ages. In his study of medieval Sicily, Epstein remarked that, since the Norman domination, there was a gradual introduction of market institutions favouring trade and economic integration, prompting a phase of 'Smithian' growth in the island.[105] According to Epstein, market integration was a driver of economic growth more important than the Malthusian shock of the Black Death.

In the same vein, Sakellariou argued that the Aragonese monarchy, who took power in the first half of the fifteenth century, introduced (Continental South) a series of important institutional reforms in the Kingdom of Naples such as the standardization of weights and measures, the introduction of a single currency, a general improvement of the road network, and especially, the creation of a system of regional fairs.[106] In her view, these policies fostered market integration, specialization, and ultimately economic growth.

The historiography dealing with the period after the sixteenth century is instead rather unanimous in highlighting the constraints which prevented economic growth. The South witnessed a major shift in political and economic power, the 'feudal reaction', in which landowners were able to re-establish exploitative relations of production.[107] This view echoes the well-known narrative of the underdevelopment of Eastern Europe after the fifteenth century.[108] In this view, feudal institutions are seen as limiting the growth of market and hindering the introduction of agriculture innovations. Lepre, whilst endorsing the idea of growing feudal rents, also stressed the relevance of resource constraints relative to growing population as the backdrop for the crisis of the mid-seventeenth century.[109]

Our estimates of GDP per capita for the South show an upward trend from the Black Death up to the early fifteenth century. Thus, at least for this period, the pessimistic interpretations seem to be widely off the mark. This phase of economic growth appears somewhat consistent with the analysis of Epstein for Sicily, even if he claimed that the positive performance lasted until the early decades of the sixteenth century. In fact, our series exhibits a clear turning point from expansion to depression during the 1400s (table 3 and figure 11).[110] Thus, this pattern does not support the optimistic perspective of Sakellariou, who argued for a phase of economic prosperity of the Continental South from the second half of the fifteenth century.[111] The two sub-periods of

[103] Luzzatto, *Storia economica d'Italia*; Jones 'La storia economica'; Aymard, 'La transizione'; Aymard, 'La fragilità'; Bresc, *Un monde méditerranéen*.

[104] Croce, *Storia del Regno di Napoli*.

[105] Epstein, *An island for itself*.

[106] Sakellariou, *Southern Italy*.

[107] Galasso, *Economia e società*; Galasso, *Il Mezzogiorno nella storia d'Italia*; Lepre, 'La crisi del XVII secolo'.

[108] Brenner, 'Agrarian class structure'.

[109] Lepre, 'La crisi del XVII secolo'.

[110] Epstein, *An island for itself*.

[111] Sakellariou, *Southern Italy*.

expansion (1328–1407) and depression (1408–1509) are related to the population movements of the Black Death, and therefore they can also be interpreted as a broad Malthusian cycle as suggested by Malanima for the Centre-North (tables 3 and 5).[112]

Our estimates confirm the conventional wisdom of a long-term stagnation and decline of the Southern economy from the early sixteenth century up to the unification. This is broadly consistent with the interpretation of Villari.[113] He argued that the failed Neapolitan revolt of Masaniello in 1647 shows the strength of the landlords and their ability to quell all trends of economic modernization, causing the structural underdevelopment of the South and the increasing divergence with the Centre-North (figure 11 and table 4).[114] Again, the phase of decline since the end of the seventeenth century coincides with an increase of population. Therefore, it is possible that the 'feudal reaction' interacted with Malthusian forces (period 1698–1777 in table 5) in determining the poor performance of the Southern economy.

VI | CONCLUSIONS

In this paper, we have presented a new set of estimates of GDP per capita for Italy and its two macro-areas, Centre-North and South, in the pre-industrial period. They are based on extensive geographical coverage, which allows for a more fine-grained perspective than the previously available estimates. We have introduced some important refinements to the standard demand-side approach, such as the division of the workforce according to the level of skill and the urban/rural location, a changing number of workdays, and the reconstruction of regional social tables in 1850, which we use to estimate PPP exchange rates with Pound/Sterling to express our series in 1990 dollars.

In international comparative perspective, our series provide support to the standard chronology of the 'Little Divergence', with the Netherlands overtaking Italy in the mid-sixteenth century and England in the late seventeenth century. Despite its losing ground with the 'winners', Italy maintained its erstwhile position relative to other countries in Europe. It was overtaken by France and Germany only in the first half of the nineteenth century.

However, our key finding is that the Italian peninsula was characterized by a 'slow motion' divergence between the Centre-North and the South, starting in the early decades of the fifteenth centuries, the historical peaks of GDP per capita in both macro-areas. In the following 300 years, the Centre-North was characterized by long-run stability, with major fluctuations and cycles, whilst in the South GDP decreased steadily. These trends opened a gap which further increased until the end of the period. Both macro-areas experienced a fast decline in the eighteenth century, which they did not recover from until the start of Italian modern economic growth in the late nineteenth century.

The connection between movements of population and the dynamics of GDP per capita suggests that the Malthusian pressures were affecting economic performance and were particularly visible during the fifteenth and the eighteenth centuries, both in the Centre-North and in the South. However, the resilience and the economic restructuring of the economy of the Centre-North until the beginning of the eighteenth century, as well as other significant medium- and

[112] Malanima, *L'economia italiana*.

[113] Villari, *La rivolta antispagnola*. See also, Galasso, *Il Mezzogiorno nella storia d'Italia*.

[114] For a recent discussion of the trends of development in Sicily in the seventeenth-eighteenth century based on real wages, see Buscemi, 'From the little divergence'.

long-term fluctuations, cannot be adequately explained by simplified models such as the Malthusian or Smithian frameworks. A comprehensive understanding of Italy's long-term economic performance calls for a complex narrative that considers the interplay of institutional changes, exogenous shocks, and factor endowments.

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REFERENCES

Acemoglu, D., Johnson, S. and Robinson, J., 'The rise of Europe: Atlantic trade, institutional change, and economic growth', *American Economic Review*, 95 (2005), pp. 546–79.

Acemoglu, D., Johnson, S. and Robinson, J., 'Institutions as the fundamental cause of long-run growth', in P. Aghion and S. N. Durlauf (eds.), *Handbook of economic growth* (Amsterdam, 2005), pp. 386–472.

Alfani, G., *Calamities and the economy in Renaissance Italy: The grand tour of the horsemen of the apocalypse* (Basingstoke, 2013).

Alfani, G., 'Plague in seventeenth-century Europe and the decline of Italy: an epidemiological hypothesis', *European Review of Economic History*, 17 (2013), pp. 408–30.

Alfani, G. and Percoco, M., 'Plague and long-term development: the lasting effects of the 1629–30 epidemic on the Italian cities', *Economic History Review*, 72 (2019), pp. 1,175–201.

Alfani, G. and Sardone, S., 'Long-term trends in income and wealth inequality in southern Italy. The Kingdom of Naples (Apulia), sixteenth to eighteenth centuries', *Explorations in Economic History*, 95 (2025), art. 101646.

Alfani, G. and Schifano, S., *Population and urbanization in Italy, 1300–1800* (Mimeo, 2025).

Allen, R. C., 'Economic structure and agricultural productivity in Europe, 1300–1800', *European Review of Economic History*, 4 (2000), pp. 1–25.

Allen, R. C., 'The great divergence in European wages and prices from the Middle Ages to the First World War', *Explorations in Economic History*, 38 (2001), pp. 411–47.
Allen, R. C., *The British industrial revolution in global perspective* (Cambridge, 2009).
Allen, R. C., 'The high wage economy and the industrial revolution: a restatement', *Economic History Review*, 68 (2015), pp. 1–22.
Alvarez-Nogal, C. and Prados de la Escosura, L., 'The rise and fall of Spain (1270–1850)', *Economic History Review*, 66 (2013), pp. 1–37.
Angeles, L., 'GDP per capita or real wages? Making sense of conflicting views on pre-industrial Europe', *Explorations in Economic History*, 45 (2008), pp. 147–63.
Arroyo Abad, L. and van Zanden, J. L., 'Growth under extractive institutions? Latin American per capita GDP in colonial times', *Journal of Economic History*, 76 (2016), pp. 1,182–215.
Aymard, M., 'La transizione dal feudalesimo al capitalismo', in R. Romano and C. Vivanti (eds.), *Storia d'Italia* (Torino, 1978), pp. 1,131–92.
Aymard, M., 'La fragilità di un'economia avanzata: l'Italia e le trasformazioni dell'economia', in R. Romano (ed.), *Storia dell'economia italiana. II. L'età moderna verso la crisi* (Torino, 1991), pp. 5–137.
Baffigi, A., 'Italian national accounts, 1861–2011', *Bank of Italy Economic History Working Papers*, 18 (2011).
Bai, J. and Perron, P., 'Critical values for multiple structural change tests', *Econometrics Journal*, 6 (2003), pp. 72–8.
Berger, H. and Spoerer, M., 'Economic crises and the European revolutions of 1848', *Journal of Economic History*, 61 (2001), pp. 293–326.
Bolt, J. and van Zanden, J. L., 'The Maddison project: collaborative research on historical national accounts', *Economic History Review*, 67 (2014), pp. 627–51.
Bolt, J. and van Zanden, J. L., 'Maddison-style estimates of the evolution of the world economy. A new 2020 update', *Maddison-Project Working Paper* WP-15, (2020).
Bolt, J. and van Zanden, J. L., 'Maddison-style estimates of the evolution of the world economy. A new 2023 update', *Journal of Economic Surveys*, 39 (2025), pp. 631–71.
Brenner, R., 'Agrarian class structure and economic development in pre-industrial Europe', *Past & Present*, 70 (1976), pp. 30–75.
Bresc, H., *Un monde méditerranéen. Economie et société en Sicile 1300-1450* (Rome and Paris, 1986), 2 vols.
Broadberry, S., 'The Industrial Revolution and the Great Divergence: recent findings from historical national accounting', in A. Bisin and G. Federico (eds.), *Handbook of Historical Economics* (London, 2021), pp. 749–71.
Broadberry, S. and Korchmina, E., 'Catching-up and falling behind: Russian economic growth, 1690s to 1880s', *Journal of Economic History*, 84 (2024), pp. 997–1,028.
Broadberry, S., Custodis, J. and Gupta, B., 'India and the great divergence: an Anglo-Indian comparison of GDP per capita, 1600–1871', *Explorations in Economic History*, 55 (2015), pp. 58–75.
Broadberry, S. N., Campbell, B. M., Klein, A., Overton, M. and van Leeuwen, B., *British economic growth*: 1270–1870 (Cambridge, 2015).
Buscemi, T., 'From the little divergence to the little divide: real wages in the Kingdom of Sicily (1540–1850)', *Economic History Review*, 78 (2025), pp. 646–72.
Buscemi, T. and Ridolfi, L., '*Venice and the Terraferma: the rural-urban dimension of Italy's decline, 1380–1797*', mimeo (2024).
Capasso, S. and Malanima, P., 'Economy and population in Italy (1300–1913)', *Popolazione e storia*, 8 (2007), pp. 15–40.
Cappelli, G., Ridolfi, L. and Vasta, M., 'Unveiling the roots of regional disparities in Italy: evidence from real wages, 1300–1860', in J. Weisdorf (ed.), *Economic development in Italy from the Middle Ages to today: a regional perspective* (forthcoming, 2025).
Casalis, G., *Appendice. Dizionario geografico storico-statistico-commerciale degli stati di S.M. il Re di Sardegna* (vols. 27–28, Torino, 1855).
Cazzola, F., 'L'introduzione del mais in Italia e la sua utilizzazione alimentare (sec. 16.–18.)', *Pact*, 26 (1991), pp. 109–27.
Chiaiese, D., 'Provincial estimates of the Italian value added in the liberal age, 1871–1911', *Rivista di Storia Economica /Italian Review of Economic History*, 40 (2024), pp. 3–43.
Chiarini, B., 'Was Malthus right? The relationship between population and real wages in Italian history, 1320 to 1870', *Explorations in Economic History*, 47 (2010), pp. 460–75.

Chilosi, D. and Ciccarelli, C., 'Evolving gaps: occupational structure in southern and northern Italy, 1400–1861', *Economic History Review*, 75 (2022), pp. 1,349–78.
Chilosi, D. and Ciccarelli, C., 'Smithian growth in the little divergence: a general equilibrium analysis', *Explorations in Economic History*, 97 (2025), art. 101682.
Cipolla, C. M., 'The decline of Italy: the case of a fully matured economy', *Economic History Review*, 5 (1952), pp. 178–87.
Cipolla, C. M., 'Economic depression of the Renaissance?', *Economic History Review*, 16 (1964), pp. 519–24.
Cipolla, C. M., 'The economic decline of Italy', in C. M. Cipolla (ed.), *The economic decline of empires* (London, 1970), pp. 196–214.
Clark, G., 'The price history of English agriculture, 1209–1914', *Research in Economic History*, 22 (2004), pp. 41–123.
Clark, G., 'The condition of the working class in England, 1209–2004', *Journal of Political Economy*, 113 (2005), pp. 1307–40.
Croce, B., *Storia del Regno di Napoli* (Bari, 1925).
Curtis, D., 'Is there an "agro-town" model for Southern Italy? Exploring the diverse roots and development of the agro-town structure through a comparative case study in Apulia', *Continuity and Change*, 28 (2013), pp. 377–419.
de Pleijt, A. M. and van Zanden, J. L., 'Accounting for the "Little Divergence": what drove economic growth in pre-industrial Europe, 1300–1800?', *European Review of Economic History*, 20 (2016), pp. 387–409.
de Pleijt, A. M. and van Zanden, J. L., 'Two worlds of female labour: gender wage inequality in western Europe, 1300–1800', *Economic History Review*, 74 (2021), pp. 611–38.
de Vries, J., *The Dutch rural economy in the Golden Age* (New Haven, 1974).
de Vries, J. and van der Woude, A., *The first modern economy. Success, failure and perseverance of the Dutch economy, 1500–1815* (Cambridge, 1997).
Dincecco, M., 'Fiscal centralization, limited government, and public revenues in Europe, 1650–1913', *Journal of Economic History*, 69 (2009), pp. 48–103.
Ditzen, J., Karavias, Y. and Westerlund, J., 'Testing and estimating structural breaks in time series and panel data in Stata', *arXiv* 2110.14550 (2021).
Doren, A., *Storia economica dell'Italia nel Medio Evo* (Padova, 1936).
Epstein, S. R., *An island for itself: economic development and social change in late medieval Sicily* (Cambridge, 1992).
Federico, G., *An economic history of the silk industry, 1830–1930* (Cambridge, 1997).
Federico, G., 'Una stima del valore aggiunto in agricoltura', in G. M. Rey (ed.), *I conti economici dell'Italia. 3.2 Il valore aggiunto per il 1891, 1938 e 1951* (Bari, 2000), pp. 3–112.
Federico, G., 'Le nuove stime della produzione agricola italiana, 1860–1910: primi risultati ed implicazioni', *Rivista di Storia Economica*, 19 (2003), pp. 359–81.
Federico, G., 'The economics of Italian unification', in U. Pfister and N. Wolf (eds.), *An economic history of first German unification* (Abingdon, 2023), pp. 319–35.
Federico, G. and Malanima, P., 'Progress, decline, growth: product and productivity in Italian agriculture, 1000–2000', *Economic History Review*, 57 (2004), pp. 437–64.
Federico, G. and Tena-Junguito, A., 'The ripples of the industrial revolution: exports, economic growth, and regional integration in Italy in the early nineteenth century', *European Review of Economic History*, 18 (2014), pp. 349–69.
Federico, G., Nuvolari, A. and Vasta, M., 'The origins of the Italian regional divide: evidence from real wages, 1861–1913', *Journal of Economic History*, 79 (2019), pp. 63–98.
Federico, G., Nuvolari, A. and Vasta, M., 'Inequality in pre-industrial Europe (1260–1850): new evidence from the labor share', *Review of Income and Wealth*, 69 (2023), pp. 347–75.
Feinstein, C., 'Changes in nominal wages, the cost of living and the real wages in the United Kingdom over two centuries, 1780–1990', in P. Scholliers and V. Zamagni (eds.), *Real wages and economic change in 19th- and 20th-century Europe* (Aldershot, 1995), pp. 3–36.
Felice, E., 'Il Mezzogiorno fra storia e pubblicistica. Una replica a Daniele-Malanima', *Rivista di Storia Economica*, 32 (2014), pp. 197–242.
Felice, E., 'The roots of a dual equilibrium: GDP, productivity, and structural change in the Italian regions in the long run (1871–2011)', *European Review of Economic History*, 23 (2019), pp. 499–528.
Fenoaltea, S., *Reconstructing the past. Revised estimates of Italy's product, 1861–1913* (Torino, 2021).

Fernihough, A., 'Malthusian dynamics in a diverging Europe: northern Italy, 1650–1881', *Demography*, 50 (2013), pp. 311–32.

Fouquet, R. and Broadberry, S., 'Seven centuries of European economic growth and decline', *Journal of Economic Perspectives*, 29 (2015), pp. 227–44.

Franceschi, F., 'The economy: work and wealth', in J. M. Najemi (ed.), Italy in the age of the Renaissance *(*Short Oxford History of Italy, III) (Oxford, 2004), pp. 124–44.

Galasso, G., 'Considerazioni intorno alla storia del Mezzogiorno d'Italia', *Rivista Storica Italiana*, 75 (1963), pp. 7–52.

Galasso, G., *Economia e società nella Calabria del Cinquecento* (Napoli, 1967).

Galasso, G., *Mezzogiorno medievale e moderno* (Torino, 1975).

Galasso, G., *Il Mezzogiorno nella storia d'Italia: lineamenti di storia meridionale e due momenti di storia regionale* (Firenze, 1977).

Giorgi, A. and Moscadelli, S., *Costruire una cattedrale. L'Opera di S. Maria di Siena tra XII e XIV secolo* (2005).

Giustiniani, L., *Dizionario geografico ragionato del Regno di Napoli* (Napoli, 1797).

Greif, A., *Institutions and the path to the modern economy: lessons from medieval trade* (Cambridge, 2006).

Groth, C. and Persson, K. G., 'Growth or stagnation in pre-industrial Britain? A revealed income growth approach', *CAGE Working Paper*, 264 (2016).

Harris, J. R. and Todaro, M. P., 'Migration, unemployment and development: a two-sector analysis', *American Economic Review*, 60 (1970), pp. 126–42.

Henriques, A. and Palma, N., 'Comparative European institutions and the little divergence, 1385–1800', *Journal of Economic Growth*, 28 (2023), pp. 259–94.

Humphries, J., '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 (2013), pp. 693–714.

Humphries, J. and Weisdorf, J., 'Unreal wages? Real income and economic growth in England, 1260–1850', *Economic Journal*, 129 (2019), pp. 2,867–87.

Jones, P., 'La storia economica: dalla caduta dell'impero romano al secolo XIV', in R. Romano and C. Vivanti (eds.), *Storia d'Italia Einaudi: dalla caduta dell'impero romano al secolo XVIII* (Torino, 1974), pp. 1,467–1,809.

Katz, L. F. and Autor, D., 'Changes in the wage structure and earnings inequality', in O. Ashenfelter and D. Card (eds.), *Handbook of Labor Economics* (Dordrecht, 1999), pp. 1,463–1,555.

Krantz, O., 'Swedish GDP 1300–1560: a tentative estimate', *Lund Papers in Economic History*, 152 (2017).

Krantz, O. and Schön, L., 'New Swedish historical national accounts since the sixteenth century in constant and current prices', *Lund Papers in Economic History*, 140 (2015).

Lanaro, P. (ed.), *At the centre of the Old World. Trade and manufacturing in Venice and the Venetian mainland, 1400–1800* (Toronto, 2006).

Lepre, A., 'La crisi del XVII secolo nel Mezzogiorno d'Italia', *Studi Storici*, 22 (1981), pp. 51–77.

Liu, Z., 'Wages, labour markets, and living standards in China, 1530–1840', *Explorations in Economic History*, 92 (2024), art. 101569.

Lopez, R. S., *The commercial revolution of the Middle Ages, 950–1350* (Cambridge, 1976).

Lopez, R. S. and Miskimin, H. A., 'The economic depression of the Renaissance', *Economic History Review*, 14 (1962), pp. 408–26.

Luzzatto, G., *Storia economica d'Italia: il Medioevo* (Firenze, 1963).

MAIC—Ministero di Agricoltura, Industria e Commercio, *Statistica del Regno d'Italia. Popolazione. Censimento generale (31 dicembre 1861*) (Torino–Firenze, 1864–65).

MAIC-DGA – Ministero di Agricoltura, Industria e Commercio, *Relazione intorno alle condizioni dell'agricoltura in Italia nel quinquennio 1870–74* (Roma, 1876–79).

MAIC-DGS – Ministero di Agricoltura, Industria e Commercio, *Salari. Prezzi medi di un'ora di lavoro degli operai addetti alle opere di muratura ed ai trasporti di terra e mercedi medie giornaliere degli operai addetti alle miniere (1862–1878)* (Roma, n.d.).

Malanima, P., *L'economia italiana. Dalla crescita medievale alla crescita contemporanea* (Bologna, 2002).

Malanima, P., 'The long decline of a leading economy: GDP in central and northern Italy, 1300–1913', *European Review of Economic History*, 15 (2011), pp. 169–219.

Malanima, P., 'When did England overtake Italy? Medieval and early modern divergence in prices and wages', *European Review of Economic History*, 17 (2013), pp. 45–70.

Malanima, P., 'Cibo e povertà nell'Italia del Sette ed Ottocento', *Ricerche di Storia Economica e Sociale*, 1 (2015), pp. 15–39.
Malanima, P., 'Italy in the Renaissance: a leading economy in the European context, 1350–1550', *Economic History Review*, 71 (2018), pp. 3–30.
Malanima, P., *The economy of Renaissance Italy* (Abingdon, 2022).
Malanima, P., 'Before modern growth. Italy's GDP 1660–1913', *Structural Change and Economic Dynamics* (forthcoming, 2025).
Maneuvrier-Hervieu, P. and Chambru, C., 'Working time, holidays, and labour conditions in early modern Normandy', *hal-04630438f Working Paper* (2024).
Mariella, V., Postigliola, M. and Rota, M., 'A reconstruction of the Italian provincial population (ca. 1770–1861): a new dataset', *Rivista di Storia Economica*, 36 (2020), pp. 3–41.
Messedaglia, L., *Il mais e la vita rurale italiana* (1927).
Møller, N. and Sharp, P., 'Malthus in cointegration space: evidence of a post-Malthusian pre-industrial England', *Journal of Economic Growth*, 19 (2014), pp. 105–40.
Nuvolari, A. and Ricci, M., 'Economic growth in England 1250–1850: some new estimates using a demand side approach', *Rivista di Storia Economica*, 29 (2013), pp. 31–54.
O'Rourke, K. H. and Williamson, J. G., 'Did Vasco da Gama matter for European markets?', *Economic History Review*, 62 (2009), pp. 655–84.
Palma, N. and Reis, J., 'From convergence to divergence: Portuguese economic growth, 1527–1850', *Journal of Economic History*, 79 (2019), pp. 477–506.
Panciera, W., *L'arte matrice. I lanifici della Repubblica di Venezia nei secoli XVII e XVIII* (Treviso, 1996).
Pedersen, M., Riani, C. and Sharp, P., 'Malthus in pre-industrial Italy', *Journal of Population Economics*, 34 (2021), pp. 1,003–26.
Pfister, U., 'Economic growth in Germany, 1500–1850', *Journal of Economic History*, 82 (2022), pp. 1,071–1,107.
Pomeranz, K., *The great divergence* (Princeton, 2001).
Prados de la Escosura, L., 'International comparisons of real product, 1820–1990: an alternative data set', *Explorations in Economic History*, 37 (2000), pp. 1–41.
Prados de la Escosura, L., Álvarez-Nogal, C. and Santiago-Caballero, C., 'Growth recurring in preindustrial Spain?', *Cliometrica*, 16 (2022), pp. 215–41.
Putnam, R. D., *Making democracy work: civic traditions in modern Italy* (Princeton, 1994).
Rapp, R. T., *Industry and economic decline in seventeenth-century Venice* (Harvard, 1976).
Razzaque, M., Osafa-Kwaako, P. and Grynberg, R., 'Secular decline in relative commodity prices', in R. Grynberg, N. Samantha and R. Newton (eds.), *Commodity prices and development* (Oxford, 2007), pp. 17–34.
Ridolfi, L., 'The days they worked, the incomes they earned: new perspectives on work patterns and annual earnings in the French construction sector (1320–1850)', *Rivista di Storia Economica*, 37 (2021), pp. 115–50.
Ridolfi, L., 'Understanding pre-industrial wages and incomes: a reassessment of the evidence and new interpretations based on France and Italy', *Rivista di Storia Economica*, 39 (2023), pp. 27–62.
Ridolfi, L. and Nuvolari, A., 'L'histoire immobile? A reappraisal of French economic growth using the demand-side approach, 1280–1850', *European Review of Economic History*, 25 (2021), pp. 405–28.
Ridolfi, L. and Vasta, M., 'Reffici debet! The making of a masterpiece: the Dome of Florence and its workers, 1296–1861', *Quaderni DEPS*, 928 (2025).
Romani, M., *Storia economica d'Italia nel secolo XIX (1815–1882)* (Bologna, 1982).
Romano, R., 'Una tipologia economica', in Storia d'Italia*, vol. 1,* I caratteri originali (Torino, 1972), pp. 256–304.
Rota, M. and Weisdorf, J., 'Italy and the little divergence in wages and prices: new data, new results', *Journal of Economic History*, 80 (2020), pp. 931–60.
Rota, M. and Weisdorf, J., 'Italy and the little divergence in wages and prices: evidence from stable employment in rural areas', *Economic History Review*, 74 (2021), pp. 449–70.
Sacco, F., *Dizionario geografico del Regno di Sicilia*, vol. 2 (Palermo, 1799–1800).
Sakellariou, E., *Southern Italy in the late Middle Ages: demographic, institutional and economic change in the Kingdom of Naples, c. 1440–c. 1530* (Leiden, 2012).
Schön, L. and Krantz, O., 'The Swedish economy in the early modern period: constructing historical national accounts', *European Review of Economic History*, 16 (2012), pp. 529–49.
Sella, D., *Crises and continuity. The economy of Spanish Lombardy in the seventeenth century* (Cambridge MA, 1979).

Sella, D., *Italy in the seventeenth century* (London, 1997).
Smits, J. P., Horlings, E. and van Zanden, J. L., *Dutch GNP and its components, 1800–1913* (2000).
Stephenson, J. Z., 'Working days in a London construction team in the eighteenth century: evidence from St Paul's Cathedral', *Economic History Review*, 73 (2020), pp. 409–30.
van Zanden, J. L. and Bolt, J., 'Two concerns about the interpretation of the estimates of historical national accounts before 1850', *Journal of Global History*, 16 (2021), pp. 294–300.
van Zanden, J. L. and Felice, E., 'Benchmarking the Middle Ages: fifteenth-century Tuscany in European perspective', *European Review of Economic History*, 26 (2022), pp. 535–54.
van Zanden, J. L. and van Leeuwen, B., 'Persistent but not consistent: the growth of national income in Holland 1347–1807', *Explorations in Economic History*, 49 (2012), pp. 119–30.
Villari, R., *La rivolta antispagnola a Napoli: le origini* (Bari, 1967).
Ward, M. and Devereux, J., 'New income comparisons for the late nineteenth and early twentieth century', *Review of Income and Wealth*, 67 (2021), pp. 222–47.
Wickham, C., *The donkey and the boat: reinterpreting the Mediterranean economy, 950–1180* (Oxford, 2023).

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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