ORIGINAL ARTICLE

Evolving gaps: Occupational structure in southern and northern Italy, 1400–1861

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Abstract

During the Risorgimento (1800–61), southern Italy was less industrial than central-northern Italy and initially agricultural provinces in the north saw rapid structural transformation. During the Renaissance (1400–1600), structural transformation in the south led to a near halving of the initial difference in agricultural employment share between the centre-north and the south, but convergence came to a halt with the 'seventeenth-century crisis'. These trends suggest that regional inequality was evolving rather than persistent.

> *'E' noto esser diversa la condizione d'un paese secondo che è diversa la proporzione delle persone che campano del prodotto delle terre, o dei capitali, o dell'industria.'*
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> *['It is known that the conditions of countries are different depending on the proportion of people whose livelihood depends on the produce of lands, capitals or industry.']*
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> (Regia Commissione Superiore, *Informazione statistiche*, p. LXIV)

How did the occupational structure of southern and northern Italy[1] evolve in the decades and centuries before their unification (1861)? The debate on the origin of the north–south divide,

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[1] Daniele and Malanima, 'Labour supply', define the centre-north as all the regions from the Alps to Latium and the south as the other regions, including the islands. This definition fits with the conventional one and is close to the one used in this paper, where we define the south as the Kingdom of Naples and the islands and all the other provinces as centre-north.

blindfolded by a dearth of quantitative data, has so far paid scant attention to what happened between the late middle ages and unification. The conventional wisdom on the subject sees the north–south Italian income gap as significant already at the time of Italy's unification.[2] Revisionist historians disagree: for them, in 1861 there was no difference in standards of living between northern and southern regions. Instead, they argue that marked differences emerged only in the wake of industrialisation, from around 1900.[3] According to Cafagna, the industrial triangle in northwestern Italy was rooted in the development of the silk industry during the Risorgimento period (1800–61).[4] However, there are only a handful of quantitative studies looking at these decades. On the one hand, Cafagna's argument sits well with evidence on human capital.[5] On the other hand, Federico and Tena-Junguito find that foreign trade was too static to imply major structural changes.[6] The conventional wisdom traces the origin of the north–south divide to the high middle ages (*c.* 1000–1300), when autonomous cities in the centre-north specialised in commerce and industry, while feudal monarchies in the south specialised in agriculture.[7] Conventional and revisionist scholars alike emphasise that, between the late middle ages and 1800, southern and central-northern Italy shared similar economic trajectories, so that their comparative development remained stable. However, in the absence of systematic quantitative analyses, such claims remain speculative.

This article offers a new quantitative analysis of the comparative development of southern and central-northern Italy in the 'forgotten centuries' between the late middle ages and unification (1400–1861).[8] We look at occupational structure for two reasons. First, in a narrow sense, crucial aspects of the debate, like medieval patterns of specialisation or northern industrialisation during the Risorgimento, directly concern the evolution of occupational structures. Second, in a broad sense, the occupational structure is a key indicator of economic development: urban sectors (industry and services) tend to exhibit higher productivity and dynamism than agriculture; Engel's law implies that rich countries tend to have lower agricultural occupational shares than poor countries.[9] The occupational structure is particularly suited to analyse data-scarce pre-modern economies: even in the absence of direct observations, occupational trends can be estimated with urbanisation rates, using early national censuses, taken before modern industrialisation altered the distribution of industry across city and country, to anchor them to final levels.[10]

Until now, however, two related obstacles prevented the application of this approach to southern Italy: first, the early Italian censuses are biased, with southern agricultural occupational shares which are too low;[11] second, the widespread presence of large centres inhabited by a

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These boundaries differ slightly from those used by Malanima, 'Long decline', who considers Latium as lying outside the centre-north, but this difference hardly affects the results, as the robustness checks reported below demonstrate.

[2] Eckaus, 'North-south'; Zamagni, 'Situazione'; Felice, *Perchè il sud*; idem, 'Roots'; *Federico et al.*, 'Origins'.

[3] Daniele and Malanima, 'Prodotto delle regioni'; eisdem, 'Regional wages'; see also Riall, *Risorgimento*, pp. 108–13.

[4] Cafagna, *Dualismo*; see also Zamagni, 'Situazione'; Ciccarelli and Fenoaltea, 'Through the magnifying glass'.

[5] Chilosi, 'Old wine'; Ciccarelli and Weisdorf, 'Pioneering'.

[6] Federico and Tena-Junguito, 'Ripples'.

[7] Abulafia, *Two Italies*; Galasso, 'Dualismo italiano'; see also Epstein, 'Dualismo', pp. 64–5.

[8] We owe the expression 'forgotten centuries' to Cochrane's seminal book, Cochrane, *Forgotten centuries*.

[9] Kuznets, *Modern economic growth*; Persson, *Pre-industrial economic growth*.

[10] Wrigley, 'Urban growth', table 4; Allen, 'Economic structure', table 2; Malanima, 'Long decline', table 3; Álvarez-Nogal and De La Escosura, 'Rise and fall', table 2.

[11] Kuznets, *Economic growth of nations*, pp. 53–4; Zamagni, 'Century of change', pp. 37–8; Daniele and Malanima, 'Regional wages', pp. 143–4. See also Vitali, *Aspetti*, pp. 164–5.

large proportion of farmers, agro-towns, make it difficult to extrapolate agricultural employment shares from urbanisation rates. As stressed by Malanima, using conventional thresholds, nineteenth-century southern Italy shows up as one the most urbanised areas of the world, not because it was one of the most developed, but because several big centres were mainly inhabited by peasant families.[12] These were agro-towns, rather than cities. We overcome the difficulties associated with estimating the occupational structure of pre-unification southern Italy by relying on a previously neglected source: censuses carried out by regional states in the early nineteenth century. We show that these censuses do not suffer from the same biases as the post-unification censuses in the south. They report occupations by province. These data allow us to examine spatial differences in the occupational structure during the Risorgimento and estimate how much the proportion of agricultural workers differed in cities of the south as compared with those in the centre-north. Combining these proportions with urbanisation rates makes it possible to extrapolate the evolution of agricultural occupational shares. With our newly compiled dataset, we are thus able, for the first time, to estimate trends in the occupational structure of Italian provinces during the Risorgimento and in southern Italy over the very long run.

We find that – consistent with the conventional wisdom and against the revisionist view – the agricultural occupational share in 1861 was on the order of 10 percentage points larger in the south than in the centre-north. This gap is even larger than that previously estimated by Felice for 1881.[13] Our aggregate picture is more consistent with the view that the Risorgimento did not see major economic changes than with that which sees it as a crucial period for Italian industrialisation: the occupational shares changed little in the south and the centre-north. There were significant differences within macro-areas, and underneath the aggregate calm the picture was rather dynamic, with rapid structural transformation in several northern provinces. However, these provinces were initially comparatively agricultural. Since they saw industrial catch-up, they fostered occupational convergence, rather than divergence. The assumption that not much happened before 1800 appears unwarranted: structural transformation in the south nearly halved the difference in agricultural employment share with the centre-north during the fifteenth and sixteenth centuries but came to a halt with the 'seventeenth-century crisis'. Our trends only imperfectly conform with the idea that the centre-north enjoyed a persistent economic advantage grounded in its precocious industrialisation in the high middle ages. We sketch an alternative model, in which institutional competition, unintended consequences, and exogenous shocks gave rise to evolving rather than persistent economic differences between central-northern and southern Italy.

The rest of the article is organised as follows. Section I presents our sources. Section II describes the occupational structure of southern and central-northern Italy during the Risorgimento (1800–61). Section III statistically describes levels and trends of the provincial agricultural employment shares during the same decades. Section IV reconstructs the agricultural employment shares in the macro-areas since 1400. Section V discusses the implications of our findings for debates on the causes of the north–south divide. Section VI concludes that the development gap between central-northern and southern Italy pre-dated unification and can be traced back to the middle ages, but the gap was more accidental and less stable than implied by the conventional wisdom on its medieval deep roots.

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[12] Malanima, 'Urbanisation', pp. 98–9.

[13] Felice, 'Roots', supplementary data.

I | CENSUSES: SOURCES AND METHODS

Taken at face value, the early Italian national censuses show that in 1861 the agricultural employment share was about 8 percentage points higher in central-northern Italy than in southern Italy and remained so until the turn of the century.[14] However, historians have raised serious concerns on the reliability of these figures.[15] In the early national censuses, they argue, women's participation in the textile industry was overstated because statisticians neglected to distinguish between home production for domestic consumption and for the market. The issue was particularly serious in the south, as the structure of southern agriculture, with fields often distant from homes, implied that women's participation in agriculture tended to be lower than in the rest of Italy. The argument that the census data overstated the share of women employed in industry can be traced back to the Italian government's commentary on the 1871 census: 'weavers, without other qualification … are probably those who, owning rough hand looms at home … weave only for part of the year … hence our figures, and particularly those of the female weavers, will appear greater than implied by the real importance of textiles in our country'.[16] Eventually, the government addressed this issue. An increase in the agricultural employment share in the south in 1901 coincides with a change in the criteria used to demarcate labour participation, with a hardening of the previously porous distinction between active and passive population.[17]

In its commentary on the 1861 census, the government proposed a different explanation for the high industrial employment share in the south from the one stressed by historians. In case of doubt, statisticians allocated people to the industrial sector if they were located in large centres, which were particularly common in the south:

> The manufacturing population appears comparatively more numerous in the Sicilian and Neapolitan provinces; that is not, in our view, due to higher industrial development, but because being [southern] inhabitants gathered almost exclusively in big centres … whenever they performed some art or work they were classified as industrialists.[18]

This upward bias in the southern industrial employment share is potentially very large. Statisticians at the time considered big centres those with at least 6000 inhabitants, a threshold which is close to those that we use now (5000 or 10 000 inhabitants) to estimate urbanisation. According to conventional thresholds, by the nineteenth century, urbanisation rates in the south had become much higher than in the centre-north (figure 5). According to the 5000 threshold, the southern urbanisation rate hovered at over 40 per cent, as compared with a European average in 1800 of 12.4 per cent.[19]

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[14] Daniele and Malanima, 'Labour supply', table 5.

[15] Kuznets, *Economic growth of nations*, pp. 53–4; Zamagni, 'Century of change', pp. 37–8; Daniele and Malanima, 'Regional wages', pp. 143–4.

[16] Ministero d'Agricoltura, Industria e Commercio *Popolazione classificata*, p. IV.

[17] Patriarca, 'Gender trouble', p. 145. Humphries and Sarasúa, 'Off the record', argue that nineteenth-century censuses systematically under-counted female labour participation. From this perspective, the post-unification censuses were actually portraying a more accurate picture than usual. Without denying the arbitrariness of the convention that only production for the market enters into national accounting, ignoring it undermines comparability and neglecting the distinction between full-time and part-time does have the potential to cause bias.

[18] Direzione della Statistica Generale del Regno, *Statistica d'Italia*, p. 90.

[19] Malanima, 'Italian economy', table 2.

In the early decades of the nineteenth century, Italian regional states began to regularly collect occupational data in population censuses. As seen in the quotation at the beginning of the article, their motivations were similar to ours: mapping comparative economic development. This does not mean that rulers at the time interpreted the figures like we do: an interest in occupational data stemmed from Physiocratic influences.[20] Physiocrats stressed that farmers were the productive class, while manufacturers and traders were sterile, quite the opposite of what we think now, looking at the data with Kuznetsian eyes.[21] Nevertheless, occupational boundaries of the time match well with the current distinction between primary and urban sectors and, thus, are suited for our purposes. Pre-unification censuses were run by different administrators from the early Italian censuses. They thus do not necessarily suffer from the same biases. In a context of high linguistic diversity, where 90 per cent or more of the people did not speak Italian as a first language,[22] regional states were arguably better equipped to reliably communicate with their citizens than a newly unified state. As we shall show below, the evidence suggests that the censuses carried out by regional states before unification do not suffer from the same biases as those carried out by the Italian state in its aftermath.

Altogether we look at 354 censuses,[23] 61 of which record occupations, carried out between 1800 and 1859 (see online appendix C for details on the sources). We rely on the first Italian census from 1861, too, for populations, but we do not include its provincial occupations in our main dataset. We only look at them for comparative purposes. Our sources report provincial data, with varying levels of detail. We compute occupational shares as the number of workers allocated to each sector (agriculture, industry, and services) divided by the total number of workers. We rely on Wrigley's primary–secondary–tertiary criteria, allocating mining to the secondary sector, however.[24] Our sources often include broad categories of workers cutting across sectors, implying that we can provide only tentative splits between industry and services. Workers in ambiguous categories are less of an issue for the primary sector, not least because we can rely on urbanisation rates to divide up such workers between urban and primary sectors (see online appendix B for details). Figure 1 shows the geographical distribution of our provincial populations (part a) and occupations (part b).

We cover virtually all of the peninsula and the islands, including also Corsica, Savoy, and Istria. Population figures are available at frequent benchmarks both in the north and the south, with an average of 21 observations per province (about one observation every 3 years). Occupations are recorded on average as many as four and a half times per province (one observation every nearly 10 years). They are particularly well covered in Lombardy and the Kingdom of Naples.

Provincial urbanisation rates are needed to estimate the different distributions of workers across city and countryside in the centre-north and the south (table 3) and extrapolate trends when occupational data are not available. We use standard criteria to measure urbanisation: population living in centres with 5000 or 10 000 inhabitants divided by total population of the area.[25] We thus need the population figures of the cities, as well as the provinces. Our censuses report population

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[20] Patriarca, 'Gender trouble', p. 148.

[21] Kuznets, *Modern economic growth*.
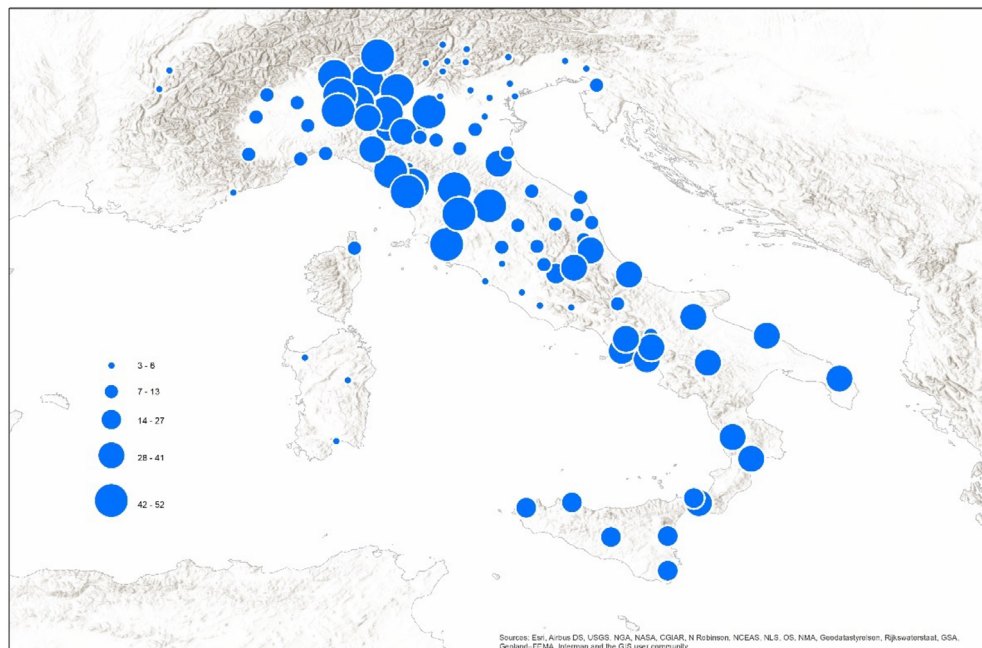
[22] Berruto, 'Lingua italiana'.

[23] Here, we refer to census as a period statistic on the population of a given state (or part of it) in a given year.

[24] Wrigley, *Poverty*, pp. 291–2.

[25] Malanima, 'Urbanisation'; de Vries, *European urbanization*. Centres are different from *comuni*, which also include the population of rural areas surrounding cities.

(a) Population

(b) Occupation
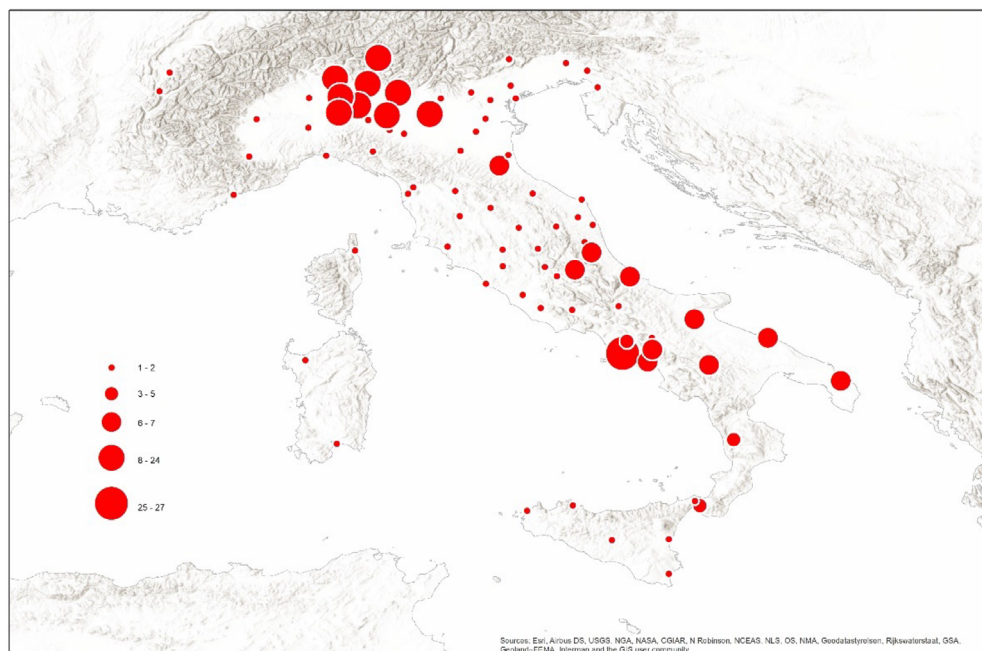
FIGURE 1   Number of observations by province, 1800–61: geographical distribution. (a) Population; (b) occupation. *Notes*: The maps include the 99 provinces for which we have population data and the 83 provinces for which we have occupations. *Sources*: See section I and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

TABLE 1 Descriptive statistics of the sample (1800–61)

	Variable	Unit	N	Places	Average year	Mean	Standard deviation	Sources
(1)	Population	City	2332	622	1834	32 277	62 855	Censuses, others (see online appendix C)
(2)	Population	Province	2038	99	1838	277 710	175 124	Censuses
(3)	Urbanisation rates	Province	4396	99	1836	16–27%	19–24%	Rows 1 and 2
(4)	Agriculture shares	Province	379	83	1840	67%	15%	Censuses
(5)	Industry shares	Province	379	83	1840	15%	8%	Censuses
(6)	Services shares	Province	379	83	1840	18%	10%	Censuses

Notes: The urbanisation rates are computed as population of the cities in a province divided by total population of the province, after linearly interpolating provincial and urban populations between available years (that is why the number of observations of urbanisation rates is greater than the number of observations for the populations of cities and provinces). The range in the urbanisation rates depends on whether the 5000 or 10 000 inhabitants threshold is used to identify cities. N = number of observations (sum of number of years per place). In the occupational statistics, we use urbanisation rates with a 5000 inhabitants threshold in the centre-north and a 10 000 inhabitants threshold in the south to allocate ambiguous categories because these thresholds provide the best fits between urbanisation and occupational structure (table 2). Urbanisation rates in the 16 provinces for which we do not have occupational data are used to compute aggregate urbanisation rates in the macro-areas (figure 3).
Sources: See section I and online appendix C.

of the cities at frequent benchmarks in only a few selected cases, mostly the regional capitals. We therefore rely also on other sources of data on urban populations, including secondary sources and period statistics (online appendix C). We linearly interpolate between available datapoints for both cities and provinces.[26] Hence, while we might miss short-term shocks, like the cholera epidemics of the 1830s, we nevertheless capture long-term trends. Table 1 reports the descriptive statistics, which complement figure 1, and allows a first glance at our key variables, urbanisation rates, and occupational shares.

Online appendix B shows that the results of a range of reliability tests are reassuring. Here, we summarise them. First, the total provincial population data are consistent with those of previous studies. Second, the provincial occupational structure shows the persistency that one would expect: the correlation coefficients between subsequent provincial measures are consistently very high across states and sectors (the average coefficients range from 0.89 to 0.98), with the only and partial exception of industry in Veneto (0.56), where the censuses are 34 years apart – much longer than in the other cases – and we detect a marked increase in the industrial share.[27] Third, a comparison with the 1861 census shows that the mean differences in provincial employment shares are consistent with a positive bias in 1861 in the industrial employment shares of southern provinces, which translates into a negative bias for agricultural employment shares in the same provinces.

Next, we focus on the sources of bias in the southern occupational shares in the pre-unification and 1861 censuses, beginning with the bias caused by over-representation of women employed in industry. Kuznets notices that in the late nineteenth century the labour participation rate (active

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[26] For the cities, we also extrapolate a few missing observations in 1800 with the values fitted by a fixed-effect regression of (log of) population over year dummies.

[27] As discussed (section V), the Veneto's trends are consistent with Bonelli–Cafagna's hypothesis that northern industrialisation during the Risorgimento was rooted in agricultural developments rather than initial industrialisation, Bonelli, 'Capitalismo italiano'; Cafagna, *Dualismo*.

TABLE 2 Labour participation rates, non-agricultural female labourers over total population and industrial employment shares in the pre-unification and 1861 censuses (main polities)

Polity	Census	(1) Labour participation rate Male	(2) Female	(3) Total	(4) Non-ag F/P	(5) Industrial employment share Male	(6) Female	(7) Total	(8) Max. bias
Centre-north									
Piedmont	Pre-unification	74%	60%	67%	9%	21%	18%	20%	−1%
Piedmont	1861	74%	49%	62%	7%	17%	14%	16%	−1%
Lombardy	Pre-unification			23%		12%		18%	
Lombardy	1861	75%	50%	63%	10%	20%	30%	24%	4%
Veneto	Pre-unification			67%				13%	
Tuscany	Pre-unification	76%	34%	55%	10%	19%	40%	26%	7%
Tuscany	1861	74%	41%	58%	10%	22%	36%	27%	5%
Papacy	Pre-unification			62%				13%	
Papacy	1861	78%	51%	65%	9%	15%	24%	18%	3%
South									
Naples	Pre-unification			50%				6%	
Naples	1861	78%	59%	68%	13%	16%	38%	26%	9%
Sicily	Pre-unification			55%				5%	
Sicily	1861	70%	34%	52%	13%	20%	57%	33%	12%
Sardinia	Pre-unification	71%	14%	43%	4%	17%	32%	20%	2%
Sardinia	1861	72%	17%	45%	6%	12%	13%	12%	0%

Notes: Piedmont = Kingdom of Sardinia (mainland); Naples = Kingdom of Naples; Non-*ag F/P* = non-agricultural female labourers over total population; Max. = maximum. In polities with repeated measurements (Lombardy, Veneto, and Naples), we report the mean values.

Sources: See section I and online appendix C.

population over total population) in Italy was abnormally high: in 1871 it was nearly 60 per cent, as compared with about 40 per cent in other developed countries.[28] In support of the argument that inflated industrial participation of women in textiles was behind the Italian anomaly, Kuznets reports that in 1871 the ratio of Italian women in non-agricultural occupations over the total population was 12 per cent, the same as in the UK and much higher than in countries like France (6 per cent) or Germany (4 per cent), where the occupational structure can be expected to be closer to that of Italy's than that of the birthplace of the industrial revolution.[29] Table 2 reports mean labour participation rates and industrial employment shares in the main Italian pre-unification polities, together with those recorded in the first Italian census in 1861 in the same territories. Where available, we also include the breakdown by gender and the ratio of non-agricultural women to total population. In proto-industrial societies, like Risorgimento Italy, women are expected to have a lower agricultural and higher industrial labour share than men.[30] Hence, the difference between total and male industrial employment share (column 7 minus column 5) shown in column 9 is

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[28] Kuznets, *Economic growth of nations*, pp. 53–4.

[29] Ibid.

[30] Shaw-Taylor and Wrigley, 'Occupational structure', pp. 68–9; Sarasua, 'Women's work'.

an upper-bound estimate of the bias in the total industrial employment share due to an over-representation of industrial work amongst women.

Relatively high labour participation rates and volatile female labour participation rates suggest that we cannot rule out a positive bias in the female industrial employment share in the centre-north also before unification.[31] Yet small differences between male and female industrial employment shares indicate that this bias is bound to be small. In the south, in the Kingdom of Naples, the labour participation rate was much higher in 1861 than before. There, a bias in the 1861 industrial female employment share can potentially account for nearly half of the difference between the industrial employment share in the 1861 and earlier censuses. By contrast, in Sicily and Sardinia it seems that over-counting of industrial women was not a major issue: labour participation shares were relatively low both before unification and in 1861. A much higher industrial employment share in Sicily in 1861 than before had to be mainly due to another factor: a positive bias in the industrial employment shares of agro-towns.[32]

Finally, we show how the workforce was distributed differently across city and countryside in the centre-north and the south. Agro-towns imply that we expect to find a significantly higher share of agricultural workers in southern cities than in central-northern cities. The erroneous allocation of agricultural workers in southern agro-towns to the secondary sector in the 1861 census implies that we expect the share of agricultural workers in southern cities in 1861 to be too low. Hence, the hypothesis that the previous censuses do not suffer from the same bias predicts an agricultural employment share in southern cities lower in 1861 than for previous censuses. As mentioned before, over-counting of industrial women in 1861 was related to the structure of rural work in the south. Hence, this bias is consistent with a lower agricultural employment share in 1861 than before also in the southern countryside.

To obtain the distributions of agricultural workers in cities and countryside, which will also be needed to map urbanisation rates into agricultural employment shares, we run separate pooled ordinary least-squares (OLS) regressions of provincial agricultural employment shares on urbanisation rates for the south and the centre-north:

$$\text{ag}_{it} = \alpha + \beta \text{urb}_{it} + u_{it} \qquad (1)$$

where ag_{it} is the agricultural employment share and urb_{it} is the urbanisation rate in province i in year t. With this specification, the constant α is the expected value of the agricultural employment share in a province with no urbanisation, or in the countryside. The sum of the constant α and the slope β is the expected value of the agricultural employment share in a province with 100 per cent urbanisation, or in a city. Table 3 reports the results. Columns 6 and 7 show the key results: the different shares of agricultural workers in cities and countryside in the centre-north and the

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[31] Although relatively high participation rates could also be traced to double-counting of workers belonging to multiple categories: we had to disregard occupational censuses from two small areas (Trentino and Modena), as labour participation rates were greater than one, since statisticians allocated individuals to multiple occupational groups, like clerks and military; Roncaglia, *Statistica generale*, p. 10. In pre-unification Lombardy, in contrast to the other polities, labour participation rates appear too low, suggesting under-counting. Lombard censuses were carried out very frequently, but evidently not as thoroughly as in the other polities. Yet a lower male industrial employment share before unification than in 1861 suggests that any bias in the pre-unification censuses militates against our finding that Lombardy saw structural transformation (figure 4).

[32] In the provinces of the Sardinian Isle, too, the agricultural employment share was higher before unification than in 1861, although, differently from the other southern areas, this difference was driven by services rather than industry. Hence, our finding that Sardinia was less agricultural than the Kingdom of Naples (figure 3) is robust.

TABLE 3 Agricultural employment share–urbanisation OLS regression (1800–61)

Sample	(1) Urbanisation threshold	(2) N	(3) Adj. R^2	(4) α	(5) β	(6) ag in cities	(7) ag in country
A (our data)							
Centre-north	**5000**	**267**	**0.323**	**0.729*****	**−0.462*****	**27%**	**73%**
Centre-north	10 000	267	0.235	0.709***	−0.443***	27%	71%
South[a]	5000	112	0.907	0.930***	−0.427***	50%	93%
South[a]	**10 000**	**112**	**0.937**	**0.903*****	**−0.480*****	**42%**	**90%**
B (for comparison)							
Centre-north 1861	5000	34	0.501	0.722***	−0.527***	20%	72%
South 1861[a]	10 000	25	0.589	0.695***	−0.409***	29%	69%

Notes: N = number of observations (sum of number of years per province), adj. = adjusted, ag = agricultural employment share. α and β are estimated with equation (1). ag in cities is equal to $\alpha + \beta$; ag in country is equal to α. Including Latium in the south has a tiny effect on the size of the coefficients and implies a slightly poorer fit there than under our baseline boundaries.
Sources: See section I and online appendix C. ***Significant at 1% level, **significant at 5% level, *significant at 10% level.
[a]Interaction of the slope with Naples dummy allows a different urban agricultural labour share in that province.

south (columns 6 and 7). Panel A reports the results based on the pre-unification censuses. For the sake of comparison, panel B reports the results using data from the 1861 census.

The goodness of fit improves in the centre-north with a 5000 threshold and in the south with a 10 000 threshold. The results for the centre-north agree with Alfani's argument that the presence of several small cities implies that the 5000 threshold better represents urbanisation in pre-industrial northern Italy than the 10 000 threshold.[33] Those for the south are consistent with the expectation that southern agro-towns were less prevalent amongst relatively large places. Indeed, the urban agricultural employment share drops significantly with the 10 000 threshold in the south, but not in the centre-north. We therefore focus on the first and fourth specifications (highlighted in bold in the table). The results imply that, for the pre-unification censuses, the agricultural employment share in southern cities was much higher than in central-northern cities, 42 per cent versus 27 per cent. Astonishingly, this difference almost entirely disappears in the 1861 census. Agro-towns hardly show up there. Moreover, for the pre-unification censuses, rural industry and/or services were more developed in the centre-north than in the south. This difference, too, disappears in the 1861 census, consistent with a positive bias in southern industry also in places with less than 10 000 inhabitants[34] and the expectation that the positive bias when counting industrial women affected mainly rural areas in the south. The hypotheses that agricultural employment shares in cities and countryside were the same in the centre-north and south are soundly rejected with the pre-unification censuses data but accepted with the 1861 census.[35] In

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[33] Alfani, 'Economic inequality', p. 1082.

[34] As said before, 6000 inhabitants was used as a threshold to identify large centres at the time. Moreover, there were also several places with fewer inhabitants which had the juridical status of a town and might have been considered as such by the statisticians allocating workers to urban occupations.

[35] The *F*-statistics with pre-unification censuses are: 169.27*** (null hypothesis that the agricultural employment share in the country is the same in the centre-north and south) and 8*** (null hypothesis that the agricultural employment share in the city is the same in the centre-north and the south). With the 1861 data, the same *F*-statistics are 0.66 and 0.69, respectively. *** denotes significance at the 1% level.

short, the pre-unification censuses emerge as more reliable guides to the agricultural occupational shares of southern provinces than the 1861 census.

II | OCCUPATIONAL STRUCTURE DURING THE RISORGIMENTO: MACRO-AREAS

We can now turn to the evolution of the occupational structure during the Risorgimento in the centre-north and the south. We base our assessment on the occupational shares across the three main sectors in the provinces. To reconstruct these time series of provincial employment shares, we rely on direct observations for the *levels*. We interpolate *trends* between points with occupational data and extrapolate when interpolation is not viable.[36] Following a standard approach, to extrapolate *trends* in the agricultural employment shares, we use urbanisation rates.[37] To do so, we need to take into account that not all workers in cities were employed in the secondary and tertiary sectors and not all workers in the countryside were agricultural. That is why we rely on the fitted differences by our favourite specifications from table 3 (the first and the fourth specifications) (for details on this equation, as well as the other regression equations used in the analysis, see online appendix A).[38] As before, we estimate different coefficients for the centre-north and the south. By definition, urbanisation does not allow us to distinguish between the two urban sectors. We thus split extrapolated changes in the agricultural employment shares evenly between them.

All our provincial estimates (1800–61) are presented in the next section. Here we present the trends by macro-area. Since the panel is unbalanced, provincial shares are aggregated with fixed-effects regressions weighted by the means of the provinces' populations.[39] Figure 2 presents trends in the occupational structure of Risorgimento Italy.

The overall picture is one of stagnation, across the three sectors, with a very slow movement from agriculture to industry. The levels yield two related results. First, our data are much more in line with the conventional wisdom than those of the post-unification censuses. Southern Italy was significantly more agricultural than the centre-north, with stable differences of over 10 percentage points. These differences are significantly bigger than that found by Felice, two points, after adjusting 1881 census data with Ellena's 1876 industrial census data to address over-counting of industrial women in southern Italy (following Zamagni).[40] Felice's upward adjustment of the southern agricultural employment share does not go far enough, consistent with his neglect of a positive bias in the industrial employment share of agro-towns.[41] Second, the levels point to a

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[36] As industry emerges as noisier than the other two sectors (see online appendix B: tables A1 and A2), we treat it as a residual category between interpolations. The same approach is used with the results by macro-area (figure 2).

[37] Wrigley, 'Urban growth', table 4; Allen, 'Economic structure', table 2; Malanima, 'Long decline', table 3; Álvarez-Nogal and Prados de la Escosura, 'Rise and fall', table 2.

[38] However, to estimate the regression coefficients, we use a slightly refined method: a generalised linear model for fractions, so that the fitted values are bounded between 0 and 1, as expected for occupational shares; Papke and Wooldridge, 'Econometric methods'. The results based on the OLS coefficients reported in table 3 are qualitatively identical.

[39] Constant weights may potentially introduce distortions in the levels. Yet comparison with weighted averages in the years when these are viable (1848–53 for the centre-north and 1838–61 for the south) shows that, while the panel figures for agriculture are slightly too low, the differences are small, just over a percentage point on average and always less than two. While the Italian shares are nearly identical, a similar bias affects the estimates for centre-north and south, implying that their differences are hardly affected: the error is 0.07 percentage points, on average.

[40] Felice, 'Roots', supplementary data; Zamagni, 'Century of change', p. 38.

[41] Felice, 'Roots'.
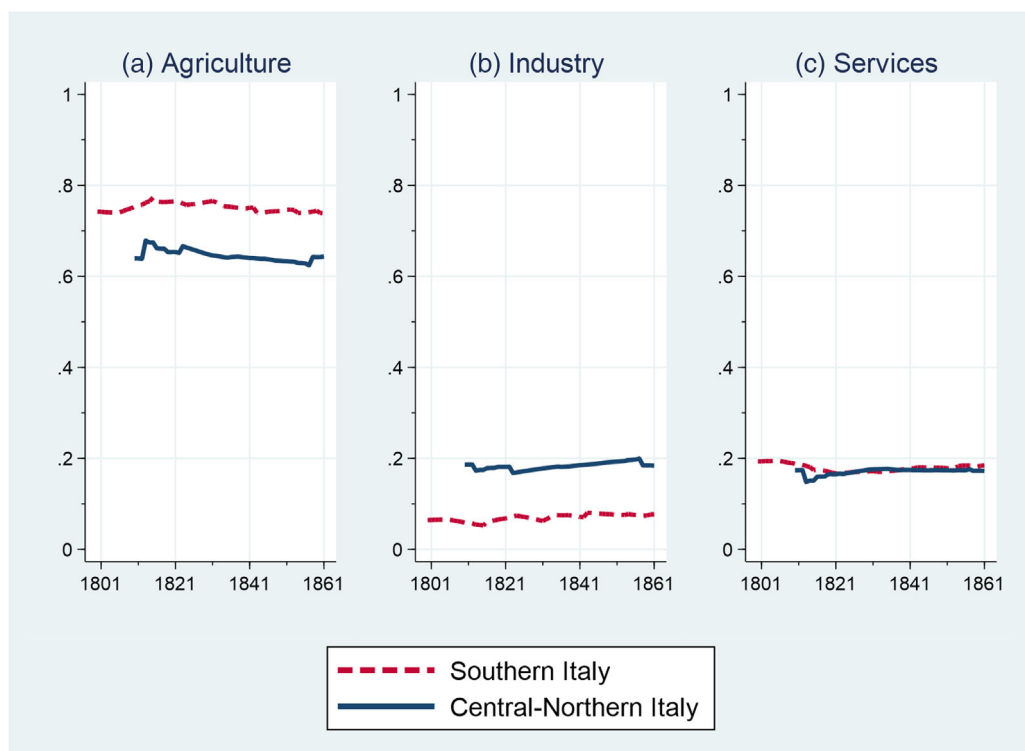
FIGURE 2   Sectoral employment shares in southern and central-northern Italy, 1800–61. *Notes*: We omit the centre-north in 1800–9 as data are available from only two provinces. Figures based on provincial estimates aggregated with equation (3) (online appendix A). *Sources*: See the text and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

previously unnoticed feature of the north–south divide: while the services employment shares were the same in the centre-north and in the south, the industrial employment shares were significantly higher in the former than in the latter.

In part, the high share of services in the south must be an artefact of the crude division employed in the censuses of the Kingdom of the Two Sicilies,[42] which typically grouped all secondary workers together with domestic servants, while offering a more refined division of other tertiary occupations. The differences between employment shares of services and industry of southern provinces are downsized, but nevertheless confirmed, by Petroni's census, which covered the continental part of the kingdom and offered a very refined occupational division, including nearly 500 different categories.[43] Thus, our estimates for 1848 show that, on average, the provincial difference between the shares of services and industry was 8 per cent; for Petroni's data it was 5 per cent.[44]

Petroni's census also offers insights into the nature of the southern Italian service sectors.[45] Five categories of workers stand out as being much bigger than the rest: priests (12 per cent of

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[42] In the provinces of the Sardinian Isle (Cagliari and Sassari), the industrial employment share was higher than the services employment share (1858 census).

[43] Petroni, *Censimento*.

[44] Ibid.

[45] Ibid.

services), servants (11 per cent), domestic workers (10 per cent), clerks (10 per cent), and sailors (10 per cent) together accounted for over half of the whole sector.[46] Workers involved in sales and finance accounted for a relatively low share of services: 13 per cent combined. In the Sardinian Isle in 1858, also in the south, commerce accounted for a similarly low share of services, 12 per cent, though 'capitalists' together with 'owners and pensioners' accounted for 6 per cent of the service sector. In the mainland of the Kingdom of Sardinia, in north-western Italy, the corresponding figures were much higher: 17 per cent and 21 per cent, respectively. Similarly, in the Papal States in Central Italy in 1853, 'dealers, merchants, bankers and money changers' accounted for over a fifth of services. In sum, before unification, southern Italy was already less industrialised and probably less commercialised than the centre-north. These differences remained stable during the Risorgimento.

III │ OCCUPATIONAL STRUCTURE DURING THE RISORGIMENTO: PROVINCES

Is the picture of stability altered if we look at disaggregated provincial data? To answer this question, we run simple tests of sigma- and beta-convergence, as is standard in the economic history of regions, with our agricultural employment shares.[47] Tests of sigma-convergence are designed to look at overall convergence or divergence, regardless of the initial conditions, and are typically carried out with the cross-sectional coefficient of variation. As we are dealing with an unbalanced panel, here we look at an equivalent measure: the ratio between provincial agricultural employment share and cross-sectional average, placing on the numerator whichever is higher. As this variable is computed for each province, we can rely on a fixed-effects panel regression – which yields robust results even with an unbalanced panel – to examine its trend. Formally:

$$\text{abs}\left[\ln\left(\frac{\text{ag}_{it}}{\overline{\text{ag}}_t} \right) \right] = \alpha_i + \beta t + u_{it} \tag{2}$$

In our context, beta-convergence aims at testing the hypothesis that initially agricultural provinces saw faster structural transformation than provinces with initially high shares of workers employed in the urban sectors. We look at beta-convergence by running the OLS cross-sectional regression:

$$\dot{\text{ag}}_{i,t1-t0} = \alpha + \beta \ln\left(\text{ag}_{i,t0} \right) + u_i \tag{3}$$

where, in both regressions, ag is the agricultural employment share, the subscript i refers to the province and t is the year (the initial and final ones in equation 5), and $\overline{\text{ag}}_t$ refers to the

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[46] In industry, two occupations accounted for a fraction of the total secondary share greater than 10%: 'shoe-makers' and 'spinners and weavers'.

[47] Rosés and Wolf, 'Regional growth'. These tests are usually applied to regional incomes, rather than occupational shares. Hence, our coefficients are not directly comparable with those of other studies. Re-running the same beta-convergence test with provincial wages computed assigning an urban wage premium of 1.7 – a figure which matches available data on value added by sector – suggests that, within Italy, the speed of convergence (0.65%) was very slow, both compared with Italy after unification (1%) and especially with the modern norm (2%); Felice, 'Regional income', p. 181. The speed of beta-convergence was slower still within the south (0.25%), but within the centre-north (2.19%) it was in line with the modern norm. As 11 estimates (0.3% of the sample) from the Trieste province were slightly below zero and positive occupational shares are needed to run the tests, we substituted them with the minimum value from the same province (0.01%).

TABLE 4 Sigma- and beta-convergence of the agricultural employment share, 1800–61

| Sample | Convergence | N | R^2 (%) | β*100 | Fitted ratio provincial and average ag | |
					1800	1861
Italy	Sigma	3803	0.04	−0.021	1.22	1.20
Centre-north	Sigma	2541	0.41	−0.092***	1.21	1.15
South	Sigma	1262	0.66	0.034***	1.23	1.26
Italy	Beta	82	26.85	−0.952***		
Centre-north	Beta	59	52.13	−2.002***		
South	Beta	23	29.12	−0.234**		

Notes: N = observation; ag = agricultural employment share. The tests of sigma- and beta-convergence are carried out with equations (2) and (3).

Sources: See section I and online appendix C. ***Significant at 1% level, **significant at 5% level, *significant at 10% level.

cross-sectional average and $\dot{a}g_{i,t1-t0}$ to the average yearly rate of change.[48] In both cases, the coefficient of interest is β, with a negative (positive) value implying convergence (divergence). We weight the regressions with average provincial populations. Table 4 presents the results. In both cases, the main variable of interest is the coefficient β, with a negative (positive) value implying convergence (divergence). Beta-convergence is necessary but not sufficient for sigma-convergence, which also requires that the speed of convergence is sufficiently fast and/or the dispersion is sufficiently small.[49]

We find an increase in the dispersion of the agricultural employment share (sigma-divergence) only within the south. In the other two samples, the relevant coefficient has an opposite sign, implying overall convergence, but is statistically significant only in the centre-north. The fitted ratios between provincial and average agricultural employment share show small changes in the overall dispersion within the south and in Italy as a whole, but rather significant changes within the centre-north. In consequence, while at the beginning of the period the occupational structure of the central-northern provinces was nearly as heterogeneous as in the south, by 1861 it had become significantly more homogeneous. The results of the beta-convergence test cast light on the dynamics underlying these results. While in all samples it was initially agricultural provinces that experienced comparatively fast structural transformation, this beta-convergence was a lot faster within the centre-north than within the south (or than within the peninsula as a whole).

What accounts for these differences between the central-northern and southern provinces? In the presence of decreasing returns, differences in the occupational structure can signal impediments to factors mobility, which prevent capital and labour from flowing from where they are abundant and cheap to where they are scarce and dear. However, heterogeneous occupational structures can also, on the contrary, signal integrated markets, with provinces specialising in the sector where they have a comparative advantage. To gain insights into why the level of heterogeneity was different, we look at provincial agricultural employment shares in 1848 (figure 3), when estimates are available for all provinces in the sample. These shares indicate that there are two main reasons why the occupational structure remained more heterogeneous in the south than

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[48] The average yearly rate of change is computed, as is standard, with the regression equation $\ln(ag_{it}) = \alpha + \dot{a}g_{i,t1-t0}t + u_i$, where the notation is the same as in equations (2) and (3).

[49] Furceri, 'β and σ-convergence'.
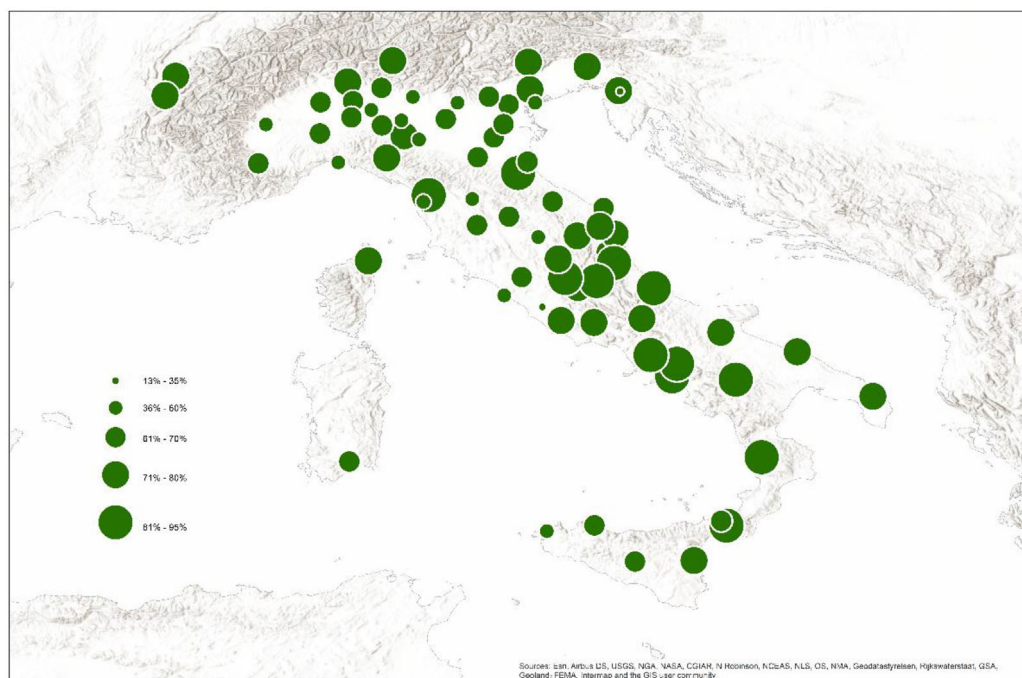
FIGURE 3 Agricultural employment shares by province in Italy in 1848. *Source*: See section I and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

in the centre-north.[50] First, heterogeneity between polities was stronger in the south than in the centre-north. In line with 1871 industrial value-added figures,[51] the Sardinian and Sicilian isles, with shares of 64 per cent and 68 per cent, respectively, emerge as much less agricultural than the Kingdom of Naples (79 per cent). By contrast, in Tuscany the agricultural employment share (55 per cent) was particularly low, but in the other main polities of the centre-north the differences were very modest: in the mainland of the Kingdom of Sardinia and Lombardy the share (64 per cent) was only a little lower than in Veneto (66 per cent) and the Papal States (67 per cent). These shares mapped neatly into patterns of trade specialisation: the Grand Duchy of Tuscany was the only large Italian polity which was a net exporter of manufactures at the time.[52] Marked within-south differences can also, at least in part, be traced to Ricardian specialisation. Relative to the rest of the south, Sicily had a comparative advantage in the secondary sector, having a global monopoly in the mining of sulphur. Similarly, in the Sardinian Isle, a relatively large metallurgical sector developed in synergy with mining: in the 1858 census these two sectors accounted for 7.8 per cent of the secondary sector, as compared with 6.5 per cent in the mainland of the kingdom in north-western Italy. Conversely, wheat price gaps – an indicator of market segmentation – were comparatively low in southern Italy: between 1800 and 1860, on average, the wheat price ratio between two cities 200 km apart was 1.22 in southern Italy, as compared with 1.25 in the

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[50] That the variability of the provincial agricultural employment shares in 1848 was more marked within the south than within the centre-north is confirmed by the population-weighted coefficient of variations, which were 23% and 17%, respectively.

[51] Ciccarelli and Fenoaltea, 'Through the magnifying glass', table 2.

[52] Federico and Tena-Junguito, 'Ripples', table 3.

centre-north and 1.28 in Europe.[53] Evidently, in southern Italy, a comparatively large domestic market, as well as a long coastline, more than compensated for a likely less developed commercial sector (section II) and a more slowly growing transport infrastructure than in central-northern Italy.[54]

The second source of heterogeneity in the occupational structure of southern provinces was that services and industry were highly concentrated in Naples. In the province of the 'capital of the south', the agricultural employment share was only 28 per cent. All the other provinces of the Kingdom of Naples exhibit a share higher than 70 per cent. In no other southern province do we find an agricultural employment share lower than 60 per cent.[55] By contrast, within the polities of the centre-north, we find several pockets of specialisation in manufacturing/services also outside the regional capitals. In Tuscany, in the province of Pisa, the agricultural employment share (51 per cent) was as low as in the province of Florence. Similarly, in Lombardy, the provinces of Brescia (56 per cent), Lodi and Crema (56 per cent), and Cremona (57 per cent) had agricultural employment shares significantly lower than in Milan (64 per cent). Although the province of Roma and Comarca does stand out for its low agricultural employment share (33 per cent), within the Papal States we also find comparatively low values in the province of the Port of Civitavecchia (46 per cent) and in those of Orvieto (54 per cent) and Perugia (56 per cent) in Umbria. The pattern agrees with the conventional wisdom (opening section): the main city of nearly all these central-northern provinces had been free communes in the high middle ages. Industrial development of small cities was also a defining trait of the proto-industrial wave of the fifteenth century.[56] Hence, the strong concentration of southern industry/services in Naples agrees with the high share of agricultural workers in the countryside noticed before (table 3), suggesting that proto-industry was comparatively under-developed in southern Italy.
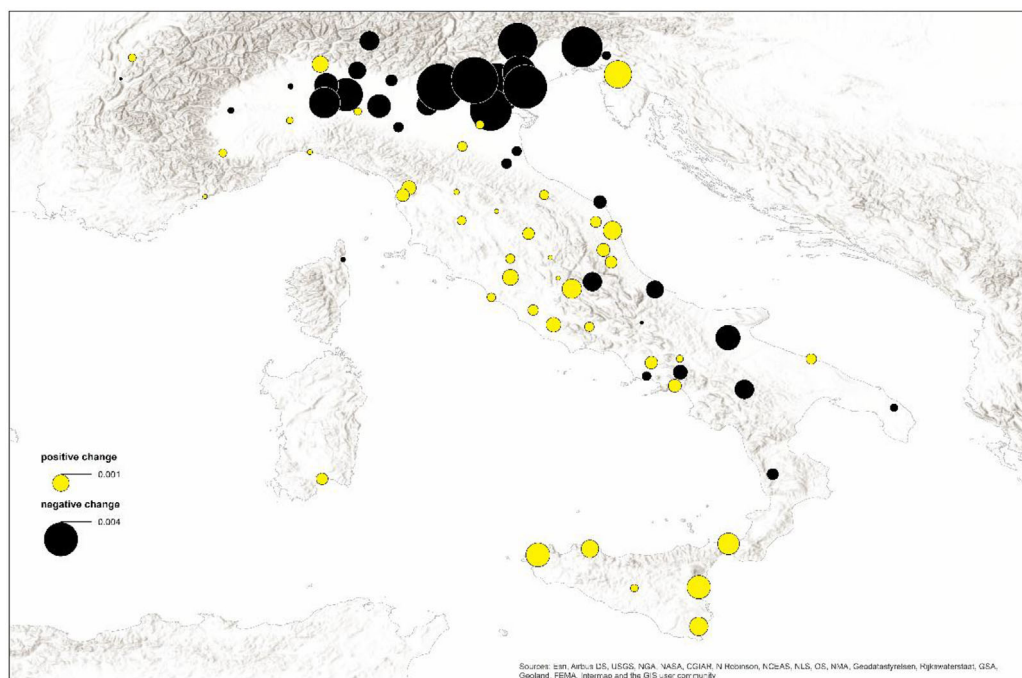
Provincial trends in the agricultural employment shares (figure 4) reveal that during the Risorgimento, underneath the aggregate calm, the picture was rather dynamic: we detect statistically significant trends in 66 out of 83 provinces, nearly evenly spread between negative (31) and positive (35) trends. Consistent with our results on beta-convergence (table 4), both within the south and, especially, the centre-north, structural transformation did not correlate well with initial development of the urban sectors. Within the south, there was relatively rapid structural transformation, with yearly changes in the agricultural employment shares of less than −0.1 percentage points, in four Neapolitan provinces. Their initial agricultural employment shares in 1800 were all very high, ranging from 86 per cent in Capitanata to 91 per cent in Abruzzo Citra. By contrast, the six southern provinces where we find significant de-industrialisation, with an increase in the

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[53] These ratios are computed as the fitted values of regressions explaining the absolute value of log price ratios with the log of distance. We use 35 641 price ratios from southern Italy, 11 243 from central-northern Italy, and 1 827 416 from Europe, computed with wheat prices from Federico et al., 'European goods'.

[54] The first railway in Italy was opened in Naples in 1839, but subsequent developments were much faster in the centre-north. By 1861, the railway density (length of the lines over area) in the centre-north was over ten times as high as in the south but about half as high as in the rest of Western Europe. Our computations are based on data from Ciccarelli and Groote, 'Spread of railroads'; Ciccarelli et al., 'History of rail'.

[55] There is only one exception: the province of Trapani in Western Sicily, where the agricultural employment share is particularly low: 42%. However, caution is in order. Traditionally, Western Sicily – the classic area of the *latifundia* – exported grain into the Eastern part in exchange for manufactures; Epstein, 'Dualismo'. A significant negative bias in the agricultural employment share of Trapani can be expected: there, 'owners' account for an unusually large share of the workforce (40%) and the urbanisation rate is particularly high (70%), signalling that agro-towns were particularly widespread in this province.

[56] Epstein, *Freedom and growth*, chapter 6; Franceschi, 'Economy', pp. 131–3.

FIGURE 4   Trends (yearly changes) in agricultural employment shares by province in Italy, 1800–61. *Notes*: The yearly change is equal to the average annual marginal change estimated with the following regression model, which is suitable for fractions: $ag_{it} = \frac{e^{\alpha+\beta t}}{(1+e^{\alpha+\beta t})}$, where ag_{it} is the agricultural employment share in province i and year t. *Source*: See section I and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

agricultural employment share of more than 0.1 percentage point per year, were all in Sicily, where, as we have just seen, urban sectors were more developed than in the rest of the south. This de-industrialisation was arguably related to increased integration with the world markets: the Kingdom of Sicily, significantly more than any other Italian polity, during the Risorgimento saw increased exports, thanks to agricultural products, as well as sulphur.[57] Under the rather undemanding assumption that labour productivity was higher in sulphur mining than in agriculture, the net effect on the occupational structure would have been de-industrialisation.

Central Italy was also slowly de-industrialising, suggesting that its remaining comparative advantage in manufacturing was being gradually eroded. The ten Italian provinces with the fastest structural transformation were all in two regions of the north: Lombardy and Veneto.[58] In the early nineteenth century, Lombardy and Veneto were about as agricultural as southern polities and much more agricultural than the other polities of the centre-north. The agricultural

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[57] Federico and Tena Junguito, 'Ripples', p. 361.

[58] These two regions were both part of the Habsburg Empire. Yet, their shared pattern does not look like a border effect relating to the way that the census was taken. The format and frequency of the data is rather different in the two regions. We cannot entirely rule out missing out on similar developments in Piedmont, where only one direct observation is available in 1858 and we rely on urbanisation – which does not capture changes in the significance of rural industry – to extrapolate the previous trend. Yet in Piedmont in 1858, silk processing – the most important Italian rural industry – accounted for only 4.3% of the industrial workforce and 0.9% of the total workforce. Moreover, even if our Piedmontese agricultural employment share at the beginning of the century were negatively biased, our hypothesis that structural transformation was comparatively rapid in initially agricultural provinces would be robust.

employment shares were 71 per cent in Lombardy (1813) and 83 per cent in Veneto (1823), as compared with 83 per cent in the Kingdom of Naples (1814) and 67 per cent (1816) in Sicily in the south, 64 per cent in the mainland of the Kingdom of Sardinia in the north-west (1819), 55 per cent in Tuscany (1810), and 66 per cent in the Papal States (1816) in the centre. Moreover, at the time the shares of rural agricultural workers were also not so different from the Risorgimento level in the south (90 per cent): these shares were 81 per cent in Lombardy (1821) and 91 per cent in Veneto (1823).[59] These high agricultural employment shares are consistent with Alfani's hypothesis that the seventeenth-century plague had negative and long-lasting economic consequences for Lombardy and especially Veneto, where it was particularly deadly, as it led to human capital losses and de-industrialisation: in the territory of the Republic of Venice in 1800, the urbanisation rate had barely grown since the times of the plague and was still significantly lower than in 1600.[60] To return to the question that we posed at the beginning of this section on whether provincial data alter the picture of stability, structural transformation was significantly faster in several northern provinces than in southern Italy. However, in these northern provinces, the agricultural employment shares were initially rather high. Hence, the end result was that, just as with macro-areas, overall, we find no divergence of the Italian provincial occupational structures during the Risorgimento.

IV | AGRICULTURAL OCCUPATIONAL SHARES SINCE 1400

What happened in the previous centuries? Systematic direct observations of occupational data before 1800 are not available. Consequently, any estimate obtained by back-projecting information for later periods will tend to become progressively less reliable as we move to earlier epochs. To extrapolate backwards the agricultural employment shares, we rely on *trends* in urbanisation rates from our macro-areas (figure 5) (see online appendix C for details on sources and computation).[61] Population data by macro-area become available at 50-year intervals from 1300, but we deem it prudent to start in 1400, avoiding the cataclysmic century of the Black Death.[62] For the urban populations, we draw on Malanima's database, as well as others.[63] Cities' populations are mostly available at 50-year intervals from 1500, but only at 100-year intervals before that date. Populations by macro-area are expected to be less reliable before 1500, when the political map of central-northern Italy (but much less that of the south) was highly fragmented. We estimate urbanisation rates every 50 years and linearly interpolate between benchmark years. The urbani-

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[59] The share for the south is from table 3. Since we look at only one cross-section, the number of observations is not sufficient to use a regression approach for Lombardy and Veneto. Their shares are computed assuming that – consistent with the expectation that industrial development in these two regions at the time was centred in the country-side – the urban agricultural employment share was the same as in the centre-north (this value, again, comes from table 3) and using the following formula: $ag_{country} = (ag - urb \times ag_{city})/(1 - urb)$ where ag is the agricultural employment share and urb is the urbanisation rate of the region.

[60] Alfani, 'Plague in seventeenth-century Europe'; idem, 'Pandemics'; Alfani and Percoco, 'Plague and long-term development'; Alfani and Di Tullio, *Lion's share*, figure 4.3.

[61] For the extrapolation, again, we use the fitted differences by our favourite specifications from table 3, with a generalised linear model for fractions (online appendix A: equation 2a). To obtain the relevant coefficients, we still rely on the Risorgimento data, but we weight the regressions by mean province population.

[62] As the population figures are at republican borders, we exclude provinces outside those borders from this part of the analysis.

[63] See on-line appendix C: 'Urban population'.
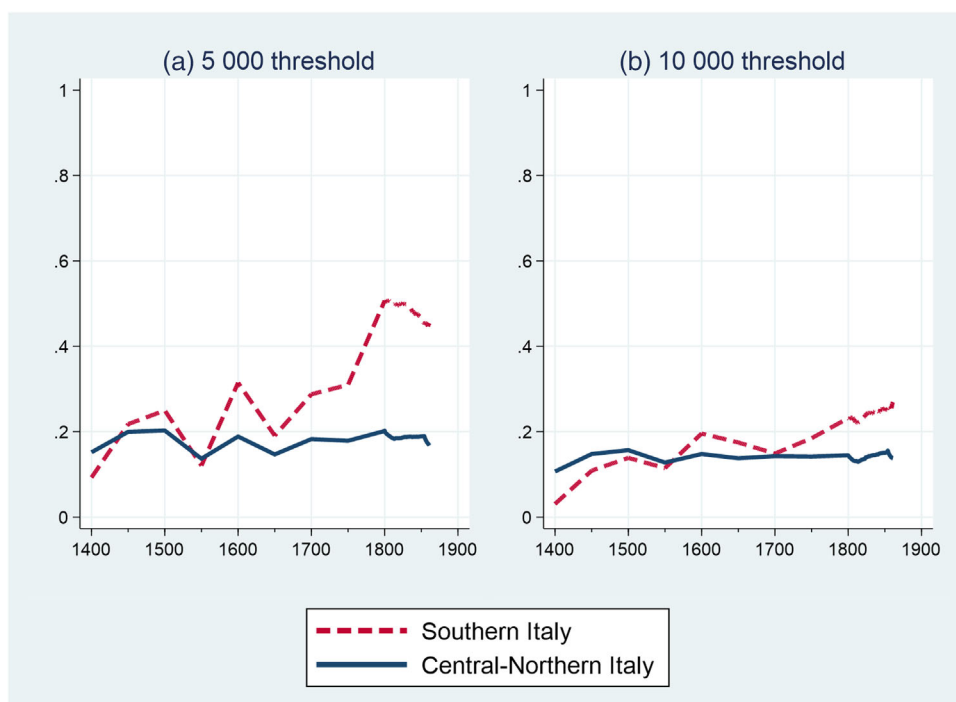
FIGURE 5 Urbanisation rates in southern and central-northern Italy, 1400–1861. *Notes*: We use standard criteria to measure urbanisation: population living in centres with 5000 or 10 000 inhabitants divided by total population of the area (Malanima, 'Urbanisation'; de Vries, *European urbanization*). *Sources*: See section IV and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

sation rates that we use for the extrapolations are nearly identical to those estimated by Malanima (online appendix C: table A3). The nineteenth-century agricultural employment *levels* are determined by aggregated provincial agricultural employment shares in years when estimates from all provinces in the samples are available (1848–53 for the centre-north and 1838–61 for the south). The estimates take into account that Naples was not an agro-town: the agricultural employment share is estimated separately for the city (province since 1800), assuming that it remained at the early nineteenth century level of 4 per cent, and the rest of the south, before they are aggregated.

Backward extrapolation of agricultural employment shares assumes that the distribution of agricultural workers across cities and countryside did not change much in our macro-areas in the four and half centuries before 1861. While this assumption is standard in the literature,[64] the growth of proto-industry can render it problematic. Yet, as stressed also by Malanima,[65] the available evidence consistently indicates that rural industry was under-developed in Italy, by European standards (online appendix D: table A4). Italy saw proto-industrial waves in the fifteenth and seventeenth centuries, but, as mentioned in section III, these developments often meant growth of industry in minor cities, rather than in the countryside, and their impact was uneven:

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[64] Wrigley, 'Urban growth', table 4; Allen, 'Economic structure', table 2; Malanima, 'Long decline', table 3; Álvarez-Nogal and Prados de la Escosura, 'Rise and fall', table 2.

[65] Malanima, 'Long decline', p. 184.

the south saw less growth of proto-industry than the north.[66] Even in the centre-north, strong urban institutions hindered the development of competing industrial production in the countryside, particularly in Tuscany.[67] The most important Italian rural industry was silk processing, which came to maturity only in the nineteenth century.[68] Hence, it seems likely that the importance of Italian proto-industry was even lower in previous times. To factor in the growth of proto-industry, Allen recommends allowing an increase in the agricultural employment share for any given level of urbanisation in 1500 and before.[69] His adjustment would lead to a modest increase in the early estimated agricultural employment shares in central-northern Italy (three percentage points in 1400 and half a percentage point in 1500) and none in the south, where it is not binding.

Agro-towns can be potentially problematic, too. If the share of agricultural workers living in large centres increased over time, an increase in urbanisation rates would overstate the actual increase in urban occupational shares. In some respects, the phenomenon of agro-towns did harden in the early modern period: in Sicily, nearly 150 new towns were founded between the fifteenth and the eighteenth centuries, leading to the agglomeration of previously scattered peasant families.[70] However, such changes hardly touched centres with more than 10 000 inhabitants. Thirty of the new Sicilian towns had 5000 or more inhabitants in 1800, but only two of them reached (only just) the 10 000 threshold. Indeed, the rise in urbanisation rates in early modern southern Italy using the 5000 threshold is significantly faster than using the 10 000 threshold (figure 5). Our assumption that in cities with at least 10 000 inhabitants the share of agricultural workers in cities remained broadly constant can thus be regarded as robust. Moreover, since urbanisation rates in the south and the centre-north were initially very similar, only in the extreme case that southern agro-towns only emerged after 1400 would more rapid urbanisation in the south than in the centre-north be entirely spurious. We can rule out such a possibility: the origin of southern agro-towns can be traced back to antiquity.[71] Hence, the urbanisation rates imply that we can be confident that southern Italy was less agricultural in 1861 than in 1400.

Figure 6 presents our agricultural employment shares. The upper and lower bounds measure the uncertainty of the backward extrapolation deriving from heterogeneity in the shares of agricultural workers in city and country across the provinces of Risorgimento's Italy. Very narrow bands in the centre-north suggest that rural industry was distributed homogeneously across its provinces and, in contrast to the south, distinctions between rural and urban dwellings could be drawn precisely. Nevertheless, in the south, too, this margin of error is relatively narrow and is not sufficient to alter the long-term picture that emerges from our baseline estimates. In spite of slightly different borders, our shares for central-northern Italy are very close to those from Malanima and the overall picture is one of secular stagnation. The 1400 value for us (Malanima) is 65 per cent (67 per cent), while the 1861 value is 64 per cent (62 per cent).[72] Our estimates are also consistent with the agricultural employment share of the Republic of Florence from the Catasto

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[66] Epstein, *Freedom and growth*, chapter 6; Franceschi, 'Economy', pp. 131–3; Sella, *Italy in the seventeenth century*.
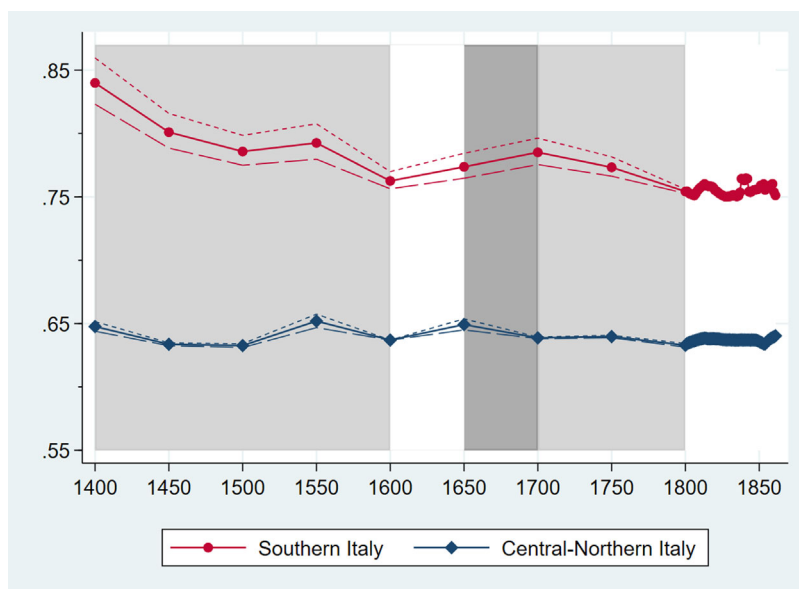
[67] Epstein, *Freedom and growth*, chapter 6.

[68] Federico, *Economic history*, pp. 34–5; idem, 'Seta'.

[69] Allen, 'Economic structure', pp. 6–7.

[70] Fagiolo and Madonna, 'Sicilia'.

[71] King and Strachan, 'Sicilian agro-towns'.

[72] Malanima, 'Long decline', table 3.

FIGURE 6 Agricultural employment shares in Italy, 1400–1861. *Notes*: The background is dark grey when the gap is increasing, light grey when it is decreasing, and white when it is not changing. The lower and upper bound are computed with the 95% confidence intervals of the coefficients used for the backward extrapolation of the agricultural employment shares with urbanisation rates. The backward extrapolation applies equation (2a) (online appendix A) to macro-areas. The coefficients are estimated with provincial data from the Risorgimento, weighted by average population size. The confidence intervals assume that urbanisation rates are precise and constant distributions of agricultural workers across cities and countryside. However, they capture that these distributions were heterogeneous within the two Italian macro-areas. *Sources*: See sections I and IV and online appendix C [Colour figure can be viewed at wileyonlinelibrary.com]

of 1427: between 57 per cent and 59 per cent.[73] Our agricultural employment share in the regional state in the same year is at 56 per cent, using the same approach as for the centre-north.[74]

Consistent with an upward urbanisation trend (figure 5), southern Italy, in contrast to the centre-north, saw slow structural transformation: the agricultural employment share declined from 84 per cent to 75 per cent, implying that the gap with the centre-north went from a maximum of 19 percentage points in 1400 to a minimum of 11 in 1861, with most of the closing of this gap taking place in the fifteenth and sixteenth centuries, when it nearly halved. Structural transformation in the south during these two centuries agrees with Sakellariou's conclusions that commercialisation and textile production significantly increased in the Kingdom of Naples during this period.[75] Aymard also stresses that during the 'long sixteenth century' the southern economy bounced back from the fourteenth-century crisis in a more consistent manner than the centre-north, where the Republic of Venice restructured successfully the economy, but otherwise there was stagnation.[76]

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[73] van Zanden and Felice, 'Benchmarking', table 3 and p. 22.

[74] Tuscan population data in 1427 are from Van Zanden and Felice, 'Benchmarking', table 4. Since the territory of the Republic of Siena was not part of the Republic of Florence in 1427, we exclude the province of Siena from our computations of the 1841 level.

[75] Sakellariou, *Southern Italy*.

[76] Aymard, 'Fragilità', pp. 50–4.

As predicted by traditional historiography, the onset of the 'seventeenth-century crisis' was accompanied by de-industrialisation both in the centre-north and the south: textile production suffered due to competition with cheap cloth from beyond the Alps.[77] Revisionist historians, like Domenico Sella, stress that the dynamism of rural industry at the same time tended to offset the decline of urban industry, with a particular focus on Lombardy.[78] Hence, we can expect our estimate in the centre-north to overstate the extent of seventeenth-century de-industrialisation. Yet it should be again stressed that – as confirmed by our own estimates of non-agricultural employment shares in the countryside of Lombardy and Veneto in the early nineteenth century (section IV) – the evidence indicates that, before 1800, Italian rural industry remained comparatively under-developed by European standards (online appendix D: table A4). Any negative bias in the industrial employment share of the centre-north would only reinforce our result that the gap between the south and the centre-north saw an increase during the 'seventeenth-century crisis'. In the eighteenth century, we detect faster structural transformation in the south than in the centre-north. These trends are consistent with Caracciolo's assessment that the southern economy performed well at the time, while the north was a mixed bag, with development in Piedmont but stagnation in Lombardy and Veneto.[79] In summary, our long-term trends are consistent with the results of several prior studies, both quantitative and qualitative.

V | OCCUPATIONAL STRUCTURE AND THE NORTH–SOUTH DIVIDE: TOWARDS A DYNAMIC MODEL

A full analysis of the causes underlying our occupational patterns is beyond the scope of this article. However, some preliminary considerations can be made. Consistent with the conventional wisdom (opening section), southern Italy emerges as more agricultural than central-northern Italy since the middle ages. However, as stressed by several scholars, north–south trade was never sufficiently important to be the key determinant of occupational structures.[80] This is most obviously the case during the Risorgimento. By that time, as mentioned in section III, most polities in the centre-north had become net exporters of primary products. Moreover, during the Risorgimento the degree of openness of the Italian polities was low by European standards, and four-fifths of their foreign trade was with countries outside Italy.[81] Even before the seventeenth century, when probably centre-northern Italy lost a comparative advantage in textile production,[82] most of the agricultural production in the south was for domestic consumption. Renaissance Sicily stood out as a paragon of openness by the standards of the time, but it never exported more than about 10 per cent of the wheat it produced.[83] At the same time, in the Kingdom of Naples, the dominance of domestic consumption of wheat production was even more marked.[84] Even wool – a key raw

[77] Cipolla, *Before the industrial revolution*, pp. 190–2; Coniglio, *Viceregno*, p. 59.

[78] Sella, *Crisis and continuity*; idem, *Italy in the seventeenth century*; Vigo, 'Origini'. See also Lanaro, 'Centre'; Panciera, 'Industries of Venice'.

[79] Caracciolo, 'Storia economica', pp. 518–20.

[80] Cafagna, *Dualismo*; Epstein, 'Dualismo'; Sakellariou, *Southern Italy*; Federico and Tena Junguito, 'Ripples'.

[81] Federico and Tena Junguito, 'Ripples', tables 1, 3, and 5.

[82] Cipolla, *Before the industrial revolution*, pp. 190–2.

[83] Epstein, 'Dualismo', p. 70.

[84] Sakellariou, *Southern Italy*, p. 268.

material for the textile industry – was mainly used by local industries: only about up to a third of it was exported.[85]

Differences in agricultural employment shares thus mainly reflected differences in the structure of domestic demand. Engel's law predicts that, as income rises, the share of it that is spent on primary products falls. Consequently, there is an inverse relationship between income per capita and share of the workforce employed in agriculture. One caveat is that this relationship is mediated by agricultural labour productivity: if labour productivity is relatively high, then the domestic demand for agricultural products can be satisfied with only a relatively small share of the workforce being employed in its production. Fortunately, the evidence is that – certainly by the nineteenth century – there was little difference in the agricultural labour productivity of southern and central-northern workers. Federico finds that, surprisingly, in 1891 the index of agricultural labour productivity in the south (102.4) was higher than in the centre (71.8) and the north (87.2).[86] However, he bases himself on post-unification census data. If we substitute in our estimate of the agricultural employment share in the south in 1861 – a better estimate, in the light of the biases plaguing post-unification Italy's censuses (section I) – the index in the south becomes 77.3, essentially the same as in the centre-north. It is therefore safe to infer that a significantly lower agricultural employment share at the time of the Risorgimento signals that southern Italy was significantly poorer than the centre-north.[87]

By the same token, the near halving of the differences between agricultural employment shares in the south and the centre-north that we detect in the fifteenth and sixteenth centuries suggests that their income gap was significantly reduced. This reduction sits uneasily with the idea that the communal experience of the high middle ages gave central-northern Italy a persistent economic advantage relative to the south. Differences between the two areas should thus be seen dynamically. In our alternative model, institutional competition interacted with unintended consequences and exogenous shocks, giving rise to evolving rather than persistent patterns of advantage, as we now begin illustrating with the case of the fiscal-military state. This institution was pioneered by the medieval city-states of central-northern Italy, which as early as the twelfth century began raising public debts serviced with earmarked tax flows.[88] By the end of the middle ages, taxation per capita in the Italian centre-north was much higher than any other place for which data are available (for sources and data at benchmark decades, see online appendix D: table A5). However, eventually, similar institutions were also adopted by territorial states elsewhere in Europe, including southern Italy. By the mid-sixteenth century, the southern Italian kingdoms had developed consolidated public debts and fiscal systems able to exercise a fiscal pressure comparable to those of the regional states of the centre-north: for our estimates, in 1500, the revenue per capita in the centre-north was still 125 per cent higher than in the south; by 1550 the figure had become 25 per cent, a level at which it stayed until the end of the century.[89] The traditional view emphasises the negative economic consequences of the burden of Spanish taxation for the south.[90]

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[85] Ibid., p. 295.

[86] Federico, 'Agricoltura', p. 324.

[87] If southern agricultural labourers were more productive than central-northern labourers, the difference in revealed incomes would increase.

[88] Pezzolo, 'Bonds'; O'Brien, 'Afterword'.

[89] For a comparison between Italian polities, see Chilosi, 'Risky institutions', pp. 896–9.

[90] Luzzatto, *Storia economica*; Galasso, *Mezzogiorno*. More recently, historians have been ambivalent, stressing the positive role of state formation, but continuing to denounce seventeenth-century taxation as excessive; Villari, 'Spagna', p. 19.; Calabria, *Cost of empire*.

Following the recent literature on the fiscal-military state, which stresses the unintended positive economic consequences of fiscal capacity,[91] the growth of Aragonese and Spanish taxation can now be seen in a rather more favourable light. In the eyes of Sakellariou, increased state capacity meant lower transaction costs and more developed markets within the Italian south.[92] From this perspective, that fiscal reform during the 'long sixteenth century' was accompanied by structural transformation was no mere coincidence.

However, in the second half of the seventeenth century, the fiscal capacity of the southern states fell increasingly behind those of the centre-north. Our estimates indicate that the percentage difference between the per capita fiscal revenues in the two Italian macro-areas went up quickly, from 19 per cent in the 1650s to 60 per cent in the 1690s. It is only much later, during the restoration after 1815, that taxation in the south eventually caught up with that of the centre-north (online appendix D: table A5). The seventeenth-century fiscal trends agree with those of the agricultural employment shares in suggesting that the second half of the seventeenth century was more difficult for southern than central-northern Italy. An exogenous epidemiological shock can help us to understand why. Consistent with Alfani's hypothesis that the seventeenth-century plague caused de-industrialisation,[93] in the first half of the seventeenth century, we detect a particularly marked increase in the agricultural employment share in the centre-north, while in the second half of the century only the south saw a rise of this share. The pattern matches neatly the different timing of the seventeenth-century plague, which hit the centre-north in the 1630s and the south in the 1650s. The central part of the peninsula was relatively little affected by the epidemiological crisis. Consequently, in the aggregate figures, the centre-north had already rebounded by 1700. The Kingdom of Naples was amongst the worst-hit areas: there, the plague was about as deadly as in the Republic of Venice, wiping out over one-third of the population.[94] Correspondingly, recovery in the south took longer than in the centre-north: in 1750, the southern agricultural employment share was still higher than in 1600. From this perspective, the set-back that followed the seventeenth-century plague not only sealed the fate of northern Italy to economic marginality within western Europe, but also interrupted the path of southern Italy towards convergence with the richer central-northern part of the peninsula.

Our occupational trends during the Risorgimento (figure 4) are also at odds with the idea that the centre-north enjoyed a persistent advantage rooted in its precocious industrialisation in the high middle ages. Low initial industrial development was not the crucial condition that held southern manufacture back during the Risorgimento: structural transformation was rapid in Lombardy and Veneto, which in 1800 were about as agricultural as the southern regions (section III). These trends are consistent with a key prediction of Bonelli–Cafagna's model: specialisation in silk production rather than prior proto-industrial development provided the crucial impetus behind the industrialisation of northern Italy during the Risorgimento.[95] Even if Lombardo–Veneto's exports grew little overall, between 1815 and 1855 its silk exports grew more than three-fold, while those of Piedmont and the south stagnated. In consequence, by the

[91] O'Brien, 'Afterword'.

[92] Sakellariou, *Southern Italy*. Epstein also stresses that late medieval state formation benefited the Italian south more than the centre-north, thus promoting catch-up. See Epstein, *Freedom and growth*, pp. 62–3.

[93] Alfani, 'Plague in seventeenth-century Europe'; idem, 'Pandemics'; Alfani and Percoco, 'Plague and long-term development'.

[94] Alfani, 'Pandemics', pp. 202–4.

[95] Bonelli, 'Capitalismo italiano'; Cafagna, *Dualismo*.

1850s, silk accounted for 78 per cent of exports from Lombardy–Veneto, as compared with 40 per cent from the Kingdom of Sardinia and 22 per cent from the Kingdom of Naples.[96] Federico's quantitative analysis confirms Cafagna's insight that silk was no ordinary primary product and its export growth had powerful unforeseen consequences: the evidence is consistent with the view that silk production and processing was a leading sector in the industrialisation of Lombardo–Veneto during the Risorgimento, as it generated capital to be re-invested in industry, a demand for banking services, and positive spill-overs on the formation of industrial workers and entrepreneurs.[97]

This chain of unintended effects was unleashed by an exogenous shock: the global demand for silk greatly increased in the wake of the industrialisation of north-western Europe. Parts of southern Italy did react promptly to the new opportunities opened up by the growth of international trade: Sicily's exports increased much more than those of Lombardo–Veneto in the early decades of the nineteenth century, and by 1858 the isle was nearly as open.[98] However, when the demand for silk boomed, the most important silk-producing areas in Italy were in the north, which thus enjoyed a comparative advantage, thanks to agglomeration economies.[99] The development of silk production in northern Italy was a relatively recent phenomenon. Before the mid-seventeenth century, Italian silk production was concentrated in southern Calabria and eastern Sicily, in the south.[100] Had the industrial revolution happened in the decades around 1600 instead of the decades around 1800, it is possible that the geography of Italian industrialisation would have been rather different, with southern areas playing a more central role.

Industrialisation in Lombardo–Veneto was also associated with a comparatively early development of mass schooling, which was particularly evident in Lombardy.[101] This leadership was clearly not primarily the product of the legacy of medieval communal institutions in the centre-north: in the early nineteenth century, the difference between the diffusion of schooling in Lombardo–Veneto and the rest of the centre-north was much more evident than that between the latter and southern Italy.[102] Lombardy's schooling advantage pre-dated the French period (1796–1815). Cameralist policies of schooling expansion were pioneered by German-speaking countries in the eighteenth century to promote state formation. In consequence, since Lombardy was at the time the main Italian territory directly administered by Austria, popular schooling began growing much more rapidly than in the rest of the peninsula by the closing decades of the eighteenth century.[103] In other words, from the perspective of schooling, too, the industrial advantage of northern Italy during the Risorgimento owed more to the unintended consequences of evolving strategies of institutional competition than to the persistent effect of medieval institutions.

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[96] Federico and Tena Junguito, 'Ripples', pp. 359–61.

[97] Cafagna, *Dualismo*; Federico, 'Seta'.

[98] Federico and Tena Junguito, 'Ripples', table 4.

[99] Cafagna, 'Occasione', p. 81. For a critique of this argument see Fenoaltea, *Reinterpretation*, p. 195.

[100] Aymard, 'Feudalism to capitalism', p. 195.

[101] In Piedmont, too, primary schooling developed particularly rapidly during the Risorgimento, but only from the 1840s, so that its effect on the human capital of the workforce was mainly felt after 1861.

[102] Chilosi, 'Old wine', figure 2. See also Ciccarelli and Weisdorf, 'Pioneering', figure 6.

[103] Chilosi, 'Old wine', p. 427. See also Green, *Education and state formation*.

VI | CONCLUSION

This article has reconstructed the agricultural occupational share in the decades and centuries before Italy's unification to offer new perspectives on the origin of the north–south divide. We have relied on pre-unification censuses that do not suffer from the same biases plaguing the early Italian censuses. In line with the conventional wisdom and in contrast to the censuses carried out after unification, we found that the agricultural employment share was higher in southern than in central-northern Italy at the time of unification in 1861, as the southern provinces were less industrialised and probably less commercialised. In both macro-areas, the aggregate occupational structure changed little between 1800 and 1861, matching the perspective that this was a period of economic stasis. Yet, while provincial trends confirmed a lack of overall divergence in the occupational structures, they also revealed particularly rapid structural transformation in Lombardo–Veneto. Its provinces were initially comparatively agricultural, lending support, in this respect, to Bonelli–Cafagna's insight that northern industrialisation came in waves, rather than as a cumulative process.[104]

We challenged the idea that not much happened to the north–south divide between the late middle ages and 1800: our reconstructions suggested that, while the agricultural employment share in the centre-north changed little between 1400 and 1861, the south saw structural transformation during the Renaissance (1400–1600), nearly halving the difference in agricultural employment share with the centre-north. We inferred that southern Italy was catching up with the centre-north before the 'seventeenth-century crisis' brought the process of convergence to a halt. This part of the analysis relied on urbanisation rates to extrapolate trends in agricultural employment shares rather than on direct observations. Its results are therefore not as reliable as those from the Risorgimento. We hope, however, that they will stimulate further research on Italy's pre-modern occupational structures.

Nevertheless, our pre-modern and Risorgimento trends both point in the same direction, as they only imperfectly match the idea that the centre-north acquired a persistent economic advantage in the high middle ages. The alternative model that we sketched accords to historical change a much more central role: institutional competition, unintended consequences, and exogenous shocks implied that the size of the northern economic advantage changed over time and unevenly across space. In other words, while the north–south divide pre-dated unification, our 'decompression of history' suggests that it was more accidental and less stable than implied by the conventional wisdom on its medieval deep roots.

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[104] Bonelli, 'Capitalismo italiano'; Cafagna, *Dualismo*. See also Mori, 'Industrie'.

AUTHOR CONTRIBUTIONS

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