

11

Employment, 1850–2015

The latest round of national accounts (CNE10) provides data on the number of full-time equivalent (FTE) workers and hours worked and its distribution by industry from 1995 to 2015. Unfortunately, no similar data are provided in earlier rounds of national accounts that present only figures for the number of occupied back to 1980 (CNE80 and CNE86). However, the 1995-based quarterly national accounts (CNTR95) provide data on FTE workers for 1980–1995. I have, then, spliced the two sets of FTE workers through linear interpolation to get consistent estimates over 1980–2015.¹

For the pre-1980 years, García Perea and Gómez (1994) provide estimates of employment back to 1964 that can be pushed further back to 1954 with the rate of variation of employment provided in earlier national accounts (CNE64) (Instituto de Estudios Fiscales 1969: 33–34). I have assumed that the number of FTE workers evolved alongside employment and, thus, projected its 1980 level backwards to 1954 with the employment rate of variation to derive FTE employment series for the period 1954–2015 for the economy as a whole and its main economic sectors.

The next challenge was to link the post-1954 series with the historical evidence back to 1850. Thus, on the basis of population censuses, I constructed yearly employment estimates for 1850–1954 for the four main sectors: agriculture, forestry, and fishing; industry, mining, and utilities; construction; and services. Major shortcomings appear in Spanish census data: working population is only available at benchmark years and refers to the economically active population [EAN, thereafter], with no regard of involuntary unemployment.² Moreover, censuses tend to only record one activity per person, the one that individuals consider to be their principal activity, and this is usually ‘farmer’. However, in a developing society the division of labour is low and a single person might undertake various work tasks over the course of a year.³ Henceforth, activities corresponding to the industrial and, particularly, service sectors end up being underestimated in population censuses.⁴ In addition, figures for female EAN in agriculture seem to be inconsistent over time.⁵ Therefore, I have been forced to make some choices. For example, in order to derive consistent figures over time for EAN in agriculture, I excluded the census figures for female population, while assumed that female labour represented a stable proportion of male labour force in agriculture and, hence, increased the number of days assigned to each male worker (see below).⁶ Moreover, as the share of EAN in agriculture is suspiciously stable over 1797–1910, in spite of industrialization and urbanization, I corrected it by assuming that the agricultural share of EAN moved along, and could not exceed, the proportion of rural population (living in towns with less than 5,000 inhabitants) in total population.⁷ Thus, I adjusted downwards the percentage of EAN employed in agriculture between 1887 and 1920 by redistributing ‘excess’ agricultural workers proportionally between industry, construction, and services.⁸ The next step was to obtain yearly EAN figures through log-linear interpolation of benchmark observations. Since the resulting estimates do not capture yearly fluctuations in economically active population, a partial solution has been, firstly, to compute EAN share in working age population (WAN) and WAN share in total population (N), being WAN and N computed through linear interpolation (ⁱ) between population censuses.⁹ Then, these ratios have been multiplied by the new

yearly population estimates (N) to derive annual figures of economically active population (EAP). Thus,

$$\text{EAP} = (\text{EAP}^i / \text{WAN}^i)(\text{WAN}^i / \text{N}^i)\text{N} \quad (11.1)$$

Later, in order to adjust for differences in labour intensity across main economic sectors and obtain a crude measure of full-time equivalent worker by industry, the data on EAP were converted into days worked per year. I assumed that each full-time worker was employed 270 days per annum in industry, construction, and services. Such figure results from deducting Sundays and religious holidays plus an allowance for illness. This assumption is in line with contemporary testimonies and supported by the available evidence.¹⁰ In agriculture, however, contemporary and historians' estimates point to a lower figure for the working days per occupied, as full employment among peasants only occurred during the summer and, consequently, workers were idle for up to four months every year. It can be assumed that the working load per year for the average male worker in agriculture would range, at most, between 210 and 240 days.¹¹ However, in order to make for the exclusion of female employment in agriculture (due to the absence of consistent data), I increased the number of days assigned to male workers employed in agriculture to match the figure used for the rest of economic sectors (270).¹²

Lastly, figures for full-time equivalent employment by economic sector for 1850–1953 were derived by assuming that their yearly changes mirrored those in economically active population and, thus, FTE employment estimates for 1954 were backwards projected with those for economically active population (EAN). Total FTE employment for 1850–1954 resulted from adding up figures for sectoral estimates. It is worth noting that, in 1954, the ratio between FTE employment and EAN for each economic sector is 1.003 (agriculture), 0.872 (industry), 1.095 (construction), and 1.069 (services), and 1.000 for the aggregate. The implication, in the case of agriculture, is that the upper bound figure for male employment (resulting from an attempt to make for missing female labour figures) matches that of full-time equivalent total employment (including female work).

The final step has been to derive hours worked in which I draw on Prados de la Escosura and Rosés (2010: 526). For mid-nineteenth-century agriculture, Caballero (1864) estimated 10 h per day and a similar average figure, 9.7 h, was found for the mid-1950s.¹³ Thus, I accepted 10 h per day for 1850–1911, interpolated these two figures over 1912–1935, and retained 9.7 h for the period 1936–1954. For industry and services, I interpolated Huberman's (2005) figures for 1870–1899 to derive annual hours worked, and the number of hours worked in 1870 was accepted for 1850–1869. I adopted Domenech's (2007) estimates for different industries and services in 1910 for 1900–1910, and Silvestre's (2003) annual computations for industry for 1911–1919. As regards the interwar years, Soto Carmona (1989: 596–613) provides some construction and services figures. Data on hours worked for the early 1950s are often close to those of 1919. I accepted the number of working hours per occupied in 1954 for the years 1936–1953, and interpolated the figures for 1919 and 1936. For the post-1954 period, hours worked for each branch of economic activity derive from Sanchis (private communication) for the 1950s, Maluquer de Motes and Llonch (2005) for 1958–1963, Ministerio de Trabajo (1964–1978) for 1964–1978, and OECD (2006) for 1979–1994. From 1995 onwards, the latest round of national accounts (CNE10) provides annual figures of hours worked. The resulting estimates show that the amount of total hours worked increased moderately, multiplying by 2.1 over the 166 years considered, but falling short of the increase in population that multiplied by 3.1.

Notes

1. The CN10/CNTR95 ratio in the overlapping year, 1995, is 1.02 for total FTE workers and 0.99, 0.93, 1.00, and 1.04 for full-time equivalent workers employed in agriculture, industry, construction, and services, respectively. See Section VI.1 and, in particular, expression (16) for the linear interpolation procedure used.
2. Nevertheless, in a predominantly agricultural economy such as that of Spain up to the 1950s, modern unemployment in the modern sense of the word was quite reduced, save during exceptional crises. Still, there

was a lot of seasonal as well as hidden unemployment in the agricultural sector (labour hoarding) (Pérez Moreda 1999: 57).

3. Moreover, as the opportunity cost of allocating agricultural labour to alternative occupations during the slack season was minimal, peasants carried out additional non-agricultural activities, such as producing their own implements, clothing and providing services such as transportation and storing, and working in construction industry.
4. The time of year in which census data were collected will also affect the very definition of one's occupation. If, for example, a census is conducted during the harvest season, results for agricultural employment include all those persons temporarily employed in agriculture, despite the fact that their principal occupation during the rest of the year may be in a separate sector.
5. Female labour was not included in agricultural EAN in the 1797 and 1860 population censuses and represented a small and declining proportion of male labour, thereafter. Thus, female/male ratios in agricultural EAN were, according to population censuses, around 0.2 over 1877–1900 and ranged between 0.05 and 0.1 during the first half of twentieth century (Nicolau 2005).
6. The exclusion of females working in agriculture from the total working population is usual in Spanish historical literature (Nicolau 2005; Erdozain and Mikelarena 1999; Pérez Moreda 1999: 55). Carré et al. (1975: 89) followed a similar strategy to one proposed here for the French case.
7. Pre-1930 figures for rural population come from Gómez Mendoza and Luna Rodrigo (1986) and EAN from Pérez Moreda (1999), for 1860 and 1877, and Nicolau (2005), thereafter. Not everyone living in rural districts worked in agriculture, as some proportion, however small it might be, must have been employed in the provision of services and processed goods. It is often alleged that, at least in the south of the Iberian peninsula, there were agglomerations of fairly expansive populations that had no urban characteristics until the mid-1900s, as their inhabitants continued to carry out agricultural tasks. However, in these population centres a significant portion of the working population provided services and non-agricultural goods to the rest of the inhabitants. Thus, I have made the reasonable conjecture that those persons employed in agriculture but living in urban centres would tend to balance out with the population of industrial and service sector workers

- living in rural population centres. Moreover, as income levels increase, both the rural population and the overall population of agricultural workers will decrease, although the latter does so at a faster rate, as there always exists some part of the population that opts to live in the countryside despite not being employed primarily in either agriculture or the raising of livestock (Prados de la Escosura 2007).
8. Thus, the percentage share of agriculture in EAN for 1887 (65.3), 1900 (66.3), 1910 (66.0), and 1920 (57.2) became 62.7, 60.75, 58.0, and 54.5%, respectively. Original shares come from Nicolau (2005).
 9. Yearly estimates of population aged 15–64 for 1858–1960 were derived through interpolation between age cohorts at census benchmarks by David Reher, who kindly supply them to me. I extended the estimates back to 1850.
 10. Soto Carmona (1989: 608) pointed out that, on average, the number of days worked per occupied up to 1919 ranged between 240 and 270. Vandellós (1925) reckoned that, in 1914, the average number of days worked per year in mining was 250. Doménech (2007: 472), in turn, provides a figure of 291 days per year for textile industry workers in the early twentieth century.
 11. Gómez Mendoza (1982: 101) emphasized the seasonal nature of late nineteenth-century employment and estimated that, on average, a farm labourer worked 210 days out of 275–300 working days per year. This figure is not far from Bairoch (1965) estimate of 196 days for nineteenth-century Europe. Simpson (1992) obtained even a lower Fig. (108 to 130 days per worker-year) from labour requirements in Andalusia's agriculture between 1886 and 1930. García Sanz (1979–1980: 63) provided a higher figure, 242 days per year, for day labourers in mid-nineteenth-century Spain.
 12. The implication is that the assumed female/male ratio, in equivalent work effort, would range between 0.125 and 0.286, depending on whether male employees in agriculture are assumed to work 240 or 210 days per year, respectively.
 13. The figure for the 1950s was obtained by dividing the figure for yearly hours, which was kindly provided by Teresa Sanchis (private communication), by the number of working days per year.

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