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Heights, calories and welfare: a new perspective on Italian industrialization, 1854–1913[☆]

Giovanni Federico

Department of History and Civilizations, European University Institute, Via Boccaccio 121, 50133 Firenze, Italy

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Abstract

The height of Italian conscripts was increasing throughout the second half of the 19th century due primarily to an increase in food intake, but also to an improvement in sanitary conditions, and diffusion of primary schooling. The increase in food intake reflects a growth in agricultural production, contrary to the standard series of national accounts. We infer from an improved estimate of agricultural output, and from the increases in physical stature that the timing of the onset of modern economic growth in Italy was substantially different from the conventional Gerschenkronian perspective.

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1. Introduction

The average increase in the height of Italian men between 1854 and 1980 of 12.3 cm (Danubio et al., 2003; ISTAT, 1958, p. 48; ISTAT, 2002), is a common feature of the European experience, and is associated with modern economic growth.¹ That the height of individuals depends on their genetic potential as well as on their net nutritional status during the period of biological growth is well known (Tanner, 1989; Komlos, 1989, p. 23; Komlos, 1994; Arora, 2001). Insofar as the genetic potential evolves extremely slowly (in

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E-mail address: giovanni.federico@iue.it (G. Federico).

¹ For data on other countries, see Cavelaars et al. (2000), Floud (1994), Fogel (1997), Komlos (1998), Baten (2000), Steckel and Floud (1997) and De Groot et al. (1991).

the absence of substantial migration), short-term changes in heights reflect changes in net nutrition, defined as the difference between intake of nutrients and the claims upon it, i.e. the effect of diseases which reduce the absorption of nutrients, as well as the amount needed to maintain the functioning of the organs, and performing all other activities such as work. Modern economic growth clearly affects both sides of the equation. It augments income, which can be spent on purchasing greater quantities and more nourishing food on a more regular basis, as well as more sanitation, medical services or more leisure, while technical progress reduces substantially the need for the expansion of physical energy. Thus, heights have been used as a proxy for GDP per capita or for other, more sophisticated measures of welfare such as the, the biological standard of living (BSL) or the human development index (HDI) (Engerman, 1997; Crafts, 1997, 2002; Komlos, 1985; Steckel, 1995). This paper extends the evidence on the anthropometric history of Italy to the late-19th and early-20th centuries and uses that evidence to join the debate on the nature of Italian economic growth in the period. We argue, in fact, that increasing heights must have been caused primarily by improved nutritional status, implying the rejection of the currently accepted agricultural output series in favor of a new one computed by the author.

Italians were among the early advocates of anthropometrics already in the 1870s, and the country has quite good height data beginning with the birth cohorts of 1854 (Costanzo, 1948). A'Hearn's (2003) study of the height of North Italian soldiers (mostly from Lombardy) of the Habsburg army, covers an earlier period, i.e. 1745–1860. He finds that the average heights fell in the late-18th century (by some 5 cm, i.e. by 3%), and thereafter remained roughly stable.² Although Lombardy was the most advanced region of Italy, modern economic growth was barely beginning by 1860. As shown below, the average height of Italian men was increasing, albeit slowly and cyclically, after 1860. The next three sections examine the causes of this rise—the fall in claims and the increase in gross intake. We subsequently estimate the contribution of these causes to the increase in heights, while the last section sketches the implications of the findings for the interpretation of modern economic growth in Italy.

2. Italian heights in the late-19th and early-20th centuries

The official collection of Italian historical statistics the *Sommario di Statistiche Storiche*, published series conscripts' height, both actual and standardized at age 20 beginning with the cohort born in 1854 (Fig. 1) (ISTAT, 1958, p. 48; ISTAT, 1985, Table 2.20).³ The records should be quite accurate. They were not subject to truncation (due to a minimum height requirement) or to self-selection biases, which bedevil many datasets on heights of soldiers (Mokyr and O'Grada, 1996; A'Hearn, 2003). The heights were measured during a medical

² On the contrary, heights rose in the small city of Casale Monferrato (Piedmont) from the 1790s onwards (Costanzo, 1939).

³ The height data have been collected and standardized by Costanzo (1948, Table III). They refer to Italy with the current borders, i.e. after 1901 they include the conscripts from the areas in the north-east which had become part of Italy after World War I. In the following, all height data (unless indicated otherwise) refer to the year of birth.

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