Health and education during industrialization: Evidence from early twentieth century Japan

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1. Introduction

Economic growth is considered to be a principal factor in explaining income distribution in the steady state of the world economy (Barro, 1991; Mankiw et al., 1992). Human capital leads to sustainable economic growth as a core value of capital goods, and thus, educational opportunities for children are one of the most important determinants of human capital accumulation in developing economies (Romer, 1986; Lucas, 1988; Rebelo, 1991; Edmonds, 2005, 2008). Since human health can affect educational attainment, investigating the inter-relationship between health and education is an important policy agenda in industrializing countries (Schultz, 2010).

The Japanese national government, for example, introduced a compulsory education system in the early stages of the Industrial Revolution and thus, the average years of schooling increased throughout the early 20th century. Consequently, human capital accumulation via educational investment in the pre-war period accelerated the rapid and sustainable “miracle” growth in the post-war period (World Bank, 1993). This historical feature of Japan has been highlighted here, because Western countries had widely depended on child labor during their respective Industrial Revolutions (Saito, 1995, 1996; Humphries, 2003, 2010). However, despite a large volume of literature on the national school system and population health in Japan (Duke, 2009; Ogasawara, 2017), very few previous studies have explored the relationship between parents’ health status and children’s educational opportunities during the industrialization of Japan due to the lack of historical micro-datasets.

Considering these backgrounds, the present paper aims to explore how adverse parental health shocks affected the educational opportunities of children in industrializing Japan. While there was a dramatic improvement in children’s educational opportunities across Japan in the early 20th century, as already described, the public health environments in the country at that time were similar to those in developing countries. In fact, one in 10 infants died within 12 months of birth around 1920 in Japan, which was close to the highest rates in modern-day developing countries (World Health...
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Educational investment in the prewar period, which accelerated inclusive, our results suggest that part of human capital accumulation via our estimates are consistent with the resource allocation bias against observed in industrializing Japan with significant gender bias. In fact, our empirical strategy aims to analyze the plausible correlations rather than the causal effects, this study’s result suggests that improvements in parental health raised the educational attainment of their daughters. A set of robustness checks confirms the result.

This article complements the existing related literature. A growing body of economic studies, in fact, has found that adverse parental health shocks tend to increase the employment probability of children and decrease educational opportunities due to the absence of an adequate system of insurance (Bratti and Mendola, 2014; Adeb Alame, 2015). Our results indicate that adverse substitute effect had been observed in industrializing Japan with significant gender bias. In fact, our estimates are consistent with the resource allocation bias against girls seen during the process of economic development in Western countries (Horrell and Oxley, 1999, 2012). Although less than conclusive, our results suggest that part of human capital accumulation via educational investment in the prewar period, which accelerated postwar sustainable economic growth, might have been increased by the overall improvement in the health of people in early 20th century Japan. Thus, our finding could also complement the ongoing research emphasizing the long term effects of historical mortality improvements on human capital accumulation during economic development (Beach et al., 2016).

The remainder of this paper is organized as follows: Section 2 describes the main historical records used to build our dataset and explains the sample characteristics and definitions of children and their status. Section 3 provides an overview of children’s status. Section 4 analyzes the relationships between parental health and the status of children. Section 5 provides a set of robustness checks. Section 6 discusses the implications of our findings and concludes.

2. Data, sample characteristics, and definitions

2.1. Data

First, we provide an overview of the main historical material used in this study. To analyze children’s status in households, we compiled an original survey slip, which recorded detailed information on urban households at the Tokyo Metropolitan Archives. The historical material used in this article was the HSST, which is a complete survey of 2298 people in 518 households located in the 7th group of the 6th district in Fukagawa ward in the east area of Tokyo city between October and November 1922. The 7th group was a part of Sarueura town, which is illustrated in Fig. 1a.

The HSST was conducted by Yoshikazu Uchida, a famous architect in Japan. Uchida served as the director of Dojyunkai, which was an incorporated foundation established as a matter of national policy after the Great Kantō Earthquake in 1923. He was also inaugurated as president of the Tokyo Imperial University in 1943. Since the “Furyo jyu-taku” (deteriorated houses) were concentrated in Sarueura town, the HSST has been considered to be a pilot survey of a plan for slum clearance (Fujimori, 1987, pp. 546–547). In fact, Dojyunkai conducted the first improvement project of deteriorated houses in Sarueura town after the Great Kantō Earthquake (Dojyunkai, 1934, pp. 226–227, p. 228).

One important characteristic of the HSST was that skilled social workers took charge of its interview survey. In interwar Japan, volunteer social workers had been recruited by the local government to investigate poor households, and they had conducted extensive surveys and relief records (Ogasawara and Kobayashi, 2015). In the HSST, the social workers, who were employed by Uchida, investigated all households in the survey area and compiled the characteristics not only of the residences but also of the families. Fig. 2 shows an old map of these sampled households in the 7th group of the 6th district in Fukagawa. We use the geographical information on these houses in the map in our empirical analysis.

Accordingly, we argue that the HSST is an appropriate survey for the purpose of this study. First, this survey contained a wide range of income groups. Most household surveys conducted in prewar periods were targeted at a certain group in the area of interest, such as the poor (James and Suto, 2011). By contrast, all households located in a part of Sarueura town were investigated regardless of the social classes or occupations in the HSST. Second, the HSST recorded rich information on individual and household characteristics. To the best of our knowledge, we use the geographical information on these houses in the map in our empirical analysis.

For more related studies, see also Gertler and Guber (2002); Asfaw and von Braun (2004); Sun and Yao (2010); and Choi (2011).

One exception is Saaritsa and Killi (1996), who investigated the case of early 20th century Finland and observed female education advantages in secondary schooling.

Note 5 The HSST is divided into three volumes: volume 1 (U365,38, Fu,627), volume 2 (U365,38, Fu,628), and volume 3 (U365,38, Fu,629). Throughout this paper, we refer to our dataset constructed by using these three volumes as the “HSST dataset.” When we refer to a certain material in each volume of the HSST, we stipulate the volume number(s) as well as the document number(s) in the tables and figures. Since volumes 2 and 3 of the HSST are treated as secret documents, this is the first time that the Tokyo Metropolitan Archives has permitted researchers to use these records. As such, personal information such as name and legal domicile was masked in advance.
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