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Collateral damage: The German food crisis, educational attainment and labor market outcomes of German post-war cohorts

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ABSTRACT

Using the German 1970 census to study educational and labor market outcomes of cohorts born during the German food crisis after World War II, I document that those born between November 1945 and May 1946 have significantly lower educational attainment and occupational status than cohorts born shortly before or after. Several alternative explanations for this finding are tested. Most likely, a short spell of severe undernutrition around the end of the war has impaired intrauterine conditions in early pregnancies and resulted in long-term detriments among the affected cohorts. This conjecture is corroborated by evidence from Austria.

1. Introduction and historical background

Labor and health economists have recently begun to study causal effects of early life conditions, in particular intrauterine conditions and early childhood health, on later-life outcomes such as educational attainment or labor market success (e.g. Almond and Currie, 2011; Currie, 2011). For identification, part of this literature uses plausibly exogenous variation in early life conditions, such as famines (Chen and Zhou, 2007; Lindeboom et al., 2010; Neelsen and Stratmann, 2011; Scholte et al., 2012), man-made disasters (Almond et al., 2009), natural disasters (Pörtner, 2010), influenza pandemics (Almond, 2006), drugs legislation (Nilsson, 2008), pollution (Sanders, 2012), or variations in weather conditions (Maccini and Yang, 2009). By comparing the outcomes of cohorts that were affected, for instance, by a famine with cohorts that were not, one hopes to isolate the causal effect of intrauterine or early childhood under- and malnutrition on later-life outcomes. One also hopes to contribute to the wider discussion on the origins of the health-wealth gradient – the ubiquitous finding that social status and health are correlated. Early life conditions, if they have an effect on both health and wealth at older ages, could provide one important explanation for this finding. An illustrative example for Germany of the long-term effects of being born during the hunger years of World War I on health and labor market outcomes later in life is given by Börsch-Supan and Jürges (2012), who show a substantial hike in early retirement rates (before age 55) among both German men and women born towards the end of the World War I. The aim of the present paper is to analyze educational attainment and labor market outcomes (occupation and income) of the German war and post-war cohorts of the Second World War.[1] Following the fetal origins literature, I hypothesize that intrauterine malnutrition towards the end of the war and in the first months after the end of the war have lead to worse long-term educational and economic outcomes. After showing empirical results that strongly support this hypothesis, I try to rule out alternative explanations.

My paper makes two important contributions to the literature on the effect of wartime or war-related famines on later-life outcomes. First, most of the current evidence is based on studies of the Dutch hunger winter 1944/1945 (e.g. Stein et al. (1975)). Thus evidence from other regions with similar periods of undernutrition are needed to confirm the findings from the Netherlands. As I will show, the food crisis in Germany (and Austria) in 1945 may have been – at least in some parts of the country – of similar proportions as in the

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[1] A broader analysis of long-term effects of World War II across a range of European countries can be found in Kesternich et al. (2012).

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Netherlands. Second, even for the Dutch hunger winter there is little evidence in terms of economically relevant outcomes. Recently, Scholte et al. (2012) were able to show that intrauterine malnutrition in the first trimester of pregnancy had significant effects on the likelihood of being employed at the age of 60. My study finds substantial effects of the food crisis on education, occupational status (as important markers of economic success in life), and also labor market income (at younger ages) of cohorts conceived during the height of the crisis. My analysis benefits from the fact that the data partly allow me to isolate effects of malnutrition in early versus late pregnancy. I find stronger effects of early pregnancy than late pregnancy malnutrition, which is in line with recent animal studies on brain development (Antonow-Schlorke et al., 2011).

1.1. World War II and the food crisis

From late 1944 to 1948, Germany suffered a severe food crisis. The three main reasons were (1) the loss of agricultural areas in the former Eastern Provinces (Germany's "breadbasket"), (2) immediate war consequences such as destruction of machinery, and (3) the inflow of some 12 million refugees from the eastern provinces (Pomerania, Silesia, East Prussia) and other East European countries (e.g. Czechoslovakia) between late 1944 and 1950. Food was officially rationed from the outbreak of World War II in 1939 until 1950 (in West Germany, the last food to be exempted being sugar) and 1958, respectively (in East Germany). The main medical problems caused by the food crisis were quantitative and qualitative (particularly protein) malnutrition, causing dystrophy, infant mortality, growth problems and an increased susceptibility to infections (Droese and Rominger, 1949).

Panel A of Fig. 1 shows data on average daily caloric intake in a Western part of Germany between 1939 and 1949. The data are based on monthly food rations for adults. These are nominal allowances, and there are a number of reasons why actual caloric intake may have deviated (in either direction). For instance, food could be bought on the black market, and those living in rural areas were sometimes able to hide produce from the authorities. On the other hand, just because some food item is printed on a ration card, it need not be available on the market. It is thus not clear how reliable or generalizable data based on ration cards are, but the general picture is clear: average daily caloric intake was reasonably high during most of the Second World War. With the exception of a minor trough in 1942 (due to the shortage of potatoes), the average allocated number of calories was close to healthy levels.

The situation begins to deteriorate visibly in early 1945. Between the 72nd 4-week allocation period (which began on February 2, 1945) and the 75th allocation period (which began on April 30, 1945), the average daily number of calories dropped from 1603 to 678. The latter period also marks the end of the Second World War in Europe and goes along with the lowest reported number of calories across the entire period. Afterwards, average daily calories hover between 1000 and 1500 until the middle of 1948 and then increase to somewhat less than 2000 calories after the currency reform. Clearly, the food crisis was most severe during the

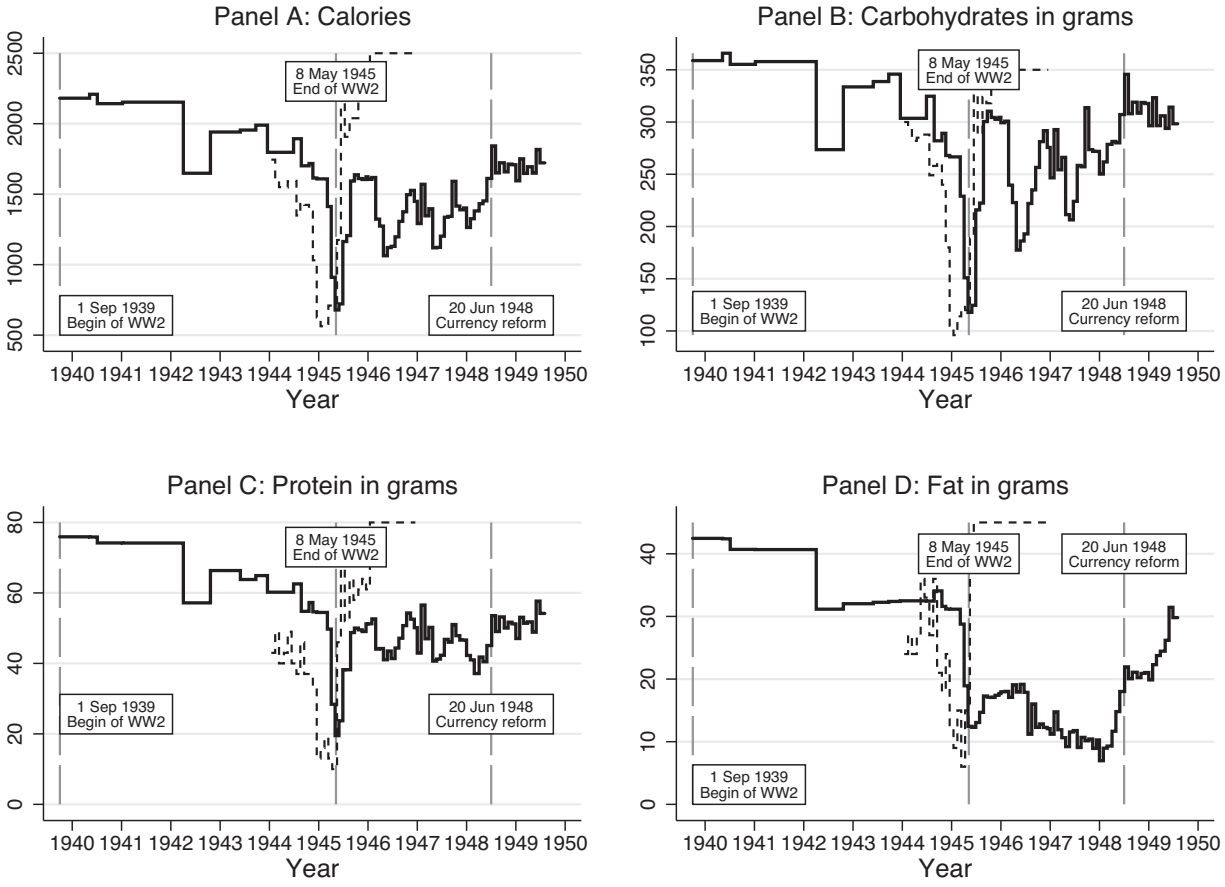

Fig. 1. Average daily allowances according to food ration cards. Data are for Wuppertal (September 1939 to August 1944, allocation periods 1–65), Düsseldorf and Wuppertal (September 1944 to May 1947, allocation periods 66–101), Düsseldorf (June 1947 to November 1947, allocation periods 102–107) and Northrhine-Westphalia (December 1947 to August 1949, allocation periods 108–129). The dashed lines show average daily allowances in the Dutch famine area (Stein et al., 1975).
Sources: Sons (1983, Table 11), Schön (1947).