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Abstract

We analyze the relationship between the business cycle and childhood health. We use a retrospective survey on self-reported childhood health for 10 Western European countries and combine it with historically and internationally comparable data on the Gross Domestic Product. We validate the self-reported data by comparing them to realized illness spells. We find a positive relationship between being born in and growing up during a recession and childhood health. This relationship is not driven by selection effects due to heightened infant mortality during recessions. As the business cycle is exogenous from the individual perspective, our results can be considered causal.

Keywords: Childhood Health, Business Cycle, Western Europe
JEL-Codes: I12, E32, O52

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1. Introduction

Bad childhood health has consistently been related to adverse outcomes later in life. Indeed, factors such as low birth weight have been connected to income, employment and health statuses at various stages of the adult life-cycle by Currie and Hyson (1999), Case *et al.* (2005) and Deaton (2007), respectively. Currie (2009) provides an excellent survey of the literature in this field. In the same survey, she highlights the scarce attention that has been devoted to the determinants of child health in the first place. In this regard, the main focus has been on the socio-economic environment in which the child is growing up. In an early survey, Spencer (2003) provides compelling evidence that there is a strong global as well as historical link between the socio-economic status of the parents and, for instance, the birth weight of the child. In recent contributions, Case *et al.* (2002), Currie *et al.* (2007) and Victorino and Gauthier (2009) show that parental income is strongly associated with health outcomes throughout childhood and that this association becomes stronger as the children become older. A clear caveat in using the socio-economic status of the parents as an explanatory variable for childhood health is that both variables may be driven by a third, unobservable, factor such as parental ability. Thus, the observed relationships represent associations and not causal effects.

Using the fact that the state of the business cycle can be considered as exogenous from the individual perspective, a recent literature has emerged studying how and why recessions affect health outcomes. A recession is a transitory downturn in economic activity, which leads to a temporary drop in income and employment.[1] Hence, a recession can change the type of goods consumed by individuals (Ruhm and Black, 2002) and the amount of time spent on healthy and unhealthy activities (Ruhm, 2000). Viewing health as an outcome of a health

[1] We identify a recession as a period in which the Gross Domestic Product is below its trend value. According to the methodology of the Business Cycle Dating Committee of the National Bureau for Economic Research this does not necessarily constitute a research but rather an economic downturn. For sake of brevity we follow the literature in this field and refer to these economic downturns simply as recessions (see, Van den Berg *et al.*, 2006, 2009a and 2009b).

production function which takes time and consumption as inputs, any changes in behavior due to the recession will impact health outcomes (Grossman, 1972). In a series of papers, Van den Berg *et al.* (2006, 2009a and 2009b) and Portrait *et al.* (2010) show that there is a robust negative relation between being born during a recession and mortality later in life. Contradicting these results, DeHeija and Lleras-Muney (2004) show that children born during recessions are generally healthier. In a similar vein, Ruhm (2000) shows that health of the population increases during recessions. Tapia Granados and Diez Roux (2009) show that this effect can be found even if very deep recessions such as the Great Depression are taken into account.

In this paper we contribute to this literature by focusing on how childhood health outcomes are influenced by the state of the business cycle. Following Currie (2009), we interpret childhood health as the result of a childhood health production function that takes parental time and consumption as inputs. Within that framework we begin by discussing the link between recessions and childhood health outcomes.

For the subsequent empirical analysis we turn to retrospective information from the third wave of the Survey of Health, Ageing and Retirement in Europe (SHARELIFE) on a sample of roughly 18,000 respondents born in 10 Western European countries before 1957. This survey provides detailed information on the health status of the respondent during childhood and information about the socio-economic environment in which he or she grew up. For the macroeconomic data we turn to the World Economy Database of Maddison (2010) which provides internationally and historically comparable time series on the Gross Domestic Product (GDP) of all countries that we are interested in.

As our main variable of interest we use the self-reported childhood health status of the respondent. This is a categorical variable for which the respondents are asked to classify their health status as somewhere in the range between poor and excellent. A common concern of

self-reported data is that the recall of the respondents may be low or distorted. To this end, we use the methods of Smith (2009) and Havari and Mazzonna (2011) to analyze the quality of the data by studying the relationship between the self-reported health status and objectively observable conditions such as childhood diabetes, visual problems and mental health problems.

For the state of the business cycle we follow Van den Berg *et al.* (2006, 2009a and 2009b) and decompose the development of GDP into a cyclical and a trend component. We use the cyclical component to measure the state of the business cycle but also include the trend component of GDP at birth to control for the positive relationship between the level of economic development and access to good health care facilities (Deaton, 2007). In addition, we include a set of household level and individual specific variables to control for the general setting in which a child grew up as well as any cohort specific effects. Naturally, any relationship between the business cycle and childhood health may be driven by the fact that infant mortality could be anti-cyclical. To this end, we use data from the Human Mortality Database and the methods of DeHeija and Lleras-Muney (2004) and Gerdtham and Ruhm (2006) to analyze whether infant mortality is heightened during recessions.

The remainder of this paper is organized as follows. The next section discusses the relationship between recessions and childhood health outcomes. Section 3 introduces the data and explains the variables that we use in our analysis. Section 4 outlines our methodology and Section 5 presents our estimation results and provides a robustness analysis of our key results. The final section concludes and provides a brief policy discussion.

2. Recessions and Childhood Health

In general, childhood health can be seen as the outcome of a childhood health production function and can be understood using some form of the life-cycle model proposed by Heckman (2007) and discussed in Currie (2009). In that model, childhood health is produced

through inputs of altruistic parents who care about the well-being of their children. The parents must choose between alternative uses of their resources and their total amount of resources is constrained by earning abilities. Although the model can give rise to some very complex relationships, a number of straightforward conclusions can be drawn from it. First of all, richer parents (that is, parents with a higher socio-economic status) should be able to provide their children with higher quality health inputs. Hence, a higher socio-economic status should be associated with a healthier child. Second, parental behavior can have (positive and negative) externalities on the health of a child. Thus, children of heavy drinkers are probably less healthy because the side-effects of drinking (aggression and neglect) directly affect a child's health. Finally, from a macroeconomic point of view the model suggests that, if the general level of income increases in a country, more parents will be able to acquire better health inputs. Therefore, a higher level of GDP should be associated with a higher level of health.

Within this framework a recession can be considered as a transitory downturn in economic activity, which leads to a temporary drop in income and employment.[2] This leads to an increase in the time that can be spent on healthy activities and a decrease in the consumption of both healthy and unhealthy goods. Ruhm and Black (2002) and Ruhm (2003) suggest that the reduction in the consumption of unhealthy goods is higher than the reduction of healthy goods. Hence, recessions decrease the amount of consumption but improve its composition. Similarly, Ruhm (2000) shows that recessions are associated with an increase in time spent on healthy activities. For the current purpose, this could be seen as an increase in the time spent on nurturing a child. In addition to purely economic factors, recessions also influence the general environment in which the child is growing up. On a positive note, such effects are that

[2] For the current purpose we focus the discussion on findings from high-income countries, Suhrcke and Stuckler (2012) suggest that in low-income countries different factors may drive the relationship between recessions and childhood health.

recessions reduce the amount of pollution (Chay and Greenstone, 2003), lower the number of car accidents (Khang *et al.*, 2005) and decrease the amount of risk taking (Ruhm, 2005). On a negative note, side effects of recessions include enhanced parental stress due the economic uncertainty that surrounds recessions (Pedersen *et al.*, 2005). In sum, both economic and non-economic factors suggest an ambiguous relationship between the state of the business cycle and childhood health outcomes.[3]

3. Data and Descriptive Statistics

As main data source we use SHARELIFE, a retrospective study conducted as part of the Survey of Health, Ageing and Retirement in Europe (SHARE) project. Although the SHARELIFE data has been used for a variety of studies regarding early-life conditions,[4] to the best of our knowledge, none focus on the correlates of child health. From the data collected for the SHARELIFE survey we construct a measure for our key variable of interest; child health. In addition, we use the data to construct various measures indicating the social economic status of the household in which the child grew up. For the macroeconomic data we turn to the World Economy Dataset (WED) of Maddison (2010). The WED was designed specifically to provide comparable indicators of the development of the Gross Domestic Product (GDP) of countries around the world over a long stretch of history.

3.1 SHARELIFE Data

The Survey of Health, Ageing and Retirement in Europe (SHARE) is a longitudinal study, which collects extensive information on the current socio-economic status, health and expectations of European individuals aged 50 and over and their partners. In 2008/2009 the third wave of data collection, known as SHARELIFE, asked all respondents to provide

[3] This ambiguity has also been noted by Kaplan (2012), who gives an overview of the channels along which the current recession may affect health outcomes.
[4] See, for instance, Brandt *et al.* (2012), Havari and Perrachi (2011) and Mazzonna (2011), for studies on successful ageing, old age health and social mobility, respectively.

information on their entire life-histories instead of their current situation. The retrospective information ranges from childhood health, to accommodation and parental background, to complete work, accommodation and health histories during adulthood. SHARELIFE interviewed 26,836 individuals in thirteen European countries: Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, the Czech Republic and Poland.

In our empirical analysis we exclude Poland and Czech Republic because no reliable economic data is available for Warsaw Pact countries (3,791 observations) and Greece due to data quality problems[5] (2,951 observations). In addition, to focus on a homogenous group, we exclude the cohorts born before 1920 and after 1957 because they represent a small share of the sample (912 individuals). Finally, we drop observations for which we have missing values for one of the variables used in the estimations and individuals who did not live in Western Europe during their childhood: fortunately, these represent only 6% of the total sample.

Our final estimation sample consists of 18,182 individuals born between 1920 and 1957 in ten Western European countries. Since our analysis focuses on the determinants of childhood health, we consider the period of life between birth and the 15th year of age. Our key variable of interest is derived from a subjective question in which respondents had to rate their health in childhood before age 16 on a five-point scale from poor to excellent. The advantage of using this indicator is that it summarizes in a single index a variety of conditions and circumstances that might have affected health status. In our analysis, we recode the original variable in three categories: 1. poor or fair health, 2. good health, 3. very good or excellent health. Haas (2007) shows that using broad categories makes self-reported observations of childhood health more reliable because respondents are more likely to remember their general health status than whether it was very good or excellent. In addition, Haas suggests that it is

[5] In particular, in comparison to the other countries, Greece has an extremely low number of respondents who indicate having been in bad health during childhood (see below). Ignoring these issues and including Greece anyhow does not alter the later estimation results significantly (available on request).

better to use a general observation of the health status than to ask the respondent whether the he/ she suffered from specific conditions as the latter is more prone to recall bias.

As Banks *et al.* (2011), we construct four broad birth cohorts: those born before 1930, those born between 1930 and 1939, those born between 1940 and 1949 and those born after 1949. In Figure 1 we report the percentage of respondents reporting very good or excellent childhood health by cohort and country. The graph shows a general decline in health status for the cohorts that experienced the Second World War during childhood (or the Civil War for Spain) in all countries besides Sweden, which was only peripherally affected by the Second World War. In Table 1 we tabulate the percentage of respondents by the three categories and by country. For comparison, we have included Greece to highlight that its proportion of self-reports of bad or fair health is less than one tenth of the proportion observed for the country with second lowest reports of bad and fair health (Italy).

[FIGURE 1 ABOUT HERE]

[TABLE 1 ABOUT HERE]

Validating Self-Reports: A common caveat in using retrospective surveys is that individuals may have trouble recalling what their health status was when they were still young. Especially because our survey respondents are looking back a very long time period we might encounter this problem. To this end, in Table 2, we estimate an ordered probit model to analyse how our measure of self-reported health relates to the occurrence of a set of childhood illnesses that respondents were asked to report. The estimation results are in line with those found by Smith (2009) for the US using 2007 data from the Panel Study of Income Dynamics. In particular, self-reported health is negatively and significantly correlated with all

childhood diseases besides the most common ones, namely infectious diseases (e.g. measles, rubella, chickenpox, mumps, tuberculosis, diphtheria and scarlet fever) and broken bones and fractures. For the sake of space, this analysis is brief and only focuses on our key variable of interest. However, Havari and Mazzonna (2011) provide a comprehensive treatment of the validity of the self-reported questions in SHARELIFE. Their results regarding our variable of interest are in line with those found in Table 2.

[TABLE 2 ABOUT HERE]

Individual Background Characteristics: From the same survey**,** we use individual reports on living conditions at birth and during childhood. First and foremost, these act as control variables for the individual background characteristics of the household in which the child grew up. In addition, these variables assure that, if a recession leads to a change in the composition of the birth cohort, such composition effects do not drive our results.[6] For the conditions during childhood, we construct a measure of socio-economic status (SES) following the methodology of Mazzonna (2011). First, we construct four indicators of SES, as measured at the age of 10: the number of rooms per capita in the accommodation (excluding kitchen, bathrooms and hallways), the number of features in the house (fixed bath, cold running water supply, hot running water supply, inside toilet, central heating), the approximate number of books at home (none or very few – 0 to 10 books, enough to fill one shelf – 11 to 25 books, enough to fill one bookcase – 26 to 100 books, enough to fill two bookcases – 101 to 200 books, enough to fill two or more bookcases – more than 200 books) and the occupation of the main breadwinner (divided in three groups: 1. high skills, 2. medium skills, 3. low skills). Second, we centre these indicators on the country level, that is, we deduct the country average. Finally, we use principal component analysis to construct a

[6] In Section 5 below we also study the consequence of positive selection due to an increase in infant mortality.

single index that summarizes the information provided by these indicators of SES. Table 3 shows that the first principal component, which is used to construct our SES index, explains more than 50% of the total variance and it is the only one whose signs of the factor loadings are consistent with a measure of SES.

[TABLE 3 ABOUT HERE]

In addition to the SES index, we include indicators for whether the biological mother and the biological father were living in the same house as the child at the age of 10 and an indicator for whether the child was living in a rural or urban area at the age of 10. Both indicators represent proxies for the general environment in which the child grew up. In addition, we use information on malnutrition during childhood, which is a well-known determinant of the health status of an individual (Alderman *et al*., 2006). For this indicator, as in Havari and Peracchi (2011), we use responses from the general life section of the SHARELIFE questionnaire to construct indicators for whether the child suffered from hunger in the first two years of life, between the age of 3 and 9 and between the age of 10 and 15.

3.2 Macroeconomic Data

The World Economy Dataset of Maddison (2010) provides annual data on the GDP per capita of countries around the world, expressed in constant 1990 dollars. We apply a trend/cycle decomposition to the logarithm of GDP using the Hodrick-Prescott filter with smoothing parameter 6.25, as suggested by Ravn and Uhlig (2002), using the time series from 1920 to 1971 separately for each country.[7] Figure 2 shows the logarithm of the GDP and the smoothed series for an example country, Germany.

[7] In the robustness analysis in section 5 we study the sensitivity of our results to the use of different smoothing parameters and an alternative filtering technique.

[FIGURE 2 ABOUT HERE]

Following Van den Berg *et al.* (2006, 2009a and 2009b), we then construct an indicator for whether the child was born in a recession, as opposed to a boom, and for whether there was an economic downturn when the child was aged 1-2, 3-9 and 10-15 (i.e. whether the average of the cyclical components of the decomposition of the GDP over the corresponding years was negative). We use the cyclical component to measure the state of the business cycle but also include the actual value of the logarithm of the GDP at birth to take into account the positive relationship between the level of economic development and the general availability of good health services (Deaton, 2007).

The other substantive macroeconomic indicator, which we use, is whether a child was born during a war.[8] Both Havari and Peracchi (2011) and Van den Berg *et al.* (2006) document that periods of war are negatively associated to health outcomes later in life. Given the historical period under consideration the key events are the Second World War and the Spanish Civil War. Regarding the former, it is important to take into account that it affected different countries at different time intervals. Table 4 indicates the periods of war suffered by the countries in our sample. Finally, Table 5 presents descriptive statistics for all the variables included in our analysis.

[TABLE 4 ABOUT HERE]

[8] From a methodological point of view it does not make sense to include variables of whether a child experienced war at age 1-2, 3-9 or 10-15 (that is, a set of war dummies that is similar to the set-up of the macroeconomic variables). To see this, note that if, for example, somebody experienced war at 10-15, he/ she did not experience it at 1-2 by definition. Hence, it is not clear what the indicator is actually measuring. Naturally, this is a direct consequence of the fact that each country only experienced one war, that this war was consecutive and at most 6 years long. A similar caveat does not hold for the macroeconomic variables because these are cyclical.

[TABLE 5 ABOUT HERE]

4. Methods

In order to statistically analyze the determinants of childhood health, we estimate a model of the type used by Case *et al.* (2005):

$$h^*_{i,t} = \alpha + X_i\beta + Y_t\gamma + \varepsilon_{i,t} \tag{4.1}$$

where $h^*_{i,t}$ is the health status of child i born at time t, X_i is a vector of indicators at the individual level, Y_t is a vector of macroeconomic indicators, α, β and γ are the parameters of the model and $\varepsilon_{i,t}$ is the error term. In our data, we do not observe directly $h^*_{i,t}$ but its discrete counterpart $h_{i,t}$, which is recorded as an ordered variable that takes the value 1 if health in childhood was poor or fair, 2 if it was good and 3 if it was very good or excellent:

$$h_{i,t} = j \quad if \quad \tau_{j-1} \le h^*_{i,t} \le \tau_j, \quad j = 1,2,3 \tag{4.2}$$

for unknown τ_j, with $\tau_0 = -\infty$ and $\tau_3 = \infty$.

We estimate our specification through a standard ordered probit model. As outlined above, the X_i vector typically includes measures of the living conditions and environment, as well as gender and a full set of country and cohort dummies. The Y_t vector includes the value of the logarithm of trend GDP per capita in the birth year and measures of the state of the business cycle at birth and at 1-2, 3-9 and 10-15).

Ideally, we would also like to include the logarithm of GDP when the child was 1-2, 3-9 and 10-15, this is, however, highly collinear to its value at birth and is excluded from the

analysis. That is, the correlation between GDP at birth and the average GDP at 1-2, 3-9 and 10-15 is 0.98, 0.86 and 0.77, respectively. Similarly, the correlation between average GDP at 1-2 and average GDP at 3-9 and 10-15 is 0.92 and 0.80, respectively. Finally, the correlation between average GDP at 3-9 and 10-15 is 0.92.

5. Estimation Results

Our main estimation results are presented in Table 6. Interpretation of the results is straightforward: a positive parameter estimate indicates that its accompanying variable has a positive association with childhood health and a negative parameter estimate indicates a negative association.

First, consider column 1, in which we include only the macroeconomic indicators and a gender dummy. The recession indicators at birth and for the age interval between 10 and 15 both have a significant positive impact on childhood health. This implies that, taken together, the change in parental behavior induced by a recession positively affects the health of their children. Column 2, in which we add war dummies to the basic specification, indicates that our recession indicator does not simply pick up the impact of the economic downturns associated with the Second World War or the Spanish Civil war. We may note that the logarithm of trend GDP at birth and the war dummies are not significant. This is mainly driven by the inclusion of cohort fixed effects in the model. Excluding these makes the logarithm of trend GDP at birth significantly positive and the war dummies significantly negative but does not affect the other results (not shown but available on request).

Next, consider column 3 in which we add individual background characteristics to the estimation equation. In line with expectations we find that the social economic status of the household has an important positive association with child health. That is, children growing up in a household with a higher social economic status experience less health problems in childhood. Also the non-economic indicators of the household are seen to influence childhood

health. Especially, we see that children growing up in a household were the father is not present experience worse health throughout their childhood and that children growing up a rural area are generally healthier. The latter finding is often attributed to better water quality and less pollution in the countryside than in big cities (Van den Berg *et al.*, 2006). Naturally, rural areas may also be further away from medical services, thus, inhibiting health. However, the aggregate effect of growing up in a rural area is seen to be positive.

Finally, consider column 4 which highlights that children who are affected by malnutrition at any stage childhood are at risk of having health problems. For the current purpose the most important insight from columns 3 and 4 is that, even after controlling for episodes of hunger and individual background characteristics, being born and growing up during a recession has a beneficial impact on childhood health. As the business cycle is exogenous from the individual perspective, this relationship can be considered causal.

Selection Effects: As with all retrospective and longitudinal surveys, our results are conditional on the survival of the respondents. Hence, the positive relationship between recessions and childhood health may simply be because high risk individuals did not survive infancy. Amongst others, Chay and Greenstone (2003), DeHeija and Lleras-Muney (2004), Gerdtham and Ruhm (2006) and Schady and Smitz (2010) find that the infant mortality rate is either non-cyclical or anti-cyclical, in the sense that it decreases during recessions. However, to the best of our knowledge, no studies have focused on the cyclical nature of infant mortality for the countries in our sample throughout the historical period that we are interested in.

To this end, we use country-level panel data on infant mortality data from the Human Mortality Database[9] for most of the countries in our sample[10] and analyse the relationship

[9] *Human Mortality Database*. University of California, Berkeley (USA), and Max Planck Institute for Demographic Research (Germany). Available at www.mortality.org or www.humanmortality.de.

between infant mortality and the business cycle. Following Gerdtham and Ruhm (2006) we use a linear regression model to estimate the relationship between the infant mortality rate and recessions:

$$M_{jt} = \alpha_t + \beta_j + \beta_j \tau + X_{jt}\gamma + \varepsilon_{jt} \tag{5.1}$$

where M_{jt} is the logarithm of the infant mortality rate, α_t is a time fixed effect, β_j is a country fixed effect, τ is a time trend (so that $\beta_j \tau$ is a country-specific time trend), X_{jt} are time-varying country specific variables (such as recessions, GDP or a war dummy) and ε_{jt} is the error term.

Our estimation results are presented in Table 7. While in the top panel we give equal weight to all observations, in the lower panel we weight observations by population size (as suggested by DeHeija and Lleras-Muney (2004)). In the first column we only include the recession indicator and country and year fixed effects. In the second column we also add the country-specific time trends. In the third column we drop the time trend and include the logarithm of GDP instead. Finally, in column 4 we also include the war dummy. All these estimation results indicate that there is no cyclical relationship between infant mortality and the business cycle. In fact, the estimation results show that there is no statistically significant result between these two variables. The lower panel confirms that even if observations are weighted by population size, there is no relationship between infant mortality and the business cycle. These results allow us to conclude that the positive relationship between the recession indicator and childhood health is not driven by positive selection effects due to an increase in infant mortality.[11]

[10] Austria and Germany are excluded from this estimation because internationally comparable infant mortality rates are not available for the relevant cohorts in those countries. Redoing our other estimations for the sample without Austria and Germany does not alter the results significantly (available on request).

[11] To capture any effects of recessions *during* pregnancy instead of *at* birth, we have also done the estimations of Table 7 using lagged recessions. This did not lead to any significant results (available on request).

Robustness Analyses: We have performed a wide variety of robustness checks so as to understand the validity of our results. First, we have used different smoothing parameters for the Hodrick-Prescott filter (100 and 500 as used by Van den Berg *et al.* 2006 and 2009b, respectively). Second, we have used the Butterworth filter as an alternative to the Hodrick-Prescott filter. Third, instead of using the ordered probit model from (4.1) we have used a regular probit model in which we compare being in good or excellent health to all other health statuses. Finally, we have also included all the elements of the social economic status indicator separately instead of as a factor. All of these robustness checks did not change the conclusions that we can draw from our results and are available upon request. Regarding the social economic status, it is interesting to note that especially household facilities are the driving forces in the relation between the socio-economic status and childhood health.

5. Conclusion

In this paper we study the relationship between the state of the business cycle and self-reported childhood health in a sample 18,000 respondents from 10 Western European countries. We first validate the self-reported health statues by comparing them with realized childhood illness spells. That exercise shows that the self-reported data captures the actual presence of illnesses very well. Regarding the business cycle, we use internationally and historically comparable data on the Gross Domestic Product (GDP) and decompose it into a trend and a cyclical part. Letting negative deviations from the trend be recessions, we go on to analyze whether being born in and/ or growing up during a recession has an impact on childhood health. Naturally, any relationship between recessions and childhood health can be driven by positive selection due to heightened infant mortality in recessions. However, when analyzing the relationship between infant mortality and the recessions, we find no evidence of such a relationship. Taking the above into account, our main findings are that being born in

and growing up during a recession is beneficial to childhood health. As recessions are exogenous from the individual perspective, these results can be seen as causal.

In terms of policy, our results specifically do not imply that governments should pursue a policy of constant recession. Indeed, our results for the general level of development (that is, the trend value of GDP) indicate that being born in more developed countries and/ or times is beneficial for childhood health. Hence, the actual policy conclusion is that governments should pursue a policy of steady growth and simultaneously focus on keeping business cycle fluctuations mild.

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TABLES

Table 1. Percentage of respondents by country and by category

	Health status		
	Poor or fair	Good	Very good or excellent
Sweden	8.38%	18.49%	73.13%
Denmark	7.46%	14.13%	78.41%
Germany	11.87%	36.50%	51.64%
Netherlands	11.31%	37.37%	51.32%
Belgium	8.30%	21.46%	70.24%
France	11.40%	28.70%	59.90%
Switzerland	10.36%	28.00%	61.64%
Austria	13.04%	22.14%	64.82%
Spain	10.98%	24.40%	64.62%
Italy	6.31%	22.30%	71.39%
Greece	0.55%	5.87%	93.59%

Table 2. Predicting self-reported childhood health status

Ordered probit model. Dependent variable: self-reported health (1=poor of fair, 2=good, 3=very good or excellent)	
Infectious diseases	0.004
	(0.025)
Polio	-1.067***
	(0.101)
Asthma	-0.991***
	(0.059)
Respiratory problems	-0.808***
	(0.048)
Allergies	-0.334***
	(0.049)
Severe diarrhoea	-0.666***
	(0.087)
Meningitis/encephalitis	-0.687***
	(0.095)
Chronic ear problems	-0.577***
	(0.052)
Speech impairment	-0.534***
	(0.117)
Difficulty seeing even with eyeglasses	-0.362***
	(0.061)
Severe headaches or migraines	-0.330***
	(0.041)
Epilepsy, fits of seizures	-1.020***
	(0.122)
Emotional, nervous or psychiatric problems	-0.773***
	(0.079)
Broken bones, fractures	-0.027
	(0.034)
Appendicitis	-0.126***
	(0.031)
Childhood diabetes or high blood sugar	-1.739***
	(0.319)
Heart trouble	-1.173***
	(0.106)
Leukemia, cancer or malignant tumour	-0.559*
	(0.323)
Country and cohort fixed effects	YES

Table 3: Principal component analysis for childhood SES index

	Component			
	1st	2nd	3rd	4th
Rooms per person	0.3985	0.8731	-0.2803	-0.0173
Books	0.5330	-0.0437	0.6546	-0.5343
Number of facilities	0.5650	-0.1882	0.1686	0.7855
Occupation level	-0.4878	0.4477	0.6815	0.3188
Explained variance	0.5056	0.2056	0.1646	0.1242

Table 4. Periods of War

	Years
Sweden	---
Denmark	1939-1945
Germany	1939-1945
Netherlands	1940-1945
Belgium	1940-1944
France	1940-1944
Switzerland	---
Austria	1939-1945
Spain	1936-1939
Italy	1940-1945

Table 5. Descriptive statistics for the variables used in the estimation (N=18,182)

	Mean	Standard deviation
Female	0.545	0.498
Born before 1930	0.119	0.323
Born between 1930 and 1939	0.260	0.438
Born between 1940 and 1949	0.373	0.483
Born after 1949	0.248	0.433
Log GDP at birth	8.381	0.364
Recession at birth	0.429	0.495
Cycle negative age 1-2	0.440	0.496
Cycle negative age 3-9	0.543	0.498
Cycle negative age 10-15	0.511	0.500
Living in a rural area (at age 10)	0.425	0.494
SES (at age 10)	-0.007	1.500
No mother at home (at age 10)	0.041	0.199
No father at home (at age 10)	0.097	0.297
Hunger age 0-2	0.012	0.110
Hunger age 3-9	0.043	0.203
Hunger age 10-15	0.045	0.207
Sweden	0.092	0.289
Denmark	0.106	0.308
Germany	0.100	0.300
Netherlands	0.111	0.314
Belgium	0.137	0.343
France	0.116	0.320
Austria	0.043	0.202
Spain	0.104	0.306
Italy	0.133	0.339

Table 6. The determinants of childhood health

Ordered probit model. Dependent variable: self-reported health (1=poor of fair, 2=good, 3=very good or excellent)				
Female	-0.116***	-0.116***	-0.116***	-0.120***
	(0.018)	(0.018)	(0.018)	(0.018)
Recession at birth	0.032*	0.033*	0.033*	0.038**
	(0.019)	(0.019)	(0.019)	(0.019)
Cycle negative age 1-2	-0.029	-0.025	-0.026	-0.024
	(0.021)	(0.021)	(0.021)	(0.021)
Cycle negative age 3-9	0.003	0.005	0.005	0.007
	(0.024)	(0.024)	(0.024)	(0.024)
Cycle negative age 10-15	0.076***	0.073***	0.072***	0.070***
	(0.020)	(0.021)	(0.021)	(0.021)
Log GDP at birth (trend)	0.089	0.085	0.094	0.140**
	(0.070)	(0.070)	(0.071)	(0.071)
War		-0.034	-0.019	-0.010
		(0.030)	(0.030)	(0.030)
SES (at age 10)			0.042***	0.039***
			(0.007)	(0.007)
No mother at home (at age 10)			0.027	0.030
			(0.048)	(0.048)
No father at home (at age 10)			-0.155***	-0.138***
			(0.032)	(0.033)
Living in a rural area (at age 10)			0.065***	0.059***
			(0.020)	(0.020)
Hunger age 0-2				-0.197**
				(0.089)
Hunger age 3-9				-0.213***
				(0.059)
Hunger age 10-15				-0.150***
				(0.053)
Cohort fixed effects	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes
Observations	18,182	18,182	18,182	18,182

Table 7. Infant mortality and the business cycle

	Infant mortality rate (in logarithm)			
VARIABLES	(1)	(2)	(3)	(4)
A- No weights				
Recession	0.009	0.004	0.008	0.007
	(0.016)	(0.013)	(0.015)	(0.015)
Log of GDP (trend)			-0.361***	-0.331***
			(0.065)	(0.070)
War				0.056
				(0.040)
Constant	-2.648***	24.145***	0.321	0.080
	(0.044)	(3.260)	(0.532)	(0.566)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country-specific time trend	No	Yes	No	No
Observations	304	304	304	304
R-squared	0.959	0.970	0.964	0.965
B- Population used as weights				
Recession	0.016	0.005	0.019	0.022
	(0.018)	(0.014)	(0.019)	(0.020)
Log of GDP (trend)			-0.237***	-0.201**
			(0.087)	(0.086)
War				0.074*
				(0.045)
Constant	-2.629***	24.132***	-0.693	-0.986
	(0.043)	(2.971)	(0.703)	(0.694)
Country fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Country-specific time trend	No	Yes	No	No
Observations	304	304	304	304
R-squared	0.953	0.968	0.956	0.956

FIGURES

Figure 1. Percentage of respondents reporting very good or excellent health by country and cohort.

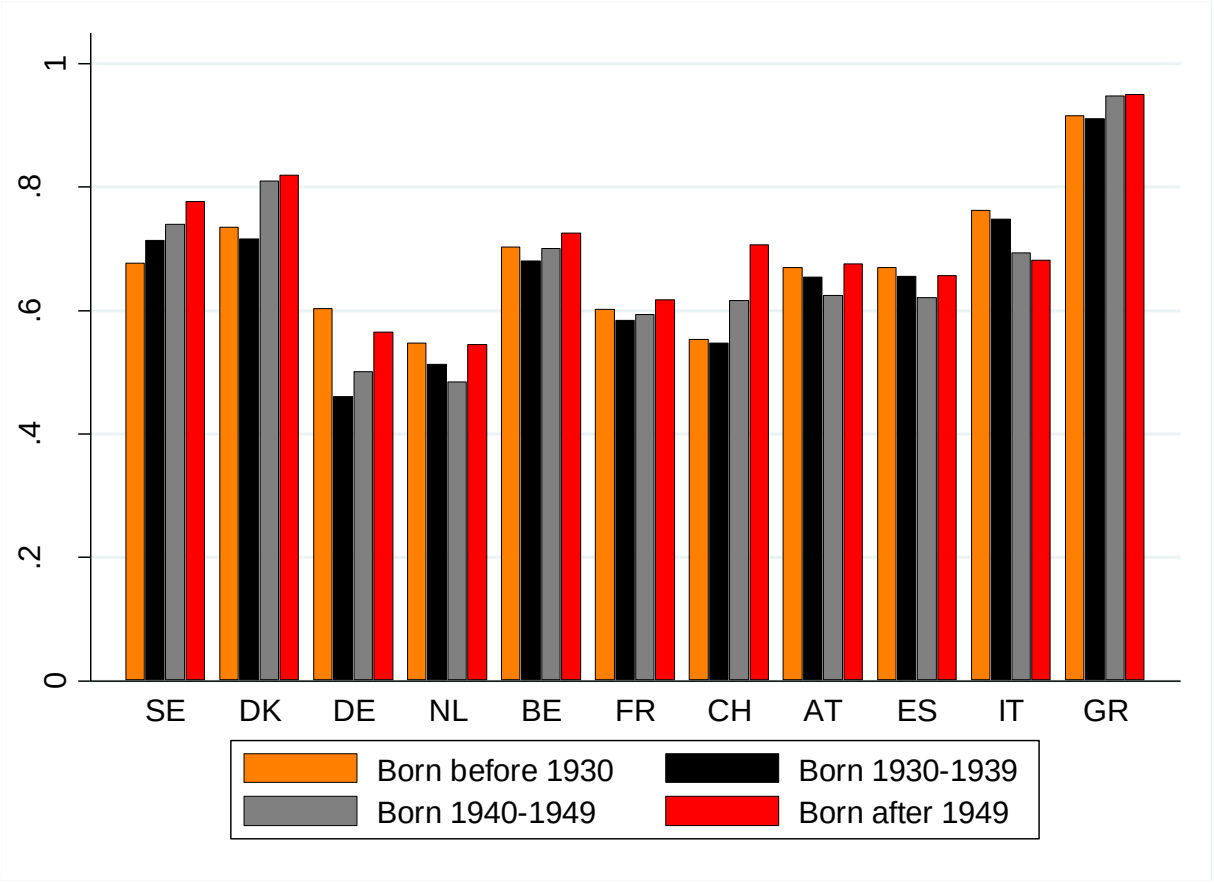

Figure 2. Log annual per capita GDP in Germany