About depression babies and red diaper babies: Do macroeconomic experiences affect everybody’s risk taking in the same way?

Henning Cordes\textsuperscript{a}, Maik Dierkes\textsuperscript{b, *}

\textsuperscript{a} Finance Center Münster, University of Münster, Universitätstraße 14-16, 48149 Münster, Germany
\textsuperscript{b} Institute of Banking and Finance, Leibniz University Hannover, Königsworther Platz 1, 30167 Hannover, Germany

\textbf{Abstract}

We study how macroeconomic growth experienced throughout a person’s lifetime affects the decision to participate in the stock market, and how this interacts with political education. For people who have been raised in the market economy of the Federal Republic of Germany, we find that macroeconomic growth experienced throughout the lifetime predicts the likelihood of holding stocks and recent experiences have a higher impact. These findings do not extend to people who have been raised under the communist regime of the former German Democratic Republic and thus have experienced a market economy only since the German reunification in 1989.

\section{Introduction}

Available resources vary over time and location, which obviously affects people’s lifetime wealth. Lately, economists discovered a subtler reason why time and location influence economic wellbeing: Evidence amounts that the economic environment people grow up in and the length of time they spend in it affect their beliefs, preferences and financial decisions. Malmendier and Nagel (2011) find evidence in US-data that stock returns which occurred over people’s lifetime affect their decision to participate in the stock market. They suggest that people do not use all available information to form a posterior belief, but focus on personally experienced data. Osili and Paulson (2008) document that US immigrants’ likelihood to hold stocks depends on their home countries’ institutional quality (e.g., protection from expropriation). The effect is persistent and absorbed early in life. Guiso et al. (2004) show that properties of one’s birthplace (e.g., social ties or trust) affect financial decisions even years after having moved to a different location. Together, these findings advance the traditional economic view: Individuals carry their own portmanteau of beliefs and preferences, which has been packed by the time and location they have been born into.

Above research focuses only on one dimension, either time or location. This study combines the two dimensions and explores their joint impact on stock market participation in Germany. In the time dimension, we follow Malmendier and Nagel (2011) and analyze how macroeconomic growth realized over people’s lifetime affects the likelihood of participating in the stock market. We then extend the location dimension by looking at West and East Germans separately. That is, except for West Germans being raised in the market economy of the Federal Republic of Germany throughout their lives and East Germans being raised under the communist regime of the German Democratic Republic until the German reunification in 1989, we look at a homogeneous sample.\footnote{For example, the self-reported willingness to take financial risks and the expected economic development (both measured on 11-point Likert-scales) differ by only 0.34 and 0.11 points between groups, respectively. The number of correct answers on the three financial literacy questions from Lusardi and Mitchell (2011) differ by only 0.04 between groups.}

Our study provides four main insights. First, the results of Malmendier and Nagel (2011) extend to the West German population. That is, stock returns realized over the lifetime positively predict the likelihood of holding stocks, and recent developments have a higher impact than developments earlier
in life. Secondly, the West Germans’ decision to participate in the
stock market is not only affected by salient stock returns
realized over their lifetime, but also by less salient GDP-growth.
Thirdly, people seem to internalize this information unconsciously,
(i.e., they literally “experience” macroeconomic developments. We
cannot confirm the competing explanation that people consciously
focus on macroeconomic growth realized over their lifetime by
looking it up in historical data. All this supports the validity of
the experience-based learning model of Malmendier and Nagel
(2011). Fourthly and most importantly, we find no evidence that
the East Germans’ decision to participate in the stock market is
affected by their macroeconomic experiences. This raises questions
about differences in financial decision making between people
from formerly communist countries (that is, a substantial part
of today’s world population) and people from all time market-
oriented countries.

2. Methodology and data

Following Malmendier and Nagel (2011), we compute the
weighted macroeconomic lifetime growth ($A_t$) of individual $i$ from
her birth until year $t$ by:

$$A_t(\lambda) = \sum_{k=1}^{age_i=1} w_{it}(k, \lambda) R_{t-k}$$

(1)

with

$$w_{it}(k, \lambda) = \frac{(age_i - k)^{\lambda}}{\sum_{k=1}^{age_i=1} (age_i - k)^{\lambda}}$$

(2)

where $R_{t-k}$ denotes the return in year $t-k$. The weighting function’s
shape parameter $\lambda$ takes a value larger (smaller) than zero if recent
growth has a higher (lower) weight than growth earlier in life. Fig. 1 illustrates lifetime growth weights of a 50-year-old person for different values of $\lambda$.

We estimate the effect of weighted lifetime growth on the
likelihood of participating in the stock market with probit models:

$$Prob(participation_{it} = 1|A_t(\lambda), x_{it}) = \Phi(\alpha + \beta A_t(\lambda) + \gamma' x_{it} + \epsilon_{it})$$

(3)

where $x_{it}$ represents a battery of control variables. To ensure that
we find the global optimum, we first estimate the model for all
values of $\lambda \in [-10; 10]$ with grid-size 0.001. The $\lambda$ resulting in
the highest likelihood subsequently serves as the starting value in
a further numerical optimization.

All macroeconomic time series are obtained from Global
Financial Data and are adjusted for inflation. Stock returns are
taken from the CDAX-index, which comprises the 500 largest
companies in Germany. East Germans have not been directly
exposed to the West German (or any other) stock market between
1949 and 1989. Therefore, we additionally employ GDP-growth as
a proxy for economic development, which is separately available
for the German Democratic Republic during that time.

Asset holdings and demographics are obtained from the SAVE-
study, a representative German household panel running from
2001 until 2013 (Börsch-Supan et al., 2008). East Germans
are identified via their educational degrees. Thus, there are
only people in our East German sample who have been raised
and educated under the communist regime of the German
Democratic Republic, and not people who moved to East Germany
after the reunification in 1989. We exclude respondents born
before 1926 to ensure return data availability. We further exclude
all non-German respondents.

Our control variables feature the same advantages as in Mal-
mendier and Nagel (2011). We use age and year dummies to control
for age and time effects simultaneously. Demographic con-
trols include the number of children (squared) and dummies for
gender, marital status, professional education and retirement. Fi-
nancial controls include dummies for Germany-specific “Riester”-
savings plans and other savings plans. We interact log liquid finan-
cial assets and log income with year dummies to allow for year-
specific slopes. Liquid financial assets and income are deflated to
purchasing power in 2013 and are winsorised at the 99%-quantile.

For robustness checks, we experimented with the inclusion
and specification of our control variables. All results are consistent with
the reported figures.

To overcome problems of item non-response, an iterative
multiple imputation procedure ($N = 5$) has been applied to the data
(Schunk, 2008). All regression coefficients and standard errors
reported in this study are adjusted for this multiple imputation
(Rubin, 1987).

3. Results

Our interest centers on the impact parameter of weighted
lifetime growth ($\beta$) and the weighting function’s shape parameter
($\lambda$). If Malmendier and Nagel’s (2011) US-based results extend
to the German population, $\beta$ and $\lambda$ are positive. That is, higher
lifetime growth increases the likelihood of holding stocks and
recent developments have a higher impact than developments
earlier in life.

Model (1) of Table 1 presents the effect of weighted lifetime
CDAX-returns on the likelihood of holding stocks in the West
German sample. The impact parameter of weighted lifetime
growth ($\beta$) and the weighting parameter ($\lambda$) are both significantly
positive. A piecewise estimation of weighted lifetime growth
revealed neither a non-monotonic shape of the weighting function
nor non-positive relationships between experienced returns and
the likelihood of holding stocks. We conclude that the results
of Malmendier and Nagel (2011) extend to the West German
population.

Unlike West Germans, East Germans did not experience the
German stock market throughout their lives but only after the
reunification in 1989. Thus, the natural experiment of the German
reunification is a nice test for the experience-story proposed by
Malmendier and Nagel (2011): They suggest that people
unconsciously experience and thereby internalize stock return
information over their lifetime. A competing explanation is that
people consciously focus on returns realized over their lifetime,
e.g., by looking it up in historical data. If the experience-story
proposed by Malmendier and Nagel (2011) applies, the weighting
function’s shape parameter ($\lambda$) will be significantly larger in
the East German than in the West German sample (because East Germans only experienced stock market developments
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