



Full length article

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

Henning Cordes^a, Maik Dierkes^{b,*}^a Finance Center Münster, University of Münster, Universitätsstraße 14-16, 48149 Münster, Germany^b Institute of Banking and Finance, Leibniz University Hannover, Königsworther Platz 1, 30167 Hannover, Germany

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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 communistic regime of the former German Democratic Republic and thus have experienced a market economy only since the German reunification in 1989.

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1. 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 pref-

erences, 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 communistic regime of the German Democratic Republic until the German reunification in 1989, we look at a homogeneous sample.¹

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

* Corresponding author.

E-mail addresses: henning.cordes@wiwi.uni-muenster.de (H. Cordes), maik.dierkes@finance.uni-hannover.de (M. Dierkes).<http://dx.doi.org/10.1016/j.jbef.2017.02.004>

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¹ 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.

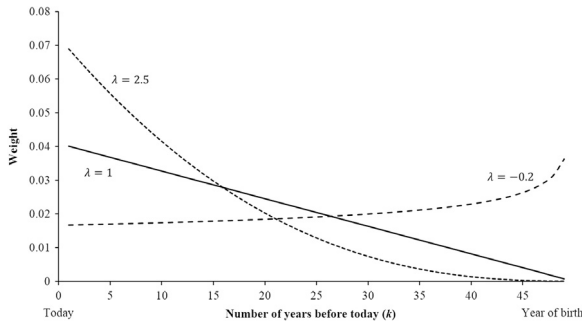


Fig. 1. Lifetime growth weights of a 50-year-old person for different values of λ (see Malmendier and Nagel (2011)).

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 communistic 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_{it}) of individual i from her birth until year t by:

$$A_{it}(\lambda) = \sum_{k=1}^{age_{it}-1} w_{it}(k, \lambda) R_{t-k} \quad (1)$$

with

$$w_{it}(k, \lambda) = \frac{(age_{it} - k)^\lambda}{\sum_{k=1}^{age_{it}-1} (age_{it} - k)^\lambda} \quad (2)$$

where R_{t-k} denotes the return in year $t-k$. The weighting function's shape parameter λ 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 λ .

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

$$\begin{aligned} \text{Prob}(\text{participation}_{i,t} = 1 | A_{it}(\lambda), x_{it}) \\ = \Phi(\alpha + \beta A_{it}(\lambda) + \gamma' x_{it} + \varepsilon_{it}) \end{aligned} \quad (3)$$

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 λ 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 communistic 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 Malmendier and Nagel (2011). We use age and year dummies to control for age and time effects simultaneously. Demographic controls include the number of children (squared) and dummies for gender, marital status, professional education and retirement. Financial controls include dummies for Germany-specific "Riester"-savings plans and other savings plans. We interact log liquid financial 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 (β) and the weighting function's shape parameter (λ). If Malmendier and Nagel's (2011) US-based results extend to the German population, β and λ 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 (β) and the weighting parameter (λ) 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 (λ) 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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