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The Lasting Well-being Effects of Early Adulthood Macroeconomic Crises

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Abstract

This paper studies the effects of macroeconomic crises experienced in early adulthood on subjective well-being later in life. Using repeated cross-sectional survey data of over 100 000 individuals from 38 countries around the world combined with historical data on macroeconomic circumstances, I find that having experienced a macroeconomic crisis at ages 18 to 25 is detrimental to subjective well-being. This result is in line with earlier literature that focuses on other individual-level outcomes. However, the analysis presented in this paper reveals that outcomes related to individual's earnings, employment status, family life, and religion cannot fully explain the lasting effect of a macroeconomic crises on well-being. Results on heterogeneous responses show that the negative effect is largest for females and for individuals with low educational attainment.

Keywords: Subjective well-being; Happiness; Life satisfaction; Macroeconomic crises; Recession

JEL codes: O11, I31

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I. Introduction

Previous literature has shown that recessions experienced in early adulthood have lasting effects on a variety of individual-level outcomes. Giuliano and Spilimbergo (2014) find that preferences on redistribution are different for those individuals who have experienced a macroeconomic crisis in early adulthood. Bianchi (2013) shows that, among employed individuals with a college degree, job satisfaction is higher if an individual has graduated during a recession. Malmendier and Nagel (2011) report that experienced past recessions are also associated with individuals' risk taking later in life. Furthermore, a number of studies have found that labour market outcomes are less favourable for those cohorts that graduated from college or university during a bad economy (see, for example, Oyer, 2006; Kahn 2010; Oreopoulos, Von Wachter, and Heisz, 2012). Maclean and Hill (2015) show that individuals' self-esteem is also affected by the macroeconomic circumstances at school graduation. However, so far there is no analysis on the lasting effects of macroeconomic crises experienced in early adulthood on individuals' happiness and life satisfaction.

This study fills this gap in the literature by examining the lasting well-being effect of a crisis experienced at ages of 18–25. The novelty of this paper is that it utilises international differences in the timing of past macroeconomic crises to analyse their lasting effects on individuals' subjective well-being (SWB). Using repeated cross-section data of over 100 000 individual respondents to the World Values Survey¹ combined with historical data on macroeconomic circumstances allows us to compare the early adulthood experiences between multiple birth cohorts in multiple countries.

Macroeconomic crises can have immediate and long-term effects on young adults' SWB due to biological, psychological, and economic reasons. During the years of early adulthood, the human brain is still in the process of developing, and, because of this developmental plasticity, individuals who face unfavourable environments can also experience enduring suffering in the course of their lives (Steinberg, 2014). In addition, Krosnick and Alwin (1989) have theorised that during the impressionable years of 18 to 25, individuals' values, attitudes and world views are formed and that they change very little in later years of adulthood. In most countries, in-

¹Inglehart et al. (2014) and EVS (2015).

dividuals also graduate and enter the labour market between the ages of 18 and 25. Adverse economic conditions at school leaving may have cumulative impacts on individuals' opportunities, resources, and experiences in later adulthood (Maclean and Hill, 2015). As a result, bad early experiences in the labour market may also have lasting impacts on individual well-being (Bell and Blanchflower, 2011).

During times of economic turmoil, when output falls rapidly, many individuals face unemployment, falling income, or both. Clark, D'Ambrosio, and Ghislandi (2016) show that negative changes in individual's income are associated with long-lasting effects on SWB. Hovi and Laamanen (2017) find similar results using panel data on national income and average national SWB. Clark, Georgellis, and Sanfey (2001) and Clark et al. (2008) also report lasting negative effects on SWB from experiencing unemployment. Experiences of unemployment can scar individuals to the extent that their SWB does not return to its initial level even after re-employment (Clark et al., 2001; Clark et al., 2008; Knabe and Rätzel, 2011). Experiences of unemployment are especially detrimental for young adults because of their negative effect on mental health (see, Bell and Blanchflower, 2011; Mossakowski, 2009; Strandh et al., 2014).

This paper contributes to the existing literature by providing estimates of the very long-term (extending over 20 years) SWB effects of macroeconomic events. In this study, I can identify two possible channels through which early adulthood macroeconomic crises may impact SWB in the long-term. First, experiencing a macroeconomic crisis in early adulthood can have a scarring effect on SWB.² Second, the early adulthood experience can affect outcomes later in life, which in turn affect SWB later in life. In this study, I examine the relative importance of these two channels.

The results presented in this paper show that experiencing a macroeconomic crisis between the ages of 18 and 25 has a negative effect on SWB later in life. This effect is not fully transmitted through outcomes related to earnings, employment status, family life, or religion. According to the results, individuals with low educational attainment are most affected by the crisis. Furthermore, the estimated negative effect is larger for females. The results suggest that

²Following Clark et al. (2001) and Knabe and Rätzel (2011), scarring refers to a situation where an event inflicts permanent harm on individual's SWB. That is, the event has an immediate negative effect and it also leaves a permanent 'scar' on individual's SWB.

in the aftermath of a severe macroeconomic crisis, policy-makers should focus their attention on the outcomes of those groups that experience a lasting decline in their subjective well-being.

The paper is organised as follows. In section II, I describe the data sets and the empirical model used in the analysis. In section III, I present the estimation results and in section IV, I study the robustness of the results. Section V concludes.

II. Data and methods

A. Data

I use the combined World Values Survey and European Values Study data (WVS, from here onwards). The WVS provides the best available data for testing the lasting effects of macroeconomic crises because it is the longest-running international repeated cross section study that has included all the relevant survey questions. The WVS includes two questions on individual well-being: happiness, measured on a scale from 1 to 4, and life satisfaction, measured on a scale from 1 to 10. Incorporating both measures into the analysis allows us to assess the lasting effects of past crises on different aspects of well-being. In addition to the SWB questions, the WVS collects information on respondent's age, gender, relationship status, religious beliefs, educational level, number of children, employment status, and position in her country's income distribution. Following the earlier empirical literature, I use these attributes as control variables in the analysis conducted in the next section.

The WVS has been conducted since 1981 but the first questionnaires that include all of the above-mentioned questions are from 1989. Thus, the time period used in the analysis runs from 1989 to 2014. However, the WVS is not conducted annually, but in waves. There is on average six years between two questionnaires in a country. Each time the survey is conducted, about 1000 individuals are interviewed within a country. I combine the WVS data with Barro and Ursúa's (2008) data on real GDP per capita, which is based on the Angus Maddison's output time series for 40 countries. I augment this real GDP per capita series with data from the World Bank's World Development Indicators (WDI) to include years 2007–2014.³ The combined data

³There is no real GDP data available for Taiwan for the time period 2007–2014 in WDI. I use the IMF's World

includes individuals from 38 countries. Two countries are excluded because of missing data in the WVS.⁴ The use of historical output series allows us to link even the older respondents in the earliest waves of the WVS with the macroeconomic situation they faced in their youth.

To link the WVS respondents with the economic circumstances in their youth, I need information about the birth cohort of each individual. Most of the WVS surveys gather information not only on respondent's age, but also on respondent's birth year. For each individual I calculate the birth cohort as survey year minus the reported age. If this calculated birth cohort differs by more than one from the reported birth year, then the individual is excluded from the analysis. I include all individuals from those surveys where question about the birth year was not included and calculate their birth cohort as described above.

Because my focus is on examining the lasting effects of macroeconomic crises on well-being, I restrict the estimation sample to include only individuals who are older than 25 at the time of the survey. This is standard in studies that examine the long-run impacts of macroeconomic circumstances that take place at a certain age or at a certain life event (see, for example, Kahn, 2010; Giuliano and Spilimbergo, 2014; Maclean and Hill, 2015).

B. Baseline Specification

Following Barro and Ursúa (2008), and using the peak-to-trough method, I define a crisis period as one where the cumulative real GDP per capita decline is 10% or more.⁵ Figure A1 in the Online Appendix shows the crisis years for each country based on this definition. As in Giuliano and Spilimbergo (2014), I link each respondent to the macroeconomic history of her country by creating a dummy variable $shock_{ict}^{18-25}$ equal to one, if the individual lives in a country that experienced at least one crisis year when the individual was 18–25 years old.⁶

Economic Outlook data on real GDP growth to include observations for Taiwan for 2007–2014.

⁴The countries included in the sample are Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, Denmark, Egypt, Finland, France, Germany, Greece, Iceland, India, Indonesia, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States, Uruguay and Venezuela. Sri Lanka cannot be included in the sample because the WVS questionnaires have not been conducted there. Portugal, although included in the WVS, does not have all the relevant individual level variables needed for the analysis.

⁵The time period of the GDP decline may be several years. During this period, output does not have to decline every year, but the overall decline in output has to be at least 10% from peak to trough.

⁶Some, but not all, questionnaires of the WVS have collected information on whether or not respondents were born in the survey country. Where this information is available, I exclude all immigrants from the analysis. In

To assess the impact of these negative macroeconomic shocks on individual SWB, I follow Giuliano and Spilimbergo (2014) and use OLS to estimate

$$SWB_{ict} = \beta_0 + \beta_1 shock_{ict}^{18-25} + \beta_2 shock_{ct} + \psi_c + \delta_t + \eta_{age} + \eta_{cohort} + \psi_c * cohort_{ict} + \gamma' X_{ict} + \epsilon_{ict}, \quad (1)$$

where SWB_{ict} is the self-reported well-being of individual i in country c in survey year t , δ_t , ψ_c , η_{age} , η_{cohort} control for year-, country-, age-, and birth-cohort specific fixed effects, respectively, $cohort_{ict}$ is the birth year of individual i , X_{ict} is a vector of individual specific control variables, and ϵ_{ict} is the error term.^{7,8} To control for the current macroeconomic situation, I include variable $shock_{ct}$, a dummy equal to one if country c is experiencing a crisis during the survey year t .⁹ The individual level control variables included in X are: number of children (if number of children is less than 8, otherwise zero), a dummy that equals one if the number of children is 8 or more,¹⁰ gender (1 if male), highest educational level attained (2 dummies),¹¹ five dummies for relationship status (married, living together as married, divorced, separated, widowed, and single/never-married as the reference group), five dummies for religious denomination (muslim, orthodox, protestant, roman catholic, other, and no religious denomination as the reference group), seven dummies for employment status (part-time employed, self-employed, retired, housewife, student, unemployed, other, and full-time employed as the reference group), and nine dummies for income deciles (lowest decile as the reference group).

those survey waves where this information is not available, I consider all respondents as natives. This generates measurement error to the crisis variable and causes attenuation bias.

⁷In the estimation, I use population weights reported in the WVS to make samples representative for each country-year specific population from which they are drawn. I scale the weights so that their average equals one in each country-year cell. For those country years without reported weights, each individual is weighted equally.

⁸In a repeated cross section with multiple countries, age-, year-, and cohort- specific fixed effects can be included as controls simultaneously. Thus, following Giuliano and Spilimbergo (2014), I include the maximum number of age-, year- and cohort dummies possible to control for their respective effects.

⁹I have also experimented with controlling the macroeconomic situation at the survey year by including country-year dummies into the model. For the variable $shock_{ict}^{18-25}$ this strategy produces coefficient estimates which are smaller in absolute value but statistically significantly different from zero.

¹⁰Giuliano and Spilimbergo (2014) do not control for the number of children. However, because it is standard in the SWB literature, I have included controls for the number of children.

¹¹Educational attainment dummies include: middle education dummy that gets value 1 if individual has completed secondary school education or has incomplete university-preparatory type schooling, high education dummy that gets value 1 if individual has attained a university level degree or has some university level education without a degree, and low education with incomplete secondary school as the reference group.

Cohort fixed effects control for the experiences that are shared globally and could affect SWB, such as World War II or technological progress. In all specifications, I also control for nonlinear global age trends in SWB by including age dummies in the model.¹² Because the coefficient of interest, β_1 , is identified from the differences in experiences across birth cohorts within a country, I want to make sure that I am not estimating the effect of some omitted country-specific cohort trend. To rule out this possibility, I also include variables $\psi_c * cohort_{ict}$ into the model. Hence, for each country, I control for a linear trend in birth cohort.¹³

III. Results

A. Baseline Results

Table 1 shows the results from estimating equation (1) with OLS with country-clustered standard errors. Although the dependent variables are measured on a discrete scale, I have chosen to use OLS to ease the interpretation and to keep the results comparable with the existing literature. As in previous literature, ordered probit estimation is found to produce similar results to OLS (see, for example, Ferrer-i-Carbonell and Frijters, 2004).

In Column 1 of Table 1, I regress happiness on the early adulthood shock dummy, the current shock dummy, and on those control variables that cannot be considered as possible outcomes of the early adulthood shock. Therefore, I only control for those individual level variables that measure age, cohort, and gender. The variable of interest, $shock^{18-25}$, enters with a negative coefficient estimate, which is statistically significantly different from zero at the 5% level.

In Column 2 of Table 1, I add controls for the number of children, education, religion, and relationship status. All these variables can be affected by a crisis experienced in early adulthood and, therefore, the happiness effect may be mediated through them. However, in Column 2, the estimated coefficient for $shock^{18-25}$ remains very similar in magnitude and still statistically significantly different from zero. This implies that the added controls do not mediate the effect

¹²I include one dummy for each age.

¹³I acknowledge that the method used does not guarantee the identification of causal effects. However, I have chosen to use expressions such as ‘affect’ or ‘the effect of’ when discussing the results found in this paper. These expressions are used to improve the readability of the paper.

Table 1. SWB and Macroeconomic Shocks

	(1) Happiness	(2) Happiness	(3) Happiness	(4) Satisfaction	(5) Satisfaction	(6) Satisfaction
shock ¹⁸⁻²⁵	-0.037** (0.014)	-0.035** (0.014)	-0.035** (0.013)	-0.079** (0.036)	-0.073* (0.036)	-0.071* (0.035)
Current shock	-0.289*** (0.073)	-0.282*** (0.077)	-0.274*** (0.060)	-0.685*** (0.235)	-0.653*** (0.239)	-0.592*** (0.166)
Male	-0.032** (0.013)	-0.051*** (0.013)	-0.041*** (0.010)	-0.071* (0.039)	-0.119*** (0.041)	-0.111*** (0.024)
Middle education		0.082*** (0.027)	0.040** (0.018)		0.288*** (0.085)	0.102* (0.052)
High education		0.132*** (0.031)	0.044** (0.017)		0.517*** (0.096)	0.134** (0.051)
Number of children		-0.009* (0.006)	-0.005 (0.004)		-0.029* (0.015)	-0.008 (0.011)
Number of children: 8 or more		-0.033 (0.036)	-0.005 (0.032)		-0.077 (0.087)	0.046 (0.068)
<i>Religion:</i>						
Muslim		0.046 (0.042)	0.057 (0.043)		0.073 (0.123)	0.124 (0.117)
Orthodox		0.056 (0.076)	0.066 (0.075)		-0.054 (0.145)	-0.005 (0.149)
Protestant		0.085*** (0.017)	0.079*** (0.017)		0.256*** (0.059)	0.230*** (0.055)
Roman Catholic		0.060*** (0.014)	0.054*** (0.012)		0.182*** (0.049)	0.156*** (0.043)
Other religion		0.050*** (0.013)	0.052*** (0.013)		0.129*** (0.041)	0.141*** (0.035)
<i>Marital status:</i>						
Married		0.246*** (0.022)	0.191*** (0.014)		0.681*** (0.050)	0.447*** (0.037)
Living together as married		0.137*** (0.021)	0.102*** (0.018)		0.363*** (0.069)	0.215*** (0.073)
Divorced		-0.017 (0.028)	-0.015 (0.023)		-0.034 (0.073)	-0.023 (0.052)
Separated		-0.077*** (0.026)	-0.077*** (0.025)		-0.232*** (0.074)	-0.234*** (0.073)
Widowed		-0.011 (0.025)	-0.026 (0.021)		0.141** (0.054)	0.074 (0.047)
<i>Income decile:</i>						
2nd Income Decile			0.055* (0.029)			0.202* (0.118)
3rd Income Decile			0.097** (0.039)			0.390*** (0.136)
4th Income Decile			0.149*** (0.030)			0.630*** (0.151)
5th Income Decile			0.194*** (0.040)			0.836*** (0.173)
6th Income Decile			0.222***			0.965***

Continued on next page

Table 1 – Continued from previous page

	Happiness	Happiness	Happiness	Satisfaction	Satisfaction	Satisfaction
			(0.050)			(0.193)
7th Income Decile			0.262*** (0.050)			1.144*** (0.206)
8th Income Decile			0.264*** (0.055)			1.196*** (0.214)
9th Income Decile			0.281*** (0.052)			1.277*** (0.216)
10th Income Decile			0.314*** (0.047)			1.314*** (0.204)
<i>Employment status:</i>						
Part time employed			-0.005 (0.015)			-0.126*** (0.035)
Self-employed			-0.006 (0.013)			-0.027 (0.048)
Retired			-0.026* (0.013)			-0.096** (0.047)
Housewife			0.024 (0.016)			0.044 (0.062)
Student			0.057* (0.029)			-0.185 (0.120)
Unemployed			-0.178*** (0.027)			-0.586*** (0.054)
Other employments status			-0.054** (0.025)			-0.304*** (0.063)
Age FEs	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES
(Country dummies)*cohort	YES	YES	YES	YES	YES	YES
Observations	104328	104328	104328	103808	103808	103808

All models estimated with OLS. The omitted category is single/never married full-time employed lowest income decile females with low education and no religious denomination. Country-clustered standard errors in parentheses.
***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

of early adulthood macroeconomic crisis on happiness.

Let us now examine whether experiencing a macroeconomic crisis in early adulthood affects happiness through labour market outcomes and earnings later in life. In Column 3 of Table 1, I add seven dummies for the current employment status and nine dummies for the current income rank of the individual as controls.^{14,15} Inclusion of income and employment status dummies have expected effects on the coefficients of other control variables. For example, the positive effect of educational attainment is now much smaller. However, the coefficient estimate of the early adulthood macroeconomic shock is still statistically significant at the 5% level, and similar in magnitude. This indicates that the relationship between early adulthood macroeconomic crises and happiness does not operate through employment status or income rank in later life.

In Columns 4, 5 and 6, I report the results for the same models as in the previous three columns, but with life satisfaction as the left-hand-side variable. The absolute values of the coefficients in the life satisfaction models are higher because of the different measurement scale. Macroeconomic shocks experienced at the ages of 18–25 are associated with about 0.08 lower life satisfaction later in life according to Column 4. When I add control variables the absolute value of the coefficient decreases slightly, and in Columns 5 and 6 the coefficient estimate is only significant at the 10% risk level. It appears that a small portion of the negative effect of early adulthood crisis experience is transmitted through lower income rank of the individual.¹⁶

¹⁴In the WVS surveys, the respondents are usually given a scale with ten income brackets describing income before taxes and deductions. The brackets are based on an estimate of the survey country's current income distribution. Those individuals who have chosen not to answer questions about their income are excluded from the analysis. In WVS surveys, most country-years have 10 brackets (based on country's income deciles), but some have less. For those country-years that have less than 10 brackets I have scaled the income variable to match the ten-point scale. Thus, I include nine income decile dummies to the estimation equation, leaving the lowest decile as the reference group. Excluding observations from those country-years that do not have all the ten income brackets represented produces similar results as the ones presented in the paper. These results are available upon request.

¹⁵The fact that I use income decile dummies in an analysis with multiple countries implies that these variables capture the effect of income rank on SWB. Thus, the income decile dummies do not capture the effect of absolute income on SWB, but rather the effect of individual's income relative to others in that specific country-year cell. For a discussion about income rank as the measure of relative income see, for example, Mujcic and Frijters (2012).

¹⁶Experiencing a macroeconomic crisis in early adulthood can also lead to lower lifetime earnings and lower wealth. Unfortunately, the WVS does not include any questions about individuals' wealth. However, the WVS includes a question about individuals' financial satisfaction. This variable, together with the income decile dummies, can be used to capture some of the differences in individuals' wealth (for an empirical analysis on the relationship between financial satisfaction and wealth see, for example, Hansen, Slagsvold, and Moum, 2008). When I include

When assessing the magnitude of the results I find that a one standard deviation increase in the early adulthood shock variable is associated with a decrease of 0.02 standard deviations of happiness and 0.01 standard deviations of life satisfaction among respondents within a country. Furthermore, the effect of the early adulthood shock is 20% and 12% of the effect of being unemployed for happiness and life satisfaction, respectively. Although I assess the effect based on differences between individuals at a point in time, it should be kept in mind that for an individual the cumulative losses in SWB can be much larger over time.

Together, these results on happiness and life satisfaction show that experiencing a macroeconomic crisis in the early adulthood is negatively associated with individual's well-being later in life. Moreover, the results indicate that, at best, only a small fraction of the negative SWB effect of early adulthood crisis operates through outcomes concerning number of children, educational attainment, relationship status, religious denomination, employment status, or one's position in the income distribution. In conclusion, early adulthood macroeconomic crises can have a scarring effect on SWB or they can affect well-being later in life via other outcomes than the ones controlled here. By looking at the results presented in the Table 1, I am not able to distinguish between the two proposed channels. To form a clearer picture on the mechanisms, I will analyse SWB effects for different sub-groups in the following sections.

B. Heterogeneous Effects

In this section, I examine which groups of individuals are most affected by the early adulthood crisis experience. I study the SWB effect for males and females and for individuals with low, middle, and high educational attainment. Previous studies have shown that graduating from high school during a recession can differently affect the labour market outcomes of females and males (Genda, Kondo, and Ohta, 2010; Hersbein, 2012). Furthermore, Glewwe and Hall (1998) and Corbacho, Garcia-Escribano, and Inchauste (2007) have shown that the effects of macroeconomic crises on income, consumption, and unemployment spells are often most

this variable in the analysis, the sample sizes decrease to 94495 and 93637 for happiness and life satisfaction, respectively. The estimated coefficient for shock¹⁸⁻²⁵ is closer to zero but statistically significant at the 5% level for happiness and at the 10% level for life satisfaction. This implies that the negative effect of a macroeconomic crisis experienced in early adulthood is not fully transmitted through lower income and lower financial satisfaction later in life. These results are not reported here but are available upon request.

pronounced for low-educated households. Nevertheless, the lasting effects of early adulthood macroeconomic crises on subjective well-being of these different groups have not yet been studied.

To study the different associations between SWB and early adulthood macroeconomic crises with the WVS data, I include interaction variables in equation (1). I interact the male dummy and the education level dummies with the variable shock¹⁸⁻²⁵. This allows us to examine the magnitude of the SWB effect for individuals with different educational attainment and gender.¹⁷ I also control for the heterogeneous well-being effects of a macroeconomic shock at the survey year by interacting the male dummy and the education level dummies with the current shock variable.

Results from estimating the model with interaction terms are reported in Table 2. In Columns 1 and 4 of Table 2, I report the same baseline results as in Columns 1 and 4 of Table 1, but I have added controls for education level and the interaction terms. The estimated coefficient for shock¹⁸⁻²⁵ now captures the SWB effect of an early adulthood crisis for females with low education, which is the reference category. This group is hit hardest by the early adulthood crisis experience, with 0.11 lower happiness and 0.22 lower life satisfaction compared to individuals with same education level and gender that have not experienced a macroeconomic crisis in early adulthood.

In all columns of Table 2, the coefficient of Male \times shock¹⁸⁻²⁵ is positive and statistically significant at the 5% level. This indicates that, on average, the lasting negative effect of experiencing a macroeconomic crisis in early adulthood is smaller for males. Adding control variables does not seem to decrease the relative difference in the SWB effect between males and females. In fact, in Columns 2 and 5, adding controls for relationship status, number of children, and religious denomination slightly increases the estimated coefficient for the male interaction, while also causing the estimated coefficient for the early adulthood shock dummy to move towards zero. This is in line with Maclean, Covington, and Kessler (2016) and Her-

¹⁷As discussed in the previous section, education level can be an outcome of experiencing a macroeconomic crisis in early adulthood. If this were true, it would bias the estimates of the effect of early adulthood shock on well-being for different educational levels. To rule out this possibility I have regressed the high education dummy as well as the low education dummy on the variables presented in Columns 1 and 4 of Table 1. These results are not reported here, but they show that education level is not statistically significantly associated with early adulthood shock. These results are available upon request.

Table 2. SWB and Macroeconomic Shocks, Interactions

	(1)	(2)	(3)	(4)	(5)	(6)
	Happiness	Happiness	Happiness	Satisfaction	Satisfaction	Satisfaction
shock ¹⁸⁻²⁵	-0.107*** (0.019)	-0.104*** (0.020)	-0.095*** (0.020)	-0.218*** (0.072)	-0.209*** (0.074)	-0.179*** (0.065)
Male × shock ¹⁸⁻²⁵	0.053** (0.026)	0.056** (0.021)	0.053** (0.023)	0.136** (0.058)	0.144** (0.055)	0.146** (0.056)
Middle education × shock ¹⁸⁻²⁵	0.054 (0.033)	0.052* (0.030)	0.043* (0.024)	0.071 (0.101)	0.064 (0.091)	0.029 (0.072)
High education × shock ¹⁸⁻²⁵	0.119** (0.050)	0.109** (0.043)	0.089** (0.034)	0.250 (0.174)	0.224 (0.152)	0.141 (0.114)
Current shock	-0.264*** (0.059)	-0.265*** (0.058)	-0.254*** (0.047)	-0.552** (0.268)	-0.551** (0.266)	-0.475** (0.217)
Male × Current shock	-0.118 (0.073)	-0.121* (0.071)	-0.096 (0.058)	-0.319 (0.286)	-0.324 (0.281)	-0.224 (0.237)
Middle education × Current shock	0.080 (0.066)	0.088 (0.059)	0.065 (0.045)	0.058 (0.191)	0.075 (0.174)	-0.022 (0.126)
High education × Current shock	0.092 (0.144)	0.098 (0.128)	0.043 (0.098)	0.251 (0.377)	0.262 (0.335)	0.026 (0.232)
Male	-0.041*** (0.010)	-0.053*** (0.010)	-0.046*** (0.009)	-0.099*** (0.029)	-0.123*** (0.029)	-0.126*** (0.024)
Middle education	0.069*** (0.020)	0.063*** (0.018)	0.025* (0.014)	0.279*** (0.064)	0.266*** (0.060)	0.097** (0.044)
High education	0.108*** (0.021)	0.105*** (0.019)	0.025 (0.015)	0.469*** (0.071)	0.464*** (0.064)	0.110* (0.058)
Number of children		-0.009 (0.005)	-0.005 (0.004)		-0.027** (0.013)	-0.008 (0.010)
Number of children: 8 or more		-0.028 (0.036)	-0.002 (0.031)		-0.066 (0.083)	0.052 (0.067)
Employment status dummies	NO	NO	YES	NO	NO	YES
Income dummies	NO	NO	YES	NO	NO	YES
Relationship dummies	NO	YES	YES	NO	YES	YES
Religion dummies	NO	YES	YES	NO	YES	YES
Age FEs	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES
(Country dummies)*cohort	YES	YES	YES	YES	YES	YES
The effect of shock ¹⁸⁻²⁵ for:						
low-educated females	-0.107***	-0.104***	-0.095***	-0.218***	-0.209***	-0.179***
p-value	0.000	0.000	0.000	0.004	0.008	0.009
low-educated males	-0.053*	-0.048*	-0.042*	-0.082	-0.065	-0.032
p-value	0.080	0.068	0.091	0.440	0.506	0.715
middle-educated females	-0.053*	-0.052*	-0.052**	-0.147***	-0.145***	-0.150***
p-value	0.099	0.061	0.047	0.005	0.002	0.000
middle-educated males	0.000	0.004	0.001	-0.011	-0.001	-0.004
p-value	0.980	0.845	0.956	0.857	0.987	0.945
high-educated females	0.012	0.005	-0.007	0.032	0.015	-0.038
p-value	0.792	0.881	0.821	0.791	0.877	0.607
high-educated males	0.065**	0.061**	0.047**	0.168	0.159*	0.108
p-value	0.024	0.016	0.027	0.104	0.087	0.111
Observations	104328	104328	104328	103808	103808	103808

All models estimated with OLS. Lower panel reports the test result for the SWB effect of an early adulthood macroeconomic shock for each gender-education group. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively. Country-clustered standard errors in parentheses.

shbein (2012) who find that leaving school in an economic downturn is negatively associated with the marital status of males. Adding controls for income decile and employment status in Columns 3 and 6 has only a small impact on the difference between the SWB effect of males and females. Thus, the difference in the lasting SWB effect between males and females cannot be explained by differences in the observed outcomes related to family life, religion, employment status, or income rank.

In Table 2, the estimated coefficients for the education interactions reveal that the SWB of individuals with higher educational attainment is more resilient to early adulthood macroeconomic shocks. The difference in the happiness effect between low-educated and middle-educated individuals, captured by the coefficient of $\text{Middle education} \times \text{shock}^{18-25}$, is statistically significant at the 10% level in Columns 2 and 3. For low-educated and high-educated individuals, the difference is statistically significant at the 5% level in all models of happiness. In models of life satisfaction, the differences are positive but not statistically significant. The addition of control variables decreases the coefficient estimates of the education interactions in models happiness and life satisfaction. However, the control variables are not able to fully explain the differences in the happiness effect between individuals with different levels of educational attainment.

To further assess the estimated effects for individuals with different levels of educational attainment and gender, I have tested the effect of experiencing a macroeconomic shock at 18–25 for each of the six gender-education groups in the lower panel of Table 2. I report the sum of the coefficients of the shock variables that are relevant for each group. I also report the p-value from an F-test of the sum of the coefficients that are relevant for each group. These tests show that crisis experiences are associated with lower levels of happiness at the 1% risk level and at the 10% level for low-educated females and low-educated males, respectively. In addition, early adulthood crisis experiences are associated with lower happiness levels among middle-educated females. In terms of life satisfaction, the results for females are very similar. It seems that low and middle-educated females are suffering the negative consequences of early adulthood crisis experiences. In contrast, early adulthood crisis experience is not statistically significantly associated with life satisfaction among low and middle-educated males.

There are two possible explanations for the observed difference between males and females. First, the SWB scarring effect of early adulthood macroeconomic crisis could be much larger for females than it is for males. Second, for females, the early adulthood crisis experience can have a larger impact on other outcome variables than the ones included in Columns 3 and 6 of Table 2. The relative importance of these two proposed channels can be assessed by looking at the coefficient estimates of Current shock and its interaction with male dummy. These coefficients capture the effect of a macroeconomic crisis at survey year for all low-educated individuals who are older than 25. It can be observed that the negative SWB effect of a macroeconomic crisis at the survey year is not stronger for females. Although this analysis is conducted using individuals older than 25, similar results are obtained if the analysis is conducted using individuals younger than 26.¹⁸ Thus, it is very unlikely that the SWB scarring effect of a macroeconomic crisis is larger for females than for males.¹⁹ It is more plausible that experiencing a crisis in early adulthood has a heterogeneous impact on other outcomes later in life.

Finally, let us turn to the results presented in the lowest row in the lower panel of Table 1. These results provide evidence for a positive happiness effect of early adulthood crisis for high-educated males. This result is in line with Bianchi (2013), who finds that among educated individuals those who have graduated during economic downturns are more satisfied with their jobs. This result is also in line with Giuliano and Spilimbergo (2014), who find that experiencing a macroeconomic shock in early adulthood affects individuals' perceptions about the key determinants of success in life. Giuliano and Spilimbergo (2014) show that individuals who have experienced a crisis in early adulthood see luck as a more crucial determinant for success than hard work. It is possible that those who have experienced a crisis place higher value on the benefits that high education has brought into their lives. These benefits, of course, are not similar for all high-educated individuals and may differ between females and males.

¹⁸These results are not reported here, but are available upon request.

¹⁹Clark et al. (2001) and Kanbe and Rätzel (2011) reach similar conclusions when studying the scarring effect of unemployment among working aged German nationals. According to their results, the negative effect on subjective well-being is not larger for females.

C. Results on Dynamic Effects

The results reported thus far, have shown the average SWB effect of experiencing a crisis in early adulthood among all age groups over 25. I have assumed that the association between early adulthood macroeconomic crisis and SWB is similar for individuals who have experienced a crisis in the previous year and individuals who have experienced it, for example, 20 years ago. To relax this assumption, some studies that focus on other outcome variables allow for dynamic effects by including dummy variables measuring the years elapsed from the experience (see, for example, Oreopoulos et al., 2012 and Buccioli, Alessandro, and Zarri, 2015).²⁰

I examine the dynamic effects of early adulthood macroeconomic crises using a similar dummy variable strategy. I start by calculating the number of years passed from the early adulthood crisis experience for those individuals who have experienced a crisis at the ages of 18–25. For such individuals, I define the age at 18–25 which is last coded as a crisis year using Barro and Ursúa (2008) definition. Then I subtract this age from individual’s age at survey year. For example, for a 40-year-old individual for whom the last crisis year during early adulthood was when she was 23 years old I code the number of years passed as 17. If a country has experienced a crisis in the years when the individual was 22–27 years old, then for that individual the last year coded as crisis is when she was 25 (the highest age in the eight-year range interval).

In Columns 1 and 4 of Table 3, I have augmented the baseline model from Columns 1 and 4 in Table 1 with two dummy variables $\text{shock}^{18-25} \times D_{10-19}$ and $\text{shock}^{18-25} \times D_{>19}$. The former equals one if the individual has experienced a crisis at the ages of 18–25 and there is 10 to 19 years from that experience. The latter equals one if the individual has experienced a crisis in early adulthood and there is more than 19 years from that experience. The effect of an early adulthood macroeconomic crisis for individuals whose crisis experience took place less than

²⁰In the SWB literature, the dynamic effects of changes in individuals’ circumstances are usually studied using longitudinal individual level data (see, for example, Clark et al., 2008). However, with cross-section data, which is linked to historical output data, the dynamic effect can be evaluated by studying the differences between birth cohorts within a country. The latter approach has two advantages. First, it allows for the examination of the effects over a much longer time span. Second, it allows us to assess the effects of experienced circumstances that individual faced at a specific age, even if individual level data from that age is not available. However, when using between variation, it is crucial that global age- and cohort fixed effects are controlled. Fortunately, this can be done with international repeated cross-section data. In what follows, *dynamic effects* will refer to these estimated effects that are identified from differences between individuals.

Table 3. SWB and Macroeconomic Shocks, Dynamic Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	Happiness	Happiness	Happiness	Satisfaction	Satisfaction	Satisfaction
shock ¹⁸⁻²⁵	-0.072 (0.077)	-0.201*** (0.063)	-0.172** (0.071)	-0.272*** (0.096)	-0.706*** (0.257)	-0.594*** (0.201)
shock ¹⁸⁻²⁵ × D ₁₀₋₁₉	0.004 (0.079)	0.027 (0.085)	0.016 (0.087)	0.134 (0.098)	0.380 (0.260)	0.315 (0.234)
shock ¹⁸⁻²⁵ × D _{>19}	0.067 (0.088)	0.141* (0.080)	0.119 (0.087)	0.305** (0.116)	0.690** (0.280)	0.599** (0.227)
Male × shock ¹⁸⁻²⁵		0.041 (0.036)	0.040 (0.040)		0.322** (0.155)	0.322** (0.127)
Male × shock ¹⁸⁻²⁵ × D ₁₀₋₁₉		0.049 (0.033)	0.042 (0.030)		-0.210 (0.307)	-0.223 (0.266)
Male × shock ¹⁸⁻²⁵ × D _{>19}		0.004 (0.043)	0.004 (0.047)		-0.232 (0.185)	-0.221 (0.158)
Mid. educ. × shock ¹⁸⁻²⁵		0.140* (0.072)	0.122** (0.052)		0.263 (0.204)	0.190 (0.132)
Mid. educ. × shock ¹⁸⁻²⁵ × D ₁₀₋₁₉		-0.058 (0.038)	-0.061* (0.036)		-0.057 (0.087)	-0.058 (0.072)
Mid. educ. × shock ¹⁸⁻²⁵ × D _{>19}		-0.099 (0.084)	-0.088 (0.066)		-0.308 (0.262)	-0.253 (0.181)
High educ. × shock ¹⁸⁻²⁵		0.179*** (0.063)	0.122*** (0.039)		0.692** (0.329)	0.466** (0.197)
High educ. × shock ¹⁸⁻²⁵ × D ₁₀₋₁₉		-0.047 (0.040)	-0.024 (0.046)		-0.498** (0.192)	-0.393** (0.151)
High educ. × shock ¹⁸⁻²⁵ × D _{>19}		-0.057 (0.046)	-0.019 (0.040)		-0.557* (0.289)	-0.393** (0.189)
Current shock	-0.290*** (0.073)	-0.266*** (0.058)	-0.252*** (0.047)	-0.673*** (0.236)	-0.504** (0.233)	-0.424** (0.191)
Male × Current shock		-0.108 (0.072)	-0.095 (0.059)		-0.331 (0.267)	-0.256 (0.221)
Mid. educ. × Current shock		0.076 (0.049)	0.059* (0.032)		0.033 (0.154)	-0.045 (0.104)
High educ. × Current shock		0.090 (0.133)	0.042 (0.094)		0.180 (0.315)	-0.032 (0.195)
Male dummy	YES	YES	YES	YES	YES	YES
Education dummies	YES	YES	YES	YES	YES	YES
Controls for number of children	NO	NO	YES	NO	NO	YES
Employment status dummies	NO	NO	YES	NO	NO	YES
Income dummies	NO	NO	YES	NO	NO	YES
Relationship dummies	NO	NO	YES	NO	NO	YES
Religion dummies	NO	NO	YES	NO	NO	YES
Age FEs	YES	YES	YES	YES	YES	YES
(Age dummies)*Male	NO	YES	YES	NO	YES	YES
(Age dummies)*Middle education	NO	YES	YES	NO	YES	YES
(Age dummies)*High education	NO	YES	YES	NO	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES
(Country dummies)*cohort	YES	YES	YES	YES	YES	YES
Observations	104328	104328	104328	103808	103808	103808

All models estimated with OLS. shock¹⁸⁻²⁵ × D_{>19} = 1 if more than 19 years have passed from the last shock year at ages 18-25. shock¹⁸⁻²⁵ × D₁₀₋₁₉ = 1 if more than 9 years but less than 20 years have passed from the last shock year at ages 18-25. Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

10 years ago is captured by the coefficient of shock^{18-25} . If more than 9 years but less than 20 years have passed since last crisis year in early adulthood, the effect is calculated as the sum of the coefficients of shock^{18-25} and $\text{shock}^{18-25} \times D_{10-19}$. When more than 19 years have passed since the last crisis year, the effect is calculated as the sum of the coefficients of shock^{18-25} and $\text{shock}^{18-25} \times D_{>19}$. The well-being trends among those individuals who have not experienced a crisis in early adulthood are controlled by the age fixed effects.

Results reported in Columns 1 and 4 of Table 3 imply that, on average, the negative well-being effect of an early adulthood macroeconomic crisis dissipates over time. Using the estimated coefficients, I have tested the statistical significance of the average SWB effect of early adulthood macroeconomic crisis for individuals with different number of years passed from the crisis. These tests reveal that happiness is statistically significantly lower only for those individuals who have 10 to 19 years from the last crisis year. For life satisfaction, the negative effect is statistically significant only for those individuals who have less than 10 years from the last crisis year. To save space, these test results are not reported in Table 3.

Next, I will focus on the dynamic response to the early adulthood crisis for the different gender-education groups. In Columns 2 and 5 of Table 3, I replicate the results presented in Columns 1 and 4 of Table 2, but now I also allow for different dynamic effects for males and females, and for individuals with different levels of educational attainment. In the models estimated in Columns 2 and 5, I have also interacted education and gender dummies with age dummies. This is done to make sure that the estimated dynamic effects are not capturing some underlying difference in the age trends of males and females, and individuals with different levels of educational attainment.

In Columns 3 and 6 of Table 3, I add control variables for the number of children, relationship status, religious denomination, income decile, and employment status. To ease the interpretation of the results, Figure 1 illustrates the dynamic happiness effect for different gender-education groups using results presented in Columns 2 and 3. In Figure 1, horizontal axis displays the years that have elapsed from the crisis experience and vertical axis measures the size of the estimated happiness effect.

The top left graph of Figure 1 shows that the negative happiness effect is largest for those

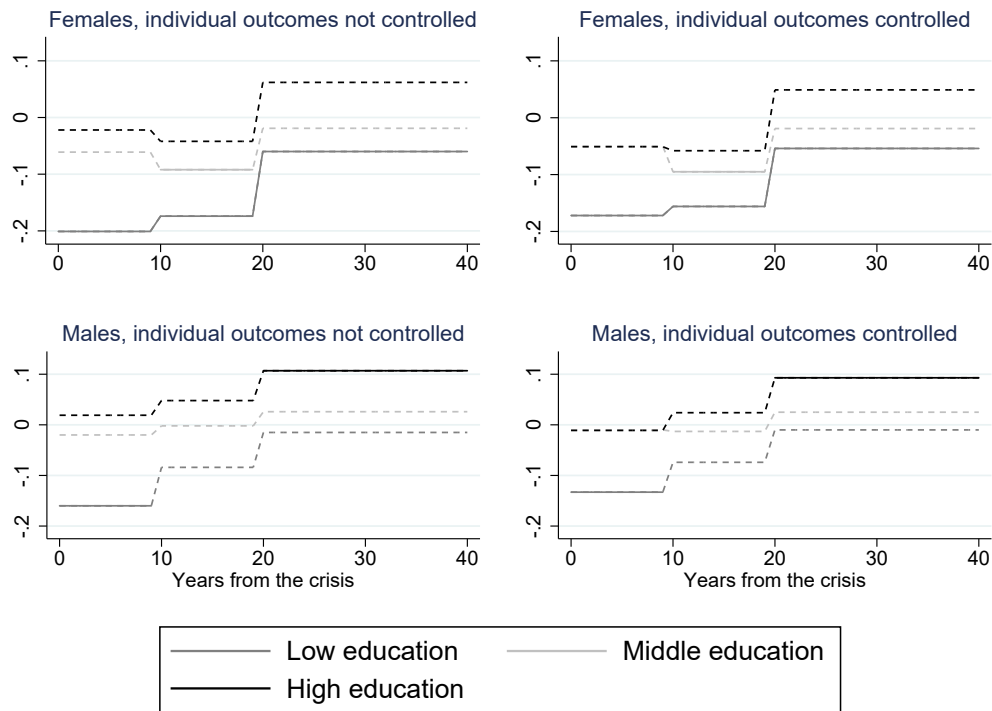


Figure 1. The dynamic happiness effect of an early adulthood macroeconomic crisis by education level and gender

Note. Reported happiness effect in the left-hand side (right-hand side) graphs is based on results reported in Column 2 (3) of Table 3. Line is dashed when the effect is not statistically significant at the 5% level.

low-educated females who have experienced the crisis most recently. However, the happiness effect is negative and statistically significant at the 5% level also for those low-educated females who have experienced the crisis over 19 years ago. The dark grey line in the bottom left graph of Figure 1 shows that the negative happiness effect for low-educated males is statistically significant only for those who have experienced the crisis recently. Comparing the light grey lines in top left and bottom left graphs of Figure 1 reveals the differences between middle-educated females and males. For the latter, experiencing a crisis in early adulthood has virtually no effect on happiness in later life. In contrast, for middle-educated females the effect is negative and statistically significant if 10 to 19 years have elapsed from the crisis.

Based on these results it is unlikely that individual happiness is scarred because of experiencing a macroeconomic crisis in early adulthood. In the case of SWB scarring, we would not expect to see both genders suffering similar negative effects in the immediate aftermath of the early adulthood crisis and only males recovering. These results rather suggest that females face different circumstances than males when more years have passed from the early adulthood

crisis experience. Comparison of the happiness effects reported in the light grey lines in the top left and bottom left graphs of Figure 1 supports this conclusion. The path to recovery is different for males and females.

Let us next examine the role of the observed individual level outcomes in explaining the dynamic happiness effect for different gender-education groups. The top right and bottom right graphs of Figure 1 report the estimated happiness effects from Column 3 of Table 3. For low-educated males and females, part of the negative happiness effect is mediated through outcomes related to family life, religion, income rank, and employment status. However, the statistical significance of the estimated happiness effect remains unchanged. The observed difference in the dynamic happiness effect between males and females is not explained by differences in the observed circumstances.

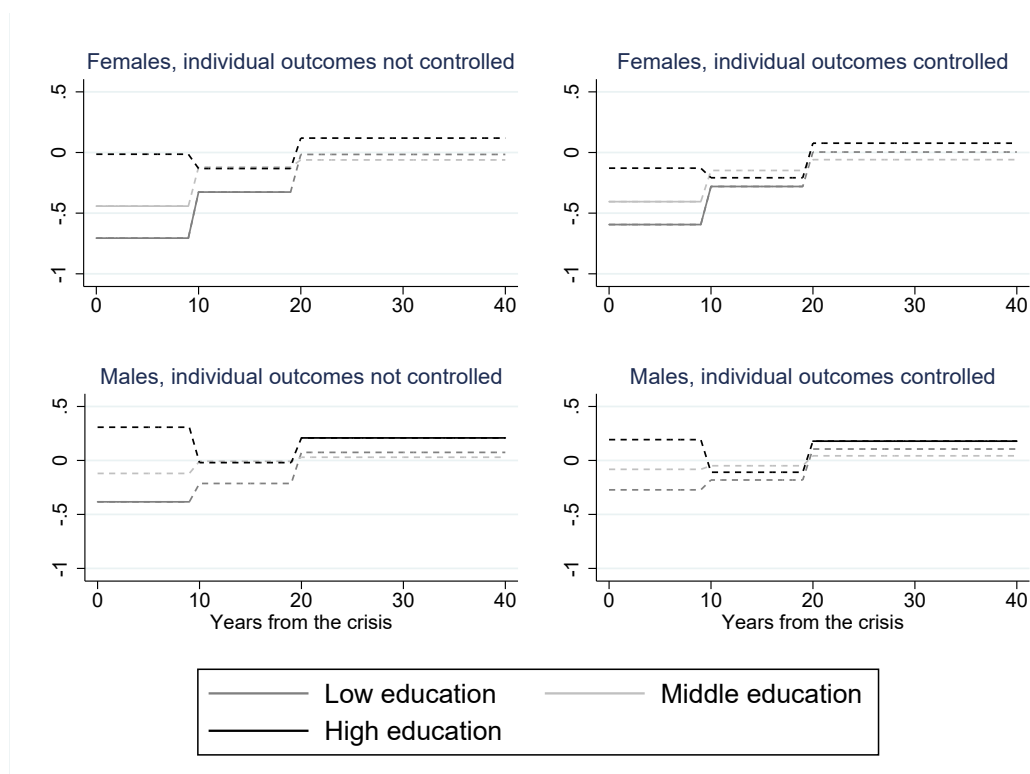


Figure 2. The dynamic life satisfaction effect of early adulthood macroeconomic crisis by education level and gender

Note. Reported life satisfaction effect in the left-hand side (right-hand side) graphs is based on results reported in Column 5 (6) of Table 3. Line is dashed when the effect is not statistically significant at the 5% level.

Figure 2 reports the estimated dynamic life satisfaction effect of the early adulthood crisis experience for different gender-education groups. Left-hand side graphs plot the results from Column 5 of Table 3 and right-hand side graphs report the results from Column 6 of Table

3. For the most part, these results are similar to the results reported in Figure 1. First, we can observe from Figure 2 that the negative life satisfaction effect is larger for females and for low-educated individuals. Second, the inclusion of control variables in the right-hand side graphs decreases the negative life satisfaction effect. Third, among high-educated males the life satisfaction effect is positive when more than 19 years have elapsed from the crisis experience.

However, results on life satisfaction are not identical to results on happiness in every respect. Figure 2 shows that early adulthood crisis experience is not statistically significantly associated with lower life satisfaction for any gender-education group if the crisis experience has taken place over 19 years ago. According to these results, the negative effect on life satisfaction is severe but not permanent.

The observed difference in the SWB effect between males and females is likely due to differences in unobserved outcomes in later adulthood. One possible explanation is that the cumulative disadvantages in opportunities and experiences generated by the early adulthood crisis are more severe for females.

IV. Robustness checks

In this section, I test the robustness of the baseline results reported in Columns 1 and 4 of Table 1. I focus on the baseline results because I can be certain that they are not contaminated by other outcome variables. First, I test the lasting effect of early adulthood macroeconomic crisis by using different thresholds for the macroeconomic crisis. Then I move on to study the effect of experiencing a crisis at different ages. Finally, I examine the robustness of the results by creating placebo treatments of the early adulthood macroeconomic crises.

In the models presented in the previous section, I have followed Barro and Ursúa (2008) and Giuliano and Spilimbergo (2014) and assumed that macroeconomic crisis is defined by a 10% peak to trough decrease in real GDP per capita. One way to test the robustness of the baseline results is to change the crisis threshold to allow smaller economic contractions to be coded as crises. I have used thresholds of 9%, 8%, 7%, 6%, and 5% peak to trough decreases in real GDP per capita in defining the crisis period in the following robustness checks. Table 4 reports

the results for the same models as the ones estimated in Columns 1 and 4 of Table 1 using the alternative crisis thresholds.

Results in Columns 1 and 2 of Table 4, show that early adulthood crises defined using the 9% and 8% threshold are also statistically significantly associated with lower levels of happiness. Using a lower crisis threshold than 8%, however, results in a smaller and, in most cases, insignificant effect on happiness. The estimated effect on life satisfaction is also closer to zero when using smaller thresholds, but is still statistically significantly different from zero at the 5% significance level. These results suggest that smaller crises experienced in early adulthood are also associated with lower SWB later in life. However, a more severe crisis in early adulthood has larger lasting impacts on SWB.

Thus far, I have focused on the effects of crisis experiences in the early adulthood. It is also possible that experiencing a macroeconomic crisis at some other age has a lasting effect on individual SWB. For example, macroeconomic crises experienced in childhood can affect the development of an individual through a variety of channels. Following Giuliano and Spilimbergo (2014), I have constructed six different eight-year range intervals for age (2–9, 10–17, 26–33, 34–41, 42–49, and 50–57). In each Column of Table 5, I test the lasting effect of experiencing a crisis during one of these ages. Only individuals who are older than the upper bound of the interval are included in the analysis. Thus, the focus is, again, on the lasting effects of past crises. The crisis is defined using the 10% peak to trough decrease in real GDP per capita as a threshold.

Columns 1–6 and 7–12 of Table 5 report the effect of experiencing a crisis at different ages on happiness and life satisfaction, respectively. Results in Columns 1 and 7 indicate that macroeconomic crisis experienced in childhood is not associated with lower subjective well-being later in life. On the other hand, Columns 5 and 10 of Table 5 show that, for individuals older than 41, the crisis experience at 34–41 is associated with statistically significantly lower happiness but no association is found with life satisfaction. Experiencing a crisis at ages 42–49 has no statistically significant effect on happiness, but a significant negative effect on life satisfaction at the 5% level.²¹ According to these results, macroeconomic crisis has a statistically

²¹When assessing the effect magnitudes, it should be noted that for individuals older than 41 or older than 49 the lasting SWB effect is identified from a much shorter time span.

Table 4. SWB and Macroeconomic Shocks, Alternative Crisis Definition

	(1) Happiness	(2) Happiness	(3) Happiness	(4) Happiness	(5) Happiness	(6) Satisfaction	(7) Satisfaction	(8) Satisfaction	(9) Satisfaction	(10) Satisfaction
Crisis threshold	9%	8%	7%	6%	5%	9%	8%	7%	6%	5%
shock ^{18,25}	-0.036*** (0.013)	-0.028*** (0.010)	-0.015 (0.009)	-0.016 (0.010)	-0.017* (0.009)	-0.080** (0.034)	-0.077** (0.035)	-0.064*** (0.028)	-0.069** (0.029)	-0.063** (0.027)
Current shock	-0.241*** (0.076)	-0.288*** (0.080)	-0.268*** (0.072)	-0.268*** (0.072)	-0.268*** (0.072)	-0.731*** (0.178)	-0.774*** (0.185)	-0.702*** (0.171)	-0.704*** (0.171)	-0.704*** (0.171)
Male	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.013)	-0.032** (0.013)	-0.071* (0.039)	-0.071* (0.040)	-0.071* (0.040)	-0.071* (0.040)	-0.071* (0.040)
Education dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Controls for number of children	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Employment status dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Income dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Relationship dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Religion dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Age FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(Country dummies)*cohort	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	104328	104328	104328	104328	104328	103808	103808	103808	103808	103808

All models estimated with OLS. Threshold used for defining a macroeconomic shock reported in the second row. Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 5. SWB and Macroeconomic Shocks, Alternative Age Ranges

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Happiness	Happiness	Happiness	Happiness	Happiness	Happiness	Satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction	Satisfaction
shock ²⁻⁹	0.012 (0.008)						0.035 (0.021)					
shock ¹⁰⁻¹⁷		-0.017 (0.011)						-0.039 (0.029)				
shock ²⁶⁻³³			-0.010 (0.012)						-0.008 (0.046)			
shock ³⁴⁻⁴¹				-0.039** (0.015)								
shock ⁴²⁻⁴⁹					-0.046 (0.035)					-0.026 (0.050)		
shock ⁵⁰⁻⁵⁷						-0.034 (0.023)						0.013 (0.079)
Current shock	-0.269*** (0.066)	-0.270*** (0.066)	-0.263*** (0.072)	-0.258*** (0.073)	-0.247*** (0.072)	-0.238*** (0.073)	-0.553** (0.211)	-0.550** (0.209)	-0.677** (0.272)	-0.618** (0.291)	-0.510* (0.268)	-0.485** (0.206)
Male	-0.038*** (0.013)	-0.038*** (0.013)	-0.019 (0.013)	-0.008 (0.014)	0.003 (0.015)	0.028 (0.018)	-0.067 (0.040)	-0.068* (0.040)	-0.053 (0.037)	-0.010 (0.031)	0.014 (0.036)	0.043 (0.043)
Education dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Controls for number of children	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Employment status dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Income dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Relationship dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Religion dummies	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Age FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
(Country dummies) [†] /cohort	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	127475	126486	80995	58665	39417	24365	126827	125842	80646	58467	39347	24394

All models estimated with OLS. Superscript in the shock variable denotes the age at which shock is experienced. Shock is defined using 10% peak to trough decrease in real GDP per capita in every column. Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

significant impact on both aspects of well-being only when it is experienced at the ages of 18–25.

To further test the robustness of the baseline results presented in Table 1, I follow Giuliano and Spilimbergo (2014) and create placebo treatments by assigning each individual with the macroeconomic history of another, randomly selected country. If this country experienced a macroeconomic crisis when the individual was 18–25 years old, then the placebo shock dummy equals 1. In Table A1 in the online appendix, I have replicated the results presented in Table 1 using the placebo shock dummy as the explanatory variable. The results show that there is no statistically significant association between the placebo shock dummy and the SWB variables. This supports the idea that the baseline model is identifying the average effect of an early adulthood macroeconomic crisis on SWB.

V. Conclusion

In this paper, I have shown that experiencing a severe macroeconomic crisis at the ages of 18–25 is associated with lower subjective well-being later in life. The negative impact on happiness is more persistent than the negative impact on life satisfaction. According to the analysis presented in the paper, the negative SWB effect is not fully transmitted through measured outcomes related to family life, religion, earnings, or employment status. However, based on the results on heterogeneous responses, it seems that experiencing a macroeconomic crisis in early adulthood does not have a scarring effect on SWB either. Thus, I propose that experiencing a macroeconomic crisis in early adulthood affects SWB later in life via other outcomes. One explanation is that experiencing a severe economic shock in early adulthood leads to cumulative disadvantages in opportunities and experiences that result in lower SWB years later. As a consequence, in the aftermath of a severe macroeconomic crisis, policy-makers should direct their focus on the life outcomes of those groups of individuals whose well-being suffers the most adverse consequences.

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ONLINE APPENDIX: THE LASTING WELL-BEING EFFECTS OF EARLY ADULTHOOD MACROECONOMIC CRISES

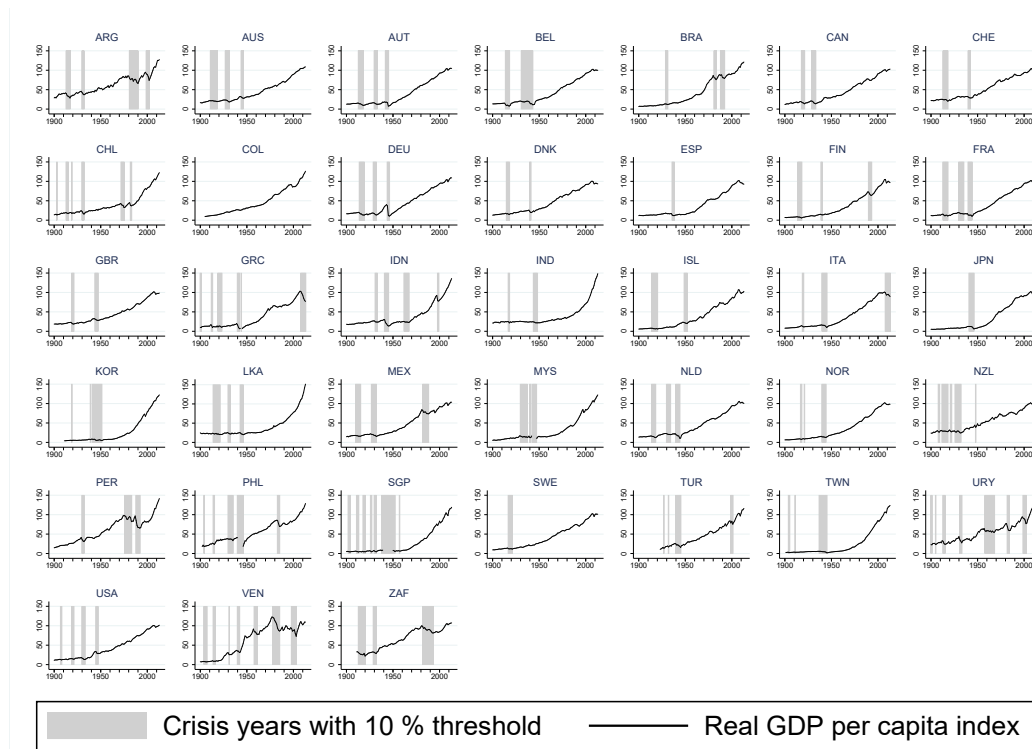


Figure A1. Crisis years

Note. 10% peak to trough decrease in real GDP per capita is used as the condition for crisis. The years considered as crisis are highlighted for the 38 sample countries. I have followed Baro and Ursúa (2008) in defining all the years when the GDP variable is missing as crisis years.

Table A1. SWB and Macroeconomic Shocks, Placebo Treatments

	(1) Happiness	(2) Happiness	(3) Happiness	(4) Satisfaction	(5) Satisfaction	(6) Satisfaction
shock ¹⁸⁻²⁵	-0.006 (0.007)	-0.006 (0.007)	-0.007 (0.006)	0.008 (0.019)	0.007 (0.019)	0.004 (0.017)
Current shock	-0.286*** (0.071)	-0.278*** (0.076)	-0.270*** (0.059)	-0.678*** (0.232)	-0.646*** (0.236)	-0.585*** (0.164)
Male	-0.032** (0.013)	-0.051*** (0.013)	-0.041*** (0.010)	-0.071* (0.039)	-0.119*** (0.042)	-0.111*** (0.024)
Middle education		0.082*** (0.028)	0.040** (0.018)		0.288*** (0.085)	0.102* (0.052)
High education		0.132*** (0.031)	0.044** (0.017)		0.517*** (0.096)	0.134** (0.051)
Number of children		-0.009 (0.006)	-0.005 (0.004)		-0.029* (0.014)	-0.008 (0.011)
Number of children: 8 or more		-0.032 (0.036)	-0.005 (0.032)		-0.076 (0.087)	0.047 (0.068)
<i>Religion:</i>						
Muslim		0.045 (0.042)	0.056 (0.043)		0.071 (0.123)	0.122 (0.117)
Orthodox		0.056 (0.076)	0.065 (0.075)		-0.055 (0.145)	-0.006 (0.149)
Protestant		0.085*** (0.017)	0.079*** (0.017)		0.256*** (0.059)	0.230*** (0.055)
Roman Catholic		0.060*** (0.013)	0.054*** (0.012)		0.182*** (0.049)	0.156*** (0.043)
Other religion		0.050*** (0.013)	0.052*** (0.013)		0.129*** (0.041)	0.141*** (0.035)
<i>Marital status:</i>						
Married		0.246*** (0.022)	0.191*** (0.014)		0.682*** (0.050)	0.447*** (0.037)
Living together as married		0.138*** (0.021)	0.102*** (0.018)		0.364*** (0.070)	0.216*** (0.073)
Divorced		-0.017 (0.028)	-0.014 (0.023)		-0.033 (0.073)	-0.022 (0.052)
Separated		-0.078*** (0.026)	-0.077*** (0.025)		-0.233*** (0.074)	-0.234*** (0.073)
Widowed		-0.010 (0.024)	-0.026 (0.021)		0.142** (0.054)	0.075 (0.047)
<i>Income decile:</i>						
2nd Income Decile			0.055* (0.029)			0.201* (0.118)
3rd Income Decile			0.096** (0.039)			0.390*** (0.136)
4th Income Decile			0.149*** (0.030)			0.630*** (0.150)
5th Income Decile			0.194*** (0.040)			0.837*** (0.173)
6th Income Decile			0.222***			0.965***

Continued on next page

Table A3. – Continued from previous page

	Happiness	Happiness	Happiness	Satisfaction	Satisfaction	Satisfaction
			(0.050)			(0.193)
7th Income Decile			0.262*** (0.049)			1.144*** (0.206)
8th Income Decile			0.263*** (0.055)			1.196*** (0.214)
9th Income Decile			0.281*** (0.052)			1.277*** (0.216)
10th Income Decile			0.314*** (0.047)			1.314*** (0.204)
<i>Employment status:</i>						
Part time employed			-0.005 (0.015)			-0.125*** (0.035)
Self-employed			-0.006 (0.013)			-0.027 (0.048)
Retired			-0.026* (0.013)			-0.096** (0.047)
Housewife			0.024 (0.017)			0.044 (0.062)
Student			0.057* (0.029)			-0.185 (0.120)
Unemployed			-0.178*** (0.027)			-0.586*** (0.054)
Other employment status			-0.054** (0.025)			-0.304*** (0.063)
Age FEs	YES	YES	YES	YES	YES	YES
Year FEs	YES	YES	YES	YES	YES	YES
Cohort FEs	YES	YES	YES	YES	YES	YES
Country FEs	YES	YES	YES	YES	YES	YES
(Country dummies)*cohort	YES	YES	YES	YES	YES	YES
Observations	104328	104328	104328	103808	103808	103808

All models estimated with OLS. Variable shock¹⁸⁻²⁵ based on a macroeconomic history of a randomly selected country (other than individual's home country). The omitted category is single/never married full-time employed lowest income decile females with low education and no religious denomination. Country-clustered standard errors in parentheses. ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.