

Corrigendum: Lifestyle Behaviors and Wealth-Health Gaps in Germany*

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Abstract

We correct two main implementation errors in Mahler and Yum (2024). First, in one part of the solution algorithm, the continuation value following an adjustment in health effort was evaluated using the inherited lagged-effort state rather than the newly chosen effort level. This error understated the dynamic benefit of effort when solving the adjustment decision. Second, the model combines three dimensions of permanent heterogeneity into a single type index. Although the solution algorithm used the correct mapping, the simulation inadvertently reversed the positions of two type indices when reconstructing the combined index. We correct both errors and re-estimate the model. The paper's main conclusions remain intact. The corrected model continues to generate substantial wealth gaps by health, accounting for an increasing share over the life cycle, reaching most of the observed gap at older ages, although the gaps are smaller than originally reported. At the same time, the corrected model implies a stronger role for endogenous health effort: equalizing health effort reduces the model-generated wealth-health gaps at the median by roughly 40–70%, reinforcing the conclusion that differences in health effort act as an amplification mechanism.

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1. The two implementation issues

The first issue concerns the solution of the health-effort adjustment decision. In the model, individuals enter period j with an inherited effort level f_{j-1} and decide whether to adjust their effort to a new level f_j . Importantly, current effort also becomes the inherited effort state in the next period. Therefore, when evaluating the value of adjusting effort, the continuation value should depend on the newly chosen effort level f_j , rather than the inherited level f_{j-1} . However, in the original implementation, the continuation value following an adjustment was evaluated at f_{j-1} instead of f_j . Suppressing other state variables, the original implementation used

$$\mathbb{E}_j [V_{j+1}(\cdot, f_{j-1}) \mid f_j] \quad \text{instead of} \quad \mathbb{E}_j [V_{j+1}(\cdot, f_j) \mid f_j]. \quad (1)$$

This inconsistency occurred only when evaluating the continuation value following an effort adjustment. The continuation value under non-adjustment was evaluated correctly, and the health transition probabilities associated with current effort were also correctly implemented. Moreover, the simulation itself correctly updated lagged effort. Thus, the error did not eliminate the dynamic role of health effort from the model, but understated its benefit when solving the effort-adjustment decision. We correct this issue by evaluating the continuation value at the newly chosen effort level.

The second issue concerns the indexing of permanent household types in the simulation. For computational purposes, the model combines three dimensions of permanent heterogeneity into a single type index to store and retrieve value and policy functions. This mapping was implemented correctly in the solution algorithm. However, when reconstructing the combined index in the simulation, one line of the code inadvertently reversed the positions of the first and last indices. As a result, some simulated individuals were assigned decision rules corresponding to a different combination of permanent characteristics. We correct this inconsistency by using the same index mapping in both the solution algorithm and the simulation. This correction also applies to the exogenous-health model.

Neither correction changes the economic model specified in Mahler and Yum (2024). We re-estimate the corrected model and report the revised quantitative results in the following sections.

2. Re-estimation and model fit

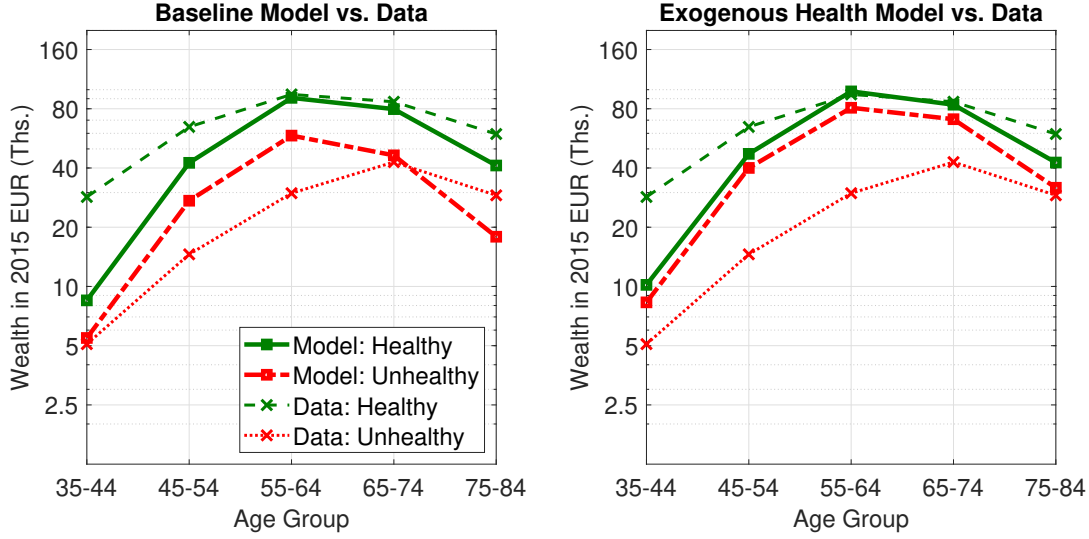
Following the corrections, we re-estimate the model using the same estimation procedure and empirical targets as in Mahler and Yum (2024). Re-estimation is necessary because these corrections change the mapping from structural parameters to model-implied moments. We retain the original model specification and estimation targets, while allowing the internally estimated parameters to adjust under the corrected implementation. The main parameter changes concern the disutility of health effort, reflecting the corrected dynamic incentives to adjust effort discussed in Section 1, and the wage intercepts, which largely absorb a correction to the normalization of idiosyncratic productivity shocks discussed in Section 4. We also re-estimate the exogenous-health model used for comparison in Figure 9. Throughout the corrigendum, we retain the figure and table numbers from the published paper to facilitate comparison.

The corrected model continues to provide a good fit to the targeted moments. The overall fit, as measured by the estimation objective function, is slightly better than in the original estimation. Corrected Table 2 reports the estimated parameters and their standard errors, while Figures 5–8 compare the model-implied moments with their empirical counterparts. The model continues to reproduce the main life-cycle patterns of employment, labor income, and health effort by health and education, as well as the evolution of wealth and health. Table 3 reports the frequencies of large individual health-effort adjustments, which are not directly targeted in the estimation and remain generally lower in the model than in the data. The complete corrected estimation and model-fit results are reported in the Appendix. Importantly, as in the original estimation, we do not directly target the joint distribution of wealth and health over the life cycle. This is because a quantitative objective of the paper is to examine how much of the observed wealth-health association can be generated by the mechanisms in the model with endogenous lifestyle behaviors.

3. Corrected quantitative results

Figure 9 presents the corrected wealth profiles by health status. The corrected model continues to account for an increasing share of the observed gap in median wealth over the life cycle, reaching roughly half by ages 55–64 and most of it at older ages, even though these gaps are not directly targeted in the estimation. The model-generated gaps are smaller than originally reported. As in the original paper, the comparison with the re-estimated exogenous-health model highlights the importance of endogenous health effort: without it, the model generally accounts for less than

Figure 9: Median Wealth Profiles by Health: Model vs. Data



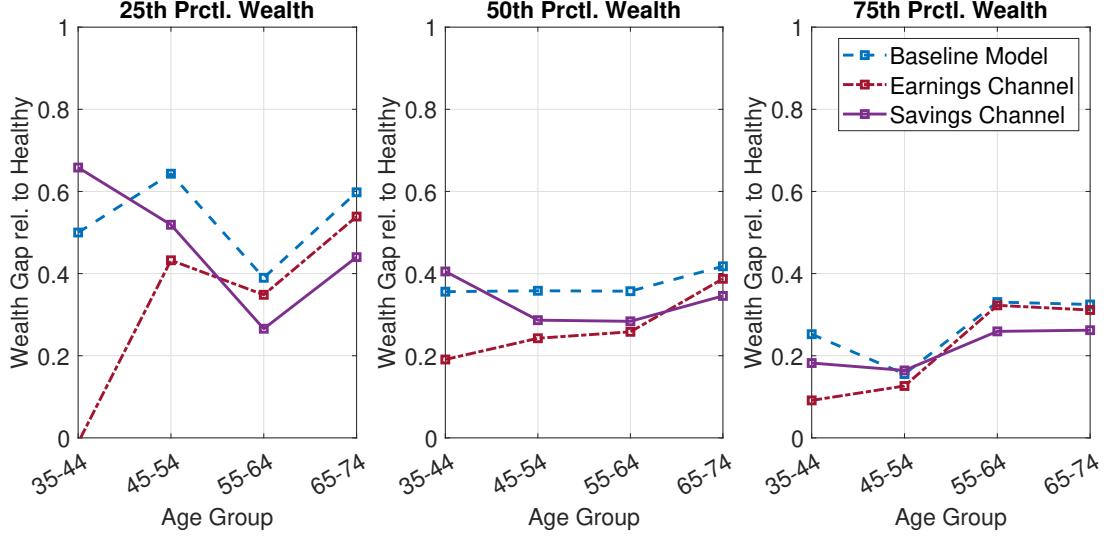
Notes: The left panel displays median wealth by 10-year age groups, distinguishing between healthy individuals (green) and unhealthy ones (red) in the baseline model relative to the data. A log scale is used for the vertical axis. The right panel plots the counterparts from the re-estimated exogenous health model that abstracts from health efforts.

one-third of the observed median wealth-health gaps. Corrected Figures A.7 and A.8 in the Appendix report the corresponding wealth profiles at different points of the distribution and by education.

We next revisit the earnings and savings channels through which health affects wealth accumulation. Figure 10 shows the corrected results of the two counterfactual experiments, which shut down the earnings and savings channels separately while holding realized health and survival outcomes at their baseline values. The earnings channel continues to be quantitatively important, particularly for younger and asset-poor individuals. The savings channel continues to matter, especially at older ages, but its contribution to wealth-health gaps is smaller than originally reported. For example, at median wealth levels, shutting down the savings channel reduces the wealth-health gaps by around 17–21% for individuals aged 45–74. The effects of these channels vary across ages and wealth positions, and their contributions need not be additive. Corrected Figure A.4 in the Appendix shows that shutting down both channels jointly, with health and survival realizations fixed at their baseline values, considerably reduces the wealth-health gaps, particularly at lower wealth percentiles, while the effects are more modest at the upper end of the wealth distribution. Further decompositions are reported in corrected Table A.12.

Figure 11 presents the corrected results of equalizing health efforts across individuals at their age-specific average levels. This experiment reduces the model-generated wealth-health gaps by roughly 40–70% at the median across age groups, with substan-

Figure 10: Effects of the Earnings and Savings Channels on Wealth-Health Gaps

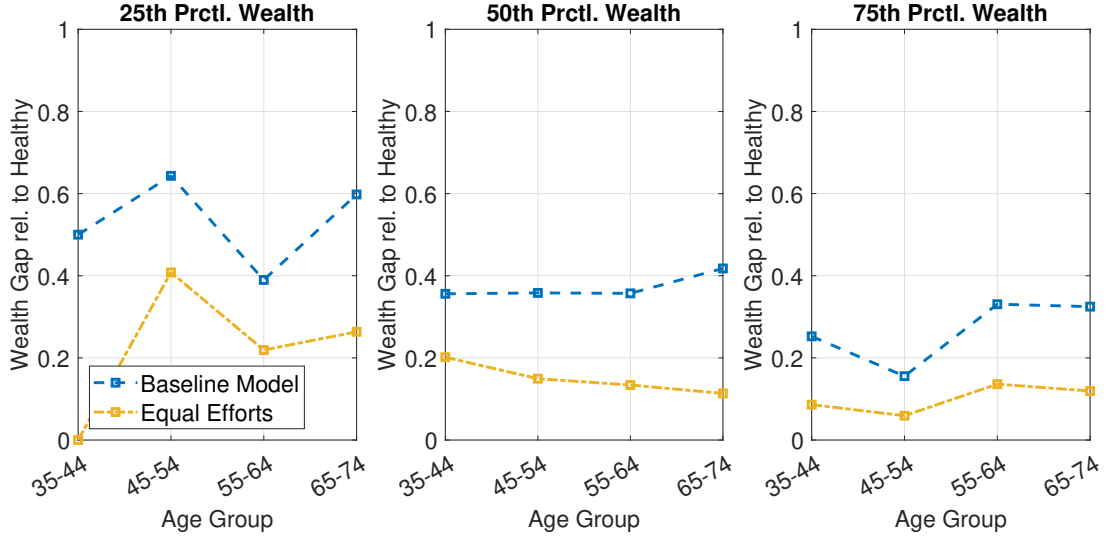


Notes: Differences in the wealth levels of those being healthy and unhealthy at the 25th (left), 50th (middle), and 75th (right) percentile of the wealth distribution in the baseline model (blue), and in the counterfactual scenarios without differences in labor supply disutility and labor productivity by health (red), and with average savings choices across health status (purple) across 10-year age groups. The counterfactual experiments are calculated using the baseline distribution of health.

tial reductions also observed at other points of the wealth distribution. The reduction is more pronounced than in the originally reported results, reinforcing the paper's conclusion that heterogeneity in health effort acts as an important amplification mechanism behind wealth-health gaps. In particular, persistent differences in health effort contribute to differences in health outcomes over the life cycle, which in turn affect wealth accumulation. As shown in corrected Table A.13 in the Appendix, most of this effect operates through the resulting changes in health outcomes. Corrected Figure A.5 further examines the role of equalizing efforts at different ages.

Finally, Table 4 revisits the experiment that equalizes anticipated wealth during retirement. As in the original analysis, the uniform retirement transfer is set equal to average wealth at retirement in the baseline economy. We therefore recompute the transfer amount using the re-estimated baseline economy. The corrected results remain qualitatively very similar to those originally reported, while the quantitative effects are somewhat stronger, particularly in terms of reducing the wealth-health gaps. Individuals with relatively little wealth increase their health efforts in response to higher anticipated retirement resources, leading to improvements in health and narrower wealth-health gaps. These findings continue to illustrate the importance of forward-looking incentives in shaping health efforts and, consequently, the relationship between wealth and health.

Figure 11: Effect of Equalizing Health Efforts on Wealth-Health Gaps



Notes: Differences in the wealth levels of those being healthy and unhealthy at the 25th (left), 50th (middle), and 75th (right) percentile of the wealth distribution in the baseline model (blue) and in the counterfactual scenario with constant health effort choices (yellow). Differences are expressed relative to the wealth levels of the healthy.

Table 4: Results of Equalizing Wealth during Retirement Periods

Unit: %	Panel A				Panel B				Panel C		
	Average Effort				Share Bad Health				Wealth-Health Gaps		
Age Group	by Wealth Quartile				by Wealth Quartile				at Percentile		
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	25th	50th	75th
35-44	0.5	0.7	0.1	-0.3	-0.5	-0.8	0.0	0.5	—	-3.8	-7.2
45-54	2.2	1.8	0.9	0.1	-1.7	-1.3	-0.5	0.0	-1.5	-2.6	-4.2
55-64	8.4	4.9	2.5	0.4	-5.2	-3.2	-1.7	0.0	-9.2	-9.3	-5.7
65-74	11.9	9.7	4.6	0.9	-9.8	-8.1	-4.5	-1.1	-14.1	-26.1	-22.2

Notes: Reported numbers are percentage changes relative to the benchmark case without the counterfactual experiment. The counterfactual experiment assumes that effort choices are based on the belief of a uniform 100% tax on wealth and retirement benefits during retirement years, along with transfers equal to the average retirement wealth in the baseline economy. Savings, labor supply, and survival realizations are held at their baseline values. At the 25th percentile, wealth of 35-44-year-olds is close to zero for both health groups, so the change in the gap is not reported for this cell.

4. Additional corrections and clarifications

We also address two minor coding issues. First, the simulation contained an additional indexing inconsistency when assigning education-specific survival probabilities. In some cases, the education index did not correspond to the education of the simulated individual. Second, the normalization of the idiosyncratic productivity process incorrectly treated a variance parameter as a standard deviation. We correct both issues in the updated code. Their quantitative implications are negligible, particularly because the change in productivity normalization is largely absorbed by the education-specific wage-level parameters during re-estimation. We also correct the calculation of the share of individuals aged 65–84 with negative health-effort adjustments exceeding 20% in Table 3, which inadvertently included observations from older ages.

We also clarify two expressions in the original paper. First, the minimum-consumption transfer $\tilde{c}$ ensures that $c_j = \max\{R_j - a_{j+1}, \tilde{c}\}$, where R_j denotes resources before the transfer and a_{j+1} denotes savings. Second, pension benefits are based on the potential full-time earnings of a healthy individual immediately before retirement, evaluated at the median transitory productivity shock and adjusted for permanent productivity: $p(\theta, e) = \omega y_{R-1}(h = 1, e) \exp(\theta)$, where $y_{R-1}(h = 1, e)$ excludes the permanent productivity component. This expression is consistent with the description in the original paper. Both rules were correctly implemented in the original code.

5. Conclusion

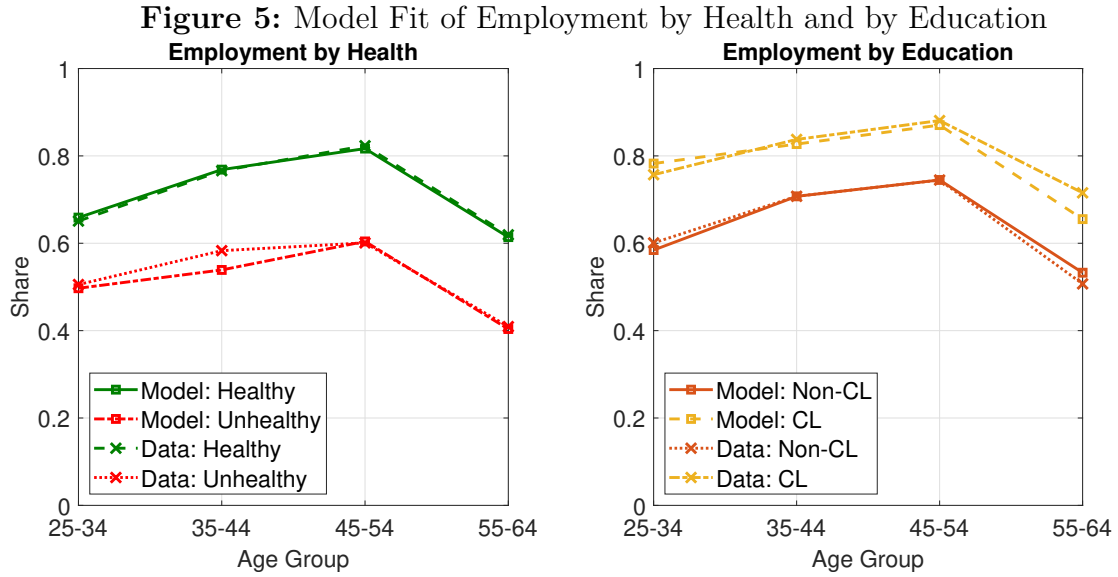
In this corrigendum, we identify and correct two main implementation errors in Mahler and Yum (2024) and report the results from the re-estimated model. Although the corrections change some quantitative results, the main conclusions of the original paper remain intact. The corrected model continues to generate substantial wealth-health gaps, accounting for most of the observed median gap at older ages. Health affects wealth through both earnings and savings, although the contribution of the savings channel is smaller than originally reported. Importantly, the corrected results imply an even stronger role for endogenous health effort as an amplification mechanism behind wealth-health gaps.

References

MAHLER, L. AND M. YUM (2024): “Lifestyle Behaviors and Wealth-Health Gaps in Germany,” *Econometrica*, 92, 1697–1733.

A. Additional Tables and Figures

This appendix provides the corrected tables and figures from Mahler and Yum (2024) that complement the results discussed in the main text. We first report the re-estimated parameters and additional model-fit results. We then present the corrected wealth-health profiles and additional counterfactual results, including the decomposition of the earnings and savings channels, the effects of equalizing health efforts at different ages, and the contribution of initial conditions to lifetime inequality.

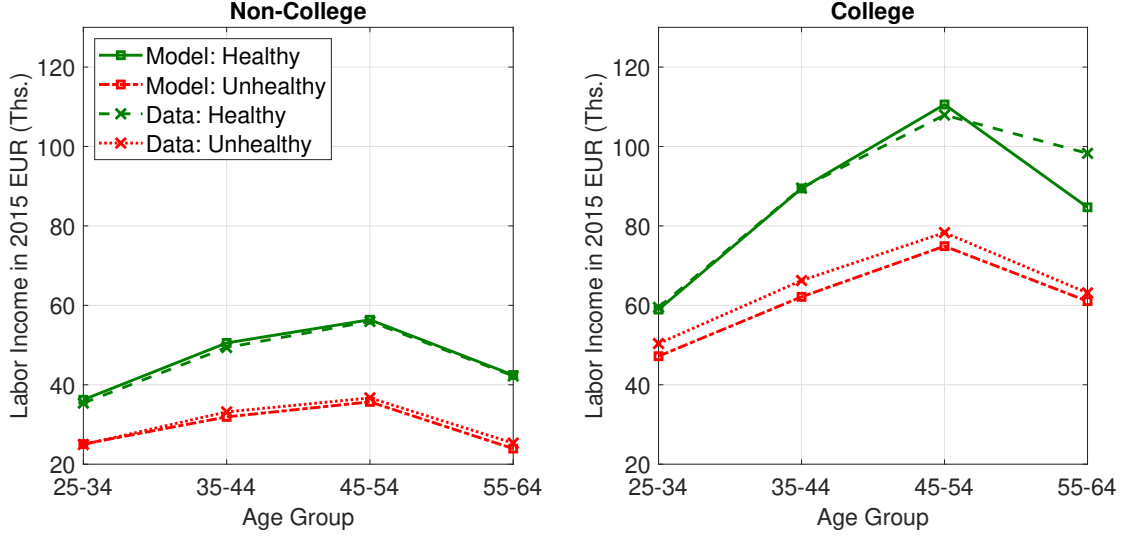


Notes: Two-year employment rate by health status (left) and by education (right) over 10-year age groups in the model and data.

Table 2: Internally Estimated Parameters

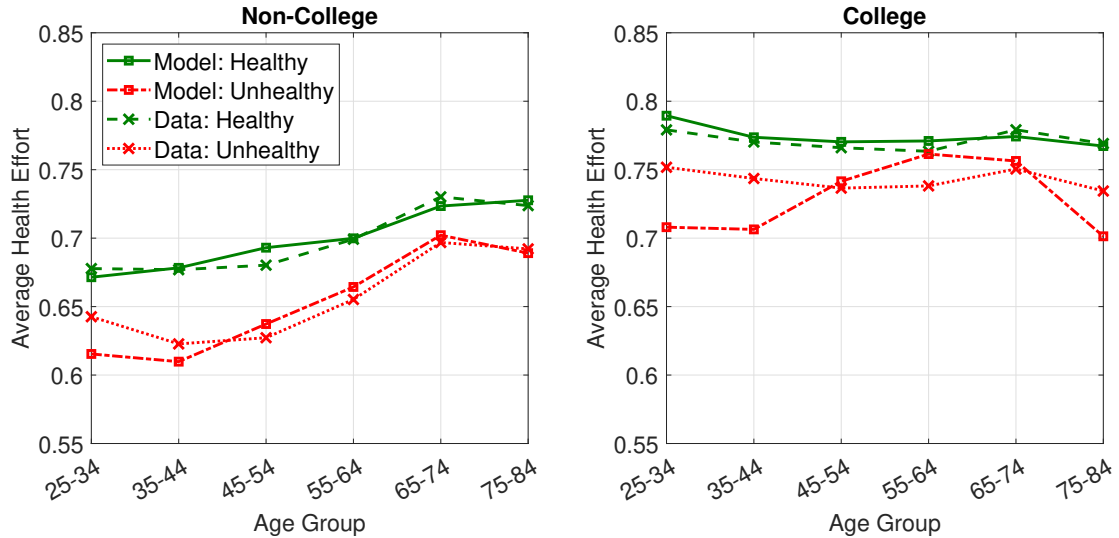
Param -meter	Estimate	S.E.	Description	Target Statistics		
				Model	Data	Description
Labor Supply and Wages						
$\nu_1^{h=1}$	2.693	0.165	Disutility of work parameters (healthy)	Figure 5 (Left Panel)		Age-Employment Profiles by Health
$\nu_8^{h=1}$	1.734	0.053				
$\nu_{13}^{h=1}$	1.302	0.064				
$\nu_{20}^{h=1}$	1.762	0.404				
$\nu_1^{h=0}$	2.158	0.729	Disutility of work parameters (unhealthy)			
$\nu_8^{h=0}$	1.858	0.259				
$\nu_{13}^{h=0}$	1.374	0.209				
$\nu_{20}^{h=0}$	2.250	0.380				
ν_e	0.782	0.015	Work Disutility for Non-CL	1.219	1.237	Education Gradient in Employment
$\zeta_0^{e=0}$	1.259	0.015	Deterministic wage profiles (non-college)	Figure 6		Age-Earnings Profiles by Education and Health
$\zeta_1^{e=0}$	0.0613	0.001				
$\zeta_2^{e=0}$	-0.0025	0.0001				
$\zeta_0^{e=1}$	1.603	0.026	Deterministic wage profiles (college)			
$\zeta_1^{e=1}$	0.0871	0.003				
$\zeta_2^{e=1}$	-0.0029	0.0003				
$w_p^{e=0}$	0.202	0.026	Wage loss for the unhealthy: Non-College			
$w_p^{e=1}$	0.154	0.045	Wage loss for the unhealthy: College			
Health Effort						
$\iota_1^{h=1,e=0}$	0.324	0.072	Disutility of effort parameters (healthy + non-college)	Figure 7		Age-Effort Profiles by Health and Education
$\iota_{12}^{h=1,e=0}$	1.159	0.073				
$\iota_{20}^{h=1,e=0}$	2.013	0.114				
$\iota_{31}^{h=1,e=0}$	2.460	0.155				
$\iota_1^{h=0,e=0}$	0.991	0.281	Disutility of effort parameters (unhealthy + non-college)			
$\iota_{12}^{h=0,e=0}$	2.591	0.163				
$\iota_{20}^{h=0,e=0}$	3.092	0.223				
$\iota_{31}^{h=0,e=0}$	1.361	0.112				
$\iota_1^{h=1,e=1}$	0.173	0.042	Disutility of effort parameters (healthy + college)			
$\iota_{12}^{h=1,e=1}$	0.689	0.069				
$\iota_{20}^{h=1,e=1}$	1.546	0.082				
$\iota_{31}^{h=1,e=1}$	2.479	0.180				
$\iota_1^{h=0,e=1}$	0.667	0.212	Disutility of effort parameters (unhealthy + college)			
$\iota_{12}^{h=0,e=1}$	1.874	0.181				
$\iota_{20}^{h=0,e=1}$	3.004	0.198				
$\iota_{31}^{h=0,e=1}$	2.104	0.179				
ψ	1.043	0.112	f cost elasticity	0.163	0.161	Std.Dev.(f)
ς^0	0.00013	0.0004	Adjustment costs	0.254	0.267	Share of
ς^1	0.123	0.024		0.335	0.328	Non-Adjusters
				0.401	0.404	by Age Group
Remaining Parameters						
$\tilde{\kappa}$	0.875	0.035	Cons. Util. shifter	1.130	1.163	Cons. Ratio by Health
μ_β	0.951	0.002	Mean of β	Figure 8		Median Wealth Profiles
δ_β	0.0348	0.005	Dispersion of β			
σ_x	0.0291	0.001	Produc. shock dispersion	0.588	0.595	Wealth Gini
ω	0.363	0.013	Pension scale	0.475	0.477	Replacement rate
b	12.89	0.872	Utility constant	8.67	8.49	VSLY/ $\bar{c}$

Figure 6: Model Fit of Labor Income by Health and Education



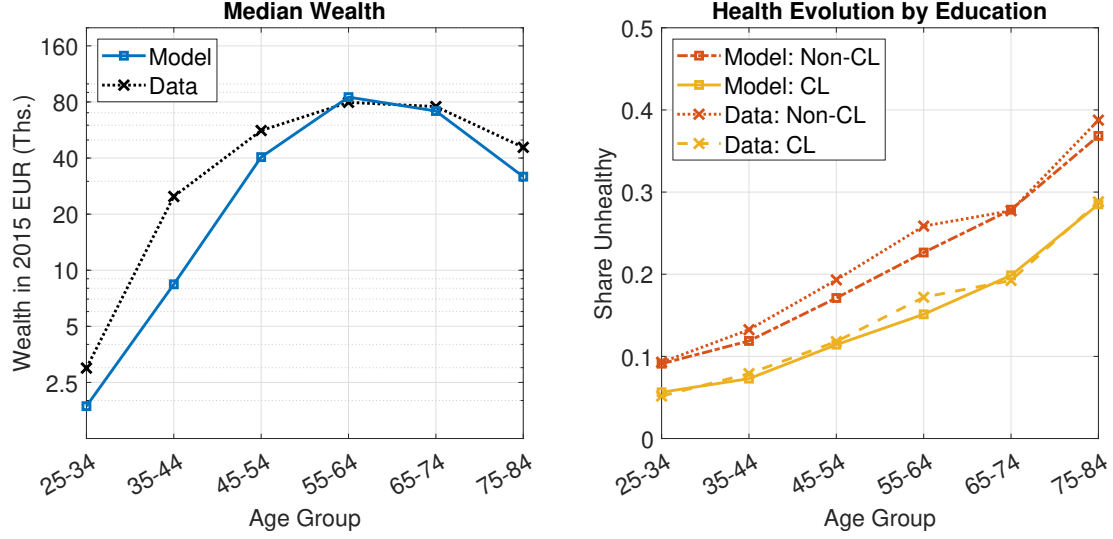
Notes: Average two-year labor income by 10-year age groups, distinguishing between healthy individuals (green) and unhealthy ones (red) in the data and the model. Left panel: Non-college educated individuals. Right panel: College educated individuals.

Figure 7: Model Fit of Health Effort



Notes: Average health effort by 10-year age groups, distinguishing between individuals being healthy (green) and unhealthy (red) in the model and data. Left panel: Non-college educated individuals. Right panel: College educated individuals.

Figure 8: Model Fit of Wealth Evolution and Average Health



Notes: Left panel: Median wealth by 10-year age group in the model and data. Right panel: Average share of unhealthy individuals by education in the model and data.

Table 3: Health Effort Adjustment at the Individual Level in Model and Data

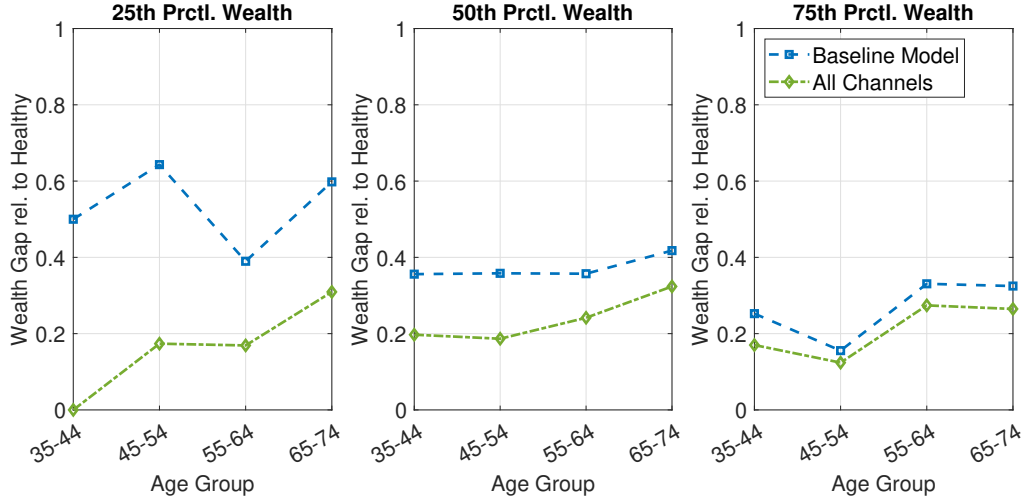
Age Group	Shares with positive changes				Shares with negative changes			
	10%		20%		10%		20%	
	Model	Data	Model	Data	Model	Data	Model	Data
25-44	0.11	0.29	0.06	0.14	0.08	0.22	0.03	0.08
45-64	0.05	0.27	0.02	0.12	0.03	0.21	0.02	0.07
65-84	0.09	0.25	0.05	0.10	0.10	0.22	0.05	0.06

Notes: Average shares of individuals adjusting health effort in the model and data by age groups. Positive (negative) changes refer to $\left| \frac{f_j - f_{j-1}}{f_{j-1}} \right| > 10\%$ or 20% .

Table A.11: Contribution of Initial Conditions at Age 25 to Lifetime Inequality

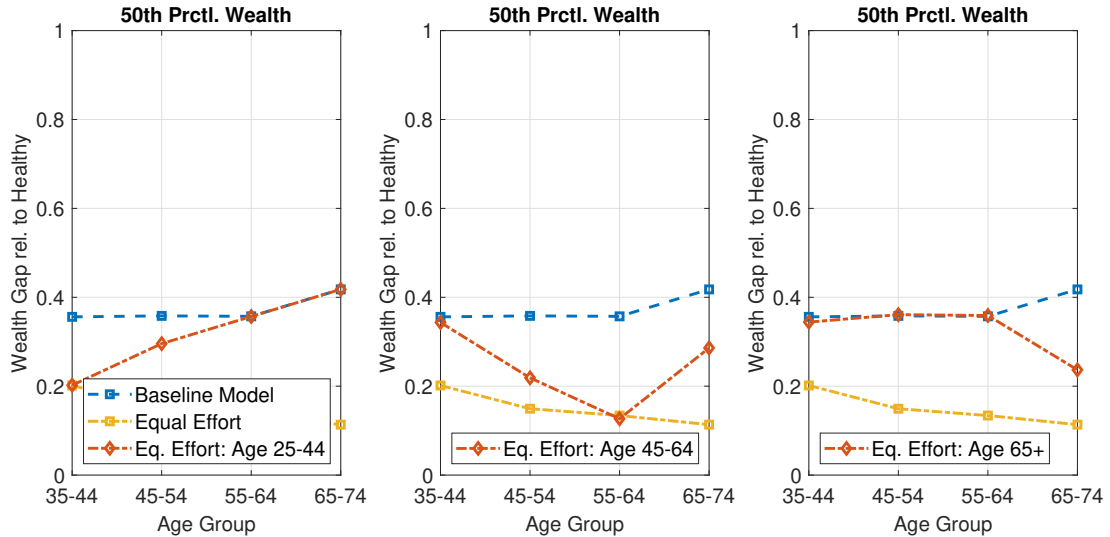
Statistic	Model
Fraction of variance in lifetime earnings	81.4%
Fraction of variance in wealth at age 65-66 (among survivors)	63.7%
Fraction of variance in healthy years	16.7%
Fraction of variance in the share of healthy years in life	20.8%

Figure A.4: Effect of Both Earnings and Savings Channels



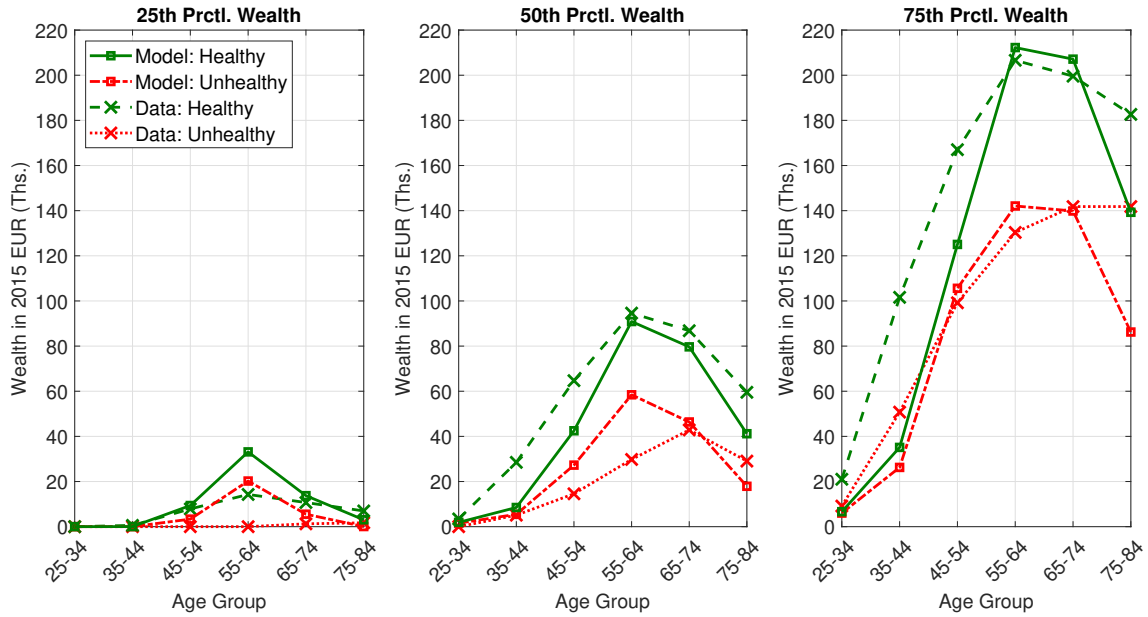
Notes: Differences in the wealth levels of those being healthy and unhealthy at the 25th (left), 50th (middle), and 75th (right) percentile of the wealth distribution in the baseline model (blue) and in the counterfactual scenario when shutting down both earnings and savings channel together (green). Differences are expressed relative to the wealth levels of the healthy. Health and survival realizations are held fixed at their baseline values.

Figure A.5: Effect of Timing of Health Efforts on Wealth-Health Gaps



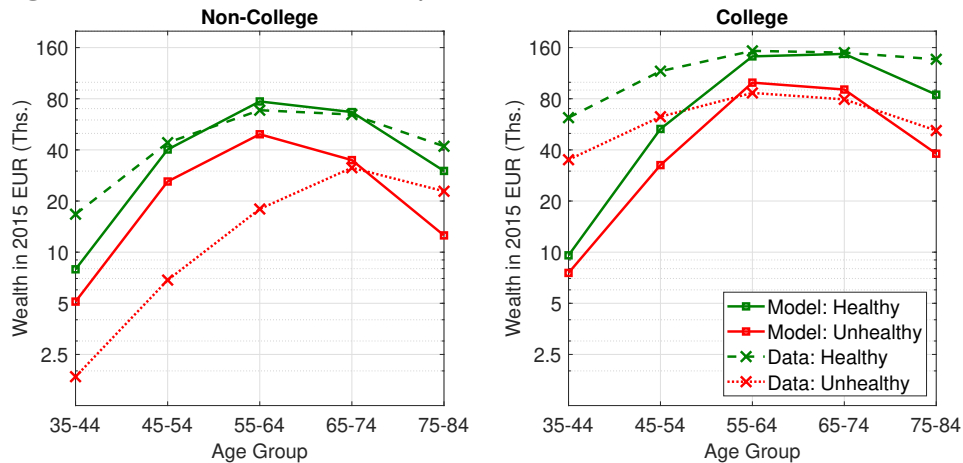
Notes: Differences in the wealth levels by health status at the median of the wealth distribution in the baseline model (blue), in the counterfactual scenario with constant health effort choices across all age groups (yellow), and in the counterfactual scenarios where health efforts are equalized separately for the 25-44-year-old (left), 45-64-year-old (middle), and 65+ (right) age groups.

Figure A.7: Wealth-Health Gaps at Different Distribution Points: Model vs. Data



Notes: Wealth by 10-year age groups, distinguishing between healthy individuals (green) and unhealthy ones (red) in the model relative to the data at different points of the wealth distribution. The y-axis is scaled linearly. Left panel: 25th percentile. Central panel: 50th percentile. Right panel: 75th percentile.

Figure A.8: Wealth Profiles by Health and Education: Model vs. Data



Notes: Wealth by 10-year age groups, distinguishing between healthy individuals (green) and unhealthy ones (red) in the model relative to the data. Left panel: Non-college educated individuals. Right panel: College educated individuals.

Table A.12: Contributions to Wealth-Health Gaps of the Baseline Model

Earnings Channel									
Wealth	Total			Wage Loss Only			Disutil. Only		
	25th	50th	75th	25th	50th	75th	25th	50th	75th
Age Group									
35-44	–	46%	64%	–	46%	46%	–	-1%	-17%
45-54	33%	32%	19%	33%	30%	7%	-2%	3%	-5%
55-64	11%	28%	2%	3%	20%	1%	5%	0%	0%
65-74	10%	7%	4%	4%	4%	3%	2%	0%	1%
Savings Channel									
Wealth	Total			Length Only			Quality Only		
	25th	50th	75th	25th	50th	75th	25th	50th	75th
Age Group									
35-44	–	-14%	28%	–	13%	-3%	–	9%	-17%
45-54	19%	20%	-6%	9%	14%	-25%	11%	4%	-13%
55-64	32%	21%	22%	23%	11%	7%	7%	2%	-1%
65-74	26%	17%	19%	25%	12%	13%	-3%	1%	0%

Notes: This table reports the proportions of the baseline relative wealth-health gaps explained by different components of the earnings and savings channels. See the text for their definitions. Health and survival realizations are held at their baseline values. At the 25th percentile, wealth of 35–44-year-olds is close to zero for both health groups in the model, as in the data. Relative wealth-health gaps, which divide by the wealth of the healthy, are therefore not informative for this cell: even changes in wealth of a few euros translate into very large percentage changes. We thus do not report these entries.

Table A.13: Contributions of Equal Efforts to Baseline Wealth-Health Gaps

Equal Efforts									
Wealth	Total			Direct Effects Only			Indirect Effects Only		
	25th	50th	75th	25th	50th	75th	25th	50th	75th
Age Group									
35-44	–	43%	66%	–	41%	56%	–	5%	0%
45-54	37%	58%	62%	34%	58%	62%	0%	0%	1%
55-64	44%	62%	59%	45%	63%	58%	-1%	-1%	1%
65-74	56%	73%	63%	56%	73%	63%	1%	1%	3%

Notes: This table reports the proportions of the baseline relative wealth-health gaps that are explained by different effects. See the text for the definitions of direct and indirect effects. At the 25th percentile, wealth of 35–44-year-olds is close to zero for both health groups in the model, as in the data. Relative wealth-health gaps, which divide by the wealth of the healthy, are therefore not informative for this cell: even changes in wealth of a few euros translate into very large percentage changes. We thus do not report these entries. In the direct-effects-only experiment, we retain the baseline decision rules while using the health realizations generated by equalizing health efforts.