Broke, ill, and obese: The effect of household debt on health

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MOTIVATION

Research question

Analyzing the causal impact of household indebtedness on different health outcomes

☑️ Effect via budget constraints or mental stress?

☑️ Adequate policy implications
  • Financial literacy and debt counseling?
  • Low price campaigns for healthy food, access to health care?

☑️ Socio-economic gradient of health
  • Poor individuals in worse health
MOTIVATION

Household debt: facts and figures

✔️ Rising private debt volume

Graph 1: GDP and loans of banks to private households

<table>
<thead>
<tr>
<th>Year</th>
<th>Consumer debt</th>
<th>Mortgage debt (remainder)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>1,300</td>
<td>18,600</td>
</tr>
<tr>
<td>2008</td>
<td>1,700</td>
<td>24,500</td>
</tr>
</tbody>
</table>

Source: Deutsche Bundesbank.

✔️ Increasing private debt burdens

Table 1: Average private debt burdens per household in euros

2.8 mill households overindebted: 6.9 % (SCHUFA, 2010)

Widespread debt-related financial distress

Broke, ill, and obese, Matthias Keese, 25 June 2010, Paris

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LITERATURE REVIEW

Literature on household debt and health outcomes

- Indebted have higher BMI (OLS)
  
  Münster et al. (2009, BMC Public Health)

- Indebted are in worse mental health (IV)
  

- Health shocks often follow arrears
  
  Duygan-Bump and Grant (2009, Economic Policy)

- Strong correlations between debt and psychological health

- Subjective debt problems reduce mental health (bivariate probit)
  
  Bridges and Disney (2010, Journal of Health Economics)
THEORETICAL FRAMEWORK

Possible links between debt and health

1. Debt affects health
   Financial stress: mental distress, psychosomatic health problems
   Budget constraints: unhealthy food and avoidance of health care utilization

2. Health affects debt
   High medical bills
   Health shocks lead to labor market exit

3. Observed third factors - X
   Unemployment: makes sick, overindebted

4. Unobserved third factors - Z
   Risk aversion, time preferences

Broke, ill, and obese, Matthias Keese, 25 June 2010, Paris
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DATA

Our dataset

- **German Socio-Economic Panel** (2002 – 2008)
- **PanelWhiz** used to prepare data
- **Individuals** under 65

  24,579 individuals, 9,596 households (originally), 111,786 observations

- **Health measures**
  - Bad self-rated health (2002-2008)

- **Debt measures**
  - Repayments: Consumer credit / Income; Home loans / Income
  - Overindebted: Income - Debt repayments < Social assistance level
ECONOMETRIC METHODOLOGY

Estimation methods

1. OLS regression: health on debt and covariates
   Age, sex, education, labor force status, HH-income, region, marital status, health insurance, etc.

2. Fixed-effects
   Account for unobserved (time-invariant) heterogeneity

3. Fixed-effects with a subgroup
   Constantly employed between 2002 and 2008
## REGRESSION RESULTS

### 1. Self-rated health and household indebtedness

- **Overall health status negatively associated by debt:** OLS
- **Health status negatively affected by debt:** fixed-effects estimator

Weaker effects when controlling for unobserved heterogeneity

<table>
<thead>
<tr>
<th>Dependent variable: self-rated health</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer debt/HH-Income</td>
<td>0.187***</td>
<td>0.039**</td>
<td>0.058**</td>
<td>0.039**</td>
<td>0.019**</td>
<td>0.025**</td>
</tr>
<tr>
<td>Housing debt/HH-Income</td>
<td>0.089***</td>
<td>0.033*</td>
<td>0.044*</td>
<td>0.033*</td>
<td>0.019*</td>
<td>0.026*</td>
</tr>
<tr>
<td>Overindebted</td>
<td></td>
<td></td>
<td></td>
<td>0.035***</td>
<td>0.013**</td>
<td>0.021**</td>
</tr>
</tbody>
</table>

**Observations** 111,786 111,786 49,014 111,786 111,786 49,014

Note. Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01; Source: SOEP, 2002-2008.
2 Mental health score and household indebtedness

- Mental health negatively associated with debt (OLS)
- Mental status negatively affected by debt (fixed-effects)

Strength of effects vary with debt measure and subsample

<table>
<thead>
<tr>
<th>Dependent variable: mental health score</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer debt/HH-Income</td>
<td>7.474*** (0.833)</td>
<td>1.491** (0.760)</td>
<td>2.815*** (0.994)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing debt/HH-Income</td>
<td>2.473*** (0.653)</td>
<td>2.717*** (0.777)</td>
<td>3.845*** (0.993)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overindebted</td>
<td></td>
<td></td>
<td></td>
<td>1.075*** (0.261)</td>
<td>0.754*** (0.229)</td>
<td>0.677* (0.346)</td>
</tr>
<tr>
<td>Observations</td>
<td>62,946</td>
<td>62,946</td>
<td>27,921</td>
<td>62,946</td>
<td>62,946</td>
<td>27,921</td>
</tr>
</tbody>
</table>

Note. Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01; Source: SOEP, 2002-2008.
REGRESSION RESULTS

### 3 Obesity and household indebtedness

- **Negative association between with health and debt (OLS)**
- **Insignificant debt coefficients when using fixed-effects**

<table>
<thead>
<tr>
<th>Dependent variable: Obesity</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
<th>OLS Full sample</th>
<th>FE Full sample</th>
<th>FE Alw. empl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer debt/ HH-Income</td>
<td>0.150***</td>
<td>-0.006</td>
<td>0.002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.020)</td>
<td>(0.017)</td>
<td>(0.026)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing debt/ HH-Income</td>
<td>0.018</td>
<td>0.001</td>
<td>-0.007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.015)</td>
<td>(0.017)</td>
<td>(0.024)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overindebted</td>
<td></td>
<td></td>
<td></td>
<td>0.014**</td>
<td>-0.006</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0.006)</td>
<td>(0.005)</td>
<td>(0.008)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>64,319</td>
<td>64,319</td>
<td>28,437</td>
<td>64,319</td>
<td>64,319</td>
<td>28,437</td>
</tr>
</tbody>
</table>

Note. Standard errors in parentheses; * p < 0.1, ** p < 0.05, *** p < 0.01; Source: SOEP, 2002-2008.
ROBUSTNESS CHECKS

1 Health measures
   Overweight and BMI as dependent variables
   Doctor visits (controlling for overall health status)

2 Financial decision-making
   Focus on household heads

3 Debt measures
   Exclusion of HH with income changes driving changes in relative indebtedness

- Results are qualitatively unchanged
- Indebted individuals are more likely to attend a doctor
CONCLUSION

Main results

1. Indebted are more often sick (overall and mental health)
   Indebted are more often overweight

2. Debt causes worse health (overall and mental health)
   Debt problems do not cause overweight

- Robust to both measures of debts
- Mental stress seems to be the channel
  (not too little money for healthy food or doctor visits)
- Income gradient of health via household indebtedness!??
CONCLUSION

Policy implications

- **Health problems and resulting poverty traps**
  - Improve debt literacy
  - Support debt counselling

- **Non-neutrality of debt with respect to health**
  - Discuss credit constraints

- **Household debt and expenditure for healthy lifestyle**
  - No need for direct action