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Triggers and Determinants of Severe Household Indebtedness in Germany

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Matthias Keese

Triggers and Determinants of Severe Household Indebtedness in Germany

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Matthias Keese¹

Triggers and Determinants of Severe Household Indebtedness in Germany

Abstract

Overindebted private households have created economic and political concern. Using measures of relative (over-) indebtedness which relate household income and debt services to different concepts of subsistence levels, this paper investigates whether severe household indebtedness is driven by trigger events such as unemployment, childbirth, divorce, or the death of the partner. Exploiting the panel structure of the German Socio-Economic Panel (SOEP), the results suggest that children are likely to cause severe household indebtedness. Unemployment also worsens the relative debt situation mainly due to the associated income drop. Strokes of fate have no direct effect but if they come along with changes in household composition, the associated income shock increases the financial fragility of the household. Furthermore, a main determinant of relative overindebtedness is a home loan which raises doubts about whether families are indeed able to manage their housing finance.

JEL Classification: D12, D14, D91

Keywords: Household finance, debt, overindebtedness, SOEP

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1 Introduction

While demand for credit and household indebtedness have risen in European countries in the last decade, the phenomenon of overindebted private households has created economic and political concern. In addition, there are households with only little residual income after paying for their debt service as well as people who perceive their debt situation as a heavy burden. Remarkably, the scant amount of contributions in this research field is conspicuous.

Certainly, debt and overindebtedness are closely related research fields but some important distinctions have to be made. Indebted households may be behaving rationally by smoothing consumption over the life cycle. Even a very high debt-to-income ratio or a high debt burden may reflect a strong preference for present consumption by reducing future consumption or the necessity to deal with severe adverse income shocks. If the household is still able to fulfill the debt obligations and, at the same time, to maintain a minimum of household expenditure, a high debt burden will not be worrisome at all, especially if repaying the debt comes along with wealth accumulation (e.g., for housing). However, even if an overindebted household saves by repaying, say, building loans, it is worthwhile to study its behavior since this household takes the (at least partly) voluntary decision to consume extremely little in the current period. Since the household budget already lies below a subsistence level, this household is financially fragile. The link to a precarious social status (receipt of public transfers, poverty etc.) is obvious. This could justify a sociopolitical intervention since indebtedness usually affects all household members, including children. A direct consequence of overindebtedness results from the fact that a large share of debt owed by overindebted persons is never paid back (including secured debt). This has implications for the institutional setting, especially on the financial market.

Descriptive evidence suggests that certain events with an impact on household income and expenditure are likely to trigger overindebtedness (Jentzsch/San José Riestra, 2006; Kempson, 2002; Knobloch et al., 2008). However, econometric analysis on household indebtedness is still scarce and causalities are not clear. In addition, little is known about the strength of these events and the question of whether they mainly affect the household income or the debt burden as well.

This paper investigates the question of whether and to which extent severe household indebtedness is driven by shocks on income or expenditure or whether household char-

acteristics are the prevailing factors. I use the German Socio-Economic Panel (SOEP) to examine the causal impact of trigger events such as unemployment, strokes of fate (death of the partner, household breakdown after separation or divorce), changes in household composition (marriage, cohabitation), and childbirth in a household's history on its debt situation. I apply measures of relative (over-) indebtedness (Korczak, 2003). These measures relate household income and debt services to different concepts of subsistence level (non-seizable household income and the potential social assistance level). The measures of indebtedness used show the severity of household indebtedness and the risk to enter a precarious debt situation: they comprise dichotomous concepts of overindebtedness as well as debt indicators that include the remainder of the household income after servicing debt. According to its definition, relative overindebtedness may arise due to changes in each of its three components, namely income, debt, or subsistence level. Therefore, I also check to what extent trigger events are likely to change the debt burden itself or whether the income shock resulting from the trigger event is the prevailing factor in explaining severe household indebtedness. This is the first paper that applies econometric methods to this concept.

The paper is structured as follows: the second section reviews the literature regarding overindebtedness and financial distress with a focus on Germany. The third section describes the dataset and the applied methodology. Descriptive results are presented in the fourth section. The fifth section shows the results of the econometric analysis. The sixth section concludes the paper.

2 Literature overview

The literature lacks a uniform definition of overindebtedness. Important approaches refer to subjective (self-assessed) and to objective overindebtedness. While the former concept relates to self-assessments of the person concerned, the latter accounts for household income and expenditure (Korczak, 2003). In the context of the objective measure, relative overindebtedness refers to a process in which the household still serves its debt but disposes of a residual income less than the subsistence level before possibly entering a consumer insolvency regime. In the German case, the applied subsistence levels are the non-seizable household income and the social assistance level, respectively (Zimmermann, 2007).

Besides self-assessed overindebtedness or overborrowing, subjective overindebted-

ness is often measured by statements on difficulties in repaying debt (Betti et al., 2007), account overdrafts, the inability to save (Fricke et al., 2007), or the use of debt counseling (Federal Statistical Office, 2008, Korczak, 2004a,b). Fricke et al. (2007) use data from the German Socio-Economic Panel (SOEP) of 2005 and, by applying an ordinary least-squares regression (OLS), they identify age, education and living in a partnership as a significantly negative and unemployment as a significantly positive determinant of potentially debt-related financial problems such as a perceived burden by consumer credit, the inability to pay accommodation costs, the inability to save or the use of account overdraft (for the latter, only age is significant). For the EU countries, Betti et al. (2007) find that self-assessed overindebtedness (“difficulty or severe difficulty in making debt payments”, p. 144) is more frequent among young, high-income individuals (a rather strange result), and lone parents.¹ In a descriptive analysis of British households, Kempson (2002) finds self-assessed overborrowing more frequently among young and single householders, lone parents, tenants, low-incomes, unemployed and part-time workers, as well as among households who recently experienced income drops. Using the British Household Panel Survey, Rio/Young (2005b) use an ordered-probit model and identify the unsecured debt-income ratio, the level of mortgage income gearing, the level of financial wealth of households, health, ethnicity and marital status as the main determinants of self-reported financial distress.² Using a tobit model, Bridges/Disney (2004) find that the risk of arrears on debt among British couples is higher for low-income, younger, and less-educated households as well as for tenants. Interestingly, they find a positive influence of wage and employment on arrears for lone parents, which is probably due to a better credit standing.

Few studies use relative/objective measures to investigate explicit overindebtedness. For Germany, Fricke et al. (2004) and Zimmermann (2007) find that low-income households are more likely to be overindebted. Knobloch et al. (2008) exploit the (non-representative) data from the German debt-counselling agencies and find that the risk of being overindebted rises with the number of children and unemployment while it is lower for older people and households with more than one adult. The main triggers for overindebtedness (reported by debt counselors) are “critical events” (57 percent) and

¹ The authors use the European Community Household Panel Survey and the (European) Household Budget Surveys.

² However, the informational value of these findings may be questionable. The study uses the unsecured debt-income ratio, the level of mortgage income gearing and the level of financial wealth of households as objective measures for the financial distress of a household. It is not surprising that households are able to self-report their objective situation.

“avoidable behavior” (16 percent, mainly bad financial management and excessive consumption). According to the Federal Statistical Office (2008), the main (self-assessed) triggers of severe debt problems are unemployment (29 percent), divorce, death, and the like (14 percent), illness, addiction, or accident (ten percent), failed self-employment (ten percent), bad housekeeping (nine percent) and failed home loan financing (four percent). Korczak (2004a,b) finds similar results for the clients’ statistics from the year 2002³.

There is no contribution in the literature applying econometric analysis to investigate objective/relative overindebtedness as defined above. Instead, overindebtedness is often proxied, mostly by measures of high debt burdens. Descriptive results for Germany suggest that the debt service as a share of (equivalent) income is higher among poor households (Knies/Speiss, 2003). In an econometric analysis for Germany, Great Britain and the US, Brown/Taylor (2008) identify a negative and significant influence of age, income and education (the latter only for Great Britain) and a positive and significant influence of the number of children on the probability to have negative household wealth as well as a negative and significant influence of age on the unsecured debt-to-income ratio. Kempson (2002) finds two main groups which are characterized by high debt repayments (more than 25% of income), namely low-to middle-income households with low debt amounts but high repayments (in relation to income) and households who recently experienced income drops.⁴

As for the determinants of debt in Germany, Brown/Taylor (2008) use the SOEP data and find that household debt increases with income, household size and is higher if the head of household is employed while age plays a minor role. For the UK, Rio/Young (2005a) identify, among others, age with a negative and income with a positive sign as significant determinants of unsecured household debt. For Italian households, Magri (2002) finds a positive correlation of income and debt but a negative influence of income uncertainty.

³The study by Knobloch et al. only refers to people who are indeed overindebted and relies partly on statements given by the counselors while the studies by the Federal Statistical Office and Korczak use information of all debt-counseling clients including self-assessed triggers of overindebtedness. However, not all clients of debt-counseling agencies are necessarily overindebted.

⁴There are further empirical contributions dealing with experience from the US and an important strand of literature on consumer insolvency and bankruptcy (e.g., DeVaney/Hanna, 1994 and 1995; Fay et al., 2002; Gross/Souleles, 2002). Since the institutional settings of both the financial market and the consumer bankruptcy regimes are quite different, it could be misleading to appropriate the findings from the US to Germany. Due to the lack of space, I therefore refrain from discussing the US results and focus on empirical findings for Germany and other European countries.

The theoretical propositions of the Permanent Income Hypothesis⁵ give several clear implications: households can be expected to increase their desired debt after a negative income shock. This shock may result from the death of a partner, divorce, separation, unemployment, or the birth of a child. In addition, the necessity of buying durable goods (also housing) after a birth or a household breakdown should have a positive impact on household debt. The exploitation of economies of scale after marriage or cohabitation should lower the debt demand of a household. But supply-side factors do matter as well: households with stability in financial affairs (higher income, marriage, employment status) should be more likely to obtain a loan or to get favorable credit terms. This indicates the existence of borrowing constraints for certain households. In addition, household debt should be higher for younger households according to the Life-Cycle Hypothesis of saving.

It is arguable whether unexpected income shocks are indeed the main drivers of severe household indebtedness. Further prominent explanations are moral hazard (due to consumer insolvency regimes), market failure (information asymmetry between creditors and debtors), myopic behavior, procrastination and hyperbolic discounting (Laibson et al., 2000), irrational behavior, excessive preference for present consumption, lack of financial or debt literacy (Lusardi/Tufano, 2009) or supply-driven overindebtedness, e.g., by predatory lending (Kempson, 2002; Stegman/Faris, 2003). As discussed above, there are correlations between income and debt shocks (trigger events) and overindebtedness. In the following, I analyze whether these events indeed have a causal impact on severe household indebtedness.

3 Dataset description and methodology

I use the German Socio-Economic Panel (SOEP) to study the debt performance of German households. The SOEP, located at the DIW Berlin (German Institute of Economic Research) started in 1984. Annually, it surveys more than 20,000 individuals in about 11,000 households⁶. In addition to relevant information on income components, socio-demographics and household composition, the SOEP contains information on repayments for home loans and consumer credit and on the amount of these monthly

⁵See e.g. Attanasio (1999), Bertola et al., (2006), Campbell (2006), and Deaton (1992) for theoretical aspects of household finance and indebtedness.

⁶For further details, see Wagner et al. (2007) and the SOEP homepage at <http://www.diw.de/en/soep>.

liabilities⁷. This information is collected at the household level.

However, the SOEP has a drawback for debt-related research questions: Home loans and consumer credit form only a part of overall household debt. Private credit, unpaid tax obligations, payment arrears of rent or alimony as well as outstanding bills of telephone companies and mail-order houses constitute important sources of household debt (Angele, 2007). However, due to data limitations, these debt components cannot be taken into account. A further limitation lies in the fact that overindebted households may have announced their insolvency (and household members may have entered the private insolvency proceedings) or stopped repaying debt. These households would not be identified as being overindebted. It could also happen that people are not completely aware of their amount of debt burden and, in addition, underestimate the monthly repayment (e.g. interest payments due to account overdrafts).

To examine the severity of a household's indebtedness, I apply the measures of relative overindebtedness mentioned above. I proceed in the following way: for each household, I calculate the income after debt repayments, the non-seizable income⁸, and the potential social assistance level that a household would have obtained in the respective year⁹. The non-seizable household income is notably higher than the social-assistance level. Using the household income, the debt burden and the different subsistence levels of a certain household, I create the measures of a household's debt performance displayed in Table 1.

The measure OI1 indicates whether a household is overindebted, namely whether its

⁷The exact wording of the questions is the following: "Do you still have financial obligations, for example loans or a mortgage, for this house or flat in which you live?" (yes/no); "How high are the monthly loan or mortgage payments including interest for this loan or mortgage?" (euros per month); "Aside from debts on loans for home and property ownership, are you currently paying back loans and interest on loans that you took out to make large purchases or other expenditures?" (yes/no); "How high is the monthly rate that you pay on these loans?" (euros per month).

⁸I compute the non-seizable income by using the attachment tables to §850c Zivilprozessordnung (Code of Civil Procedure) that were valid in the respective year accounting for the number of household members liable for support and for non-seizable social transfers (e.g. child allowances). For details, see Federal Ministry of Justice (2007).

⁹My calculation is in line with the legal basis of the social assistance in Germany (Zwölftes Sozialgesetzbuch, XII Social welfare statute book). An important piece of information is household size as well as on the number and age of the children. The head of the household receives a standard rate according to the legislation in the respective year, the additional household members receive a percentage share of the standard rate. I add lease and heating costs based on average housing expenditure for the recipients of social assistance. Additional requirements for needy or elderly people as well as for lone parents are taken into account. Since the system of social assistance changed in 2005, I add lump-sum single payments to calculate the social assistance for the years before in order to ensure comparability. To follow the methodology to compute the potential social-assistance level in detail, refer to the publications edited by the Federal Ministry of Labour and Social Affairs (2008a,b,c,d).

Table 1. Measures of overindebtedness and debt performance

Measures of overindebtedness	
Overindebted1 (OI1)	Household income minus debt service < Non-seizable income
Overindebted2 (OI2)	Household income minus debt service < Social assistance level & Debt service > 0
Measures of debt performance	
Debt performance (DP1)	(Income minus debt service) / Non-seizable income
Debt performance (DP2)	(Income minus debt service) / Social assistance level

Source: Own illustration.

income after repaying debt lies below the non-seizable income. OI2 shows whether the household income after debt repayments lies below the potential social-assistance level. Since the household income may be less than the social-assistance level, households could be overindebted without having debt. I therefore use the measure OI2 to define households as being overindebted only if they have debt obligations.

In addition to the dichotomous measures of overindebtedness, I use the measures of debt performance DP1 and DP2 to indicate the financial fragility of a household. These measures show the distance of a household between current income after debt repayments and the subsistence level as well as its closeness to a situation of overindebtedness. DP1 indicates the distance between the household income (after debt payments) and the non-seizable income; DP2 shows the same for the social-assistance level. For example, a DP2 of 200 percent means that the household income minus monthly debt service is twice the amount of the potential social-assistance level of this household.

To examine whether certain adverse shocks to the household budget are triggers for severe household indebtedness, household events are included as explanatory variables in the later regressions, namely marriage, cohabitation, childbirth, separation, divorce, and death of a partner. Since the number of observations is very small for some of these events, I aggregate household changes for which I expect the same sign of impact on the debt performance of the household: death, divorce and separation form the variable *stroke* since all three events can be assumed to have a strong negative impact on the debt situation of a household. Death comes along with high expenses (e.g., funeral) and, possibly, income losses if the breadwinner dies. Separation and divorce lead to income losses and higher expenditure due to unrealized economies of scale.

As already discussed in the introduction, there are three channels for overindebt-

edness to evolve. In addition to income and debt, one has to consider the changes in subsistence level resulting from household events as well. However, the direction is the same for all single events that form the variable *stroke*: both the non-seizable income and the social assistance level decline if the event comes along with a reduction in household size (for divorce and separation, the number of household members must not necessarily go down). Therefore, a case of death may even lead to a relaxation of the debt performance, even if the debt obligation of the deceased persists for the remaining household members: If the dead person was not an earner, the household income stays constant but the potential subsistence level declines. Thus, the difference between current income after debt repayments and subsistence levels increases.

In case of cohabitation or marriage, I expect a positive impact on income and expenditure due to benefits from pooled household expenditure or joint tax assessment. Both events form the joint variable *household change*. However, debt could rise if new loans (e.g., for durable household appliances) would dominate the effect resulting from the increased income. Furthermore, the subsistence level rises if the household size increases. This could put more tension on the relative debt situation.

To sum up, the interplay of the single effects (income, debt, and subsistence level) makes it rather complicated to guess the impact of the trigger events on the relative debt situation of a household beforehand. Though, the single effects for the events aggregated in the variables *stroke* and *household change* are likely to work in the same direction.

In addition to *stroke* and *household change*, I also include an indicator of whether the head of household experienced a job loss in the previous year (variable *job loss*) and whether a child was born in the household (*childbirth*). Since both events generally lead to a reduction in income (and the birth of a child to an increase in expenditure), I expect a negative impact on the debt performance of these occurrences. Again, the overall effect is more complicated. Unemployment could raise demand (but not supply) of debt, the subsistence level (non-seizable income) is negatively affected. A newborn can be expected to increase a household's debt demand. At the same time, both potential subsistence levels rise with the additional child.

To create the sample, I keep observations with valid statements on the relevant household characteristics, income, and debt components. Furthermore, I do not use observations with more than two adults in a household since I cannot assume that households with more than two adult members have a joint budget and, therefore, a

joint debt situation. The generated sample includes 5,378 observations at the household level with the respective characteristics of the head of household per year (2002–2007).

4 Descriptive statistics

Table 2 shows the descriptive statistics of the generated sample. Over time, the household size and the average number of children slightly increase. The mean income of the household, its calculated non-seizable income and the calculated social-assistance level also rise each year (but small drop for the latter in 2005).

Table 2. Sample composition

	2002	2003	2004	2005	2006	2007
Household size	1.98	2.00	2.02	2.04	2.04	2.05
Number of children	0.32	0.34	0.36	0.38	0.40	0.41
Household income (monthly)	2,463	2,462	2,496	2,511	2,546	2,565
Calculated social assistance level	1,035	1,062	1,077	1,052	1,061	1,086
Calculated non-seizable income	1,626	1,652	1,665	1,717	1,720	1,738
Credit	0.19	0.21	0.21	0.15	0.15	0.15
Home loan	0.18	0.19	0.20	0.20	0.21	0.21
Debt service	184	205	211	188	186	196
Homeowner	0.41	0.43	0.44	0.45	0.46	0.47
Stroke*	0.04	0.02	0.03	0.02	0.03	0.02
Household change*	0.04	0.03	0.03	0.02	0.02	0.02
Childbirth *	0.02	0.03	0.03	0.02	0.02	0.02
Unemployment shock*	0.04	0.04	0.03	0.03	0.02	0.02
Age	51.6	52.6	53.5	54.5	55.5	56.4
Full employed head of household	0.45	0.43	0.41	0.39	0.38	0.37
Unemployed head of household	0.06	0.06	0.06	0.06	0.06	0.05
Pensioner	0.38	0.39	0.42	0.43	0.45	0.46
Female	0.39	0.40	0.40	0.41	0.41	0.42
<i>Observations</i>	<i>5,378</i>	<i>5,378</i>	<i>5,378</i>	<i>5,378</i>	<i>5,378</i>	<i>5,378</i>

*These variables refer to events in the previous twelve months. Source: Own illustration. SOEP data 2002–2007. In 2007, the sample represented about 15.8 millions of households.

Table 3. Overindebtedness and debt performance of the full sample and subgroups

	All	Job loss	Stroke	Household change	Childbirth
OI1	0.14	0.22	0.14	0.12	0.36
OI2	0.03	0.03	0.04	0.02	0.14
DP1	1.32	1.14	1.19	1.35	1.14
DP2	2.21	1.71	1.97	2.44	1.77
Credit	0.15	0.19	0.20	0.30	0.23
Home loan	0.21	0.18	0.19	0.16	0.36
Total debt service	196	186	185	259	438

Source: Own calculations using the SOEP data. Year: 2007.

Consumer credit has a peak in 2004 with a share of more than 21 percent of all households in the sample repaying this type of debt. The number of households with home loans increases from about 18 percent in 2002 to more than 21 percent in 2007. In all periods, more than 40 percent of the sampled households own the house or flat they live in.

The variables *stroke*, *household change*, *job loss*, and *childbirth* refer to the respective events in the previous 12 months. The number of observations is relatively small for all events. About four percent of all households experienced a *stroke* (such as death, divorce, or separation in the last year) or a *household change* (marriage or cohabitation) in 2002. The share of both variables halves over time. The number of households with a newborn lies between two and three percent in each period. About six percent of all households have an unemployed household head while in two to four percent of all households in the sample, the head of household experienced a job loss in the previous 12 months.

Table 3 displays the debt performance of different subgroups of the sample for the year 2007. The probability of being overindebted (OI1) is higher for households if the head of household became unemployed in the previous year, as well as after a childbirth (OI1 and OI2). The same is true for the debt performance. Both debt indicators (DP1 and DP2) are lower for the mentioned household types. In contrast, overindebtedness is widespread in almost the same manner among households who recently experienced a *stroke* or a *household change*. The debt performance of these households is not notably different from the whole sample. The share of households with a home loan is also not

quite different between the whole sample and the subsamples *job loss* and *stroke* but notably higher for *childbirth* and somewhat lower for *household change* while the share of households with consumer credit is much higher among all subsamples. The total debt service is on average similar for the whole sample and household who experienced a *job loss* and a *stroke*, but the subsamples *household change* and *childbirth* have on average much higher monthly debt repayments.

These findings suggest correlations between unemployment and a recently born baby on the one hand and a situation of severe indebtedness on the other hand. For households suffering from unemployment, the debt burden itself does not seem to be the main driver while households with a newborn show indeed a notably higher debt burden. In contrast, the similarities of the debt situation of the full sample and the households with a *stroke* or a *household change* event are not straightforward. Possibly, these events only show an impact on the debt situation after a certain period of time, even if these households use consumer credit more often.

5 Empirical strategy and results

5.1 Methodology

The descriptive results indicate correlations between household changes and strokes of fate on the one hand and the objective debt situation of the household on the other hand. Under certain assumption, panel regression analysis shows the impact of these events on severe household indebtedness. One crucial assumption is that the household events under investigation such as *stroke*, *household change*, *childbirth*, and *job loss* are exogeneous with respect to the debt situation of the household conditional on other covariates.

I analyze overindebtedness and the debt performance of the households in the sample (Section 5.2). The dependent variables are the dichotomous measures of overindebtedness as well as the continuous indicators of the debt performance for both concepts of subsistence level mentioned above. In addition to the household events, I include several control variables that indicate the economic situation of the household (home ownership and outstanding home loan), the household composition (number of children and adults) and the characteristics of the household head (employment status such as white collar, civil servant, full employment, etc., education such as university en-

trance qualification and university degree, as well as socio-demographic characteristics such as gender, lone parenthood, and migrant). Furthermore, I include the dummies *home loan* and *homeowner* in the regression to account for the different debt situation of homeowners and tenants (compare to Bridges/Disney, 2004, who also control for homeownership). The argument that (secured) housing debt is less worrying than (unsecured) debt resulting from consumer credit may be brought forward. This is because repayments of housing debt are a type of asset accumulation (when subtracting the interest payments) while high repayments for consumer credit could be an expression of potential bad financial management. Nevertheless, the result is quite similar: due to their debt burden, these households have an income that lies below the subsistence level. These households are classified as financially fragile. Repayments for home loans are indeed problematic if the remaining household budget is less than needed for basic expenditures.

Subsequently (Section 5.3), I focus on the households' debt burdens. As discussed above, the composed measures of overindebtedness and the debt performance include the household income, the debt service, and a subsistence level. Severe household indebtedness may therefore be caused by several channels:

First, a certain trigger event may constitute before all an income shock while the debt burden itself stays constant. Second, the household debt may increase or decrease in response to the event. Since the effective debt burden of a household is influenced by debt demand and supply, both directions are possible: a household's debt demand may increase after a shock but the debt supplier may reject this request with a higher probability. Third, the subsistence level changes with the number of household members and the household income (non-seizable income).

To distinguish the impact of the three channels, I analyze how a household's debt burdens evolves in response to different trigger events. The three relevant dependent variables are *consumer credit* and *home loan* (binary variables that indicate whether a household repays the respective debt type) and the *total debt service* of a household. Trigger events may have a direct influence on the debt burden of a household (e.g., increasing expenditures after a birth or missing credit standing after becoming unemployed) but also an indirect effect via the household income since trigger events constitute an income shock. In addition, the income level itself may influence the debt situation of a household. Therefore, I disentangle the single effects by looking at the impact of possible trigger events on household debt and, subsequently, on the household

Table 4. Regression results: overindebtedness and debt performance

	OI1		OI2		DP1		DP2	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
Number of children	0.660*** (0.106)	0.872*** (0.0778)	0.323** (0.138)	0.606*** (0.0783)	-0.064** (0.0266)	-0.097*** (0.0107)	-0.197*** (0.0506)	-0.306*** (0.0211)
Number of adults	-0.00420 (0.160)	0.0524 (0.133)	0.0062 (0.247)	-0.528*** (0.176)	-0.0078 (0.0319)	0.0360** (0.0179)	-0.0101 (0.0648)	0.0901* (0.0464)
Unemployed	0.463*** (0.162)	0.771*** (0.154)	0.471** (0.209)	0.834*** (0.189)	-0.062*** (0.0136)	-0.072*** (0.0135)	-0.099*** (0.0350)	-0.118*** (0.0292)
Job loss last year	0.477*** (0.157)	0.459*** (0.165)	0.411** (0.162)	0.352** (0.172)	-0.00734 (0.0160)	-0.00708 (0.0148)	0.0119 (0.0339)	0.0368 (0.0354)
Stroke	0.0648 (0.194)	0.147 (0.196)	0.252 (0.238)	0.246 (0.235)	-0.0391** (0.0154)	-0.0153 (0.0150)	-0.0732** (0.0367)	-0.0124 (0.0360)
Household change	-0.0585 (0.150)	-0.228 (0.171)	0.121 (0.289)	0.132 (0.266)	0.0625 (0.0498)	0.0560 (0.0527)	0.129 (0.102)	0.114 (0.103)
Childbirth	0.572*** (0.145)	0.428*** (0.149)	1.054*** (0.198)	0.779*** (0.209)	-0.057*** (0.0132)	-0.040*** (0.0117)	-0.228*** (0.0286)	-0.151*** (0.0262)
Homeowner	0.388 (0.287)	-0.811*** (0.193)	0.338 (0.381)	-0.584** (0.244)	0.0437 (0.0497)	0.142*** (0.0365)	0.157 (0.0965)	0.341*** (0.0660)
Home loan	3.386*** (0.226)	5.250*** (0.220)	2.675*** (0.338)	3.827*** (0.245)	-0.294*** (0.0344)	-0.314*** (0.0276)	-0.528*** (0.0681)	-0.529*** (0.0522)
Observations	8,088	32,268	3,642	32,268	32,268	32,268	32,268	32,268

Fixed-effects and random-effects panel regression. Selected coefficients. Source: SOEP: 2002–2007.

Bootstrapped standard errors in parentheses (200 repetitions). * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

income.

I run fixed-effects and random-effects panel regressions. Since the within-variance is quite small for certain control variables (e.g., gender of the head of household, migrant), I exclude some explanatory variables from the fixed-effects regression that are mostly time-invariant.

5.2 Overindebtedness and debt performance

Table 4 displays the coefficient estimates for both overindebtedness (logit model) and the debt performance (OLS) for the most relevant explanatory variables. A complete list of coefficients for all control variables is included in the appendix.

In the fixed-effects regressions, *stroke* and *household change* do not have a significant

influence on the probability of becoming overindebted. Since the number of adult household members does not increase the risk of being overindebted, neither a direct nor an indirect effect is detectable. Unemployment affects overindebtedness in two ways: a job loss in the previous year as well as persistent unemployment have a significantly positive influence on OI1 and OI2. In a similar way, a newborn constitutes a risk factor for a precarious debt situation: the coefficient of *childbirth* is significantly positive in the OI1 and OI2 regressions but requires a joint interpretation with the number of children in the household. Therefore, a birth aggravates the positive effect of the number of children in the household on the likelihood of being overindebted. The coefficient of the dummy *home loan* is significantly positive and quite large implying that a home loan is a main determinant of overindebtedness.

The random-effects regressions results yield similar findings: Unemployment and children significantly increase a household's risk to become overindebted while strokes of fate and changes in household composition have no significant effect, with one exception: the probability of OI2 significantly falls with the number of adult household members.

To quantify the impact of a trigger event on overindebtedness, Table 5 shows the average marginal effects of the explanatory variables (random effects).¹⁰ The size of the aggregated effect for unemployment (job loss in the last year and current unemployment) is about six percentage points (OI1) while the unemployment shock itself does not have any influence on OI2 (in contrast, persistent unemployment does in a minor way). If an adult leaves the household, the risk of being overindebted declines by about a half percentage point (OI2). Thus, *stroke* and *household change* have no direct but an (economically small) indirect impact on overindebtedness. A birth increases the risk of being overindebted (OI1) by about six percentage points, for OI2 the increase is about three percentage points (again, since a newborn generally rises the number of children in the household, both effects have to be taken together).

¹⁰For comparison, I also run fixed-effects and random-effects regressions applying a linear probability model (with marginal effects which equal the regression coefficients). The impact of children, unemployment, and real estate financing is confirmed in both the fixed-effects and random-effects specifications: childbirth: between three and six percentage points; number of children: eight (OI1) and two (OI2) percentage points; job loss: two to four percentage points; unemployment: three to five percentage points; home loan: more than 30 (OI1) and ten (OI2) percentage points.

Table 5. Marginal effects for overindebtedness

	OI1 (non-seizable income)	OI2 (social assistance)
Number of children	0.043*** (0.006)	0.009*** (0.002)
Number of adults	0.002 (0.006)	-0.005** (0.002)
Unemployed	0.036*** (0.009)	0.013*** (0.004)
Job loss last year	0.021*** (0.008)	0.005 (0.003)
Stroke	0.006 (0.009)	0.003 (0.003)
Household change	-0.001 (0.007)	0.002 (0.004)
Childbirth	0.020** (0.008)	0.012** (0.005)
Homeowner	-0.033*** (0.009)	-0.008** (0.004)
Home loan	0.402*** (0.037)	0.078*** (0.018)

Random-effects panel regression. Source: SOEP: 2002–2007

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

The marginal effect of a home loan is very large. Taking out this type of debt boosts the risk of overindebtedness by 40 or eight percentage points, respectively. However, the effect of becoming a homeowner diminishes the impact of a home loan a little (three percentage points or about one percentage point, respectively).¹¹

As expected, the findings are similar for the debt performance of a household (Table 4). With an increasing DP1 and DP2, a household augments the difference between its current income after repaying debt and the subsistence level. Therefore, an opposite sign for the coefficients (compared to the overindebtedness regressions) can be expected. A positive coefficient indicates a relaxation of the debt situation. The number of children and a birth significantly worsen the debt performance; the same is true for ongoing unemployment (not for a job loss in the previous year) and a home loan. Furthermore,

¹¹When excluding 'home loan' from the regression, the dummy of 'homeowner' absorbs a large share of the effect resulting from housing debt. I also run regressions excluding both 'home loan' and 'homeowner'. In all cases, the impact of the control variables of interest is basically unchanged.

a stroke of fate significantly worsens the debt performance of a household (fixed-effects regressions) but does not trigger overindebtedness.

One additional point is that severe household indebtedness seems to be a major problem for younger households: In all random-effects regressions, the coefficient of *age* is significant and indicates that both the risk of being overindebted and the debt performance improve over the life cycle (see results in the appendix).

5.3 Household debt and income

The results of the debt and income regressions are displayed in Table 6. To begin with, I discuss the impact of children on household debt: After a childbirth, the probability of having consumer credit increases significantly while the number of children has no significant impact. In addition, the probability of having a home loan rises with the number of children in the household but a newborn lowers this effect.¹² Both findings indicate that the debt burden rises with a further child in the household, although only to a minor extent since the total debt service increases by only 40 euros (in the fixed-effects model).

Households affected by a job loss of the household head increase their probability for consumer credit (however, the evidence is only weak in the fixed-effects regression). The total debt service is not affected. In contrast, the coefficients of 'unemployed' are insignificant in the fixed-effects regressions. This shows that households affected by job loss are likely to rely on consumer credit to smooth consumption over the unemployment period (the supply side does not seem to make an issue with the lost job) but only in the short term.¹³ Persistent unemployment does not influence debt, be it because the households do not demand further debt or because the credit rating decreases such that creditors refuse loan applications more frequently. As for *stroke* and *household change*, the coefficients are mostly insignificant. However, the probability of having a home loan rises with the number of adult household members but this effect weakens due to the significantly negative coefficient of 'household change' and the marginal effects are economically irrelevant. Similarly, a further adult in the household does not lead to an increase in the debt service.

¹²Taking both effects together (childbirth and number of children), the probability of having a certain type of debt with a newborn baby rises by about two and five percentage points for *consumer credit* and *home loan*, respectively, using the random-effects model.

¹³And to a minor extent: the marginal effect (random-effects model) is only about two percentage points.

Table 6. Regression results: debt determinants and household income

	Consumer credit		Home loan		Debt service		Household income	
	Fixed	Random	Fixed	Random	Fixed	Random	Fixed	Random
Income in	0.532***	0.473***	0.625***	1.557***	0.0874***	0.146***		
1,000 euros	(0.0991)	(0.0833)	(0.207)	(0.179)	(0.0148)	(0.0182)		
Number of	-0.171	-0.0575	2.480***	2.691***	0.0815***	0.109***	0.0875***	0.0780***
children	(0.105)	(0.0568)	(0.314)	(0.179)	(0.0132)	(0.00883)	(0.0102)	(0.00660)
Number of	0.0503	0.336***	0.723**	0.627**	0.00434	-0.0165	0.454***	0.510***
adults	(0.147)	(0.112)	(0.300)	(0.252)	(0.0111)	(0.0109)	(0.0124)	(0.0123)
Unemployed	0.00272	0.173	0.170	0.306	0.00773	0.0169**	-0.089***	-0.103***
	(0.125)	(0.131)	(0.327)	(0.311)	(0.00749)	(0.00764)	(0.0130)	(0.0132)
Job loss	0.213*	0.310**	-0.121	0.00821	0.0102	0.0118	0.0110	0.0286**
last year	(0.123)	(0.126)	(0.288)	(0.246)	(0.00793)	(0.00877)	(0.0109)	(0.0113)
Stroke	-0.0776	0.0977	0.166	0.487*	-0.00106	0.0125	-0.0212*	-0.00183
	(0.139)	(0.150)	(0.260)	(0.252)	(0.00802)	(0.00851)	(0.0122)	(0.0114)
Household	0.0838	-0.00668	-0.444**	-0.632***	0.00247	-0.00811	0.0139	0.00516
change	(0.111)	(0.107)	(0.179)	(0.229)	(0.0116)	(0.0126)	(0.0112)	(0.0113)
Childbirth	0.360***	0.274**	-1.235***	-1.173***	-0.0379**	-0.042***	-0.080***	-0.061***
	(0.138)	(0.132)	(0.229)	(0.210)	(0.0155)	(0.0144)	(0.0102)	(0.0103)
Observations	10,944	32,268	4,908	32,268	32,268	32,268	32,268	32,268

Source: SOEP: 2002–2007. Bootstrapped standard errors in parentheses (200 repetitions).

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Even if a household's debt service stays constant, an income drop worsens the relative debt situation and may trigger a situation of overindebtedness. The regression results are also displayed in Table 6. The income rises significantly with the number of children in the household. However, this effect is nearly compensated after the birth of a child. All in all, a further child does not drastically reduce the household income. In contrast, the coefficient for the number of adults is significantly positive and economically large. This indicates a strong negative income shock if an adult person leaves the household (be it due to death, separation, or divorce). Similarly, the household income jumps up after a change in household composition associated with an increase in adult household members (cohabitation or marriage). As expected, unemployment reduces the household income. A recent job loss (with later reemployment) has no significant

effect on the household income such that a severe indebtedness via the income channel is only likely to occur in case of persistent unemployment. Furthermore, the coefficient of *stroke* is weakly significant and negative in the fixed-effects regression implying that divorce, separation, or death of the partner is followed by an income shock that may even reinforce the income drop associated with the loss of an adult household member.

Furthermore, the debt regression results in Table 6 show that the household income has a significantly positive impact on both debt types (consumer credit and home loans) and the total debt service. Therefore, a decreasing household income tends to alleviate the debt situation of the household. In particular, the loss of an adult household member has a large (negative) effect on the household income such that the burden associated with debt repayments declines while, in contrast, a further adult entering the household is likely to increase the household income as well as the debt service.¹⁴

6 Conclusion

This paper investigates the impact of trigger events such as strokes of fate (death, separation, or divorce), change in household composition (cohabitation or marriage), unemployment, and childbirth on the debt situation of a household. For every household, several measures of relative/objective overindebtedness and debt performance have been created. These measures compare the household income after debt repayments to different concepts of subsistence levels and indicate a possible overindebtedness as well as the financial vulnerability of a household. Descriptive statistics of SOEP data from 2002–2007 show that unemployment of the head of household and childbirth seem to worsen the debt situation considerably while the risk of being overindebted and the debt performance are not notably different for households after loss of the partner (due to separation, divorce, or death), cohabitation or marriage compared to the whole sample. The monthly debt service of households with a birth in the previous twelve months is much higher than the debt burdens of other households.

First, panel-regression analysis has focussed on overindebtedness and the debt per-

¹⁴Excluding the household income from the debt service regressions yields significantly positive coefficients for the number of adults. A further household member (a child or an adult) increases the monthly debt repayment by about 40 euros (fixed effects). The effects of unemployment are also robust: a job loss in the previous year has a small impact on the probability of consumer credit while there is no significant effect of unemployment (be it temporary or persistent) on the total debt service.

formance of private households. Second, since the applied measures of relative (over-)indebtedness comprise income, debt service, and subsistence level, the influence of the single channels has been investigated to answer the question of whether severe indebtedness is primarily triggered by an income shock or whether it is a rise in the debt burden or an increase in the subsistence level that worsens the relative debt situation of a household.

My analysis has several findings: first, childbirth and the number of children have a significant impact on both increasing the risk of becoming overindebted and worsening a household's debt performance. My interpretation is that the main reasons to cause a situation of severe indebtedness after a childbirth are increases of the debt burden (home loan) and the subsistence level, while I do not find evidence for an income shock resulting from a newborn. Second, unemployment is also a trigger event for severe household indebtedness. However, the operating channel is different: the income shock associated with persistent unemployment plays the main role to worsen the measures of indebtedness while there is only a minor impact of unemployment on debt itself (consumer credit) and on the subsistence level. If the head of household is reemployed shortly after the job loss, there is no significant impact on the household income but on the probability of having consumer credit. The probability of being overindebted will increase significantly if the head of household has experienced a job loss in the last year but works again at the point of the interview. Third, the picture is more complicated for strokes of fate and changes in household composition. Both events do not show significant own effects on the risk of being overindebted, the debt performance, but some (economically small) impact on the probability of having a certain type of household debt and the debt amount. However, the number of adults in the household has a significant influence on the severity of household indebtedness only in the random-effects regressions such that there is only weak evidence for severe indebtedness caused by a stroke of fate. Several effects work against each other. If an adult leaves the household, the income drastically declines. At the same time, the potential subsistence level goes down. The latter effect attenuates the former one. The income drop resulting from the vanished adult household member rather mitigates the debt burden while the direct effect on the total debt service goes the opposite way. All in all, both effects cancel each other out. The same is true, with opposite signs, for change if this event is associated with an additional adult moving in the household.

My findings have several policy implications to tackle relative overindebtedness: as

for families, the main goal is to achieve an income that exceeds the increase in the subsistence level and that enables the household to handle a rising debt burden (home loans). Important fields of action would be childcare policies and employment incentives for both spouses. Regarding unemployment as well as strokes of fate, income stability is a central issue since the associated income shock constitutes a main threat to the household budget. Relative overindebtedness may be reduced by keeping unemployment spells shortly and by finding employment possibilities for people who have lost their partner.

One general remark is further mentionable: Even if severe indebtedness is triggered by a negative income shock or by an uncompensated rise in the subsistence level while the debt service itself stays constant, the household must have been indebted in some way before the event occurred. Given the findings of this paper, it may be doubtful that households are indeed able to manage their housing finance. The results show that a main reason for overindebtedness is simply a home loan. However, even if the debt burden has been manageable quite well before a possible trigger event occurred, one may reflect on the question of whether the forecast of trigger events has been adequate on both the demand and the supply side of the debt market.

Further research is needed to get more insights into the field of household debt. First, empirical evidence on debt persistence is desirable. Debt does not disappear after a short time. Therefore, it could be quite interesting to understand how a household's debt burden evolves over time and how it adjusts due to household characteristics and certain trigger events. Second, data limitations are still a hurdle for empirical research on debt. A notable part of household debt is not covered; several important aspects (e.g., consumer insolvency) cannot be taken into account.

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Appendix

Table A1. Regression results (fixed-effects)

	OI1 (logit)	OI2 (logit)	DP1	DP2	Consumer credit (logit)	Home loan (logit)	Debt service ²	Household income ¹
Household income ¹					0.532*** (0.0991)	0.625*** (0.207)	0.0874*** (0.0148)	
Number of children	0.660*** (0.106)	0.323** (0.138)	-0.064** (0.0266)	-0.197*** (0.0506)	-0.171 (0.105)	2.480*** (0.314)	0.0815*** (0.0132)	0.0875*** (0.0102)
Number of adults	-0.00420 (0.160)	0.00615 (0.247)	-0.00782 (0.0319)	-0.0101 (0.0648)	0.0503 (0.147)	0.723** (0.300)	0.00434 (0.0111)	0.454*** (0.0124)
Full employment	-0.242 (0.153)	-0.854*** (0.204)	0.122*** (0.0192)	0.385*** (0.0403)	0.453*** (0.108)	0.601*** (0.224)	0.0386*** (0.00819)	0.184*** (0.0119)
Unemployed	0.463*** (0.162)	0.471** (0.209)	-0.062*** (0.0136)	-0.099*** (0.0350)	0.00272 (0.125)	0.170 (0.327)	0.00773 (0.00749)	-0.089*** (0.0130)
Job loss last year	0.477*** (0.157)	0.411** (0.162)	-0.00734 (0.0160)	0.0119 (0.0339)	0.213* (0.123)	-0.121 (0.288)	0.0102 (0.00793)	0.0110 (0.0109)
Stroke	0.0648 (0.194)	0.252 (0.238)	-0.0391** (0.0154)	-0.0732** (0.0367)	-0.0776 (0.139)	0.166 (0.260)	-0.00106 (0.00802)	-0.0212* (0.0122)
Household change	-0.0585 (0.150)	0.121 (0.289)	0.0625 (0.0498)	0.129 (0.102)	0.0838 (0.111)	-0.444** (0.179)	0.00247 (0.0116)	0.0139 (0.0112)
Childbirth	0.572*** (0.145)	1.054*** (0.198)	-0.057*** (0.0132)	-0.228*** (0.0286)	0.360*** (0.138)	-1.235*** (0.229)	-0.0379** (0.0155)	-0.080*** (0.0102)
Homeowner	0.388 (0.287)	0.338 (0.381)	0.0437 (0.0497)	0.157 (0.0965)				
Home loan	3.386*** (0.226)	2.675*** (0.338)	-0.294*** (0.0344)	-0.528*** (0.0681)				
Constant			1.351*** (0.0448)	2.205*** (0.0965)				-0.525*** (0.101)
Log likelihood	-2,530.0	-1,164.4						
Wald χ^2	708.51	170.27	578.35	650.47	76.19	110.21	128.47	1,917.18
Observations	8,088	3,642	32,268	32,268	10,944	4,908	32,268	32,268
Households	1,348	607	5,378	5,378	1,824	818	5,378	5,378

¹Deflated household income (log) ²Total monthly debt service in thousand euros. Source: SOEP: 2002–2007.
Bootstrapped standard errors in parentheses (200 repetitions). * p < 0.1, ** p<0.05, *** p < 0.01.

Table A2. Regression results (random-effects)

	OI1 (logit)	OI2 (logit)	DP1	DP2	Consumer credit (logit)	Home loan (logit)	Debt service ²	Household income ¹
Household income ¹					0.473*** (0.0833)	1.557*** (0.179)	0.146*** (0.0182)	
Number of children	0.872*** (0.0778)	0.606*** (0.0783)	-0.097*** (0.0107)	-0.306*** (0.0211)	-0.0575 (0.0568)	2.691*** (0.179)	0.109*** (0.00883)	0.0780*** (0.00660)
Number of adults	0.0524 (0.133)	-0.528*** (0.176)	0.0360** (0.0179)	0.0901* (0.0464)	0.336*** (0.112)	0.627** (0.252)	-0.0165 (0.0109)	0.510*** (0.0123)
Self- employed	-0.395* (0.216)	-0.0293 (0.273)	0.269*** (0.0576)	0.677*** (0.113)	0.316* (0.164)	1.070*** (0.313)	0.0355* (0.0207)	0.174*** (0.0182)
Whitecollar	-0.225 (0.137)	-0.993*** (0.208)	0.0094 (0.0222)	0.143*** (0.0542)	0.278** (0.114)	0.750*** (0.213)	0.0276** (0.0111)	0.114*** (0.0109)
Bluecollar	0.296** (0.146)	-0.304 (0.190)	-0.052*** (0.0170)	-0.0162 (0.0403)	0.554*** (0.122)	0.429* (0.256)	0.00398 (0.00859)	0.0599*** (0.0109)
Civil servant	-1.687*** (0.299)	-2.485*** (0.666)	0.0702** (0.0358)	0.298*** (0.0799)	0.560** (0.224)	1.406*** (0.452)	0.0672** (0.0267)	0.163*** (0.0230)
Univ. entr. qualification	-1.194*** (0.171)	-0.802*** (0.198)	0.264*** (0.0510)	0.649*** (0.107)	-0.706*** (0.152)	0.0101 (0.322)	0.00988 (0.0118)	0.187*** (0.0170)
University degree	-1.115*** (0.181)	-0.768*** (0.237)	0.230*** (0.0447)	0.581*** (0.0911)	-0.0826 (0.149)	0.238 (0.298)	-0.00732 (0.0126)	0.234*** (0.0179)
Age	-0.073*** (0.00523)	-0.06*** (0.00649)	0.0031*** (0.000621)	0.0063*** (0.00125)	-0.081*** (0.00358)	-0.0051 (0.00685)	-0.002*** (0.000367)	0.00228*** (0.000390)
Female	-0.015 (0.129)	-0.235 (0.159)	-0.057*** (0.0218)	-0.115** (0.0509)	-0.113 (0.0987)	-0.487*** (0.248)	-0.0163* (0.00906)	-0.040*** (0.0137)
Lone parent	-0.119 (0.286)	0.474 (0.301)	0.0585 (0.0801)	0.0448 (0.159)	-0.0766 (0.216)	-2.014*** (0.478)	-0.100*** (0.0164)	0.131*** (0.0266)
Migrant	0.141 (0.219)	0.837*** (0.220)	-0.0179 (0.0226)	-0.0878* (0.0519)	-0.101 (0.205)	-0.839 (0.659)	-0.0222 (0.0186)	-0.0594** (0.0274)
Full employment	-0.350** (0.140)	-0.848*** (0.174)	0.140*** (0.0228)	0.396*** (0.0507)	0.330*** (0.105)	0.513** (0.216)	0.0361*** (0.00978)	0.136*** (0.0114)
Unemployed	0.771*** (0.154)	0.834*** (0.189)	-0.072*** (0.0135)	-0.118*** (0.0292)	0.173 (0.131)	0.306 (0.311)	0.0169** (0.00764)	-0.103*** (0.0132)
Job loss last year	0.459*** (0.165)	0.352** (0.172)	-0.00708 (0.0148)	0.0368 (0.0354)	0.310** (0.126)	0.00821 (0.246)	0.0118 (0.00877)	0.0286** (0.0113)
Stroke	0.147 (0.196)	0.246 (0.235)	-0.0153 (0.0150)	-0.0124 (0.0360)	0.0977 (0.150)	0.487* (0.252)	0.0125 (0.00851)	-0.00183 (0.0114)
Household change	-0.228 (0.171)	0.132 (0.266)	0.0560 (0.0527)	0.114 (0.103)	-0.00668 (0.107)	-0.632*** (0.229)	-0.00811 (0.0126)	0.00516 (0.0113)
Childbirth	0.428*** (0.149)	0.779*** (0.209)	-0.040*** (0.0117)	-0.151*** (0.0262)	0.274** (0.132)	-1.173*** (0.210)	-0.042*** (0.0144)	-0.061*** (0.0103)
Homeowner	-0.811*** (0.193)	-0.584** (0.244)	0.142*** (0.0365)	0.341*** (0.0660)				
Home loan	5.250*** (0.220)	3.827*** (0.245)	-0.314*** (0.0276)	-0.529*** (0.0522)				
Constant	-0.981*** (0.371)	-1.933*** (0.493)	0.959*** (0.0622)	1.293*** (0.126)	-3.190*** (0.596)	-21.48*** (1.372)	-0.832*** (0.130)	6.457*** (0.0378)
Rho	0.676	0.581	0.557	0.589	0.672	0.944	0.579	0.748
Log likelihood	-7,077.6	-3,308.4			-10,698.4	-6,797.9		
Wald χ^2	1,547.17	975.39	1,361.59	1,565.39	1,106.23	600.52	1,145.86	5,607.36
Observations	32,268	32,268	32,268	32,268	32,268	32,268	32,268	32,268
Households	5,378	5,378	5,378	5,378	5,378	5,378	5,378	5,378

¹Deflated household income (log) ²Total monthly debt service in thousand euros. Source: SOEP: 2002–2007.
Bootstrapped standard errors in parentheses (200 repetitions). * p < 0.1, ** p < 0.05, *** p < 0.01.