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Stefan Angel and Karin Heitzmann

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Over-indebtedness in Europe: The relevance of country-level variables for the over-indebtedness of private households

Stefan Angel und Karin Heitzmann

Vienna University of Economics and Business

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Abstract

So far, research on the causes of over-indebtedness in Europe has predominantly focused on the characteristics of individuals or households. This article investigates to what extent country-level factors are associated with a European household's risk of being over-indebted. We examine variables that reflect policies aimed at combating over-indebtedness (the average level of economic literacy prevalent within a country and its classification into a specific debt-discharge regime) and variables that reflect other welfare state policies (a country's affiliation to a specific employment regime and a summary measure referring to the net replacement rate in the case of long-term unemployment). The results, which are based on multilevel logistic regression analyses of European Union Statistics on Income and Living Conditions (EUSILC) data for 27 European countries, suggest that all four country-level factors matter. This particularly applies to the variables reflecting other welfare-state policies, thus underlining the relevance of the design of social policy in fighting over-indebtedness.

Keywords: over-indebtedness, country-level factors, cross-national research, multilevel analysis, EU-SILC

Introduction

Under its initiative to fight poverty and social exclusion and against the background of the economic and financial crisis that hit Europe in 2008, the European Commission has defined tackling over-indebtedness as a key challenge. In contrast to *indebtedness*, which is not necessarily problematic but simply a part of a household's normal financial repertoire, *over-indebtedness* implies that households are no longer able to meet their financial obligations. A household's illiquidity may then lead to poverty and social exclusion, aggravating these and related problems for society as a whole.

The recent economic and financial crisis has increased the number of private households experiencing financial problems in Europe. In 2007, one year prior to the beginning of the crisis, 9 percent of all households in the EU-27 identified themselves as having great difficulties in making ends meet and 35 percent as being unable to face unexpected expenses. By 2012, these figures had risen to 11 percent and 40 percent, respectively. Similarly, the proportion of households with payments in arrears rose

from 10 percent in 2007 to 11.4 percent in 2012.¹ This latter indicator is often used in empirical research as a crude proxy for over-indebted households (Duygan-Bump and Grant, 2009; European Commission, 2008; Gummy, 2007).

The data thus suggest an increase in the number of over-indebted households. Further evidence points at considerable variation between European countries, particularly since the crisis. In 2012, the proportion of households with arrears in payments ranged from 4 percent in Luxembourg to 39 percent in Greece.² But what accounts for these large differences between countries?

To answer this question, it is necessary to understand the routes into and out of over-indebtedness. In this context, the literature usually differentiates between micro-level factors and macro-level factors (see, e.g., Dubois and Anderson, 2010; European Commission, 2008; Kilborn, 2009, 2011; Niemi-Kiesiläinen and Henrikson, 2005; Reifner et al., 2010). The former refer to individual or household characteristics (e.g. household size and composition) as well as the behaviour of individuals (e.g. their money management). Macro-level factors are relevant for the total population of a country and comprise, for instance, a country's macroeconomic performance, its credit market characteristics or the policies it has implemented to combat over-indebtedness. In contrast to research conducted in the United States, European studies on over-indebtedness have predominantly examined the relevance of micro-level factors in explaining this phenomenon (with the exception of Duygan-Bump and Grant, 2009).

This article thus aims to examine the role of country-level factors in explaining the propensity to be over-indebted of European households. We are particularly interested in the relevance of both policies specifically designed to combat over-indebtedness and other welfare policies with different explicit aims. As proxies for outputs of the first type of policies, we chose the average level of economic literacy prevalent within a country and a country's affiliation to a specific debt-discharge regime. For the latter type of policies, the net replacement rate concerning benefits paid by the welfare state to the long-term unemployed and the classification of countries by employment regimes were selected as proxies. As will be shown, all of these country-level factors, particularly those referring to the wider social policy framework, help to explain differences in the rate of over-indebted households between countries.

To achieve our research goal, we used information from the 2008 wave of the European Union Statistics on Income and Living Conditions (EU-SILC) dataset, which includes a special module on over-indebtedness, as well as macro-level variables from various sources. With regard to methodology, we rely on multilevel logistic regressions, which make it possible to assess the relevance of both micro-level and country-level variables in explaining over-indebtedness.

The remainder of this article is structured as follows. We start by discussing relevant micro-level and macro-level factors that explain a household's risk of being over-indebted. Next, we describe the variables included in the data analysis and the empirical approach adopted. Following this description, we present the results of the analyses and, in the final section, discuss these results.

Factors accounting for the risk of over-indebtedness

The routes into and out of over-indebtedness are multi-dimensional and complex. Previous research has shown that a household's likelihood of facing periods of over-indebtedness is influenced by a variety of factors (for an overview, see Anderloni and Vandone, 2008). These can be located at either

¹ All data are derived from the Eurostat database (9 December 2013).

² Data are derived from the Eurostat database (09 December 2013).

the individual or household level and/or be specific to the total population of a country. In this section, we discuss the theoretical arguments and present empirical evidence for the relevance of these factors in explaining over-indebtedness.

Micro-level factors

The over-indebtedness of households is usually the result of illiquidity, for which three causes have been identified in the literature. The first is the specific behaviour of an individual such as over-spending as a result of poor money management (Anderloni and Vandone, 2010; Gathergood, 2012; Knobloch and Reifner, 2009; Livingstone and Lunt, 1992). The second is a persistently low household income which is ultimately exceeded by household expenditures (European Commission, 2008; Kempson, 2002; Knobloch and Reifner, 2009). The third refers to 'critical' life events (e.g. unemployment) that increase expenditures and/or decrease incomes, triggering an imbalance in a household's budget (Reiter, 1991; Sullivan et al., 1989, 2006; Warren, 2004). With regard to the latter, empirical evidence has been collected which shows that a major decrease in household income leading to over-indebtedness can result from unemployment, separation or divorce, reduced employment income (e.g. because of a reduction of working overtime) and failed self-employment (Angele et al., 2008; Goode, 2012; Himmelstein et al., 2005; Keese, 2009; Kim, 1996; Lyons and Fisher, 2006). In contrast, enhanced household expenditures include the establishment of one's own household, the birth of a child or an unexpected rise in housing or other costs (e.g. health expenditures; Knobloch and Reifner, 2009).

Country-level factors

In addition to micro-level factors, also country-level factors affect a household's probability of becoming over-indebted. This particularly applies to policies specifically designed to combat over-indebtedness. In a 2008 report for the European Commission (2008), researchers identified six categories of preventive and alleviating measures that should be implemented in order to combat over-indebtedness effectively. Preventive measures include policies to help improve people's financial competence (e.g. programmes to foster financial education), policies that protect consumers from irresponsible lending (e.g. the implementation of credit-scoring schemes, credit reports, usury laws) and policies that allow for responsible arrears management and debt recovery by lenders (e.g. instruments that help to avoid arrears, handle arrears and collect debts). Alleviating measures include the supply of debt advice services for consumers with financial difficulties, provisions to enable amicable arrangements outside the courts between creditors and debtors (e.g. formal procedures to set up payment plans) and provisions that allow for court arrangements (e.g. judicial debt settlement procedures, bankruptcy provisions).

The empirical relevance of these policies has already been demonstrated. For example, programmes aimed at enhancing the economic literacy of individuals were shown to lead to an improvement in their abilities to manage their money. Individuals changed their spending behaviour, thereby reducing the probability that they would enter over-indebtedness (Dick and Jaroszek, 2013; Hilgert et al., 2003; Lusardi and Tufano, 2009; Schürz, 2006). Available data also suggest that credit reporting systems reduce information asymmetries between borrowers and lenders, resulting in two related effects. First, creditors deny credit to individuals with problematic credit histories, thus protecting the latter from irresponsible lending (Behr and Sonnekalb, 2012; Brown and Zehnder, 2007; Niemi-Kiesiläinen

and Henrikson, 2005). Second, it has been shown that borrowers have greater incentives to repay a debt, as they know that their documented credit record will influence their future access to credit (Padilla and Pagano, 2000; Turner et al., 2009). The latter is a good example of how policies create incentives which influence the behaviour of individuals.

Such incentive effects have also been identified concerning bankruptcy regulations. For example, Fay et al. (2002) compare the costs of bankruptcy for a household in the United States with the benefits of debt relief. The authors show that households were more likely to file for bankruptcy if this increased their net financial benefit. There is also empirical evidence for Europe that indicates that the likelihood for default or late payment is higher in countries where it is more difficult for lenders to recover debt (Duygan-Bump and Grant, 2009). As these examples suggest, policies targeted at preventing or alleviating over-indebtedness reduce the probability that a household will experience over-indebtedness. Thus, the country-specific mix of such policies should help to explain cross-country variations in the number of over-indebted households.

In addition to policies that are specifically targeted to combat over-indebtedness, other policies may affect households with financial difficulties. This refers to welfare-state policies in particular. Indeed, the relevance of welfare benefits has already been demonstrated for the United States. Fisher (2005) found that, when controlling for different years and state-fixed effects as well as socio-demographic variables, a 10 percent increase in unemployment benefits led to a 2.2 percent decrease in the bankruptcy filing rate. Given that unemployment, underemployment or failed self-employment are also among the key causes leading to over-indebtedness in Europe (see above), it is likely that the welfare state's contribution towards compensating lost (or low) employment income plays an important role in explaining differences in the risk of over-indebtedness among European households. The more 'generous' a welfare state is in this respect, that is, the more fully unemployment benefits substitute employment income, the less likely it is that households in this state will experience over-indebtedness.

It may seem obvious that the level of welfare benefits clearly influences the well-being of the recipients. In contrast, the well-being of the state's population generally is affected more strongly by the institutional design of the welfare state in question (Esping-Andersen and Myles, 2009). This also applies to how individuals in a country are protected from misfortunes in the labour market. One approach to assessing 'employment regimes' is that of Gallie and Paugam (2000), who focus on the provision of unemployment benefits and the resulting dependency of an unemployed individual on his or her family. They found that Mediterranean countries form a distinct cluster characterized by low unemployment provision and a high degree of dependency on family support. At the other end of the spectrum, they identified a group of Scandinavian countries, which have generally adopted universal provision for the unemployed and, with their focus on redistribution through the welfare state, allow individuals a high degree of autonomy and independence from their families. Liberal and conservative welfare states were rather heterogeneous concerning these aspects, and harder to group.

Another approach is that taken by Bukodi and Róbert (2007), who examined the strictness of employment protection legislation among different countries and the extent to which (active) labour market policies assist in sustaining employment. They suggest that the Scandinavian countries, which are characterized by both strong employment-sustaining policies and high flexibility on the labour market, form a distinct cluster. This also applies to conservative countries, which share the strong employment-sustaining policies with the Scandinavian cluster, but have very strict employment protection legislation and thus a less flexible labour market. The remaining welfare regimes are all

characterized by weak labour market policies. Those belonging to the liberal regime allow for highly flexible labour markets, whereas Mediterranean countries are characterized by very strict employment protection legislation. Post-socialist countries fall between the latter two regimes.

Given that unemployment and a permanently low income are key explanatory causal factors of over-indebtedness, we suspect that households in countries with strong employment-sustaining policies (i.e. particularly social-democratic and conservative welfare states) and a focus on redistribution (i.e. particularly social-democratic welfare states) should have a lower risk of being over-indebted compared to households in countries with weaker employment policies (liberal, Mediterranean and post-socialist regimes) and less focus on redistribution.

Data, Variables and Methodology

For our study, we used the EU-SILC User Database 2008. This includes a special survey module on debts and financial exclusion.³ The sample used for our analysis thus contains information on more than 200,000 households from 27 European Union (EU) and European Free Trade Association countries. The macro-level variables relevant for our analysis were added to the dataset. The following section introduces the dependent and independent variables chosen for our assessment, including the data sources used for the macro-level variables.

Dependent variables

‘Material deprivation’ is one of the commonly agreed EU indicators of the social inclusion portfolio. This is determined by a household’s lack of three out of nine specified items, one of which refers to its financial inability to pay for rent, mortgage or utility bills. In the (few) cross-country comparisons on over-indebtedness published so far, this indicator has often been used as a dependent variable (e.g. Duygan-Bump and Grant, 2009; European Commission, 2008). Hence, we also operationalize over-indebtedness as comprising all households that, during the last 12 months and/or at the time of the interview, were in arrears with payments for (a) mortgage or rent, (b) utility bills, (c) hire purchase instalments or other loan payments, or (d) other non-housing bills (the latter information is only available from the 2008 module of EU-SILC).⁴ These households are henceforth referred to as ‘households in arrears’ (HIA).

For their report, ‘Towards a common operational European definition on over-indebtedness’, a group of experts examined different definitions of over-indebtedness prevalent at both European and national levels (European Commission, 2008). It identified common core elements of the concepts and

³ See the *European Community Statistics on Income and Living Conditions* (n.d.) for a detailed description and codebooks for 2008.

⁴ We use information from the European Community Statistics on Income and Living Conditions (EU-SILC), User Database, variables hs010/hs011, hs020/hs021, hs030/hs031, mi060 referring to the ‘last 12 months’ and mi065, mi075, mi085 referring to the ‘current situation’. The dataset also contains information on arrears with credit cards/store cards and on bank overdrafts. Preliminary analysis revealed that the majority of households do not hold credit cards (56%). Moreover, there is a significant difference in access to credit cards regarding income poverty and the educational level (of the head of the household). Thus, in constructing our dependent variable, we do not consider information on arrears with credit card payments or on bank overdrafts, which produced similar results.

proposed operationalizing a household as being over-indebted if it meets all of the following five criteria: (a) comparably high commitment payments push it below the poverty threshold, (b) it is in structural arrears with at least one financial commitment, (c) it considers the burden of monthly payment commitments at least ‘heavy’, (d) it considers its payment capacity at least ‘difficult’ and (e) it is unable to meet unexpected expenses (European Commission, 2008: 55).

Based on this suggestion and the availability of information in the EU-SILC dataset, we constructed a second dependent variable which is a subgroup of the first. Starting with all ‘households in arrears’, we excluded those that expect their financial situation to improve within the next 12 months. This ensures that only households with structural, or enduring, financial problems, albeit subjectively defined,⁵ are maintained. Moreover, we excluded households that did not consider the financial burden of their total housing cost *or* of repaying debts from hire purchases or loans as ‘heavy’. We also excluded households that did not perceive it as ‘difficult’ or ‘very difficult’ to make ends meet. Finally, we excluded households that claimed to have the financial capacity to face unexpected financial expenses.⁶ The remaining group of households are henceforth referred to as ‘households at risk of over-indebtedness’ (HAROI).

Independent variables

The relevance of micro-level factors for a household’s probability of experiencing over-indebtedness is well documented. As discussed earlier, critical events that reduce income or enhance expenditures are identified as one group of factors causing illiquidity. EU-SILC contains a variable that asks whether a household has experienced a major income drop within the last 12 months, and which event caused this drop. Based on the empirical evidence, we hypothesize that households that have experienced such an income shock are more likely to be over-indebted than those that have not.

In addition to ‘critical’ events, permanently low income has been identified as a key cause of illiquidity and of over-indebtedness in the long run. We include five variables reflecting relative income positions. The first is the equalized personal income of individuals. Obviously, persons with low incomes (i.e. belonging to the first income decile) can be expected to have higher odds of being over-indebted compared to individuals belonging to the fifth and, particularly, the tenth income decile. Second, we include a dummy variable indicating whether a household has earnings from assets.⁷ We assume that households without such earnings will have higher odds of being over-indebted compared to the reference group. Third, empirical evidence suggests that both lone-parent households as well as two-adult households with three or more children are more likely to be income-poor compared to other types of households (e.g. Chzhen and Bradshaw, 2012). Thus, these family forms are likely to have higher odds of being over-indebted than other family types. Fourth, we suspect, again following

⁵ Given that we utilize cross-sectional data, we cannot include longitudinal information on over-indebted households. Dynamic analyses of the European Union Statistics on Income and Living Conditions (EU-SILC) and its predecessor, the European Community Household Panel (ECHP), on households in arrears have been published, for example, for Austria (Angel and Heitzmann, 2013).

⁶ The European Community Statistics on Income and Living Conditions (EU-SILC) does not contain full information on the level of commitment payments. Thus, we are not able to meet the first criteria of the experts’ proposed definition.

⁷ Interest, dividends, profits from capital investment, income from rental of property or land.

empirical evidence,⁸ that households with a male top-earner⁹ will have lower odds of being over-indebted than households with a female top-earner. Fifth, we assume that the older the top-earner in the household, the lower the odds that this household will be over-indebted. The rationale for this assumption is that employment income usually rises with work experience and thus with age. The final variable included in the micro-level analysis (highest educational level achieved by the top-earner) mirrors the likely income position of the household in question, but may also be interpreted as a proxy for specific behaviour. We assume, again supported by a broad body of empirical evidence (e.g. Becker, 1993; Heckman, 2008), that the higher the educational level of the top-earner, the higher the household income will be and the lower the propensity to become over-indebted. Moreover, we argue that the level of financial literacy is linked to the educational level of the top-earner. We suspect that the higher the achieved educational level of the top-earner, the higher the level of financial literacy within the household and, consequently, the lower its probability of being over-indebted.

To examine the relevance of macro-level factors in explaining the probability that a household will experience over-indebtedness, we have chosen four variables that reflect country characteristics. The first two variables refer to specific policies implemented to combat over-indebtedness. The remaining two refer to other welfare-state policies.

We have screened a multitude of secondary data sources containing information on policies that attempt to combat over-indebtedness (Dubois, 2012; European Commission, 2008; Habschick et al., 2007; IFF and ZEW, 2010; Kilborn, 2011; Micklitz, 2012; Niemi, 2012; Niemi et al., 2009; Niemi-Kiesiläinen and Henrikson, 2005; Reifner et al., 2003; World Bank, 2013). However, the information available is either too limited to allow for a sensitive analysis,¹⁰ not comparable due to differences in collecting the data,¹¹ and/or only available for a small number of countries. Based on these shortcomings, we decided to include two indicators approximating the specific outputs of over-indebtedness policies.

The first variable refers to an important policy aiming to prevent over-indebtedness, that is, programmes that increase the financial literacy of citizens within a country. Some comparative information is available on the number of programmes implemented to increase financial literacy in selected countries (Habschick et al., 2007). However, these data do not allow any inferences to be made concerning the scope, quality or coverage rate of these programmes. Thus, we follow an approach adopted by Jappelli (2010) and Lo Prete (2013) and rely on information on the average level of economic literacy prevalent within countries. This indicator reflects the results of all (public and private) initiatives or programmes (including, e.g., regular courses at school) that should help improve the economic literacy of the population. Information on this indicator is collected annually and published in the World Competitiveness Yearbook of the International Institute for Management Development (IMD, 2013). To calculate the level of economic literacy within a country, interviews with

⁸ In the EU-27, women's gross hourly earnings were on average 16 percent below those of men in 2011 (data from the Eurostat database).

⁹ Defined as the household member with the highest personal income (sum of employee cash or near cash income, cash benefits or losses from self-employment, imputed money value for company car, unemployment and old-age benefits, all other social monetary benefits).

¹⁰ For example, the available data only make it possible to identify whether or not countries have implemented specific programmes without providing further information on their content, quality, scope or coverage rates (e.g. European Commission, 2008).

¹¹ For example, information on the proportion of people registered within a credit registry is available for a broad variety of countries (www.doingbusiness.org/data). Further assessment of these data shows that they differ concerning the population considered. Some countries include the total population within such registries, while others only include households/individuals with a credit history.

4000 senior business leaders from 55 countries are conducted annually. As members of the top and middle management of local or foreign enterprises, they are asked to evaluate the country in which they have lived and worked for the past year on a 0–10 scale with regard to the statement: *‘Economic literacy among the population is generally high’*. As argued by Jappelli (2010), there are two advantages to using these data. First, they allow for a consistent comparison of economic literacy across many European countries. Second, the business leaders interviewed usually work in enterprises with an international dimension and should therefore be less inclined to use country-specific response scales.

To compensate for annual variations concerning this indicator, we calculated an average value of this index based on the years 2005 to 2008. Data on ‘economic literacy’ is available for 25 of our study countries, and vary from a low of 3.03 points in Romania to a high of 7.69 points in Iceland (see Table 1). Supported by existing evidence (Dick and Jaroszek, 2013; Hilgert et al., 2003; Lusardi and Tufano, 2009; Schürz, 2006), we expect that the higher the average level of economic literacy within a country, the lower the propensity of its households to be over-indebted.

The second macro-level variable refers to an alleviative measure to successfully combat over-indebtedness, namely the extent and quality of provisions that allow for court arrangements between creditors and debtors (European Commission, 2008). To enable a sensible comparison of the different schemes available within European states (for an overview of the specific policies, see, e.g., Schönen, 2009, 2010), we rely on a clustering provided by Hoffmann (2012). Based on the information on discharge conditions in a variety of European countries which is available for 20 of the countries in our study, the first regime covers countries in which there were either no or only very strict¹² consumer debt-discharge mechanisms in place in 2008 (see also Table 1). This group mainly includes countries in Central and Eastern Europe, but also Greece, Ireland, Italy and Luxembourg. The second regime type refers to countries which allow for a partial discharge of debts. Examples include Latvia and the Czech Republic, but also Austria and Portugal. The remaining discharge regimes all allow a complete discharge of debts, although they vary in their approaches. We cluster the Nordic countries as well as Germany, the Netherlands and Belgium into one group. Finally, the policies prevalent in the United Kingdom (and France) are identified as ‘most debtor-friendly’ due to their low admission thresholds and short procedures leading to immediate discharge, and thus form a distinct regime. These countries are the most attractive destinations for relief-seeking debtors from all over Europe, as the European Insolvency Regulation (EIR, 1346/2000/EC) means a discharge granted successfully in one member state is generally recognized in the home country as well (Hoffmann, 2012: 462).

As a result, two contradicting hypotheses may be formulated regarding the likely effects of belonging to different discharge regimes, provided over-indebted households do not move to other countries for a debt discharge. First, households located in countries with no or only weak discharge mechanisms are less likely to be over-indebted if the incentive hypothesis is valid and households are unwilling to face the higher costs/difficulty of being discharged from their debts. An alternative hypothesis suggests that countries with no or only very weak discharge regimes are likely to have more over-indebted households, as their chances of escaping their debts are lowest. In other words, over time, more and more households are added to the disadvantaged group while only few households can escape (given that court arrangements to discharge of their debts are not available). As we rely on cross-sectional data in our empirical analysis, we cannot disentangle these two possible mechanisms but should be able to observe a net effect.

¹² For example, the conditions in Ireland were so strict that in 2008 only eight people went bankrupt.

The remaining two variables refer to the other welfare-state policies that are relevant for explaining differences in the propensity of households to be over-indebted. One of these reflects the ‘generosity’ of welfare states with regard to individuals receiving income security outside the labour market. The underlying concept of de-commodification has been introduced by Esping-Andersen (1990) into the welfare-state literature. Unfortunately, available data on the de-commodification index proposed by Esping-Andersen are either outdated (Scruggs, 2004) or do not include the appropriate type of information for our research interest (Scruggs et al., 2013.). Given that unemployment is a key cause of over-indebtedness, we thus rely on a summary measure representing the net replacement rate (NRR) in the case of long-term unemployment. This rate is calculated by comparing the aggregate level of welfare-state benefits paid with the level of the previous employment income. The NRR can achieve a level between 0 percent (no benefits are paid) and 100 percent (employment income is fully substituted by welfare benefits). Benefits considered in calculating this replacement rate include unemployment insurance, unemployment assistance, social assistance and housing benefit. The summary measure is calculated by considering two different levels of earnings, three family situations and 60 months of unemployment. Comparable data on this summary measure are available from the Organization for Economic Co-operation and Development (OECD) database for a broad variety of countries.¹³ For our analysis, we chose data for 2007, since most income data included in the EU-SILC module of 2008 refer to this income year. The net replacement rates for the countries in our study range from a low of 23 percent in Italy to a high of 74 percent in Norway and Denmark (see Table 1). We hypothesize that the higher the rate within a country, the less likely it is that its households will be over-indebted.

Given the relevance of employment-related explanations for over-indebtedness, the final variable reflects different employment regimes. We use the typology introduced by Gallie and Paugam (2000), extended by Bukodi and Róbert (2007), and applied by Whelan and Maître (2010), among others. We cluster our countries into five regime types (see Table 1). We differentiate between a liberal regime (Ireland, UK), a corporatist regime (Austria, Belgium, Germany and Luxembourg), a social-democratic regime (all Scandinavian countries, Iceland and the Netherlands¹⁴), a Mediterranean regime (Cyprus, Spain, Greece, Italy and Portugal) and a post-socialist regime (covering 10 countries in Central and Eastern Europe). We expect that households which form part of the social-democratic regime, with its emphasis on universalism, its high level of security regarding both labour market policies and unemployment benefits, and the high extent of labour market flexibility will have the lowest risks of being over-indebted in Europe.

--- Table 1 ---

Estimation Methods

As already discussed, we hypothesize that differences in the likelihood of over-indebtedness between countries are not only explained by micro-level factors but also by country-level factors. To account for differences between countries, we use two alternative estimation strategies.

¹³ Data retrieved from http://www.oecd.org/els/soc/GRR_EN.xlsx, 14.10.2013.

¹⁴ We follow Whelan and Maître (2010) in grouping the Netherlands to the social-democratic cluster.

First, we employ several one-step multilevel logistic regressions. For Model 1, the country-level is included by random intercepts¹⁵ (Cheslock and Rios-Aguilar, 2011; Rabe-Hesketh and Skrondal, 2012), whereas for Model 2, by country dummies. These types of regression analyses make it possible both (a) to account for similarities in observations relating to the same country and, more importantly (b) to examine to what extent the regression constants vary across countries. Models 3–6 again include countries as random intercepts. In each of these models, we include one of our four independent macro-level variables.

As a second research strategy, two-step multilevel logistic regressions are applied (Raudenbush and Bryk, 2006). This type of analysis is recommended for multilevel models in which the number of second-level groups (i.e. the number of countries analyzed) is relatively small (Bryan and Jenkins, 2013; Huber et al., 2005; Maas and Hox, 2005; Moineddin et al., 2007; Paccagnella, 2011). In a first step, the dependent variables are regressed on the micro-level variables for each country, thereby calculating intercepts. In a second step, the intercepts are then used as dependent variables and regressed on the macro-level variables.¹⁶

Results

As can be seen in the last two columns of Table 1, 11.5 percent of all households in the 27 European countries analyzed were in arrears (HIA) in 2008, and 3.5 percent were at risk of over-indebtedness (HAROI). As already indicated in the introduction, there are considerable differences between nation states. In the same year, only 3.1 percent of all households in Luxembourg were in arrears, while this applied to 34.9 percent of Bulgarian households. Denmark had the lowest proportion of HAROI with 0.7 percent, while Bulgaria remained the outlier with a rate of 14.3 percent. As discussed earlier, HAROI are a subgroup of HIA. It is interesting to note that the size of the former group as a proportion of the latter also varies between countries. In some countries, about half of all households which are in arrears with their payments are also at risk of over-indebtedness. In other countries, however, this only amounts to an eighth, while the EU-27 average is 30 percent. Obviously, in some countries, most notably in Cyprus, the Czech Republic, but also Ireland, Hungary, Portugal, the Slovak Republic, Bulgaria and Poland, being in arrears appears to be a more enduring problem than in other countries in the study. Interestingly, all countries belonging to the social-democratic employment regime group have (far) below-average levels of HAROI as a proportion of HIA.

The results of the multilevel estimations are summarized below. Table 2 contains the results of the first two multilevel logistic regressions, which include both micro-level and country-level information. For Model 1, country differences are included on the basis of random intercepts, which make it possible to determine whether country-level differences exist (Rabe-Hesketh and Skrondal, 2012: 532). The results of this, measured by the intra-class correlation coefficient (ICC), suggest that about 12 percent of the variation in both dependent variables is explained by country-level differences.

¹⁵ We use the *xtlogit* command in STATA with the default of 12 quadrature points for the log likelihood approximation. A check for 8 and 16 quadrature points was conducted via the *quadcheck* command. Test statistics did not suggest a change of the number of quadrature points (no changes of the point estimates before the fifth decimal digit).

¹⁶ For this analysis, we utilized the *edvreg* procedure in STATA (Huber et al., 2005; Lewis and Linzer, 2005), which applies a weighted least-squares estimation with robust S.E. to the data.

Regarding micro-level variables, Table 2 also reveals that almost all critical events leading to a major drop in income are associated with statistically significant higher odds of being over-indebted compared to households that have not experienced such an income decline. Factors affecting the employment or employability status of the household appear to be of the greatest importance. Furthermore, most of the coefficients for the remaining micro-level variables show the expected results. The higher the equalized income, the older the household's top-earner and the higher his/her educational level, the lower the propensity of the household to be in arrears or at risk of over-indebtedness. Moreover, a household with income from assets has a negative correlation with over-indebtedness. The data also confirm that households with a female top-earner have higher odds of being over-indebted compared to households with a male top-earner. Concerning household composition, the results suggest that those with dependent children, most notably single-parent households and households with three or more children, bear a higher risk of being over-indebted compared to the reference group, that is, one-person households. All of these results support earlier studies on over-indebtedness and appear to be robust, given that they have been confirmed for both definitions of over-indebtedness applied in our study.

For the estimation of Model 2, we included countries as dummy variables. This makes it possible to examine whether the effects of the micro-level variables on over-indebtedness change when controlled for unobservable country characteristics. The results suggest that there are some changes concerning the effects of the household-level factors. However, these changes are not substantial and even disappear when using less complex estimation procedures.¹⁷ Furthermore, and as one would expect, countries with the highest proportions of HIA and of HAROI (see Table 1) are also those with the highest odds ratios displayed in Model 2.

--- Table 2 ---

The results presented so far suggest that variations among over-indebted households across countries are indeed influenced by country-level differences. In the following, we summarize the results that explain the contribution of the four macro-level variables we have selected in explaining these differences. Methodologically, and as mentioned above, we rely on both one-step and two-step multilevel logistic regressions. Table 3 contains the results of the one-step multilevel regression models, in which the country-level variables and all of the household-level variables have been included.¹⁸ The resulting parameters show which factor changes the odds of being over-indebted if a household in a country with a certain macro setting is compared to a household in a different setting. Due to limitations of space, we only display the estimated results of the country-level parameters,¹⁹ since the parameters for the household-level variables did not change substantially between the different models and compared to the results presented in Table 2.

¹⁷ Observed differences are mainly due to the fact that in the country-dummy models it is possible to account for complex sampling by using special weights. Estimating these models without complex sampling weights results in almost identical parameters as in the random effects models.

¹⁸ Additional analyses suggested that the inclusion of control variables (we introduced the gross domestic product (GDP), the GINI index and social protection expenditures as a proportion of GDP) led to an over-specification of our models. Some of the macro-level variables chosen lost their statistical significance. Obviously, the number of 20 to 27 countries, included in our multilevel regression analyses, is too small to allow for a joint assessment of more than one macro-level indicator at the same time.

¹⁹ Complete estimation results are available from the authors upon request.

Concerning HIA, only the net replacement rate and countries belonging to the partial debt-discharge regime (compared to countries with no or very weak discharge possibilities²⁰) appear to have a significant influence on the probability of a household being in arrears. The effects of these variables are as expected: the higher the net replacement rate, the lower the odds that households in these countries will be in arrears. Similarly, households in countries with partial debt-discharge possibilities are less likely to be over-indebted (with an odds-ratio amounting to 0.431) than households with no debt-discharge possibilities. Interestingly, households in countries with full discharge possibilities have higher odds compared to countries with partial debt possibilities (0.698). Concerning debt-discharge regimes, the odds of being in arrears are indeed as high in the most debtor-friendly countries as in nations with no or only very weak discharge regimes. Even though the latter two results are not statistically significant, it appears that both hypotheses proposed above may be possible explanations for these results.

In contrast to HIA, all four macro-level indicators have a significant effect on the propensity of households to be at risk of over-indebtedness. The results suggest that an improvement of one point on the economic literacy index reduces the odds of households being at risk of over-indebtedness by approximately 18 percent. Moreover, and compared to households living in a country with no or very weak discharge mechanisms, it is particularly regimes with a partial and, even more so, a full discharge regime in which the likelihood that their households will be over-indebted is considerably lower (by approximately 50%). This result suggests that the alternative hypothesis about debt-discharge regimes given above (i.e. that households in countries with no or only weak discharge possibilities are more likely to be over-indebted as their chances of exiting over-indebtedness are smaller) appears to be more relevant than the first hypothesis. The results also confirm a significant effect of the net replacement rate. If this rate is enhanced by one percentage point, the odds of households being at risk of over-indebtedness decreases by 2.4 percent. Concerning employment regimes, LR statistics suggest that this variable does not have a significant influence on the likelihood of HAROI. However, the odds are approximately 50 percent lower for households located in countries belonging to the social-democratic group than for households in the post-socialist regime. This supports the plausibility of the hypothesis forwarded above. With the exception of the Mediterranean countries, the other regimes also display lower odds than the reference group. However, these results are not statistically significant.

--- Table 3 ---

The first step in conducting two-step multilevel logistic regressions requires estimating separate models for each of the countries in the sample. To achieve the relevant results, we include all micro-level variables into these analyses and calculate an intercept for each of the 27 countries being studied. These intercepts represent the country-specific baseline odds of being over-indebted. The second step of two-step multilevel logistic regressions requires entering the intercepts as dependent variable and the country-level variables as independent variables into a model. Following the suggestion of Bowers and Drake (2005), we illustrate the results of these estimates for each of the countries and regimes studied using graphs in Figure 1. The figure displays the associations between the estimated intercepts and the four country-level variables. Concerning HIA, there appears to be no relationship with any of the four variables analyzed. With regard to HAROI, however, it is possible to see a modest negative

²⁰ However, LR tests suggest that debt-discharge regimes as such do not have a significant influence.

relationship concerning the level of economic literacy prevalent within a country and the average level of its net replacement rate in the case of unemployment. Furthermore, households belonging to social-democratic welfare regimes and belonging to full discharge debt regimes are correlated with a lower probability of being at risk of over-indebtedness.

--- Figure 1 ---

Table 4 contains the results of the second step of the two-step logistic regression models (Models 7–10). In contrast to the one-step analysis, the parameters are in a different metric; they represent the change of the country-specific intercepts (expressed in log odds) due to a change in the macro-level variables.

Unsurprisingly, and confirming the results displayed in Figure 1, none of the four country-level variables is statistically significant concerning the group of HIA. Concerning HAROI, results suggest that the two variables which represent outcomes of policies implemented to combat over-indebtedness do not have a significant effect on the propensity of households to be over-indebted. However, the variables indicating other welfare-state policies show a significant effect. The estimated effects once more support our hypotheses: the higher the net replacement rates for the long-term unemployed, the lower the propensity of households in these countries to be at risk of over-indebtedness. Moreover, households in countries belonging to a social-democratic regime have a considerably lower propensity of being at risk of over-indebtedness compared to households in post-socialist countries. In contrast, households located in liberal, corporatist or Mediterranean welfare states do not appear to be significantly different from the reference group concerning their propensity to be over-indebted.

--- Table 4 ---

Discussion

This article aimed to examine the relevance of four country-level factors (the average level of economic literacy prevalent within a country; its classification into a specific debt-discharge regime; its affiliation to a specific employment regime; a summary measure referring to the net replacement rate in case of long-term unemployment) for explaining the large differences in the rates of over-indebted households among 27 European states. Depending on the methods chosen for our analysis and the operationalization of 'over-indebtedness', it has been possible to see that all four country-level variables are statistically significant in explaining the propensity of households to be at risk of over-indebtedness. When using a conservative estimation method, the two variables related to general welfare-state policies (the net replacement rate and employment regimes) appear to be more relevant predictors of cross-country variations than the two variables that reflect policies that are specifically designed to combat over-indebtedness (economic literacy and debt-discharge regime). This underlines the relevance of the wider social policy framework in addressing over-indebtedness.

The results of our research emphasize the importance of applying a multilevel perspective and methodology to study the phenomenon of the over-indebtedness of private households. Some findings stand out. For example, almost all of our micro-level factors (e.g. household type, educational

level of the top-earner, gender of the top-earner, households that have experienced a major income drop) are relevant predictors for the probability that a household will experience over-indebtedness. In contrast to country-level factors, moreover, these micro-level variables are relevant predictors for both HIA and HAROI. Country-level factors appear to be more relevant predictors for the smaller group of HAROI. This suggests that country variations make a difference if households face enduring financial problems. However, as the definition of HAROI includes information based on the self-evaluation of the respondents, cross-country variations may be influenced by cultural factors.

Our results also suggest that further research is needed to better understand which (micro-level and) macro-level variables explain cross-country differences in the number of over-indebted households across Europe. We have drawn on a vast variety of publications as well as secondary and primary data sources to detect information that would reflect inputs or outputs of policies targeted to combat over-indebtedness. However, we have been confronted with a lack of data for a multitude of countries, the low quality of the available data which proved inapt for our purposes or data that are not comparable across countries as that have not been collected according to the same standards. For some policies combating over-indebtedness, for example, measures concerning irresponsible lending, information does not exist at all. Unfortunately, even the data we have used are in part not of the best quality. For example, the average level of educational literacy is only calculated on the basis of interviews with business leaders within the respective countries. Consequently, due to the limitations concerning the availability of macro-level data our analysis should not be interpreted as a direct evaluation of the causal impact of certain policies. Thus, an important future research endeavour would be to identify and collect relevant macro-level data of good quality which would then be comparable across countries.

Research evidence suggests that a meso-level approach might also be relevant for explaining differences in the rate of over-indebted households across countries. For example, Barron et al.'s (2002) estimations for US counties covering the period 1993–1999 show significant (but small) increases in the number of personal bankruptcy filings after the introduction of casino gambling at the county level. This example also suggests that it would be necessary to conduct dynamic panel analyses to further examine the propensity of households to be over-indebted. This would help to rule out endogeneity problems and to better understand the ways into and out of over-indebtedness which might explain differences in the rates of over-indebted households between countries. Finally, it would be a worthwhile future research endeavour to examine and select further possible definitions and indicators to better operationalize over-indebtedness. It can thus be concluded that over-indebtedness is a social risk that is still in its infancy with regard to research, despite its prominent role in the European Commission's effort to fight poverty and social exclusion.

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Table 1: Independent country-level variables and dependent variables: descriptive sample statistics

	Independent variables				Dependent variables	
	Economic literacy (2005-2008)	Debt-discharge regimes*	Net replacement rate (2007)	Employment regimes**	HIA % of total (2008)***	HAROI % of total (2008)***
Austria	6.04	2	55	2	8.1	2.2
Belgium	5.52	3	62	2	8.5	3.0
Bulgaria	3.98	1	37	5	34.9	14.3
Cyprus	n.a.	n.a.	54	4	13.2	6.9
Czech Republic	5.15	2	50	5	4.4	2.3
Germany	5.17	3	56	2	9.0	1.5
Denmark	7.06	3	74	3	5.3	0.7
Estonia	5.85	n.a.	38	5	7.7	1.0
Spain	3.33	n.a.	51	4	6.9	2.2
Finland	6.83	3	63	3	15.7	2.6
Greece	4.59	1	28	4	24.9	7.8
Hungary	4.53	1	46	5	13.9	6.1
Ireland	6.92	1	70	1	10.4	5.0
Iceland	7.69	n.a.	56	3	14.8	2.2
Italy	3.63	1	23	4	15.1	5.8
Lithuania	3.83	1	35	5	7.7	2.0
Luxembourg	5.39	1	63	2	3.1	0.8
Latvia	n.a.	2	43	5	14.1	4.9
Netherlands	6.45	3	68	3	5.9	1.3
Norway	6.22	n.a.	74	3	9.4	1.4
Poland	3.33	1	45	5	11.8	4.7
Portugal	3.33	2	60	4	6.0	2.5
Romania	3.03	1	31	5	24.7	6.7
Sweden	6.41	3	62	3	6.2	0.9
Slovenia	3.83	n.a.	54	5	16.7	5.2
Slovak Republic	3.97	n.a.	40	5	5.1	2.1
United Kingdom	4.63	4	51	1	13.2	2.3
<i>Average of 27 countries</i>					11.5	3.5
N	25	20	27	27	27	27

Notes: HIA: households in arrears; HAROI: households at risk of over-indebtedness; n.a.: no data available; * 1 = no or very weak discharge mechanisms, 2 = partial discharge, 3 = full discharge: Scandinavian approach or German law approach, 4 = full discharge: most debtor-friendly regime; ** 1 = Liberal, 2 = Corporatist, 3 = Social Democratic, 4 = Mediterranean, 5 = Post-socialist; *** weighted frequencies.

Sources: EU-SILC 2008 (UDB); Hoffmann, 2012; OECD, 2013; IMD, 2013.

Table 2: Results (odds ratios) of one-step multilevel logistic regression models, 27 European countries, 2008, countries included as random intercepts (Model 1) and fixed effects (Model 2)

	Model 1		Model 2	
	Country = Random Intercept		Country = Fixed Effect	
	<i>HIA</i>	<i>HAROI</i>	<i>HIA</i>	<i>HAROI</i>
	Odds ratios	Odds ratios	Odds ratios	Odds ratios
Household-level factors				
Major income drop ^a				
Job loss	2.740***	2.368***	2.413***	2.275***
Change in hours worked/wages	2.407***	2.382***	2.084***	2.435***
Inability to work	3.205***	3.636***	2.850***	3.530***
Parental leave/child care	1.654***	1.916***	1.429***	1.858***
Retirement	1.210*	1.498**	0.999	1.835**
Marriage/relationship breakdown	1.855***	2.196***	1.807***	2.247***
Other change in household composition			1.714***	2.104***
Other reason	1.764***	1.903***	1.756***	1.940***
Equivalent personal income ^b				
5 th decile	0.500***	0.440***	0.537***	0.466***
10 th decile	0.220***	0.0478***	0.268***	0.054***
HH has asset income	0.500***	0.325***	0.441***	0.237***
Household type ^c (hx060)				
2 adults < 65, no dependent child	0.932*	0.945	0.901*	0.916
2 adults, at least 1 > 65, no dep. child	0.791***	0.838**	0.821***	0.828*
Other households without dep. children	1.090**	1.089	1.034	1.016
Single parent, 1+ dependent children	1.815***	1.933***	1.607***	1.747***
2 adults, 1 dependent child	1.102**	1.094	1.044	0.991
2 adults, 2 dependent children	1.022	0.903	0.965	0.872
2 adults, 3+ dependent children	1.401***	1.446***	1.250***	1.305*
Other household with dep. children	1.240***	1.133*	1.136*	1.072
Other (excl. from Laeken indicators)	1.421**	1.618*	1.284	1.609
Educational level ^d				
ISCED 2-3 of top-earner in hh	0.878***	0.818***	0.924	0.794***
ISCED 4-6 of top-earner in hh	0.688***	0.568***	0.722***	0.568***
Gender of top-earner ^e	1.124***	1.281***	1.106***	1.274***
Age of top-earner ^f				
26-35 years	0.963	0.939	0.987	1.162
36-45 years	0.780***	0.856*	0.788***	0.994
46-55 years	0.714***	0.942	0.699***	1.052
56-65 years	0.511***	0.834**	0.519***	0.938
>65 years	0.303***	0.443***	0.322***	0.498***
Countries^g				
Belgium			1.058	1.307
Bulgaria			4.618***	4.909***
Cyprus			1.204*	1.993***
Czech Republic			0.325***	0.561***
Germany			1.253**	0.737
Denmark			0.751*	0.598

Estonia			0.820*	0.370***
Spain			0.604***	0.641**
Finland			2.127***	1.104
Greece			2.905***	2.281***
Hungary			1.041	1.346*
Ireland			0.841	1.265
Iceland			1.713***	0.819
Italy			1.729***	1.834***
Lithuania			0.566***	0.440***
Luxembourg			0.341***	0.318***
Latvia			1.120	1.143
Netherlands			0.728***	0.623*
Norway			1.532***	1.301
Poland			0.964	1.194
Portugal			0.466***	0.529***
Romania			2.654***	1.917***
Sweden			0.759***	0.423***
Slovenia			1.722***	1.580**
Slovak Republic			0.378***	0.518***
United Kingdom			1.359**	0.683*
_intercept	0.384***	0.0934***	0.385***	0.105***
<i>Random effects</i>				
Est. (logged) st.dev. for random intercept	0.6658292	0.664353		
ICC	0.1187531	0.1182893		
-2LogLikelihood	-59391.325	-24379.311	-59304.64 ^h	-24308.886 ^h
R ² <i>dicho</i> /Pseudo R ²	0.18	0.32	0.15 ^h	0.18 ^h
N (households)	203653	201605	203625	201577

Note: Calculations based on EU-SILC 2008 (UDB). Odds ratios displayed. * p < 0.05, ** p < 0.01, *** p < 0.001. Sample size varies due to listwise deletion. Pseudo R² *dicho* based on Snijders and Bosker (2004: 225). Reference categories are: ^a no major drop in income, ^b 1st decile, ^c One-person household, ^d ISCED 1-2 of top-earner in household, ^e male, ^f Age of top-earner: 16-25 years, ^g Austria. Standard errors for models with country dummies are calculated using the STATA `svy` command and the complex sampling variables for EU-SILC 2008 provided at "<http://www.ua.ac.be/main.aspx?c=tim.goedeme&n=95420>" (2013-02-11) by Goedemé (2013). ^h -2log likelihood and R², however, are not available for this procedure and are thus taken from a model with cluster robust S.E but without weights.

Table 3: Results (odds ratios) of one-step multilevel logistic regression models, 27 European countries, 2008: effects of selected country-level variables on the dependent variables

	Model 3	Model 4			Model 5	Model 6			
	Economic literacy	Debt discharge regimes (Ref.: no/very weak discharge regime)			Net replacement rate	Employment regimes (Ref.: post-socialist regime)			
		Partial discharge	Full discharge	Most debtor friendly		Liberal	Corporatist	Social-democratic	Mediterranean
HIA									
Odds ratios	0.957	0.431**	0.698	1.032	0.982**	0.978	0.802	0.963	0.976
N (households)	195.177	161.136	161.136	161.136	203.653	203.653	203.653	203.653	203.653
HAROI									
Odds ratios	0.823**	0.504*^{LR}	0.466**^{LR}	0.507 ^{LR}	0.976***	0.748	0.663	0.527*	1.093
N (households)	193.129	159.237	159.237	159.237	201.605	201.605	201.605	201.605	201.605

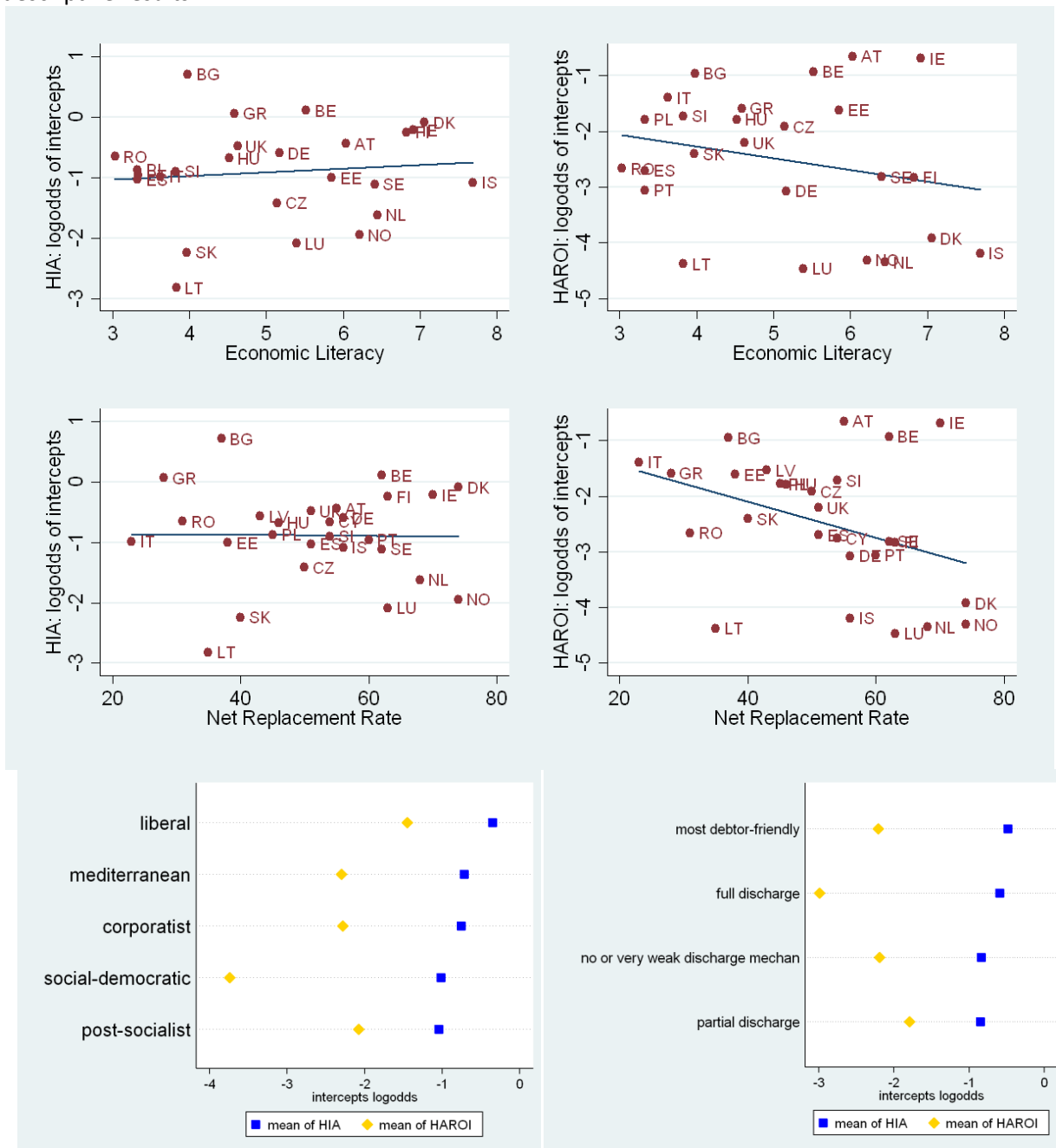
Note: EU-SILC 2008 (UDB); Hoffmann, 2012; OECD, 2013; IMD World Competitiveness Yearbooks 2005-2008. Own calculations; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. ^{LR} LR-test was significant at $p < 0.1$. HIA: households in arrears; HAROI: households at risk of over-indebtedness. All models contain micro-level variables as in Table 2 (not displayed here).

Table 4: Results (logodds) of two-step multilevel logistic regression models, 2008 (2nd step): effects of selected country-level variables on the country intercepts

	Model 7	Model 8			Model 9	Model 10			
	Economic literacy	Debt discharge regimes (Ref.: no/very weak discharge regime)			Net replacement rate	Employment regimes (Ref.: post-socialist regime)			
		Partial discharge	Full discharge	Most debtor friendly		Liberal	Corporatist	Social-democratic	Mediterranean
HIA									
Logodds	0.0421	-0.1907	0.0819	0.1887	-0.0020	0.5233	0.2910	-0.0149	0.2427
N (countries)	25	20	20	20	27	27	27	27	27
HAROI									
Logodds	-0.167	0.2356	-0.8485	-0.3489	-0.0274^b	0.3376 ^F	0.1998 ^F	-1.6569***^F	-0.1876 ^F
N (countries)	25	20	20	20	27	27	27	27	27

Note: EU-SILC 2008 (UDB); Hoffmann, 2012; OECD, 2013; IMD, 2013. Own calculations; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. ^F F-test was significant at $p < 0.5$. HIA: households in arrears; HAROI: households at risk of over-indebtedness. Models for step 1 (not displayed here) contain the same micro-level variables as in Table 2 and also account for complex sampling. 2-step estimations based on STATA *edvreg.ado*. ^b p-value for this parameter with robust S.E. is 0.14 and 0.08 without robust S.E.

Figure 1: Association of intercepts and selected country-level variables by country or regime type: descriptive results



Sources: EU-SILC 2008 (UDB); Hoffmann, 2012; OECD, 2013; IMD, 2013.

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