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The Relationship Between Sociability and Household Debt[1]

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ABSTRACT

This paper examines the influence of social interaction on household debt with using the data from the Survey of Health, Ageing and Retirement in Europe. I investigate whether sociability (participation in social activities like charity work, sport club and educational course) is related with the tendency of holding debt and the amount of debt held. For my total sample consisting of thirteen European countries, I find that sociability has sizeable positive effects on both mortgage debt and non-mortgage debt. It shows that sociable households are more likely to borrow and have greater amounts conditional on borrowing compared to the others. Nevertheless, my country-level findings present a considerable variation across countries in their social effects on debt.

***Keywords*:** Household Finance, Social Interaction, Household Debt, European Debt Crisis

Sosyallik ve Hanehalkı Borçlanması Arasındaki İlişki

ÖZ

Bu makalede sosyal ilişkilerin hanehalkı borçlanma davranışlarına olan etkisi 'Survey of Health, Ageing and Retirement in Europe' *(Avrupa Sağlık, Yaşlanma ve Emeklilik Anketi)* verileri kullanılarak incelenmiştir. Bu kapsamda borçlu olma eğiliminin ve sahip olunan borç miktarının sosyallik (hayır işi, spor kulübü ve eğitici kurs gibi sosyal aktivitelere katılım) ile bir ilişkisinin olup olmadığı araştırılmıştır. Ankette yer alan on üç Avrupa ülkesinin verileri birlikte ele alındığında, sosyalliğin hem mortgage borçlarını ve hem de mortgage dışı borçlanmaları pozitif olarak etkilediği görülmektedir. Bu durum gösteriyor ki, sosyal hanelerin borçlanma olasılıkları diğerlerine kıyasla daha yüksektir ve bu haneler eğer borçlularsa genelde daha fazla miktarda borca sahiptirler. Bu sonuçlara rağmen, sosyalliğin borçlanmaya tesirine ülkeler düzeyinde ayrı ayrı bakıldığında bazı önemli farklılıkların olduğu da tespit edilmiştir.

Anahtar Kelimeler: Hanehalkı Finansı, Sosyal Etkileşim, Hanehalkı Borcu, Avrupa Borç Krizi

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The role of social interactions in economic context has become an important area of research in recent decades. Many researchers have already examined the influence of social interaction on various kinds of economic behavior such as consumption, labor supply, entrepreneurship, bankruptcy and investment in assets. However, the emphasis on debt behavior is still novel in the literature, and this is one of the first papers to investigate social influence on debt.

There are basically two papers exploring the effect of social interaction on debt. In one of them, Georgarakos et al. (2014) analyze the Dutch data, and present that higher perceived income of peers in society is associated with greater likelihood of obtaining loans and more borrowing amounts for both collateralized and consumer loans. In the other one, Brown et al. (forthcoming), who use the British data in their analysis, report that there is positive relation between social interaction and debt holding, as well as asset holding. In my paper, for the first time in the literature, I examine social effect on household debt in an international dimension with the data from thirteen European countries.

The data used in my estimation come from the second wave of the Survey of Health, Ageing and Retirement in Europe. This wave of the survey collected data of individuals aged fifty and older from fifteen countries. These individuals were interviewed on several topics like family relations, health conditions, socio-economic status, and financial characteristics. Furthermore, they were asked the questions about their social participations and their debt holding levels, which are crucial for my analysis because the answers of these questions allow me to construct the measures for social interaction and household debt.

In my analysis, to measure the sociability of households, I construct an indicator from their participation in social activities such as voluntary works, training courses, sport clubs, and political organizations. Households are classified as *sociable* if they attend one of these social activities and as *non-sociable* if they do not attend any of them. On the other hand, the debt of households is analyzed under two types, *mortgage debt* and *non-mortgage debt*. Two indicators are constructed for each type of debt, one from the holding of debt and the other from the amount of debt held. Afterwards, I examine whether sociable households are more probably to take on mortgage debt and non-mortgage debt, and whether they borrow larger amounts of these debts.

My baseline results from pooled estimation of all countries in the sample present that the influence of social interaction on debt is positive and significant, controlling for a rich set of household characteristics including age, education, work status, health, trust, income and wealth, and also for country dummies. In specific, sociable households have a 1.6 percentage point higher probability to hold mortgage debt and a 2.7 percentage point higher probability to hold non-mortgage debt relative to

their non-sociable counterparts. Conditional on holding the relevant type of debt, sociable households have 18 percent more mortgage debt and 25 percent more non-mortgage debt than the non-sociable ones. Moreover, I find this significant positive social influence on the probability and the (conditional) amount for both mortgage and non-mortgage debt, when the frequency or the diversity of social participation is considered in my sociability measure. It is also found that the influence is stronger for more frequent and more diversified participations.

This positive impact of sociability on household debt can be through several channels. In general, people do not want to discuss their debts with others because of shame or status concern; nevertheless, if they have financial problems, then they might ask them for advice about taking loans or ask directly for loans. Although debts are not observable, people could observe the consumption, incomes or living standards of others. Therefore, they may get into debt in order to purchase what is admired from others, to match the standards in their social group, or to make conspicuous consumption. These are some plausible channels of the social impact on debt.

The causality of the positive association between sociability and debt might also be the reverse; and indebted households might prefer to participate more in social activities. Hence, to check the robustness of my results, I look at some possible ways of the reverse causality. Financially-straitened households could be more likely to engage in activities either to earn money from their engagements, or to get acquainted with rich people and borrow from them, or to meet wise people and take financial advice. These households could also be more likely to attend educational or training courses to enhance their skills for pursuing jobs. I find that my baseline results are quite robust against each of these possibilities, which supports that household debt is influenced by social interaction.

In my sample, I have thirteen countries from different regions of Europe, with a wide variation in sociability practices and debt levels. Therefore, in addition the pooled estimation, I explore the relationship between social interaction and household debt for each country in the sample. The country-by-country results display heterogeneity across countries in their social effects on mortgage debt and non-mortgage debt. There is only one country that has significant positive effect of sociability on the tendency and the size of both types of debt, which is Germany. Among the other countries, sociability has significant effects in Belgium and the Netherlands for mortgage debt, and in Sweden, Austria and Czech Republic for non-mortgage debt; whereas the rest has no significance at all.

In recent years, a number of eurozone countries have fallen into the debt crisis one after another. These countries have experienced the crisis mainly as a result of their high levels of sovereign debt. In this paper, I also investigate whether fiscally troubled

countries are more probably to exhibit borrowing behavior affected by sociability. My sample contains three of these fiscally troubled countries: Greece, Spain and Italy. The data present that these three countries do not have higher levels of household debt than the other countries. Besides, the impacts of sociability on mortgage and non-mortgage debt, contrary to the expectations, are totally insignificant for the fiscally troubled group, while those impacts are significant and sizeable for the group of non-troubled countries.

The rest of the paper is structured as follows. Section 2 reviews the existing literature on social interaction and household debt, also discusses the possible channels through which debt is influenced by sociability. In Section 3, I describe the data and explain the indicators of sociability and debt in detail. Section 4 shows the methodology used in my analysis of social influence on debt behavior; and Section 5 reports the empirical results from the estimations. Section 6 concludes.

LITERATURE

Social Interaction

The interest in social interaction has expanded into many areas of economics over the last decades. Social interaction, according to Brock et al. (2001), is the interdependencies among the decisions of people that are not mediated by markets or enforceable contracts. The beliefs, preferences and constraints faced by an economic agent are affected directly by the choices and characteristics of others in society (Durlauf et al. 2010). Therefore, many researchers have started to study the role of social interaction in explaining economic behavior.

There is a substantial literature on social influence in many different areas of economics and finance, such as consumption (Binder et al. 2001; Allenby et al. 2003), entrepreneurial activity (Giannetti et al. 2009), labor market (Grodner et al. 2011; Zenou 2013), retirement savings (Duflo et al. 2002; Beshears et al., forthcoming), stock market participation (Hong et al. 2004; Brown et al. 2008; Georgarakos et al. 2011), and bankruptcy (Miller, forthcoming). My paper contributes to this literature by exploring the influence of sociability on household debt.

To the best of my knowledge, there exist two papers analyzing the relationship between social interaction and debt holding. They find positive relations with using different datasets and different methods. On the one hand, Georgarakos et al. (2014) investigate the effect of social interaction on debt behavior for the Dutch population, emanating from the perceptions of relative standing. They show that the higher the perceived average income in the social circle is, the more the households tend to have

debt and borrow larger amounts, which is true for both collateralized and consumer (uncollateralized) debt. Besides, this positive effect is stronger for the households who perceive themselves poorer than their social circle. On the other hand, Brown et al. (forthcoming) investigate the association of social interaction with household finances (six types of assets and six types of debt) for the British population, and measures social interaction by active club membership. They find that social interaction has positive association with not only financial assets but also secured and unsecured debt, in terms of both the probability of holding and the amount held. But there are differences with respect to the magnitude of the social effects.

In my paper, the influence of social interaction on debt is analyzed in an international dimension for thirteen countries from different regions of Europe. In this analysis, to proxy the social interaction, following Hong et al. (2004) and Georgarakos et al. (2011), I create an index that is based on the participation of households into social activities (e.g. charity work, sport club and community organization). Households are distinguished between 'sociable's who participate in an activity over the last month and 'non-sociable's who do not participate in any of them. Then, I study whether the sociability of households increases their tendency to borrow and their borrowing amounts.

Social participation might influence the asset holding behavior of households through information-sharing, observational-learning or conformity-feeling of such behavior (Hong et al. 2004). However, the effect of social participation on their debt holdings is less probably to arise from these channels, because debts are usually invisible in society. People do not want their debts to be known by the others, so they prefer neither to talk about their indebtedness nor to display their debt amounts. Hence, the debts of people are mostly unobservable to the others in society. There are some other possible ways through which household debt could be influenced by social participation.

When people interact with others in social activities, they generally exhibit, discuss and observe (not their debt behavior directly, but) some other economic behaviors affecting their debt holdings, such as their consumption, incomes and living standards. Therefore, people may make conspicuous consumption so as to signal their wealth and to enhance their status in the social group (Veblen 1899). They often incur debts for financing (at least some part of) this consumption, since they want to represent themselves better than how actually they are and to advance in social ranking (Becker et al. 2006). Moreover, people usually try to imitate the spending or living standards of their social group (with feeling pressure or desire), which might probably lead to borrowing, especially when they perceive their social group to have higher wealth or income (Georgarakos et al. 2014). Besides, people may admire some of the

consumption of the others around them, and purchase the same things for themselves. Their extra purchases may result in taking on debts. These three ways show that social comparison could be important for debt behavior. On the other hand, even though people do not want to discuss debt issues, they might get information from the others about the social norms and values on holding debt; and when they face with financial difficulties, they might ask advice from their financially informed friends about how to take out formal or informal debts. Thus, information-sharing is still a possible way of the social influence on borrowing. In such hard times, people may also directly ask to borrow from their wealthy friends. Consequently, the participation in activities could increase household debt through some of these channels.

Household Debt

Demand for household debt arises either in a planned or in an unplanned way. According to Lilico (2010), households mostly plan to take up loans in order to smooth their consumption over their life-cycles or to make investment in consumer durables (like houses and cars) and human capital, whereas they might also take up unplanned loans as a result of an unexpected unemployment, a temporary drop in income or a sudden additional cost. For these different purposes, households incur different kinds of debt to finance their needs: informal debts from their family and friends, mortgages and other types of collateralized debts, or uncollateralized consumer debts such as private loans, checking account overdrafts and credit card balances (Bertola et al. 2007).

The factors influencing household debt are studied by many researchers theoretically and empirically. Cox et al. (1993), using the U.S. data, present that the demand for debt rises until the mid-thirties of household head and then declines steadily; besides it increases with permanent earnings and net worth, while decreases with current income. Del Rio et al. (2006) examine the determinants of unsecured debt for British households, and report that both the probability of having debt and the amount borrowed are affected positively by education and income, but negatively by retirement. Livingstone et al. (1992) also investigate the U.K. data, and propose that socio-demographic factors have relatively small effect on personal debt; instead attitudes towards debt play crucial role. Using the Greek data, Mitrakos et al. (2009) find the probability of a household having a loan is positively associated with education of household head, number of members in employment, income and net wealth. Magri (2002) analyzes the determinants of debt in Italy, and shows that income is more important factor of debt-market participation than net wealth. He finds that residence area is also important; and living in very small municipalities decreases loan demand.

Crook (2001) looks at the U.S. data, and reports that demand for debt is positively correlated to working head, family size, current income and home ownership; but negatively to risk aversion and net worth. Yılmazer et al. (2005), with also using the U.S. data, present a negative effect of financial assets on the likelihood of having debt and on the amount of debt compared to total assets, and a positive effect of non-financial assets on those for only secured debt. Furthermore, Lea et al. (1993) present that economic conditions strongly affect debt; nevertheless, psychological and social factors are also important determinants of debt.

In this paper, I examine whether household debt –the tendency of households to hold debt and the outstanding amount of debt held– is influenced by social interaction, controlling for all these factors such as age, education, employment, risk attitude, residence, income and wealth, with using the data from European countries. Moreover, household debt is explored under two subgroups, mortgage and non-mortgage, because they have different determinants and different properties.

DATA

Sample

My analysis is based on the Survey of Health, Ageing and Retirement in Europe (SHARE), which is a multi-disciplinary and cross-national survey collecting micro data of individuals aged fifty and above, and their spouses or partners.[2] The survey contains information upon demographics, socio-economic characteristics, health behavior, family and social relations, and financial situation.[3] Baseline study of SHARE, the first wave, was conducted in 2004-05 to eleven countries from different regions in Europe: Central Europe (Austria, Germany, the Netherlands, France, Switzerland, and Belgium), Scandinavia (Sweden and Denmark), and the Mediterranean (Spain, Italy, and Greece). Israel also joined SHARE as the first country from Middle East and provided data in 2005-06. The second wave of the survey was carried out in 2006-07

2 This paper uses data from SHARE wave 4 release 1.1.1, as of March 28th 2013(DOI: 10.6103/SHARE.w4.111) or SHARE wave 1 and 2 release 2.6.0, as of November 29 2013 (DOI: 10.6103/SHARE.w1.260 and 10. 6103/SHARE.w2.260) or SHARELIFE release 1, as of November 24th 2010 (DOI: 10.6103/SHARE.w3.100). The SHARE data collection has been primarily funded by the European Commission through the 5th Framework Programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5- CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th Framework Programme (SHARE-PREP, N° 211909, SHARE-LEAP, N° 227822 and SHARE M4, N° 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG-4553-01, IAG BSR06-11 and OGHA 04-064) and the German Ministry of Education and Research as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).

3 More detailed information can be found in Börch-Supan et al. (2008) and Börch-Supan et al. (2013).

in fourteen European countries with three new participants: Czech Republic, Poland and Ireland. Israel contributed data to the second wave in 2009-10. The third wave, SHARELIFE, was conducted to these countries (excluding Ireland and Israel) in 2008-09; however, different than the first two waves, its data collection focused on the life histories of the respondents. Recently, SHARE released its fourth wave which took place in 2011-12 in previous twelve countries (except Greece) and new four ones: Estonia, Hungary, Portugal, and Slovenia.

In my paper, I get the data from Release 2.6.0 of the second wave of SHARE to address my question whether social interaction has a significant effect on household debt in Europe. Detailed information on debts of the respondents and their social participations is available in all waves of SHARE but the third one. I prefer to work with the second wave of the survey in my analysis rather than the first one, since it comprises more countries and surveys with a larger number of individuals; and rather than the fourth one, because its time period (2006-07) enables to investigate the behavior of respondents shortly before the sovereign debt crisis in Europe, so in a good and stable economy. The second wave of SHARE includes data from 25,036 households from fifteen countries. But the households with missing information on (imputed) debt amounts, social activities and survey weights are excluded. Then, my baseline sample becomes 16,919 households from thirteen European countries: Austria, Germany, the Netherlands, France, Switzerland, Belgium, Sweden, Denmark, Spain, Italy, Greece, Czech Republic, and Poland.[4]

Indicators of Household Debt

I examine household debt under two categories, mortgage debt and non-mortgage debt; since mortgage debt has different determinants and characteristics than other kinds of debts. My debt indicators are obtained from the multiply imputed dataset of SHARE; therefore, I have not only the revealed amounts of debts but also the reliable multiple guesses for the missing values. Mortgage debt includes all mortgages and loans on household's primary residence; whereas non-mortgage debt involves in all other debts of household different than mortgage debt, such as debt on cars, overdue bills, debt on credit cards, loan from banks or financial institutions, and debt to relatives or friends.

4 My debt indicators are constructed from imputed variables ("hmortv" for mortgage debt and "hliabv" for non-mortgage debt); therefore, I exclude the respondents who do not have imputations from baseline sample. Ireland is lost during this exclusion. My main sociability indicator is obtained from the question of "activities in last month", and the respondents who have missing information on that question or refused to answer or answered as 'don't know' are also dropped from the sample. This paper analyzes the effect of sociability on household debt within Europe; thereby Israel is not included in the analysis.

Table 1 and Table 2 report descriptive statistics on the prevalence and the outstanding amounts of mortgage debt and of non-mortgage debt, respectively, for each country in my sample. The data is weighted; and all the amounts are in PPP-adjusted Euros. These statistics suggest a considerable variation in both the fraction of debt holders and the levels of debt holdings within Europe. Especially, in the debt-holding rates, the range of variation is much larger for mortgage debt. The heterogeneity in household debt across EU members (in terms of absolute volumes, relative to sizes of economies, and compositions) is also presented by Lilico (2010) in his paper prepared for European Parliament.

Table 1 shows that the prevalence of mortgage debt is highest in Denmark, Switzerland, the Netherlands and Sweden; and nearly half of their households have mortgages on primary residences. The other nine countries in the sample have much lower fractions of mortgagers relative to these four countries, about one fourth of them on average. The lowest prevalence is in Poland; only 1.4% of its households hold mortgage debt. Poland also has the second lowest median (50th perc.) conditional outstanding amount in mortgage debt, around 12,000 euro, after Czech Republic, almost 5,000 euro. On the other hand, countries with largest fractions also have greatest median debt amounts. Particularly, Switzerland has much higher median amount of mortgage debt, around 113,000 euro, than all the other countries, roughly 39,000 euro in total.

Table 1: Prevalence and Amounts of Mortgage Debt by Country

Country	Number of Observations	Prevalence	Conditional Amounts Outstanding			
			Average	25th perc.	50th perc.	75th perc.
Sweden	1,524	44.76 %	51,839	17,412	36,630	65,147
Denmark	987	49.23 %	75,553	28,877	57,668	90,082
Germany	1,251	14.58 %	54,173	16,867	35,803	75,041
Netherlands	1,395	46.10 %	99,253	34,167	72,458	134,163
Belgium	1,608	13.26 %	24,343	4,898	14,795	36,725
France	1,633	12.23 %	46,927	11,873	25,146	51,843
Switzerland	1,064	47.29 %	141,943	53,344	113,110	173,053
Austria	874	9.52 %	35,237	4,809	16,887	49,162
Italy	1,437	6.06 %	44,290	14,429	28,858	60,938
Spain	956	9.29 %	132,301	10,322	25,600	66,306
Greece	1,687	5.59 %	31,294	7,493	19,503	45,991
Czech R.	1,267	5.99 %	11,902	1,997	4,978	21,254
Poland	1,236	1.43 %	18,234	1,453	12,248	29,186
Total	16,919	13.65 %	69,609	14,747	38,851	83,683

Note: Data from SHARE 2006-07. Reported statistics are weighted and corrected for multiple imputations. All amounts are in PPP-adjusted Euros.

Table 2: Prevalence and Amounts of Non-Mortgage Debt by Country

Country	Number of Observations	Prevalence	Conditional Amounts Outstanding			
			Average	25th perc.	50th perc.	75th perc.
Sweden	1,524	34.34 %	41,127	8,993	26,909	55,360
Denmark	987	25.05 %	52,165	4,946	12,390	39,730
Germany	1,251	14.60 %	33,471	3,303	13,162	34,247
Netherlands	1,395	11.25 %	33,969	2,055	7,823	41,040
Belgium	1,608	14.12 %	21,116	1,096	5,393	15,725
France	1,633	28.43 %	23,655	2,029	6,279	16,622
Switzerland	1,064	11.30 %	187,089	6,810	90,128	171,004
Austria	874	13.52 %	26,460	4,513	13,372	32,272
Italy	1,437	11.69 %	14,536	2,398	5,772	12,505
Spain	956	11.41 %	19,303	3,546	9,400	25,147
Greece	1,687	15.06 %	24,481	2,305	7,236	17,784
Czech R.	1,267	14.37 %	6,552	1,329	3,346	7,601
Poland	1,236	19.80 %	3,473	506	1,456	3,140
Total	16,919	17.03 %	25,958	1,961	6,923	21,082

Note: Data from SHARE 2006-07. Reported statistics are weighted and corrected for multiple imputations. All amounts are in PPP-adjusted Euros.

Table 2 presents that the fraction of non-mortgage debt is largest in Sweden –about one third of the Swedish are indebted– that is followed by France with 28%, Denmark with 25% and Poland with 20% indebted households. The prevalence in other countries is between 11% and 15%. The conditional amounts of the non-mortgage debt holding of countries are not in line with their fractions. Median conditional outstanding amount for entire sample is nearly 7,000 euro. Nevertheless, Switzerland, as in mortgage debt, has the greatest median amount in non-mortgage debt, above 90,000 euro, in spite of its small prevalence, 11%. Contrarily, Poland has the lowest median amount, below 1,500 euro, although it is one of the countries with the highest fraction of households holding non-mortgage debt.

Europe has been experiencing a debt crisis in recent years particularly as a result of the large budget deficits and huge public debts of some eurozone countries. European sovereign debt crisis was triggered by Greece in May 2010; and then followed by other countries one after another: Ireland, Portugal, Spain, Italy and Southern Cyprus. Besides,

the whole Europe has been influenced from this crisis more or less. My sample includes three of these countries facing with the recent debt crisis which are Greece, Spain and Italy. When a country runs into a debt crisis, it is generally perceived as larger fraction of its households also has debt with higher amounts. However, my data shows that this perception is not right. It can be explicitly seen from Table 1 and Table 2 that these three fiscally-troubled countries have neither larger fractions nor higher conditional median amounts of mortgage or non-mortgage debt.[5] All in all, unlike their governments, households in the countries experiencing this debt crisis are not over-indebted.

INDICATOR OF SOCIAL INTERACTION

When creating an indicator of social interaction, I use the way similar to the one suggested by Hong et al. (2004). They measure the social interaction in their paper with the involvement in social activities, and separate households into two categories: 'socials' who interact with their neighbors or attend church, and 'non-socials' who do not. Therefore, in this paper, I also use the participation of households in social activities to construct my sociability indicator; and SHARE provides the necessary information with asking the following question which allows for multiple answers:

"Have you done any of these activities in the last month?"

The answer categories taken into consideration are[6]:

"*1. Done voluntary or charity work*

4. Attended an educational or training course

5. Gone to a sport, social or other kind of club

7. Taken part in a political or community-related organization"

If a respondent in household has done at least one of these four activities over the last month of the question asked, then the household is classified as "sociable"; and otherwise, as "non-sociable".

5 My data on household debt was collected in 2006-07; however, recent European sovereign debt crisis has arisen in 2010. Nonetheless, Greece and Italy had the highest debt-to-GDP ratios even in 2007. The government gross debt in 2007 is 107.4% of GDP for Greece, 103.3% for Italy, and 36.3% for Spain. (Eurostat, "General Government Gross Debt", http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language =en&pcode=tsdde410 (24.4.2014)).

6 In the survey, this question asks seven types of social activities to the respondents. Following Georgarakos et al. (2011), three of them are not included in my sociability indicator: *"2. Cared for a sick or disabled adult"*, *"3. Provided help to friends or neighbors"* and *"6. Taken part in activities of a religious organization (church, synagogue, mosque, etc.)"*. First two activities are omitted because they may not be related with the sociability of households, rather they might capture the households' financial situation. Moreover, the third one is omitted because of the inconsistency in asking the question. In some countries, as a result of differences in translation, the question on participation in religious organizations addressed as participation in church services, which could result in inconsistency.

Table 3: Prevalence of Sociability and Each Social Activity by Country

Country	Number of Observations	Sociability Indicator	Participation in Social Activities			
			Voluntary or charity work	Educational or training course	Social, sport or other kind of club	Political or community organization
Sweden	1,524	57.28 %	26.41 %	26.04 %	32.13 %	5.89 %
Denmark	987	65.17 %	28.84 %	17.82 %	48.92 %	6.45 %
Germany	1,251	43.91 %	18.52 %	7.93 %	32.05 %	4.39 %
Netherlands	1,395	55.32 %	29.55 %	11.45 %	37.49 %	4.65 %
Belgium	1,608	49.70 %	22.74 %	15.04 %	29.14 %	11.30 %
France	1,633	43.43 %	19.65 %	6.45 %	28.81 %	7.81 %
Switzerland	1,064	57.59 %	22.22 %	20.96 %	41.32 %	11.25 %
Austria	874	33.83 %	11.65 %	6.00 %	22.19 %	5.88 %
Italy	1,437	20.51 %	11.53 %	1.88 %	10.18 %	2.84 %
Spain	956	17.51 %	3.57 %	4.98 %	10.79 %	2.68 %
Greece	1,687	17.69 %	2.89 %	3.82 %	9.18 %	4.94 %
Czech R.	1,267	27.06 %	4.40 %	7.84 %	18.59 %	3.59 %
Poland	1,236	8.47 %	2.33 %	2.41 %	3.29 %	2.61 %
Total	16,919	33.88 %	14.43 %	6.91 %	22.16 %	4.82 %

Note: Data from SHARE 2006-07. Reported statistics are weighted.

Table 3 presents the prevalence of sociability and the participation rates of each of the four activities. In the pooled sample, around one third of European households are sociable; besides, there is significant heterogeneity in sociability rates among countries, but especially among regions. The highest fractions of sociable households exist in Scandinavian countries, Denmark (65.2%) and Sweden (57.3%); and then in Central European countries, Switzerland (57.6%), the Netherlands, Belgium, Germany, France and Austria (33.8%), respectively. On the other hand, East Europe (Czech Republic and Poland) and the Mediterranean (Italy, Spain and Greece) have much lower fractions of sociable households. In Mediterranean countries, the sociability rates range between 17.5% and 20.5%. Although Czech Republic has higher fraction than the Mediterranean ones, the lowest fraction of sociable households among all countries is in Poland with 8.5%. According to Table 3, the prevalence of social participation differs considerably across four activities and across countries for each activity. Moreover, regional differentiation seems to appear also in these activities, as in sociability indicator.

From Table 3, it could be seen that there are remarkable differences in the fractions of sociability and in the participation rates of social activities between regions within Europe. In addition to this, Mediterranean countries, where people generally consider themselves rather sociable, have pretty low sociability levels on the basis of my indicator. Hence, a possibility arises that the four activities defining my indicator may capture the different extents of social behavior for different countries, and so may not capture the same type of sociability for all countries. These activities might be widespread among Scandinavian and Central European households, while the Mediterranean and East European households might prefer to socialize with other kinds of activities, like going to taverns or bars, attending concerts or theaters, and taking part in neighbor meetings. Thus, my indicator of social interaction could be culturally biased, so the results of my analysis should be considered with the caveat that a cultural bias might exist. In spite of all these possibilities, the activities taken into my sociability indicator gives a general idea about the social behavior of households.

METHOD

I examine the effect of social interaction on household debt by estimating a number of probit and tobit models, in which dependent variables are the decision of holding debt and the (log) amount of debt held, respectively. In each model, the relevant debt variable is regressed on sociability variable, controlling for a broad set of demographic, socio-economic, personal and financial characteristics of household, and country dummies. In these estimations, I use the multiple imputation method, since my debt indicators (and also some of my control variables) are constructed from multiply imputed dataset. The coefficients calculated in probit and tobit models cannot be interpreted directly, therefore, I estimate and report the average marginal effects for probit models, and the average marginal effects conditional on borrowing for tobit models. The estimated marginal effects are averaged across households with using calibrated survey weights.

The object of interest in my estimations as an explanatory variable of debt behavior is household sociability, which is a binary variable showing the involvement in social activities discussed before: educational/training course, voluntary/charity work, political/community organization, and sport/social/other kind of club. Hence, there are two kinds of households, and also debtors: sociable and non-sociable. Sociable households have at least one member having involved in one (or more) of these social activities in the previous month, whereas the members of non-sociable households have not involved in any of the activities.[7]

7 It is assumed that every member of the household share all kinds of information with the other members. For example, they come together at dinner table and talk to each other about their days.

Household debt, the dependent variable in my analysis, is studied under two types, as mentioned above: mortgage debt and non-mortgage debt. I investigate these two debt types separately with probit and tobit models. In the probit specifications, the dependent variable is a dummy variable taking value 1 if household holds the debt type examined and 0 otherwise. Therefore, I explore, with probit regressions, whether sociable households are more likely to have mortgage or non-mortgage debts than non-sociable ones. In the tobit specifications, the dependent variable is the outstanding amount of the debt type under examination, which is a continuous variable but above its corner solution (zero debt holding). These continuous debt variables are used through the inverse hyperbolic sine (IHS) transformation which allows for non-linear effects of the variables and preserves all observations even the non-positive ones.[8] Thus, with tobit regressions, I explore whether sociable debtors have more mortgage debt or non-mortgage debt than their non-sociable counterparts.

When examining the effect of social interaction on household debt, I include a rich set of control variables into regressions: demographics, socio-economic status, health condition, personal traits and pecuniary characteristics of households, and country dummies. Detailed descriptions on these variables and their descriptive statistics for total sample are reported in Table 4.

Table 4: Sample Summary Statistics

Variable		Number of Observations	Mean (*Median)	Standard Deviation
Age	average age of the respondents in household, or age of the respondent if he is alone	16,919	65.81	10.62
Couple	=1 if respondent is married or lives with his partner	16,838	0.65	0.48
Household Size	number of people in household	16,919	2.22	1.17
High School Education	=1 if maximum education level of the respondents in household is high school degree, and none of them has any post-secondary education	16,919	0.34	0.47
College Education	=1 if maximum education level of the respondents in household is at least post-secondary education	16,919	0.25	0.43

8 The formula for the "inverse hyperbolic sine transformation" is: $\sinh^{-1}(y)\ \ln(y^2|1)^{1/2}|$. It is like a logarithmic transformation; but it is also defined for zero and negative values. More information on the IHS transformation can be found in Burbidge et al. (1988) and Pence (2006).

Retired	=1 if respondents in household are retire	16,916	0.55	0.50
Working	=1 if a respondent in household is still working	16,916	0.31	0.46
Poor/Fair Health	=1 if a respondent in household reports that his health is fair or poor	16,919	0.49	0.50
Number of ADLs	total number of limitations in activities of daily living that the respondents in household face with (ADL: dressing, walking across a room, bathing, eating, getting in and out bed, using the toilet)	16,919	0.33	0.95
Risk Tolerance	=1 if a respondent in household reports that he is willing to take more than average financial risks in expectation of more than average returns	16,919	0.04	0.19
Trust	maximum trust level of the respondents in household, or trust level of the respondent if he is alone (trust level is on a scale from 0 to 10)	16,779	5.67	2.51
Good Future	=1 if a respondent in household feels often that future looks good	16,677	0.38	0.49
City	=1 if household lives in a big city	16,919	0.15	0.36
Total Income	total income of household from all sources	16,919	* 20,087	32,714
Net Financial Wealth	total current value of all real assets of household minus total value of mortgage debt	16,919	* 9,250	159,569
Net Real Wealth	total current value of all financial assets of household minus total value of non-mortgage debt	16,919	* 138,783	540,465

Note: Data from SHARE 2006-07. Reported statistics are weighted; besides for relevant variables, corrected for multiple imputations. All amounts are in PPP-adjusted Euros. Averages are shown for age, household size, number of ADLs, and trust; while medians are reported for total income, net financial wealth, and net real wealth. For the remaining variables, the fractions of households having that characteristic are presented.

Demographic and socio-economic characteristics are likely to affect social interaction and debt. As demographics, my regressions contain age (through a second order polynomial), marital status and household size. Table 4 presents that, in my pooled sample, average age of households is roughly 65.8 –note that the data is from respondents fifty and more. 65 percent of households are couple who are married or living together with their partners; and average household size is 2.22. On the other hand, socio-economic status comprises education levels and labor market status. The fraction of households having high school education (at most) is 34 percent; and having college education is 25 percent. Other households either do not have any education, or have less than high school education or other kind of education. In pooled sample, 55 percent of households are retired; 31 percent are working; and the rest is inactive or unemployed.

Health status of households might have an influence on their debt holdings and social participations. Nearly half of the households in total sample report that they have poor or fair health; and average number of the limitations in activities of daily living is 0.33. Moreover, the engagement in social activities could also be related with some personal characteristics such as attitude towards risk, trust level and expectation about future, which are probably to influence the indebtedness of households. In my sample, only a small fraction of households, 4 percent, have risk tolerance; and average level of trust is 5.67 (out of 10). The fraction of households who often feel that the future looks good for them is 38 percent. In addition, I take into account the residence area of households that may affect their social interactions and debts. In total sample, 15 percent of households live in a big city, and others live in suburbs, town or rural.

Pecuniary characteristics are highly associated with the decision of borrowing and its amount; and they might also impact social involvement. To control the financial situation of households, I include three measures into the regressions: total income, net financial wealth and net real wealth –which are used through IHS transformation. The median amount of total income is around 20,000 euro; that of net financial wealth is roughly 10,000 euro; and that of net real wealth is some less than 140,000 euro.

My pooled sample includes thirteen European countries with very different social and institutional structures. The heterogeneity is also there in their separate descriptive statistics. Hence, in addition to the household characteristics, I incorporate country dummies into the pooled sample estimations to pick up country specific factors that are likely to influence the tendency to have debt and the amount of debt held. These factors might be the social norms on indebtedness, the lending practices of banks (on credit cards or mortgages), the rules on bankruptcy and the legal environment. Besides, these country dummies could pick up the differences in sociability levels between countries discussed before.

EMPIRICAL RESULTS

In this section of my paper, I initially talk about the baseline empirical results from probit and tobit regressions on my total sample. Next, I check the robustness of my sociability indicator by focusing on the extensity and the intensity of social relations. Afterwards, I discuss the possibility of reverse causality from debt to sociability, so apply various specifications to analyze the robustness of the baseline findings. Then, I look at the effect of social interaction on debt for each country in my sample with separate regressions. Lastly, I explore the fiscally troubled countries as a group to see whether the social influence on debt is different for them than for the non-troubled group.

Baseline Effects of Sociability on Household Debt

In the baseline study, I make my estimations on the pooled sample consisting of data from thirteen countries. The debt variable, the decision of indebtedness in probit models and the outstanding amount of debt in tobit models, is regressed on sociability variable and a number of control variables including household characteristics and country dummies. The results are reported for mortgage debt in Table 5 and for non-mortgage debt in Table 6. They show the average marginal effects from probit regressions and the average marginal effects conditional on debt holding from tobit regressions, their (robust) standard errors and significance levels. My baseline findings propose a positive, statistically significant and economically important role of sociability for both mortgage and non-mortgage debt.

Table 5 presents the results for mortgage debt. The marginal effect of sociability on the probability of having mortgage debt is 0.0155, and its significance is at 1% level. It implies that sociable households are 1.6 percentage points more likely to take mortgages compared to the others in society. This positive and significant influence of sociability continues when the amounts are taken into consideration. The estimated marginal effect of sociability on the log amount of mortgage debt conditional on having such debt is 0.1773, and it is also significant at 1% level. That is, sociable mortgagors borrow roughly 18 percent more than their non-sociable counterparts.

According to Table 5, the estimated impacts of my control variables for mortgage debt are generally as anticipated. The signs of their marginal effects and the levels of significances are mostly same in probit and tobit regressions; therefore, they are related with the likelihood and the conditional amount of mortgage debt in the similar way.

Table 5: Effect of Sociability on Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Sociability	0.0155	0.0047	***	0.1773	0.0547	***
Age	-0.0063	0.0034	*	-0.0516	0.0390	
Age Squared	0.0000	0.0000		-0.0001	0.0003	
Couple	0.0128	0.0065	**	0.1306	0.0772	*
Household Size	0.0066	0.0029	**	0.0876	0.0341	**
High School Education	0.0249	0.0059	***	0.3229	0.0700	***
College Education	0.0388	0.0063	***	0.4936	0.0734	***
Retired	-0.0086	0.0086		-0.1094	0.1018	
Working	0.0339	0.0082	***	0.3784	0.0964	***
Poor/Fair Health	-0.0049	0.0051		-0.0752	0.0592	
Number of ADLs	0.0000	0.0038		-0.0051	0.0473	
Risk Tolerance	0.0040	0.0083		0.0269	0.0857	
Trust	0.0011	0.0010		0.0141	0.0125	
Good Future	0.0090	0.0049	*	0.1077	0.0569	*
City	-0.0326	0.0072	***	-0.3694	0.0855	***
Total Income	0.0076	0.0024	***	0.0915	0.0293	***
Net Financial Wealth	-0.0046	0.0004	***	-0.0514	0.0038	***
Net Real Wealth	0.0203	0.0019	***	0.2458	0.0237	***
Sweden	0.1713	0.0092	***	2.0299	0.1132	***
Denmark	0.1817	0.0099	***	2.1287	0.1153	***
Netherlands	0.1891	0.0087	***	2.2760	0.1067	***
Belgium	-0.0170	0.0106		-0.2909	0.1344	**
France	-0.0392	0.0113	***	-0.4938	0.1446	***
Switzerland	0.1789	0.0098	***	2.2135	0.1165	***
Austria	-0.0353	0.0139	**	-0.5316	0.1788	***
Italy	-0.0867	0.0131	***	-1.1462	0.1702	***
Spain	-0.0278	0.0137	**	-0.3749	0.1765	**
Greece	-0.1129	0.0131	***	-1.4688	0.1621	***
Czech Republic	-0.0975	0.0141	***	-1.3688	0.1796	***
Poland	-0.1904	0.0200	***	-2.5844	0.2548	***
Number of Observations	16,518			16,518		

Note: Data from SHARE 2006-07. Dependent variable is mortgage debt. Independent variables are sociability; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth; and country dummies in comparison to Germany. Marginal effect models the probability of having mortgage debt in probit regression, and the log amount of mortgage debt conditional on having that debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

Among demographics, age has significant negative effect only on the probability of having mortgage debt, while being couple and household size have positive effects on both the likelihood and the outstanding amount. Socio-economic characteristics are very influential for mortgage debt. The sizeable influences of high school education, college education and working are positive and highly significant. In addition to these, living in a big city has strong negative relation with holding mortgages, and expecting good future has positive relation. My findings show that pecuniary variables are also important determinants of mortgage debt. With high significance levels, income and net real wealth are positively associated, and net financial wealth is negatively associated. Any other household variables such as trust, risk tolerance, and health measures are totally insignificant in the regressions. The marginal effects of country dummies represent variation in mortgage debt across countries, and mainly they are consistent with the statistics shown in Table 1.

Table 6 reports the results for non-mortgage debt. The marginal effect of sociability is 0.0273 on the likelihood of holding non-mortgage debt, and that has 1% significance level. It suggests that sociable households have 2.7 percentage points higher probability to incur non-mortgage debt than non-sociable others. I estimate the average marginal effect of sociability for the conditional outstanding amount of non-mortgage debt as 0.2492, which is statistically significant also at 1% level. This implies that sociable households with non-mortgage debt borrow around 25 percent greater amounts than the other non-mortgage debtors. From these results, it is explicitly seen that the effect of social interaction for non-mortgage debt is much higher than for mortgage debt.

The estimated impacts of control variables on non-mortgage debt, shown in Table 6, are somewhat different from their impacts on mortgage debt explained above. These influences on non-mortgage debt, which are similar for probit and tobit models, are mainly as expected and in keeping with the previous researches. As in the mortgage debt, financial characteristics have significant association with non-mortgage debt; however, the negative marginal effects of net financial wealth are larger, and the positive effects of net real wealth are much smaller. Moreover, the probability and the amount of holding non-mortgage debt are also positively correlated to both education types and working. Unlike the mortgage debt, my results report highly significant positive influence of risk tolerance on non-mortgage debt. On the contrary, demographics like age, couple and household size become insignificant when non-mortgage debt is considered. Living in a city and expecting good future are also no longer significant. Additionally, similar to the mortgage debt, being retired, trust level, and health status are not significant for non-mortgage debt. The estimated effects of the country dummies change as expected and consistently with the reported statistics in Table 2.

Table 6: Effect of Sociability on Non-Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Sociability	0.0273	0.0055	***	0.2492	0.0589	***
Age	-0.0004	0.0036		0.0361	0.0393	
Age Squared	-0.0001	0.0000	*	-0.0008	0.0003	***
Couple	0.0097	0.0064		0.1128	0.0705	
Household Size	0.0011	0.0026		0.0193	0.0282	
High School Education	0.0303	0.0066	***	0.3164	0.0704	***
College Education	0.0478	0.0071	***	0.4895	0.0755	***
Retired	0.0051	0.0086		0.0361	0.0932	
Working	0.0347	0.0089	***	0.3709	0.0948	***
Poor/Fair Health	0.0073	0.0054		0.0740	0.0583	
Number of ADLs	0.0046	0.0033		0.0563	0.0346	
Risk Tolerance	0.0363	0.0096	***	0.4061	0.1042	***
Trust	-0.0005	0.0010		-0.0078	0.0112	
Good Future	-0.0016	0.0055		-0.0318	0.0597	
City	0.0014	0.0072		0.0128	0.0780	
Total Income	0.0087	0.0020	***	0.0792	0.0203	***
Net Financial Wealth	-0.0206	0.0004	***	-0.1911	0.0026	***
Net Real Wealth	0.0013	0.0007	**	0.0148	0.0072	**
Sweden	0.1187	0.0113	***	1.2282	0.1301	***
Denmark	0.0780	0.0128	***	0.8878	0.1417	***
Netherlands	-0.0111	0.0137		-0.1526	0.1528	
Belgium	0.0325	0.0119	***	0.2788	0.1354	**
France	0.1143	0.0116	***	1.1861	0.1275	***
Switzerland	-0.0307	0.0157	*	-0.3123	0.1657	*
Austria	-0.0194	0.0145		-0.1563	0.1575	
Italy	-0.0248	0.0137	*	-0.2255	0.1492	
Spain	-0.0297	0.0156	*	-0.2778	0.1704	
Greece	-0.0882	0.0140	***	-0.7433	0.1436	***
Czech Republic	-0.0547	0.0135	***	-0.5543	0.1460	***
Poland	-0.0450	0.0142	***	-0.3739	0.1507	**
Number of Observations	16,518			16,518		

Note: Data from SHARE 2006-07. Dependent variable is non-mortgage debt. Independent variables are sociability; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth; and country dummies in comparison to Germany. Marginal effect models the probability of having non-mortgage debt in probit regression, and the log amount of non-mortgage debt conditional on having that debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

In this paper, when constructing my main sociability measure, I use the participation in four kinds of activities asked in the question of the survey; however, this question contains also three other answer categories: caring for a sick or disabled person, helping to friends or neighbors, and taking part in a religious organization. These activities are excluded from my analysis, since the first two might not be directly related with the sociability of households and the third one might have inconsistency problem. Nonetheless, I examine what if all seven activities are taken into sociability measure, and households participating in anyone of these seven activities are called as sociable. I find that the significant positive social influence on debt behavior remains unchanged, with slightly smaller marginal effects for mortgage debt and pretty larger effects for non-mortgage debt, relative to the baseline results.

Effects of 'Extensive-Sociability' and 'Intensive-Sociability' on Debt

When analyzing the association between social interaction and debt in this paper, I produce my (main) sociability indicator through considering the participation of households in social activities over the last month. In the first section, my baseline results report that sociability has significant positive relationship with the probability of holding debt and the amount held. In this section, I investigate whether these relations continue to be there when the extensity and the intensity of social participations are taken into consideration. Thus, I construct the measures of 'extensive-sociability' and 'intensive-sociability' to check the robustness of my sociability indicator.

Extensive-sociability considers the *variation* in social interaction. Four types of social activities (i.e. charity work, educational course, sport club, and community organization) are included in main sociability variable; and the engagement in one of them makes households sociable. But there are a large number of households engaging in more than one activity, and even some of them in all four activities. It could be claimed that the variety of the activities done by households should be taken into account when their social interactions are examined. Hence, I create the measure of extensive-sociability which is a categorical variable presenting the number of different types of social activities participated in, so taking the values between 0 (no participation) and 4 (participation in all four types of activities). Then, I re-estimate my baseline models with this extensive-sociability measure; and the results are shown in Table 7 for mortgage and non-mortgage debt.

Table 7: Effect of "Extensive-Sociability" on Debt

Panel A. Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Extensive-Sociability	0.0112	0.0026	***	0.1173	0.0288	***
N	16,518			16,518		

Panel B. Non-Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Extensive-Sociability	0.0157	0.0030	***	0.1466	0.0336	***
N	16,518			16,518		

Note: Data from SHARE 2006-07. Dependent variable is household debt (either mortgage debt or non-mortgage debt). Independent variables are 'extensive-sociability'; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth; and country dummies. Marginal effect models the probability of having debt in probit regression, and the log amount of debt conditional on having debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, ***, represent significance at 10%, 5% and 1% respectively.

Table 7 shows that extensive-sociability has positive significant influence on both types of debt at 1% levels. It is reported in Panel A that households engaging in one more different activity have 1.1 percentage points higher probability to have mortgage debt; furthermore, the outstanding amount of their mortgage debt is 12 percent higher. This positive influence of the diversified participation appears also for non-mortgage debt and with larger marginal effects, according to Panel B. The engagement in an extra activity increases the likelihood of having non-mortgage debt by1.6 percentage points, and the borrowing amount by 15 percent. All in all, my findings from the regressions with extensive-sociability present that the participation in social activities has positive effect on debt behavior, besides the effect increases with the diversity of the participated activities.

Intensive-sociability considers the *frequency* of social interaction. My main variable of sociability treats all the involvements in social activities in the preceding month as the same, regardless of how often these activities are involved in. All households ranging from those who attend the activities only at once to those who attend every day are classified as sociable. However, it could be argued that the intensity of these

social attendances is important when sociability of households is investigated. SHARE provides the necessary data on intensity through asking the respondents, who replied the main question as having taken part in social activities, about the frequency of their participations in such activities. I use this information in my analysis to produce the measure of intensive-sociability. The question has three answer categories: 'almost daily', 'almost every week', and 'less often'. Therefore, the measure is constructed as a categorical variable that is equal to 3 for daily participation, 2 for weekly participation, 1 for less-than-weekly participation, and 0 for non-participation. Afterwards, I re-calculate my regressions with using the intensive-sociability measure; and Table 8 reports their results.

Table 8: Effect of "Intensive-Sociability" on Debt

Panel A. Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Intensive-Sociability	0.0075	0.0022	***	0.0841	0.025	***
N	16,516			16,516		

Panel B. Non-Mortgage Debt

	Probit			Tobit		
	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Intensive-Sociability	0.0111	0.0025	***	0.1027	0.0277	***
N	16,516			16,516		

Note: Data from SHARE 2006-07. Dependent variable is household debt (either mortgage debt or non-mortgage debt). Independent variables are 'intensive-sociability'; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth; and country dummies. Marginal effect models the probability of having debt in probit regression, and the log amount of debt conditional on having debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

According to Table 8, intensive-sociability influences both mortgage and non-mortgage debts positively at 1% significance levels. Panel A shows that households attending activities more frequently, by one category higher (e.g. daily- instead of weekly-participation), are 0.8 percentage points more likely to have mortgage

debt; moreover, if they have such debt, then they borrow 8 percent more than their counterparts. For non-mortgage debt, the situation is similar with somewhat higher marginal effects, as in the extensive-sociability. It is shown in Panel B that the estimated marginal effect of intensive-sociability is 1.1 percentage points on the probability of holding non-mortgage debt and 10 percent on the amount held. Altogether, these results support that debt behavior is influenced by social interactions positively, and the influence is larger for more frequent interactions.

Robustness Check against the Possibility of Reverse Causality

In this paper, I examine the effect of social interaction on household debt, and find a positive relationship between them. Hence, I suggest that the sociability of households increases their likelihood of having debt and their borrowing amounts. This can be through some plausible channels as mentioned above: comparing themselves with others and so making conspicuous consumption or matching the living standards in social group, sharing information such as financial advices about taking debt and social norms regarding debt holding, and borrowing directly from relatives. However, the causality might be the other way around, and indebted households may engage more in social activities with financial expectations. In this section, I examine this possibility of reverse causality.

When people get into financial trouble, they may ask their rich friends for loan, or they may ask their knowledgeable friends for financial advice. I suggest that sociable households are more likely to have rich or knowledgeable friends, and they are more likely to get a direct loan or to take advice about how to get a loan; thus sociability of households increases their debt holdings. However, this channel could be reverse; and financially troubled households might particularly engage in social activities to be friends with someone who lends money or who gives financial information to them. In the survey, five possible motivations for social participation were asked to the respondents who had taken part in activities: 'to meet other people', 'to contribute something useful', 'because I am needed', 'to earn money' and 'to use my skills or to keep fit'. Their answers display that there are a great number of households attending the activities in my analysis for meeting people. This motivation might stand for not only the desire to make friends and socialize but also the aim to become acquainted with wealthy or financially informed people. To eliminate the possible effect of the latter, I make my estimations with an additional control variable that represents the participation in social activities so as *to meet other people*. The effects of my sociability indicator are found to be quite similar –just slightly greater– with my baseline

estimations. These results imply that household debt is positively related with social interaction even if these interactions are done with motives different than meeting people.

Some people are in the employ of social organizations, and make money with involving in social activities. The responses of the question about the motivations present that there are a number of involvements in the activities in order *to earn money*. These respondents might be the ones facing with financial difficulties, and also having debts. Thus, indebtedness might contribute positively to participation in social activities, which infers reverse causality. The fraction of these households is small; nevertheless, to rule out this possibility, I re-estimate my baseline models but include one more variable which controls for this 'earning money' motivation. The estimated effects of sociability stay nearly the same for both mortgage and non-mortgage debt. This indicates that the motivation of making money does not have much influence on the effect of sociability for household debt.

My sociability indicator is based on four kinds of social activities, and one of them is *educational or training course*. It could be conceivable that financially straitened people are more probably to attend these courses compared to the others in society; because they might want to enhance their abilities to find, to keep, or to improve their jobs. This could result in a positive relationship between social interaction and household debt, but then the causality would be in the opposite direction of my main argument. For this reason, I re-calculate my probit and tobit regressions with a sociability indicator depending on other three activities, and find that the positive significant influence of sociability remains on both mortgage debt and non-mortgage debt with somewhat smaller marginal effects. All the same, these findings support the main argument that social interaction increases the probability to have debt and the conditional amount of debt outstanding.

Effects of Sociability on Debt for Each Country

My baseline analysis is based on a pooled sample that includes data from thirteen European countries, and these countries have very different sociability levels and borrowing practices. The results from the pooled estimation suggest significant positive social influence on debt behavior. In these estimations, all coefficients are forced to be the same across all countries, although 'country dummies' are included into the regressions in order to capture the country level differences. Therefore, I also examine the influence of sociability on mortgage and non-mortgage debt for each country separately, with the models used for pooled sample (except country dummies). In these country-level estimations, the coefficients are determined by the data of the

relevant country, thereby other countries have no impact on them. Country-level results are summarized in Table 9 for mortgage debt and in Table 10 for non-mortgage debt. Tables display that the effect of sociability varies substantially among countries and between types of debt.

Table 9 shows that sociability has significant positive effect on mortgage debt for three countries in sample: Germany, the Netherlands, and Belgium. The estimated marginal effects of sociability in these countries are much greater than the effects in the total sample for both the probability and the amount of mortgage debt. Sociable households are 6 percentage points more likely to take on mortgage debt in the Netherlands, 3.8 percentage points more likely in Germany, and 3 percentage points more likely in Belgium. Also, sociable households having mortgages borrow 65 percent more than their non-sociable counterparts in the Netherlands, 54 percent more in Germany, and 38 percent more in Belgium.

Table 9: Effect of Sociability on Mortgage Debt for Each Country

		Probit			Tobit		
	N	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Sweden	1,491	0.0090	0.0229		0.0563	0.2283	
Denmark	958	-0.0350	0.0304		-0.3561	0.2994	
Germany	1,223	0.0376	0.0197	*	0.5352	0.2745	*
Netherlands	1,356	0.0602	0.0219	***	0.6529	0.2484	***
Belgium	1,583	0.0296	0.0157	*	0.3830	0.1900	**
France	1,528	0.0190	0.0166		0.2878	0.2444	
Switzerland	1,057	0.0169	0.0280		0.1454	0.3013	
Austria	864	0.0074	0.0187		0.1100	0.3171	
Italy	1,428	-0.0072	0.0143		-0.1895	0.3724	
Spain	924	-0.0038	0.0230		-0.0072	0.3762	
Greece	1,649	0.0162	0.0108		0.3223	0.2336	
Czech R.	1,252	0.0105	0.0147		0.2378	0.3276	
Poland	1,205	-0.0060	0.0076		-0.3194	0.3701	

Note: Data from SHARE 2006-07. Estimates of sociability are reported for each country in the sample. Dependent variable is mortgage debt. Independent variables are sociability; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth. (In probit model of Spain, risk tolerance is not included in analysis because of sample variation across imputations). Marginal effect models the probability of having mortgage debt in probit regression, and the log amount of mortgage debt conditional on having that debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

Table 10 reports that the social effect on non-mortgage debt is positive and significant in four countries which are Sweden, Germany, Austria and Czech Republic. The size of the marginal effects of sociability is pretty large in these countries compared to their size in the whole sample, as in the case of mortgage debt. The participation in social activities increases the probability of holding non-mortgage debt by 6 percentage points in Czech Republic, by 5.4 percentage points in Germany, by 5 percentage points in Sweden, and by 3.8 percentage points in Austria. Besides, conditional on non-mortgage debt holding, social participation is associated with a 66 percent rise in the amount borrowed for Germany and Czech Republic, a 50 percent rise for Sweden, and a 44 percent rise for Austria.

Table 10: Effect of Sociability on Non-Mortgage Debt for Each Country

		Probit			Tobit		
	N	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Sweden	1,491	0.0498	0.0202	**	0.4986	0.2138	**
Denmark	958	0.0385	0.0253		0.2549	0.2476	
Germany	1,223	0.0537	0.0188	***	0.6583	0.2323	***
Netherlands	1,356	0.0190	0.0156		0.2818	0.2285	
Belgium	1,583	-0.0004	0.0154		-0.0113	0.1767	
France	1,528	0.0191	0.0206		0.0805	0.1793	
Switzerland	1,057	-0.0123	0.0136		-0.1732	0.2178	
Austria	864	0.0380	0.0177	**	0.4384	0.2500	*
Italy	1,428	-0.0028	0.0180		-0.0718	0.2192	
Spain	924	0.0085	0.0205		0.1763	0.2700	
Greece	1,649	0.0248	0.0190		0.2605	0.2113	
Czech R.	1,252	0.0603	0.0188	***	0.6568	0.2143	***
Poland	1,205	0.0464	0.0424		0.4129	0.3676	

Note: Data from SHARE 2006-07. Estimates of sociability are reported for each country in the sample. Dependent variable is non-mortgage debt. Independent variables are sociability; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth. Marginal effect models the probability of having non-mortgage debt in probit regression, and the log amount of non-mortgage debt conditional on having that debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

All in all, country-level results present a remarkable variation in the influence of social interaction on debt across European countries. In my sample, six countries have significant positive effects at different levels on mortgage and/or non-mortgage debts, whereas the other seven countries have no significant effect (and some of them have even negative sign). It is seen that although the pooled estimation shows highly significant positive social impact on household debt, the country-by-country estimations could not find such impacts in many of the countries. This might be somewhat as a result of having small number of observations when analyzing each country individually. In addition to this, debt holding behavior is not widespread in general; and also some of my countries have very low fraction of debt holders, especially for mortgage debt. Hence, finding a significant relation in these countries is hardly possible. What is more, the heterogeneity in the estimated social effects among the countries may result from the definition of sociability in my analysis, which might capture the different extents of social interaction in different countries, as discussed above. Taking everything into consideration, it can be argued that participation in social activities has an important positive association, maybe not with both types of debt for all the countries but, with either type of debt in some countries.

Effects of Sociability on Debt for Fiscally-Troubled Countries

The ongoing sovereign debt crisis has shaken the European countries one-by-one. It started with fiscal trouble in Greece; and then spread to Ireland, Portugal, Spain, Italy and Southern Cyprus. These countries ran into debt crisis particularly as a result of the unsustainable levels of their sovereign debt. My main interest in this paper is household debt (borrowed by people in the country) rather than sovereign debt (borrowed by government of that country), but still they could be somehow correlated. For this reason, I investigate the households of fiscally-troubled countries separately to observe whether the effect of social interaction on borrowing behavior is larger for them than for the households of non-troubled countries.

In my sample, there are three countries facing with this recent debt crisis: Greece, Italy and Spain. In spite of their high levels of sovereign debt, these countries have neither larger fractions nor greater amounts of household debt relative to the other countries in the sample, as presented before. When social effect on household debt is considered, Table 11 shows that the group of fiscally-troubled countries has entirely insignificant effects, as opposed to the non-troubled group which has significant positive effects at 1% levels. It is reported, for non-troubled countries, in Panel A that the influence of sociability is nearly the same with pooled estimation on mortgage debt; and in Panel B that it is relatively higher on non-mortgage debt. For troubled countries, sociability has rather small marginal effects (mostly) and quite large standard errors, thus insignificant influences on both mortgage and non-mortgage debt.

It is easily seen from the results that there is a clear difference between fiscally-troubled and non-troubled countries in their social effects on household debt. In my sample, all three of the countries experiencing sovereign debt crisis are from Mediterranean region of Europe. Hence, this split between two groups might be related not only with debt crisis but also with regional differences. If the other countries in crisis are also included in the estimation, then these results might change; but I have no data on those countries. On the other hand, it is both possible for these fiscally-troubled countries that sociability has weaker influence on debt and that sociability is not precisely estimated by the social activities in my analysis because of the cultural and institutional differences with the other (non-Mediterranean) countries. However, as shown in the country-level results, some of these other countries also have insignificant effects on both types of debt. Consequently, it could be suggested that social participation (in the activities analyzed) does not have significant relationship with household debt for three fiscally-troubled Mediterranean countries of my sample, contrary to the other countries that are non-troubled and also non-Mediterranean.

Table 11: Effect of Sociability on Debt for Fiscally-Troubled Countries and Non-Troubled Countries

Panel A. Mortgage Debt

		Probit			Tobit		
	N	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Fiscally-Troubled Countries	4,001	0.0092	0.0095		0.1940	0.1963	
Non-Troubled Countries	12,517	0.0168	0.0056	***	0.1795	0.0604	***

Panel B. Non-Mortgage Debt

		Probit			Tobit		
	N	Marginal Effect	Standard Error		Marginal Effect	Standard Error	
Fiscally-Troubled Countries	4,001	0.0142	0.0110		0.1672	0.1312	
Non-Troubled Countries	12,517	0.0321	0.0067	***	0.2775	0.0688	***

Note: Data from SHARE 2006-07. Fiscally-troubled countries are Greece, Italy and Spain; and non-troubled countries are the other countries in sample. For each group, the estimates of sociability are reported. Dependent variable is household debt (either mortgage or non-mortgage debt). Independent variables are sociability; age, age squared, couple, household size, high school education, college education, retired, working, poor/fair health, number of ADLs, risk tolerance, trust, good future, city; and the log amounts of total income, net financial wealth and net real wealth. Marginal effect models the probability of having debt in probit regression, and the log amount of debt conditional on having debt in tobit regression. Marginal effects are averaged across households using survey weights. Multiple imputations are used in the estimations. Standard errors are corrected for heteroskedasticity. *, **, *** represent significance at 10%, 5% and 1% respectively.

CONCLUSION

In this paper, I have examined the influence of social interaction on the tendency to have debt and on the amount of debt conditional on having such debt, with using the data from thirteen European countries which was collected in the second wave of SHARE. The data allow me to construct the sociability indicator that is proxied by the participation of households in social activities like voluntary works, educational courses, sport clubs, and political organizations; and to create the debt indicator which is investigated under two categories, mortgage debt and non-mortgage debt.

My findings from the pooled estimation show that social interaction has significant and sizeable positive effects on debt, controlling for a number of household characteristics such as demographics, socio-economic status, personality traits and financial resources, and also country dummies. These findings indicate that, for both mortgage and non-mortgage debts, sociable households (who engaged in activities at least once in the previous month) are more likely to participate in debt and have larger amounts of debt conditional on such participation compared to their non-sociable counterparts. Furthermore, the effect of sociability on both types of debt remains positive and significant when the variety and the frequency of social engagements are also taken into consideration. Social effect seems to be stronger for more varied and more frequent engagements.

My pooled sample consists of thirteen countries which exhibit substantial heterogeneity in sociability rates and household debt levels. Hence, I also analyze the relationship between sociability and household debt for each country separately. The country level results show that the influence of sociability is mixed and depends on the kinds of debt, types of model and country considered. Among all countries, Germany is the only one having significant positive relation in all the conditions. Besides, sociability is significantly related to mortgage debt in two other countries, Belgium and the Netherlands; and to non-mortgage debt in three other countries, Sweden, Austria and Czech Republic.

As a final point, I look at the countries experiencing fiscal trouble during the recent debt crisis in Europe. My sample includes three of them, which are Greece, Spain and Italy. Unlike their sovereign debt levels, the fractions and sizes of household debt in these countries are not high relative to those in the other countries. Nevertheless, the estimated social effects on debt are different for fiscally troubled and non-troubled groups, but not as anticipated. In the group of fiscally troubled countries, the effects of sociability are insignificant for both mortgage and non-mortgage debts; whereas such effects are significant with large magnitudes in the group of other countries.

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