Journal of Behavioral and Experimental Finance ▮ (▮▮▮▮) ▮▮▮–▮▮▮

Contents lists available at ScienceDirect

Journal of Behavioral and Experimental Finance

journal homepage: www.elsevier.com/locate/jbef

Full length article

Private monetary transfers between households: Who is helped and by whom?

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ARTICLE INFO

Article history:
Received 7 August 2017
Received in revised form 15 December 2017
Accepted 21 December 2017
Available online xxxx

JEL classification:
C14
D14
E26

Keywords:
Expected value
Informal lenders
Loan or monetary gift
System of three equations with binary responses

ABSTRACT

We propose using a system of three equations with binary responses to explore the determinants of a household receiving a private monetary transfer from three different types of informal lenders in Italy. First, we observe that a semi-parametric specification of the system of equations is preferred to a fully parametric modelling approach. Second, we detect the existence of an error correlation structure that characterises the dependence of informal lenders after accounting for a number of observable covariates. Third, we find that the network of close family relationships (parents or adult children) represents the main source of an informal transfer, especially for households in debt to financial intermediaries or who are in arrears with payments and whose household head is unemployed or in poor health. Finally, we propose estimating the entity of monetary transfer in terms of expected value using a simulation that combines the joint response probabilities obtained from the system of equations with the empirical distribution of monetary transfers.

1. Introduction

Households interested in borrowing can consider different types of lenders: traditional financial institutions (also known as formal lenders), on-line platforms of peer-to-peer (P2P) lending, or – more informally – asking relatives and/or friends (also known as informal lenders). The literature is rich in studies about the benefits and risks that characterise traditional formal loans (e.g. Tian et al., 2016; Thomas et al., 2016), and an increasing number of studies are exploring the factors affecting the P2P lending channel, especially in the UK and US. However, we found few studies exploring the characteristics and factors affecting the informal loan channel (also known as private monetary transfer, hereafter *PMT*), especially in developed countries. Economists who focus on monetary transfers between families have cited a number of different motivations behind the intent to financially support (known) economically disadvantaged individuals, including mutual trust and altruism (e.g. Barro, 1974; Cox and Jappelli, 1990; Guiso and Jappelli, 1991; Berry, 2008; Genicot, 2016). Most recent studies have observed that the probability of a household having informal loans – given the liquidity constraints of access to credit banking channels – increases when that household has debts with banks in the form of both loan(s) and mortgage(s), the family lives in a large municipality, the household has a low equivalent income, and the household has a low ratio between liquid assets and net annual labour income. The probability of having informal loans also increases if the household head is unemployed, divorced, or young (e.g. Aldieri and Fiorillo, 2015; Benvenuti et al., 2017; Zanin, 2017).

To date, the empirical research regarding *PMT* has not explored the determinants of the probability of receiving an informal loan or monetary gift by distinguishing the nature of the recipient's relationship with the informal lender. Understanding the factors that most affect the probability of receiving economic support from parents, rather than from friends or other relatives, is crucial to improving knowledge about the channels of informal economic support and the possible existence of structures of dependence.

Estimating the entity of *PMT* (hereafter *EPMT*) between households is an additional key measure of interest for economic agents. In a general framework, we assume that *EPMT* can be determined by characteristics of the borrower and informal lenders. Several official national surveys are structured to collect information about households that have received a *PMT* (e.g., European Statistics on Income and Living Conditions survey), but no information about characteristics of the informal lenders who have helped the household in difficulty is usually recorded (e.g., income and wealth conditions, the time preference and risk aversion). The absence of such information can represent an important informative shortage for the estimation of the *EPMT*.

Our contribution to the literature about informal monetary transfers is twofold:

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https://doi.org/10.1016/j.jbef.2017.12.010
2214-6350/

- First, we attempt to answer the following question: Who is the household helped by the network of relative and friends and by whom is it helped?. To achieve this aim, we specify a system of three equations with binary responses to explore the determinants of whom a household receives a loan or monetary gift from: (i) parents or adult children, (ii) other relatives (e.g., brothers/sisters, brother-in-law), or (iii) friends, neighbours or acquaintances. Furthermore, we provide evidence regarding the possible dependence that characterises the binary responses. From a methodological point of view, the model can be estimated within either a parametric or semi-parametric framework (e.g. Ashford and Sowden, 1970; Filippou et al., 2017). When considering a classic parametric framework, we need to specify the continuous covariates as categorical variables defined after grouping or as linear or non-linear predictors (quadratic or cubic polynomial functions). In other words, we need to impose a priori assumptions (sometimes unknown) about the nature of the covariate-response relationship. This approach might mask some interesting structures in the data. Filippou et al. (2017) have recently proposed an extension of the parametric specification by relaxing the assumptions on covariate-response relationship using a penalised smoothing spline approach. This approach enables detecting data structures that can be difficult to capture by imposing *a priori* assumptions in parametric specifications. In this regard, several empirical studies have demonstrated the importance of applying a flexible approach to reduce some issues related to model misspecification (e.g. Zanin and Marra, 2012; Zanin et al., 2014). The use of a flexible modelling method is also important to opportunely estimate unbiased joint response probabilities.
- Second, we propose to estimate the *EPMT* in terms of expected value at the household level. The EPMT can be interpreted as the value to be expected after running a large number of experiments to examine the distribution of possible outcomes. The expected value is computed via simulation by combining the joint response probabilities estimated using the system of equations with the empirical distributions of monetary transfers.

The empirical analysis focuses on Italy and covers the period of 2010–2015. Improving knowledge about channels of informal transfer between households provides useful insights for the financial and economic literature regarding issues of income redistribution, poverty, public finance, and measures of the over-indebtedness of households.

The article is organised as follows. Section 2 describes the characteristics of the sample of households, whereas Sections 3.1 and 3.2 introduce the structure of the system of equations and describe the estimation of the expected value of the monetary transfers, respectively. Section 4 illustrates the main empirical results, whereas the conclusions are reported in Section 5.

2. Data

The analysis is based on micro-data collected for Italy as part of the European Statistics on Income and Living Conditions (EU-SILC) survey. The cross-sectional data used consider the period of 2010–2015 and consist of a sample of 114 260 households (approximately 20 000 households for each year). In addition to gathering information about living conditions, income, housing, work, demography, and education of households, the survey includes a section to collect information regarding *PMT*. Specifically, a question asks, "*In the last 12 months, in response to moments of particular economic hardship, have you received a loan or monetary gift from relatives or friends not living in the household*". If the household declared 'yes', the questionnaire includes further questions to ask who – of the network of the relative and friends – has supported the household with a monetary transfer. The responses are structured as multiple-choice variables and include the following options: parents, adult children, brothers/sisters, brother-in-law, friends, neighbours or acquaintances.

The latent variable Y^*_{lh} determines the observed response as follows: if $Y^*_{lh} > 0$, then $Y_{lh} = 1$, and 0 otherwise. The notation $l = 1, 2, 3$ identifies the three groups of informal lenders of interest, (i) parents and adult children, (ii) other relatives (brothers/sisters, other reported relations), and (iii) friends (friends, neighbours and acquaintances), respectively, whereas $h = 1, \ldots, H$ represents the h-th household of the sample.

Finally, the questionnaire includes a section to ask the monetary amount in Euros of the loans or monetary gifts that the household has received over the last 12 months. The information is recorded as an aggregate of the monetary transfers received in the year of reference. The observable factors assumed to affect the outcomes of interest (Y_{1h}, Y_{2h}, Y_{3h}) are divided into two main categories: socio-demographic characteristics of the household head (age, education, professional status, and health status) and household-level characteristics (some features of the dwelling, typology of the family, economics factors, and factors related to the area of residence). Some descriptive statistics are reported in Table 2.

3. Method

In this section, we introduce some features of the system of equations with binary responses proposed to investigate 'who is the household helped with an informal monetary transfer and who from the network of relatives and friends provides the transfer'. Furthermore, we provide a description of computational approach used to estimate the entity of the expected value of the informal monetary transfer.

3.1. The estimation of a system of three equations with binary responses

We are interested in exploring the characteristics of households that have received a loan or monetary gift from ($Y_{1h} \in \{0, 1\}$) parents or adult child(ren), ($Y_{2h} \in \{0, 1\}$) other relatives, or ($Y_{3h} \in \{0, 1\}$) friends. To achieve this aim, we specify a system of three equations with binary responses. The approach allows us to account for the possible dependence of the responses.

The system of equations is written as follows:

$$\begin{cases} Y_{1h} = \alpha_1 + \beta_{11}(age_h) + \beta_{21}(income_h) + \sum_{k=1}^{K} \gamma_{1k} x_{hk} + \varepsilon_{1h} \\ Y_{2h} = \alpha_2 + \beta_{12}(age_h) + \beta_{22}(income_h) + \sum_{k=1}^{K} \gamma_{2k} x_{hk} + \varepsilon_{2h} \\ Y_{3h} = \alpha_3 + \beta_{13}(age_h) + \beta_{23}(income_h) + \sum_{k=1}^{K} \gamma_{3k} x_{hk} + \varepsilon_{3h} \end{cases} \quad (1)$$

for $h = 1, \ldots, H$, where H is the number of households in the sample. age_h and $income_h$ represent the continuous variables age of the household head and the household's equivalent income, respectively. The term x_{hk} represents the binary and categorical exogenous variables included in the model and that characterise the household helped (see Table 2). α is the intercept, and β and γ are the parameters of the explanatory variables to be estimated. Specifically, the continuous covariates enter into model (1) under the assumption of a linear relationship with each response.

The terms $\varepsilon_{1h}, \varepsilon_{2h}, \varepsilon_{3h}$ represent the error terms of each equation in the model. The variance–covariance matrix of the error terms is as follows:

$$\begin{pmatrix} \varepsilon_{1h} \\ \varepsilon_{2h} \\ \varepsilon_{3h} \end{pmatrix} \overset{i.i.d.}{\sim} \mathcal{N}\left(\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{bmatrix} 1 & \rho_{12} & \rho_{13} \\ & 1 & \rho_{23} \\ & & 1 \end{bmatrix} \right),$$