Welfare Participation and Informal Transfers

Edwin Fourrier-Nicolaï and Ilia Gouaref

July 2017

Abstract

About 50% of individuals who are eligible to social assistance do not claim the benefit they are entitled to. We examine the role of informal transfers on welfare participation. Individuals are embedded within a fixed social network which may provide financial support to the network members they care about. Decision to participate depends on private transfers flowing from the network and on social stigma associated to participation. The social stigma is assumed to be a fixed cost common to all individuals while informal transfers depend on both the wealth of the receiver and of the network. Using the German SOEP data, we estimate the structural model and the effect of private transfers on welfare participation. We provide micro-fundations and estimates for crowding-out in the context of social assistance and we give precise estimates of the genuine incentives provided by the size of the welfare benefit. In constrast with the empirical economic literature, we found that the level of the benefit is a weak policy instrument for economies characterized by important informal transfers.

Keywords: welfare participation, social networks, informal transfers, altruism
JEL codes:

Contents

1 Introduction

Participating in social assistance is costly. What economists call the stigma cost since Moffitt (1983) actually captures various factors: information and transaction costs, complexity of the welfare program, but also a collective preference for this source of income. Provided that this cost is enough high, individuals would prefer other sources of income. Among them, of course, labour earnings are prominent but financial supports from family, friends, relatives are not negligible. One refers to them as informal transfers or equivalently as private transfers. Empirical studies show that they are quite large even in developed economies and they have increased importantly during the great crisis.

Empirical studies have found that informal transfers can neutralize the distributional impact of public transfers (see Cox and Jakubson 1995 for instance) since informal transfers react to the wealth of individuals they care about. A related question which has received considerable attention is whether public support programs simply displace or crowd-out informal support. Does 1$ more of social assistance reduces private charity of 1$? Many studies (Albarran and Attanasio (2002), Cox and Jimenez (1990), Cox and Jimenez (1992), and Jensen (2004)) have found different results and even have infered the opposite: the crowding-in hypothesis (Kunemund and Rein (1999) and Reil-Held (2006)). However, the underlying mechanism remains unclear: we do not know what determine the direction of the effect and its size. On the other hand, determinants of the decision to participate in welfare programs has received many attention since about one poor household in two does not take-up social assistance when he is eligible. This result holds for a variety of welfare programs and in numerous countries, see Currie (2004) for a survey of the literature.

However, the role of informal transfers on welfare participation has not been explored in the literature while it might have important policy implications. Particularly, if informal transfers affect markedly welfare participation, then the benefit might not be a good policy instrument (which provides enough incentives to participate) because of the crowding-out effect. Then, we question whether informal transfers affect participation in welfare programs? To answer this question, we estimate a simultaneous model of welfare participation with stigma cost and informal transfers. Individuals are embedded within a fixed social network which may provide financial support to the network members they care about. Decision to participate depends on private transfers flowing from the network and on social stigma associated to participation. The social stigma is assumed to be a fixed cost common to all individuals while informal transfers depend on both the wealth of the

receiver and of the network. Using the German SOEP data, we estimate the model and the effect of private transfers on welfare participation. We provide micro-fundations and estimates for crowding-out in the context of social assistance and we give precise estimates of the genuine incentives provided by the size of the welfare benefit. In constrast with the empirical economic literature, we found that the level of the benefit is a weak policy instrument for economies characterized by important informal transfers.

The paper is organized as follows. First, we propose a microeconomic model of welfare participation with private transfers. Second, we present an overview of the social assistance system in Germany, the data, and the microsimulation model used for identifying the eligible households. Third, we discuss the economic and econometric specifications, the estimation method and the empirical results. The last section concludes.

2 Theoretical framework

Participation in a welfare program is associated with a stigma cost, as shown in Moffitt (1983). Then, it is natural to think that individuals try to look for other sources of income. Among them, labour earnings are prominent, and the relationship between welfare and labour participation has been extensively explored in Moffitt (1983). However, another important source of redistribution (even in developed economies) is due to financial supports from relatives and friends. In this section, we propose a simulatenous equation model of welfare participation with stigma cost and informal transfers. Individuals are embedded within a fixed social network which may provide financial support to the network members they care about. Decision to participate depends on private transfers flowing from the network and on social stigma associated to participation. The social stigma is assumed to be a fixed cost common to all individuals while informal transfers depend on both the wealth of the receiver and of the network. Formally, we can write the budget constraint of an individual as:

$$y = y^0 + Pb + T(y^0 + Pb, y_{-i}). \tag{1}$$

where the individual's market income y^0 can be completed by both a welfare benefit b if he decides to participate to the welfare benefit $P = 1$, and by informal transfers T that he might receive from his network.

Private transfers he might receive depend on his own income $y^0 + Pb$ and the wealth of his network y_{-i}. Precisely, $T(y, y_{-i})$ is decreasing in y ($t'_y < 0$) while it is increasing in y_{-i} ($t'_{y_{-i}} > 0$) are reasonable assumptions. Therefore, welfare participation $P = 1$ reduces the amount of transfers received and the

specification of the transfer function $T()$ will provide more insight about the theoretical effect of private transfers on welfare participation.

The level of the entitlement b depends on the market income.[1] A general form of the benefit is:

$$b = \max(g - ry^0, 0), \tag{2}$$

where g is the guarantee level and r is the marginal tax rate on market income. Generally, r is increasing in y^0 in order to provide incentives to participate in the labour market, and of course, the total benefit b cannot be negative.

In the absence of the welfare benefit $P = 0$, individual's utility is a function of private income $u(y)$, where u is a concave utility function (i.e. $u' > 0$ and $u'' < 0$). When they participate to the welfare benefit $P = 1$, individuals suffer from social stigma ϕ, in this case utility is $u(y) - \phi$. Hence, an individual will participate only if:

$$u(y^0 + b + T(y, y_{-i})) - \phi > u(y + T(y, y_{-i})).$$

Denote P^* the utility difference between participation and non-participation:

$$P^* = u(y^0 + b + t(y^0 + b, \alpha, y_{-i})) - u(y^0 + t(y^0, \alpha, y_{-i})) - \phi,$$

hence, an individual participates if $P^* > 0$ and not otherwise. We have the following system of simultaneous equations:

$$\begin{aligned}
P &= 1 \text{ if } P^* > 0, && (3)\\
P &= 0 \text{ if } P^* \leq 0, && (4)\\
& && (5)\\
T &= T\left[y^0 + b, y_{-i}\right] \text{ if } P^* > 0, && (6)\\
T &= T\left[y^0, y_{-i}\right] \text{ if } P^* \leq 0. && (7)
\end{aligned}$$

A major omitted factor in this model is the question of what determines the eligibility condition itself. The social assistance program in Germany, namely the SGB II, like many other social assistance programs in developed economies imposes restrictions on household structure and the household means. Precisely, the household income and wealth have to be lower than a certain arbitrary threshold. This implies that there are two genuine different types of non-participation: the non-participation of those with income

[1] We exclude informal transfers from the computation of the level of the benefit for two reasons: first they are rather unobservable by the welfare provider, and second, they are not often taken into account for determining eligibility to the social benefit (as it is in our empirical application).

too high to be eligible, and the non-participation of eligible households who choose not to participate. Moffitt (1983) addressed this issue by including labor supply in the model. In order to keep the model as simple as possible, we restrict our sample to the eligible households identified thanks to a microsimulation model.

3 Data and context

In this section, we present an overview of the SGB II social assistance program in Germany. We particularly emphasize the entitlement rules and the identification of the eligible households using a microsimulation model adapted to the German Socio-Economic Panel (GSOEP). We discuss the limits of the simulated eligibility by means of a sensitivity analysis. Last, we provide descriptive statistics about the distribution of private transfers and the prevalence of characteristics according to take-up or non-take-up.

3.1 Social assistance in Germany

3.1.1 Context and eligibility for social assistance

Since the Hartz IV reforms in 2005, the main German social assistance program is the unemployment benefit II (Arbeitslosengeld II, ALG II). Although it refers to unemployment, it is designed as an assistance program which guarantees a minimum income to cover basic needs. Particularly, the ALG II provides social assistance for employable persons between 15 and 65 years old who are not employed and not in receipt of unemployment insurance benefits. Hence, this benefit is means-tested with respect to income and wealth and does not depend on previous work history. Basically, if the household income and wealth are lower than some predetermined thresholds, then the household is eligible to the ALG II benefit. This is an important source of redistribution since about 4.5 million households receive the benefit in 2011. Entitlement rules have not changed deeply since the introduction of the benefit in 2005. Only few studies have looked at welfare participation of ALG II after the reforms. Bruckmeier and Wiemers (2012) is a notable exception, they estimate a model of welfare participation and control for endogeneity of the benefit level. Moreover, it has been found that the share of eligible households who did not take-up their entitlements was persistently high in the past (Riphahn (2001), Kayser and Frick (2000), Frick and Groh-Samberg (2007), Bruckmeier and Wiemers (2012)).

The German welfare system is extensively described in Bruckmeier and Wiemers (2012). We present here the main entitlement rules for the ALG II benefit. The ALG II is the last resort safety net which guarantees a minimum income in order to cover the basic needs of the household. It targets employable (able to work) persons between 15 and 65 years old and it is means-tested with respect to income and wealth.

For testing income, the household needs are compared to the (adjusted)

household income. The needs HN_j of household j are defined as:

$$HN_j = \sum_{i=1}^{n_j} (W_{ij} + AW_{ij})BR + HC_j,$$

where n_j is the number of household members, W_{ij} is the personal weight of member i in household j, AW_{ij} are weights for additional specific needs, BR is the basic rate (set at 374 EUR in 2011) and HC_j are the housing costs including rent and heating costs of household j. The personal weight of a member W_{ij} are defined respectively as: 90% of the basic rate for each adult > 25 able to work (including the head), 80% of the basic rate for each child between 15 and 25 able to work and 60% of the basic rate for each child less than 15 years old. The basic rate was set at 375 EUR per month. Hence, the household needs (excluding housing costs) of a couple with 2 children younger than 15 is $374 \times (0.9 \times 2 + 0.6 \times 2) = 1122$. The amount of the benefit is defined as the difference between the household needs HN_j and the adjusted household incomes.

The adjusted household income HY_j is the disposable household income including labour and capital incomes, the tax paid, benefits excluding benefits and pensions that are not primarily supposed to cover basic needs (except social assistance, children's allowance and housing benefits) ; see Table 8 of Bruckmeier and Wiemers (2012). The entitlement of some other benefits (social assistance, children's allowance, housing benefits and student grants?) are determined simultaneously and the take-up of ALG II excludes the household of taking-up those benefits since they are already included in the AGL II. Moreover, allowances are granted for labour earnings in order to increase incentives to work. Table 1 provides the benefit reduction rate by labour earnings. For example, for a employment income of 900 EUR, the adjusted household income is reduced of $900 - 0.8 \times (800 - 100) + 0.9 \times (900 - 800) = 250$.

Table 1: ALG II reduction rate for employment incomes

Benefit Reduction Rate	Earnings Bounds (EUR per month)	
	From 2005 to 2011	From 2012 to 2015
0%	≤ 100	≤ 100
80%	[101-800[	[101-1,000[
90%	[800-1,200*[	[1,000-1,200*[
100%	$\geq 1,200$	$\geq 1,200$

* 1500 euros for HH with children

If the adjusted household income HY_j is lower than the household needs HN_j, then the household is eligible. Otherwise, the entitlement is excluded.

A similar test is performed on the household wealth: the cumulated assets of the household must be lower than a threshold, namely the wealth allowance. The wealth allowance WE_j depends on the age of the adults in the household:

$$WE_j = 750 + 3100 \times NbChildren + Min(9750; Max(150 \times age; 3100))$$

The wealth test is passed if household financial assets are zero after accounting for all wealth allowances.

If one of both of the tests are not passed by the household, all its members are assumed to be not eligible to ALG II.

In our case, it is important to note that eligibility to ALG II does not depend on the private transfers received. Instead, they fall within the taxation system of gifts and inheritance...

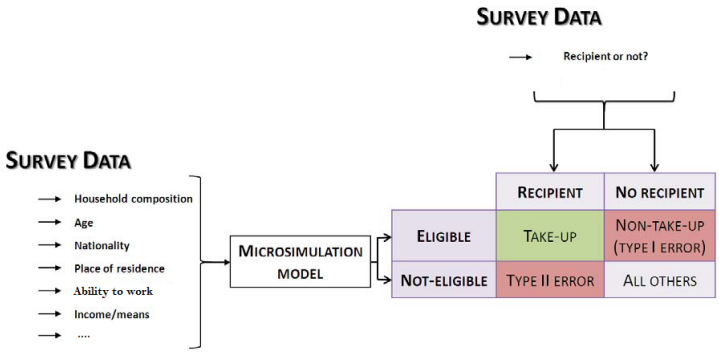
3.1.2 A microsimulation model for identifying eligiblity

We do not observe those who are eligible and do not participate, hence identifying the eligibles is a crucial point. Bargain et al. (2012) argued to use administrative data for measuring non-take-up since suvey data may be inaccurately reported. Indeed, individuals may misreport if they are on welfare since being on welfare may be perceived as degrading. But administrative data are not preserved of other biases, particularly they are not representative of the eligible households. We can only observe those who claim the benefit which is not a random sample of those who do not take-up. Instead, we combine information provided in the survey (GSOEP) and official eligibility rules in order to identify the group of eligible households, as illustrated in figure 1. First, we can check for misreporting of participation by controling for the survey instrument (who respond?, online, oral, written, ...). Second, we can perform a sensitivity analysis for determining to which extent our results are driven by the micro-simulation. Last but not the least, the GSOEP is a rich representative longitudinal survey of private households living in Germany where all the information needed to simulate eligibility is available and we observe family and social network variables in 2011. We use our own microsimulation model that follows a simplified procedure of the STSM - the IAB microsimulation model adapted for the GSOEP that is extensively described in Bruckmeier and Wiemers (2012).

Our micro-simulation correspond to the following procedure:

1. Select the sample of households for which the head is between 15 and 65 years old and able to work. Ability to work is hardly observable, hence we use the disability status available in the GSOEP to proxy this information.

Figure 1: Microsimulation with survey data



2. Compute the quantities of interest HN_j, HY_j, WE_j for every household j. This can be done easily since all the information needed is observed. A particular attention have to be devoted on the housing costs.

3. Perform the income and wealth tests, those who pass both tests are eligible.

4. Compare the simulated benefit with prioritized benefits, the household is eligible for the maximum benefit he is entitled to.

5. We restrict the sample to those who are eligible and for who ALG II represent the maximum benefit they can claim.

We have to note that the household community has been assumed to be the household observed in the GSOEP. Although they are theoretically two different notions, in practice they are very close. We have determined eligibility after having annualised incomes while the benefits are given on a monthly basis. We may miss to capture short term episodes of eligibility but we capture those who are chronically eligible. This does not affect our results.

In this specification, we obtained 1644 eligible households and 60% (982) of them do not take-up the benefit.

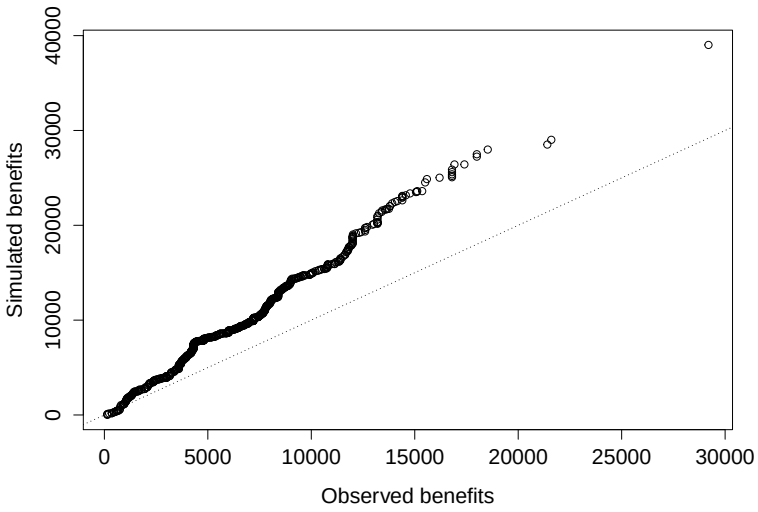
3.1.3 Sensitivity analysis

We can perform a sensitivity analysis for determining to which extent our results are driven by the micro-simulation.

First, we compare the observed benefits amounts and our simulated benefits in figure 3.1.3. The dashed 45 degree line represents the equality between

observed and simulated benefits amounts. It turns out that we slightly overestimate the benefits amounts. We suppose that it is due to the yearly basis of the simulation.

Figure 2: Observed Benefits*vs* Simulated Benefits amounts (Euros/year)



Second, we perform a sensitivity analysis by looking at the eligibility status of households whose incomes fall or exceed their needs by x percent:

$$Eligibility_i = 1 \text{ if } (1 \pm x) * HN_i > HY_i \tag{8}$$

$$Eligibility_i = 0 \text{ if } (1 \pm x) * HN_i < HY_i. \tag{9}$$

The idea is to look how the number of eligibles and type II errors are affected when x ranges from -1 to 1. Indeed, the type II error (those who take-up the benefit while they are simulated as not being eligible) is an indicator of the quality of the simulation. Mechanically, as x increases more households are eligible while the the type II error decreases. However, screening too large leads to overestimate non-take-up, see table 3.1.3. Henceforth, evaluating the simulation is a delicate trade off between type I error and type II errors.

An external validation can be found by comparing our results with the existing literature. It turns out that our results are consistent with the literature, see Table 1 of Bruckmeier and Wiemers (2012), although the comparability of these studies is limited due to different data sets and simulation approaches.

For further results, we will use the ± 0.1 as lower and upper bands to account for both simulation errors and unobserved incomes.

Table 2: Sensitivity analysis

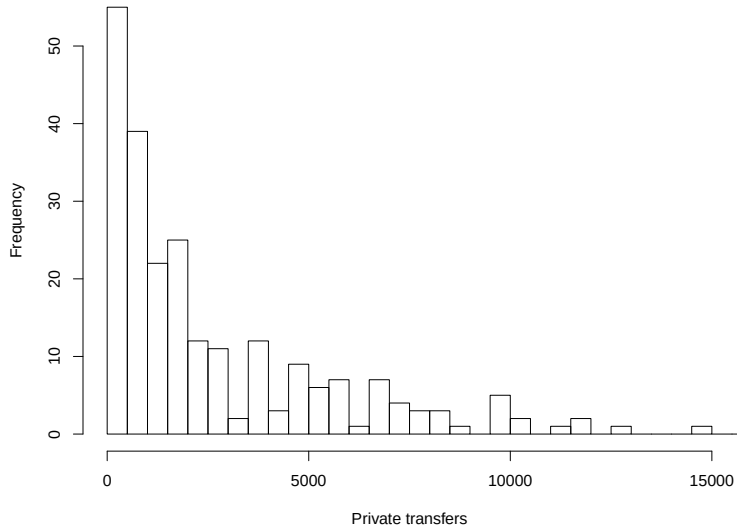
x	Eligibles	NTU	t2.rate	Matches
-1.00	105.00	0.88	0.98	0.02
-0.50	851.00	0.42	0.39	0.61
-0.10	1471.00	0.57	0.21	0.79
0.00	1644.00	0.60	0.17	0.83
0.10	1829.00	0.63	0.15	0.85
0.50	2638.00	0.72	0.09	0.91
1.00	3628.00	0.79	0.06	0.94

3.2 Descriptive statistics

Private transfers are transfers that are made between different households. They can have different motivations and it is empirically difficult to distinguish them and even to determine whether they occur with or without an informal exchange. They are self-reported by the person interviewed and there is no potential extra motivation for misreporting or underreporting them for households on welfare. They are composed of transfers coming from parents and children (living in a different household), relatives and friends. However, due to the structure of the survey, we only observe the amount of transfer received and not who gives. About 14% of eligible households receive private transfers in 2011, and they range from 0 to 15 000 EUR per year. Figure 3.2 illustrates the estimated density of private transfers using the histogram. The density is very concentrated at the beginning of the distribution giving support for financial help motives.

Table 3.2 provides a descriptive portray of the prevalence of some characteristics that are associated with welfare participation. This table has been computed using the sample of eligible households in 2011. First, we can draw the dominant features of those who receive private transfers. They are younger, usually single and have less children in average. They have a higher human capital: more educated, hence they have less chance to be unemployed, and if they are, they have a higher probability to find a job. They also have a better social capital with more friends and a higher satisfaction with social life in average. Among those who receive private transfers, we can explore their differences in characteristics between those who participate and those who do not participate. As expected, those who do not participate have more labour earnings, they are less unemployed and they receive more private transfers. This suggests a substitution between public and private transfers. They are more likely to be single and have less children in average. They have more friends and a better satisfaction with social life. The proba-

Figure 3: Histogram of private transfers



The density is estimated on private transfers which are strictly positive and on the sample of eligible households in 2011.

bility of taking-up for each group can be easily computed, those who do not receive private transfers participate with a probability of $0.36/0.86 = 0.42$ whereas it is only $0.04/0.14 = 0.27$ for those who receive private transfers. It turns out that social networks and private transfers are associated with less welfare participation.

Once we have identified and restrict the sample to the eligible households, differences in the prevalence of some characteristics put light on the genuine process. Descriptive statistics reveal that those who do not participate receive more informal transfers and that the participation rate is lower when households receive private transfers than without. This suggests that informal transfers affect welfare participation through two mechanisms. An intensive margin characterized by a substitution between public and private transfers. However when the benefit increases, more and more individuals participate to the program, this is the extensive margin. Also, these descriptive statistics also reveal that we probably have to reject the hypothesis that those who receive private transfers are a random sample of the population. Instead, evidences suggest that they are a selected-sample being the solution of an underlying model of giver-receiver. Particularly, they are younger, usually single, have less children in average but they are more educated and have more social capital.

Table 3: Descriptive statistics

	Without transfers			With transfers		
	NTU	TU	Total	NTU	TU	Total
Nb obs	809	599	1408	173	63	236
Share (%)	0.49	0.36	0.86	0.10	0.04	0.14
Household unit						
Labour earnings	11708.5	5223.0	8949.4	9215.3	6402.9	8464.5
	(357.5)	(295.4)	(255.5)	(740.8)	(868.1)	(595.0)
Private transfers	0	0	0	3436.5	1726.0	2979.9
				(317.6)	(279.0)	(249.1)
ALG II	0	6750.2	2871.7	0	6035.7	1611.2
		(160.1)	(112.0)		(489.0)	(217.2)
East-Germany (%)	0.26	0.42	0.33	0.21	0.36	0.25
	(0.015)	(0.020)	(0.012)	(0.031)	(0.061)	(0.028)
Nb children	0.61	0.83	0.71	0.32	0.90	0.47
	(0.035)	(0.046)	(0.028)	(0.051)	(0.144)	(0.056)
Marital, married (%)	0.35	0.26	0.31	0.18	0.19	0.18
	(0.017)	(0.018)	(0.012)	(0.029)	(0.049)	(0.025)
Marital, single (%)	0.30	0.34	0.32	0.72	0.56	0.68
	(0.016)	(0.019)	(0.012)	(0.034)	(0.063)	(0.030)
Marital, others (%)	0.34	0.40	0.36	0.10	0.25	0.14
	(0.017)	(0.020)	(0.012)	(0.022)	(0.055)	(0.022)
Individual unit						
Unemployment (%)	0.06	0.57	0.28	0.03	0.41	0.14
	(0.007)	(0.016)	(0.009)	(0.011)	(0.051)	(0.019)
Prob. to find a job	56.8	50.5	52.3	62.1	70.7	65.4
	(3.422)	(1.863)	(1.654)	(4.493)	(4.572)	(3.280)
Education	11.5	10.8	11.2	13.4	12.0	13.00
	(0.067)	(0.069)	(0.049)	(0.195)	(0.287)	(0.165)
Age	34.0	29.5	32.0	27.4	24.13	26.31
	(0.486)	(0.504)	(0.353)	(0.866)	(1.213)	(0.708)
Nb close friends	4.46	4.91	4.65	5.60	3.75	5.07
	(0.141)	(0.615)	(0.275)	(0.339)	(0.420)	(0.274)
Social life satisfaction	7.65	7.01	7.38	7.82	7.30	7.67
	(0.062)	(0.087)	(0.052)	(0.122)	(0.211)	(0.107)

These statistics are computed using the sample of eligible households in 2011. Standard errors are given between brackets. The variable *marital, others* includes divorced, separated and widowed situations. All statistics are average, except for those denoted by (%) which represent a ratio.

4 Empirics

4.1 Economic and stochastic specifications

In order to estimate the system of simultaneous equations, we have to specify functional forms for the utility $u(.)$ and the transfer $T(.)$ functions. Since we have no theoretical insight about the functional form of the transfer equation, our specification is driven by the data. Particularly, we suppose a linear

transfer function such that:

$$T = \beta_0 + \beta_1(y^0 + Pb) + \beta_2 y_{-i} + \epsilon_T,$$

where $\epsilon_T \sim N(0, \sigma_T^2)$, β_1 might be negative while β_2 might be positive. Moreover, we do not observe those who give i.e. negative transfers, we only observe those who receive i.e. positive transfers. Hence the econometric specification for the transfer equation has to take into account censoring[2] , this gives:

$$T = \max(0, \beta_0 + \beta_1(y^0 + Pb) + \beta_2 y_{-i} + \epsilon_T).$$

For estimating the participation equation, we have to specify the utility function. Particularly, the function has to be concave. This implies that the utility derived from a marginal variation in wealth is decreasing. In order to account for this feature, we take the simple log-utility, a specification widely used in the literature since Blundell et al. (1988). Then, we can write:

$$P^* = \alpha \log\left(\frac{y^0 + b + T(P=1)}{y^0 + T(P=0)}\right) - \phi. \tag{10}$$

A simple stochastic specification of the participation equation P^* allows for observed and unobserved heterogeneity in preferences by specifying the parameter ϕ as a linear function of observed household characteristics X and an error term ϵ_P. This is equivalent to assuming heterogeneity in the population according to taste for welfare. Hence, it is assumed that $\phi = X\gamma + \epsilon_P$ where $\epsilon_P \sim N(0, \sigma_P^2)$.

The system of estimating equations is:

$$\begin{aligned}
P &= 1 \text{ if } P^* > 0, && (11)\\
P &= 0 \text{ if } P^* \leq 0, && (12)
\end{aligned}$$

$$\begin{aligned}
T &= \max(0, \beta_0 + \beta_1(y^0 + b) + \beta_2 y_{-i} + \epsilon_T) \text{ if } P^* > 0, && (13)\\
T &= \max(0, \beta_0 + \beta_1 y^0 + \beta_2 y_{-i} + \epsilon_T) \text{ if } P^* \leq 0, && (14)
\end{aligned}$$

$$P^* = \alpha \log\left(\frac{y^0 + b + T(P=1)}{y^0 + T(P=0)}\right) - \phi + \epsilon_P. \tag{15}$$

With these stochastic specifications, the model in (11)-(15) constitutes a simultaneous equations system with two endogeneous variables P and T.

[2]In the descriptive data, we noticed that those who receive informal transfers are not a random sample from the population. It turns out that a Heckman's model would be probably more adapted to correct for selection bias.

This model is estimated by two-stage least squares (2SLS). First, we estimate the censored transfer equation's parameters (β_0, β_1, β_2) and then we use the predicted values of transfers $\hat{T}$ as an intrumental variable for T in (15). Our specification is just-identified.[3]

4.2 Results

Table 4 provides the estimation results of the model (11)-(15). We restrict the sample to the eligible households, we have 841 observations. The initial income y_0 is defined as the annual disposable household minus the amount of private transfers and of social assistance (SGBII) received. The entitlement level b is defined by microsimulation for each household on the annual basis. The wealth of the network y_{-i} is not observed in the GSOEP, hence we use the share (in %) of highest diplomas in the individual's network as a proxy for network's wealth. The first column shows the results from estimating a unique value for the parameter ϕ. As expected, disposable income reduces the amount of transfer received while the network wealth increases it. Also, the utility difference of participating is significant and affects positively welfare participation. We found evidences of a stigma cost ϕ which reduces the probability of being on welfare. For example, with perfect crowding-out ($\Delta b = -\Delta T$), it implies with $\hat{\phi} = 1.00736$ that the participation rate would be $1 - F_{\epsilon p}(\phi) \simeq 0.157$ where F_{ϵ_p} is the standard normal cdf. Interstingly, we can notice that when there is perfect crowding-out, participation does not depend on the size of the benefit but only on the stigma cost. In contrast, if we assume that there is no crowding-out (transfers are fixed $T = T^0$), then decision to participate depends only on the relative size of the benefit (relative to the other sources of income, namely the initial income y^0 and the fixed amount of transfer T^0). These results hold even when controling for observed heterogeneity as provided in the second column. Observed heterogeneity is introduced through household's characteristics (number of households members, living in East-Germany, wife present in the household), the household's head characteristics (gender, age, education, unemployment) and household head's social network characteristics (number of friends, share of the network living in East-Germany, share of females in the network, share of relatives in the network, share of unemployed people in the network, and the network mean age).

[3]Remark that this is not the best estimation strategy since both explanatory variables in the transfer equations are correlated with ϵ_P. We have to describe the potential bias introduced and to propose some remedies for this endogeneity issue. Moreover, it should be noted here that this estimation strategy does not eliminate the selection bias discussed before.

4.3 Marginal effects

Implications of the results are better described in terms of marginal effects than in estimated coefficients or elasticities since we are mainly interested in a dichotomous behaviour: participate or not to social assistance. The estimated marginal effects are provided in Table 5. These marginal effects are computed at the means and using the estimation results provided in the first column, formulas used for computing these marginal effects are given in Appendix. It has to be noted that, here, we ignore the censoring of private transfers at zero, hence there might be negative transfers.[4] We measure how the participation rate changes (in %) after a change in the entitlement level b, the stigma cost ϕ, the initial income y^0, and the network wealth y_{-i}. For instance, suppose that the government decides to increase the benefit by 10 euros per week, the participation rate would raise by 0.75% whereas Moffitt (1983) found an increase of 4.4% for the AFDC program in the USA in 1976. This important difference comes from the fact that in our model with private transfers, we consider the utility of the welfare benefit net of transfer loss. It turns out that the crowding-out effect reduces importantly the incentives of participating. Now suppose that because of the complexity of the program or because of lack of information about the program, what economists call the stigma cost doubles. It encouters a fall of 33% in the probability of participating in the welfare program and this implies an increase of 1669 euros of transfers (for those who already receive transfers). The main mechanisms of our model relies on the crowding-out effect. Measuring the crowding-out effect through the marginal effect of the welfare benefit on private transfers is more delicate since two mechanisms plays a role. The intensive margin is characterized by a substitution between public and private transfers of $\hat{\beta}_1 \approx -0.2406$, however when the benefit increases, more and more individuals participate to the program. Then, 1 more euro of social assistance implies a total fall of private transfers of $\beta_1(P + b\Delta P)$ that has been estimated (at the means) to be -0.14. Having estimated the eslaticity of transfers with respect to the benefit and the stigma cost being -0.16 and 0.27 respectively, it is clear that the private transfers are much more sensitive to social conditions than financial ones.

[4] In our estimated model, for most of possible configurations, the conditional probability that individuals receive transfers $T > 0$ is 0 even when individuals have a zero income $y^0 = 0$. Particularly, a high network wealth y_{-i} is necessary for receiving transfers. Thus a change in the entitlement level will affect only those who have a high network wealth.

5 Conclusion

Many economists attempted to explain the consistent evidences of high non-take-up rates. In this study, we have proposed to highlight the role of informal transfers on welfare participation. Using the German SOEP data, we provide micro-fundations and estimates for crowding-out in the context of social assistance and we give precise estimates of the genuine incentives provided by the size of the welfare benefit. Our main result is that the effect of informal transfers on welfare participation depends on the crowding-out effect. Our framework allows also to decompose the crowding-out effect between intensive and extensive effects. In constrast with the empirical economic literature, we found that the level of the benefit is a weak policy instrument for economies characterized by important informal transfers and with high crowding-out.

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Table 4: Estimation results

	Without controls	With controls
β_0	-2900^{***}	-2900^{***}
	(503.7)	(503.7)
β_1	-0.2406^{***}	-0.2406^{***}
	(0.02788)	(0.02788)
β_2	56.06^{***}	56.06^{***}
	(5.802)	(5.802)
α	0.91411^{***}	0.742881^{***}
	(0.09573)	(0.118949)
ϕ	-1.00736^{***}	-1.715427^{***}
	(0.07280)	(0.335197)
Network labour status		0.263847
		(0.181122)
Network related		-0.032829
		(0.173234)
Network gender (F)		-0.052383
		(0.226979)
Network age		0.005100
		(0.006685)
Network East		-0.007340
		(0.211708)
Number of friends		-0.035176^{*}
		(0.015558)
Gender (F)		0.137588
		(0.142131)
Age		-0.007288
		(0.005524)
Education		-0.002973
		(0.013953)
Number of hh members		0.215805^{***}
		(0.051505)
East		0.404553^{*}
		(0.200127)
Unemployed		1.645503^{***}
		(0.165894)
Wife		-0.081103
		(0.153535)

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 5: Estimated Marginal Effects

Marginal effect of participation	
with respect to b	+ 0.0000157483
with respect to ϕ	- 0.334905
with respect to y^0	- 0.00000873966
with respect to y_{-i}	- 0.000645174
Marginal effect of transfer	
with respect to ϕ	+ 1669.26
Crowding-out effect	- 0.144173