

NETWORK EFFECTS IN RISK SHARING

AND

CREDIT MARKET ACCESS:

EVIDENCE FROM ISTANBUL

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This thesis is dedicated to my lovely family.

ABSTRACT

Low levels of per capita income, variable incomes, and high unemployment rates are some of the main economic problems that households living in developing countries face. When health expenditures, debt repayments, and educational costs are added, households face great difficulties in smoothing consumption. Although full insurance is not observed, many studies show that households in rural areas are able to smooth consumption to a certain extent using their social networks as risk pooling instruments, when formal credit institutions fail to exist, or function properly. In contrast to the current literature, this study uses data from a household survey prepared for this study and conducted in Istanbul, where formal credit institutions are available, to analyze the household behavior in response to income and expenditure shocks. Our results indicate that households eligible for formal loan view money transfers from their social networks superior to formal loan. Moreover, networks are found to play an important role in households' access to formal credit institutions.

Keywords: Social networks, risk sharing, credit market access, Turkey

KISA ÖZET

Kişi başına düşen gelirin düşük seviyelerde oluşu, gelirlerdeki değişkenlikler ve yüksek işsizlik oranları gelişmekte olan ülkelerde yaşayan hanehalklarının karşılaştıkları başlıca ekonomik sorunlardır. Yaşanan ekonomik sorunlara sağlık ve eğitim masrafları, borç ödemeleri de eklenince haneler tüketimlerini olağan seviyelerinde tutmakta büyük zorluklar yaşarlar. Resmi kredi kurumlarının bulunmadığı ya da tam işlevsellik gösteremediği kırsal alanları temel alan önceki çalışmalarda belirtildiği gibi tam kapsamlı risk paylaşımı sağlanamasa da haneler sosyal ağlarını birer risk paylaşım aracı olarak kullanarak tüketimlerini belli oranda koruyabilmektedirler. Önceki çalışmalardan farklı olarak, bu çalışma resmi kredi kurumlarının gelişmiş olduğu İstanbul şehrinde hanelerin ani gelir ve tüketim değişimleriyle karşılaştıkları durumdaki ekonomik davranışlarını analiz etmek üzere tasarlanmıştır. Hanehalkı anket çalışması ve ekonometrik analizlerin sonuçları hanelerin bu tür durumlarda resmi kurumlardan kredi almak yerine sosyal ağlarından borç almayı tercih ettiklerini göstermektedir. Buna ek olarak hanelerin kredi pazarlarına erişimlerinde de sosyal ağlarından önemli yardımlar aldıkları sonucuna ulaşılmıştır.

Anahtar Kelimeler: Sosyal ağlar, risk paylaşımı, kredi pazarlarına erişim, Türkiye

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1 Introduction

Low levels of per capita income, variable incomes, and high unemployment rates are some of the main economic problems that households living in developing countries face, which prevent them from fully enjoying a healthy social life. When health expenditures, debt repayments and education costs are added, households face great difficulties in smoothing consumption. Many studies in the literature deal with rural parts of developing countries to show that households manage to smooth consumption to a certain extent when their incomes alternate. Since formal credit markets and well-functioning formal social security mechanisms are usually missing in such environments, social networks are considered to be the main risk-sharing instruments.¹ Although full-insurance is usually rejected, Townsend (1994, 1995), and Goldstein et al. (2005) find strong evidence of risk sharing² in networks of friends

¹The discussion of social networks takes its roots from the social capital literature. For detailed information on social capital, its role in economics, and empirical analysis of social capital see Keefer and Knack (1997), Coleman (1988), Glaeser, Laibson, and Sacerdote (2000), Durlauf (2002), and Durlauf and Fafchamps (2004). Social networks constitute the main platform for information exchange and transfers. Information flows within networks are analyzed in various areas, some of which are labor markets as in Calvo-Almengol and Jackson (2006), trade as in Fafchamps and Minten (2002), migration as in Bauer and Gang (2002), and technology adoption as in Conley and Udry (2001), Munshi (2004), and Bandiera and Rasul (2006). This study focuses on the role of networks in transfers.

²We assume risk-sharing networks to be exogenous and do not investigate how these networks are formed. Yet, detailed information on the the formation, structure, and stability of such networks and can be found at Jackson and Wolinsky (1996), Ligon, Thomas, and Worrall (2000), Genicot and Ray (2003), Bloch, Genicot and Ray (2005),

and families.³ In other words, households consumption does adjust to the idiosyncratic shocks that are faced, but social networks help to smooth the effect.

Considering only transfers between households, Udry (1994), and Fafchamps and Lund (2003) similarly show evidence of imperfect consumption smoothing in rural areas. Even when limited credit markets exist, social networks continue to play the major role in risk sharing. One important study is Rosenzweig (1988), which examines the role of family in risk pooling in low income rural areas. One of the results indicate that transfers from households are preferred over credit market insurance. Since credit markets are limited, and people living in a small rural area are well-connected, the result is as expected. Therefore, it leads to a more interesting question of whether households in urban areas, where credit markets are relatively well-developed, also prefer informal transfers to formal loans. This idea is the main motivation of our work. We believe that our results constitute a big input to the ongoing debates on social networks.

In contrast to the existing literature, we use data from a household survey and Bramoulle and Kranton (2005). For more on risk-sharing agreements and risk-sharing without commitment see Coate and Ravallion (1993), and Charness and Genicot (2004).

³There are other studies which examine risk sharing in networks including the networks of ethnic groups and neighbors such as Jalan and Ravallion (1998), Gertner and Gruber (2002), Kazianga and Udry (2004), and Suri (2005).

designed for this study and conducted with face-to-face interviews in Istanbul, in May 2006, to examine how households smooth consumption when they are short of cash as a result of idiosyncratic income or expenditure shocks. Istanbul is a big metropolitan with functioning financial institutions, and credit markets, but its unique social structure - compared to other big cities in the developed world - economic variation, and demographic attribution enable coordination through strong social networks as well. Therefore, both formal and informal risk-sharing mechanisms function within the city. In contrast to the existing literature, we consider both formal and informal loans as risk pooling instruments. The main question we ask is as follows: While formal credit institutions are accessible and willing to provide loans to households who are short of cash, do households still prefer transfers and help from exogenously determined social networks over formal institutions? Our results show that in times of cash shortages, whether eligible for loan approval or not, households primarily use their own financial instruments, including monthly income, savings, and asset sales to cope with the shortages. The second best method to deal with the shocks is to receive money transfers from social networks. In our sample, more than half of the households eligible for loan approval from formal institutions are found to receive

money transfers from social networks rather than obtaining formal loan.

Social networks not only function as sources of cash transfers, but also facilitate households' access to formal credit institutions. One important study is by Okten and Osili (2004), where they show that in Indonesia, community and family networks are important in knowing a place from which to borrow, and get loan approval. In big cities like Istanbul, knowing a place to borrow is not a problem for households since credit institutions use various advertising methods to inform the public about their services. Yet, eligible households may still use their social networks in order to accelerate the loan approval process or to benefit from the formal loan opportunities in more advantageous terms. Our results indicate that of those households who have such networks in credit markets, almost half use their networks in order to benefit from formal institutions. Moreover, we find that a very small percentage of households who are otherwise ineligible for loan approval get loans from formal institutions with the help of their social networks.

The proceeding is as follows: Section 2 presents the conceptual and econometric framework. Section 3 displays facts from Istanbul and formal institutions, information on the survey, data, and explanatory variables. Section 4 presents the results, and section 5 concludes with a discussion of the results.

2 Framework

2.1 Conceptual Framework

Studies in the risk sharing literature which test full insurance use the following idea. If risk is shared efficiently, or if there is full insurance, then individual or household consumption should not be affected by the changes in income resulting from idiosyncratic shocks. Authors generally regress the change in individual consumption on the change in average village consumption and change in income due to the shocks faced. If the coefficient of the change in income is zero, and the coefficient of the change in average village consumption is one, then it is concluded that efficient risk-sharing takes place in the village, and individual consumption varies in accordance with the average village income.⁴ Fafchamps and Lund (2003), taking the model above as basis, include asset sales, gifts, and informal loans in their analysis. This study will also include loans from formal credit institutions.

The data to be used in this paper comes from a survey conducted in an urban area. It is not realistic to expect full insurance or efficient risk-sharing in the urban areas of a developing country since financial markets do not

⁴See Cochrane (1991), Townsend (1994), Udry (1994), Goldstein (1999), Fafchamps and Kurosaki (2002) for details.

function fully even in big cities.⁵ It is also inappropriate to include a concept such as average city consumption due to the diversity in demographics and socio-economic status. The main interest is to identify how households cope with the change in their consumption resulting from a shock in income or expenditure. Modifying the model in Fafchamps and Lund (2003), this work proposes that households use the following three methods to deal with their cash shortages: credit from formal institutions, transfers from social networks, and household financial resources. The shocks responsible for cash shortages are defined to be exogenous shocks to the households. Valuable asset purchases, or marriage expenses are included in this definition, as well as unexpected health expenditures, since unless delayed such conditions arise due to the necessities that are the cost of living in a big city.

For household i , consumption at time t_0 (before the shock), c_{i,t_0} , can be expressed as follows:

$$c_{i,t_0} = y_{i,t_0} + w_{i,t_0} \tag{1}$$

where $y_{i,t}$ is the household income consisting of a permanent and a transitory component, and $w_{i,t}$ is the assets and/or savings of the household.

When the shock is faced, the household is expected to smooth consump-

⁵Efficient risk sharing is rejected even within the same households on the studies concerned with rural areas such as Udry and Duflo (2004), and Goldstein(2004).

tion using the three instruments, thus for t_1 (after the shock) the above equation becomes:

$$c_{i,t_1} = y_{i,t_1} + w_{i,t_1} + a_{i,t_1} + b_{i,t_1} \quad (2)$$

where $a_{i,t}$ is the amount of loan the household receives from formal credit institutions, and $b_{i,t}$ is the amount of transfers the household receives from its social networks.

In Istanbul, there are two sources from which to get formal credit, namely banks and independent money lenders. The decision of obtaining loan from a formal credit institution primarily depends on whether the household is eligible for loan approval or not. We consider all those households who cannot meet the conditions for loan approval, and those who applied but could not receive loan as ineligible.⁶ If the household is eligible, we categorize households in two groups, those who obtain formal loan and those who do not. As stressed above, when obtaining a formal loan, eligible households may

⁶To classify households as eligible and ineligible, we rely on the responses of the household representatives to the survey questions. The question we ask is: “As the household, in order to cope with the cash shortage due to the shock you mentioned, did you try to obtain loan from a bank (household credit or loan from credit card) or a formal money lender?”. The respondent chooses one of the following: “Did not try: We were able to obtain loan but did not obtain”, “Did not try: We knew that we would not be able to obtain loan”, “Tried but we were rejected for loan approval”, “Tried and obtained loan”. If the first and the third are reported, the household is classified as ineligible. If the second and fourth are reported, the household is classified as eligible. Out of the 600 households in our sample, 76.7 percent are found to be eligible.

use their social networks in order to accelerate the loan approval process or to benefit from formal loan opportunities in more advantageous terms. If the household is eligible, and chooses to obtain loan, there are three ways to get it. First, the household may not have any social networks to get help for the loan approval, or may ask for help but not receive any help, in such cases the loan is taken without any help. Second, the household may have social networks to get help for the loan approval, but may not use these networks, and obtain the loan without any help. Third, the household may obtain loan with help from social networks.

We assume the social networks to be exogenous. The main types of networks consist of friends and family members or relatives, who live outside the household, and do not financially depend on the household. The availability of social networks is a characteristic of the household. The networks used for easy access to loan, and networks used for money transfers need not be the same. In fact, we analyze them separately. That is, we also allow for cases where the household obtains a formal loan with help from networks, and still receives money transfers from networks, and vice versa. In our analysis of money transfers from networks, we categorize households into three groups. First, the household may not have any networks from which to get money

transfers, or may have such networks but be rejected for money transfers. Second, the household may have such networks but not use them for receiving money transfers. Third, households may ask for money transfers from their social networks, and receive the money they need.

Finally, we look at whether households use their own financial resources when they are in need of cash. Households may choose to use their monthly income to deal with the shock, and thus reduce their consumption. Other types of financial resources considered in this study are interest earnings from deposits at banks, savings, asset sales, and credit card usage.

Households can use these three instruments in various combinations. We are mainly concerned with the first two instruments, namely loans from formal institutions, and money transfers from networks. Therefore, we differentiate between households according to their usage of these two instruments. This differentiation leads to the characterization of five types of households. From now on we will refer to households according to their types. Figure 1 displays the whole structure and categorizes households into the five types explained below.

[Insert Figure 1 about here]

Type1 households are those who are not eligible for obtaining a loan from

a formal credit institution. Type2 households are those who are eligible for a formal loan, but do not obtain. Type3 households are those who are eligible, and obtain the loan, but do not have any social networks to get help for the loan approval process. Type4 households are those who are eligible, obtain the loan, and also have social networks to ask for help in the credit markets, but do use these networks for loan approval. Finally, Type5 households are those who are also eligible, obtain the loan, and use their social networks in the credit markets for loan approval. All five types of households are also divided into three groups according to the money transfers they receive from their social networks. The first group members have no social networks for money transfers, or are rejected for money transfers from their networks. The second group members have social networks for money transfers, but do use them. So, regardless of their types, the first and second group households do not receive any money transfers from their social networks. Finally, the third group members have social networks for money transfers, and receive money transfers from them. This specification of household types forms the basis of our econometric framework which is explained in the next subsection.

2.2 Econometric Framework

Our estimation method is a multi-stage logit estimation. In the first stage we look at the determinants which make households eligible for loan approval from a formal credit institution. We regress the explanatory variables - average household education level, income per household member, number of household members contributing to household income, number of children, material security, social networks index, network usage index, reciprocity index, and usage of household financial resources - on the dependent variable, which is 0 if the household is not eligible and 1 if eligible. This binomial logit estimation distinguishes between Type1 households and the rest of the sample. The results of this stage do not present the choices of households, they are descriptive.

Next, we investigate the determinants of the loan contracting decisions of households. Taking the data of those households who are eligible, we regress the explanatory variables - all the explanatory variables used in Stage1 plus one variable defining the shock, which is 1 if the shock is unexpected, and 0 otherwise - on the dependent variable, which is 0 if the household did not obtain a loan, and 1 if obtained. With this binomial logit estimation, we display the effects of money transfers from social networks on the loan

contracting decisions of the households. Excluding Type1 households, this stage distinguishes between Type2 households and the rest of the sample.

Finally, we use the data of those households who are eligible and obtained a formal loan, to examine the effects of social networks on obtaining a loan from a formal credit institution. In addition to the explanatory variables used in Stage2, we include a dummy variable which is 1 if the formal loan obtained is sufficient, and 0 otherwise. The dependent variable is 0 if the household has no networks in the credit markets, or is rejected for help, and thus obtained the loan without any network help. It is 1 if the household has networks in the credit markets, but does not use these networks for obtaining the loan, and it is 2 if the loan is obtained with help from social networks. Excluding Type1 and Type2 households, this final stage distinguishes between Type3, Type4, and Type5 households.

In order to confirm our results from this three-stage logit estimation, we also run a multinomial logit regression using the full sample. The dependent variable takes five values according to the types of the households. The results for all stages are presented in Appendix B.

3 Data

3.1 Facts from Istanbul

Istanbul is the most developed and densely populated city in Turkey. According to the 2005 data of the State Institute of Statistics (SIS), 15.92 percent of the population in Turkey lives in Istanbul (11,398,000 out of 71,611,000 people in Turkey).⁷ In the 1980-2003 Provincial Indicators data reported by SIS, Istanbul ranks first with a 33.09 percent population growth rate, whereas this rate is 18.28 percent for Turkey. A more striking statistic in the same data is the population density. Population density is 1,885 persons/kmsquare in Istanbul, whereas this number is only 88 for Turkey. The rate of university graduates, those aged 25 years and over (11.24 percent), ratio of literate population (93.39 percent), and GDP per capita (3,063 US dollars) in Istanbul are also well above the average for Turkey (7.80 percent, 87.32 percent, 2,146 US dollars, respectively).

Although the rate of immigration to the city has decreased lately, mainly the job opportunities have attracted people from other cities, and rural areas for many years, starting from the 1950s. Therefore the population of Istanbul consists of people who have origins in different cities all around Turkey. The

⁷See www.tuik.gov.tr

variation in the economic, educational, and cultural levels of individuals make it impossible to form a general profile of a household living in Istanbul. Yet, there is one common characteristic shared by most. Most households, no matter where they came from, or how long they have been living in Istanbul, belong to some form of a social network, some of which are effective in risk pooling and some are not.

Our results show that the most commonly used social networks are family and friends networks. For people whose families were in the city for many generations, the family networks are in the city. On the other hand, two cases are possible for immigrants. If they have immigrated a long time ago, or immigrated with all of their family members and relatives, their networks are also in the city. Other immigrants may still have some relatives in their city or village of origin, where they have immigrated from. Even in this case, family networks are usually preserved.

Other important networks are colocality, religious and special organizational networks. In “colocality” networks, people who have immigrated from the same city interact with each other. There are a lot of informal organizations formed, through which those coming from the same city or village of origin get to know each other and meet periodically. Since Istanbul is home

to people of varying origins, it is also home to different religions. There are many religious organizations, through which individuals are connected. Special organizational networks are formed through political, or organizational ties. Political parties do not only act in the political scene, but also function as a platform in which their members and supporters gather and connect. Special organizations, such as the freemason's lodge, alumni associations, and professional societies are also important networks in Istanbul. Although these networks are very commonly seen in Istanbul, one striking result that we find is that households very rarely benefit from them for risk pooling purposes.

3.2 Formal Credit Markets, Social Security, and Insurance

The year 2000 has been a turning point for the formal loans available to households in Turkey. The economic policies effective in 2000 caused a dramatic decrease in interest rates. As a response, the banking sector decreased the volume of funds to government financing and transferred the resources to the credit markets. Banks primarily increased the volume of loans for households instead of the commercial and corporate loans. The main motivation

for this action was that the amount of loan provided for each household is small compared to commercial and corporate loans, and has less default risk since household loans are on goods. By the end of 2000, consumer and household loans increased 368 percent in nominal terms, and 253 percent in real terms. As of 2004, deposit money bank credits for households constituted 34.5 percent of the credits given to the private sector (94 percent of the total credits). The decreasing interest rates also affected the demand side. Household consumption rose as a response to the decreasing interest rates. The suppressed consumption motivations, and beneficial credit opportunities increased the household demand for loans from formal credit institutions. Although the financial crisis in 2001 had negative effects on both the demand and supply of household loans, starting with 2002 the credit market regenerated its impetus. Yet, some problems still exist. Repayment conditions, collateral, and uncertainty about future economic fluctuations drive some households out of the credit markets.

Insurance business in Turkey is a fast growing sector which has recorded a compound annual growth rate of 30 percent since 2001. As of 2004, there are a total of 47 - which consists of 42 domestic, 5 foreign - insurance companies in Turkey. The types of insurance provided are fire, transportation, accident,

health, life, and credit. When compared with the EU countries, the main indicators of the sector imply that the insurance sector in Turkey is at its early stages of development, but has a great potential for growth. The 2005 indicators show that the lower inflationary environment of the past years has increased the demand for the life insurance segment mainly. Also, the Private Pension Law, which became effective in 2003, boosted the growth in demand. Yet, many households are uninformed about the insurance opportunities, or do not find insurance necessary.

Finally, the social security system in Turkey is organized to ensure individuals' security throughout their life span. The system is composed of three different major organizations. These organizations support the contributors with the following benefits: retirement pension, disability pension or insurance, work injury and occupational disease insurance, health insurance, death insurance, etc. As of 2004, a total of 7,227,292 contributors benefited from these social security organizations. The social security system in Turkey is becoming more beneficial and protective for households with the newly established laws and government policies. Yet, some problems still exist. The law requires that all employers and employees have one of the three types of social security. However, due to high social security expenditures, not all

employers guarantee social security to their workers. The labor force in the informal sector is another reason why some workers still do not have any form of social security.

3.3 Survey

Our data comes from a household survey that we constructed for this study. The survey was conducted through face-to-face interactions with urban households living in Istanbul by a professional survey company in May 2006. The sampling strategy is as follows. The population distribution within Istanbul is calculated on the basis of the urban population of its districts. 81 percent of the 32 districts are large size districts, and the rest are small size districts. The distribution of the sample within the large size districts is based on the population of each district, and that of small size districts is distributed equally. Neighborhoods are randomly selected as representative of the districts. Within each neighborhood, street selection is based on official records on property values. In each street, households are selected randomly. A total of 600 randomly selected households representing Istanbul were surveyed.

The household representatives were first asked whether they experienced any income or expenditure shocks in the past 2 years. We define the shocks to

be expected or unexpected necessities that cause cash shortages. Unexpected unemployment or health expenditures are included in this shock definition, as well as debt repayments and marriage. Representatives of the households, who had several shocks in the past 2 years, were then asked to specify the shock which had the most severe effect on their economic well beings, and the following questions in the survey were asked referring to this shock. The most common shocks are debt repayments (40.3 percent), unemployment (18.2 percent), health expenditures (14.0 percent), and educational costs (10.5 percent). Only 32 percent of the shocks are unexpected.

[Insert Table 1 about here]

Since the main objective of this paper is to define households' behavior in dealing with the cash shortages, the household representatives were asked whether as the household they used the risk-sharing mechanisms defined in this paper. Detailed questions on usage of formal loan, money transfers from networks, and usage of household financial resources were asked. The most preferred method to deal with cash shortage is found to be usage of household financial resources (67.5 percent of the total sample), which includes monthly income, interest earnings from deposits at banks, savings, asset sales, and credit card usage. The second most preferred method is to receive money

transfers from social networks (42.17 percent of the total sample), and the third is to obtain loan from formal credit institutions (31.67 percent of the total sample and 41.3 percent of the eligible households in the sample). Only 4.67 percent of the households could not use any of the three methods. For most of them, the shock was debt repayments, so they probably delayed the payments.

Next, the household representatives were asked whether they got help from their social networks in areas other than money transfers. We found that households also use their social networks to find new jobs, to register their children to schools, and to gain access to certain services in the health sector. But, social networks used for these areas and social networks used for money transfers are usually not identical. That is, households who have social networks for money transfers do not necessarily have social networks to find new jobs and vice versa.

Finally, the number of household members contributing to income, education levels and social security contributions of household members, monthly expenditures and material security of the households were also inquired into.

3.4 Explanatory Variables

The survey enabled us to gather a rich set of information to use as explanatory variables in our regressions. We included all the information that we think will characterize the households' eligibility, decision of obtaining formal loans, and decision of using social networks in the credit markets.

The average education level, number of people contributing to the household income, income per household member, material security, social networks index, and number of children in the household constitute the characteristics of the households. The social connectedness of households is defined in various forms in different studies. In this study, we use the social networks index to represent how many networks the households belongs to. This index is composed using the data on ethnicity⁸, religion, migration, and social awareness of the household members. Along with other variables characterizing the household, we expect this index to be significant in determining the behavior of the household in using the risk-sharing mechanisms. The households with higher education levels are expected to be more informed about the credit markets, and thus have higher tendency to benefit from advan-

⁸The most populated ethnic groups in Istanbul are those who speak Kurdish or Arabic. People from the same ethnic group are thought to be closely tied, therefore we assume ethnicity to be significant in determining how many networks the household belongs to.

tageous loan opportunities. Higher levels of material security, and income, as well as number of income earning members in the household are assumed to decrease the risk of default and therefore households with higher values in these variables are expected to be more willing to obtain a formal loan. Households with higher social networks indices are anticipated to benefit less from credit markets when eligible, since money transfers from social networks may be sufficient to deal with the cash shortages. But, if those households choose to obtain formal loan, then they are expected to obtain the loan with network help. Households with more children are more likely to pay more for education and health expenses, therefore we expect such households to face greater amounts of cash shortages compared to households with less or no children. These households are thought to be more inclined to use formal loan.

Besides how many networks the households have, the usage of these networks is also important in determining households' behavior when faced with the shock. Therefore, we include this information by using a network usage index for each household. The index is defined in two different ways. In the first definition, network usage includes money transfers from social networks as well as receiving help in other situations such as to find new jobs,

to gain access to some health services, or to register children to schools. In the second definition, the index only includes money transfers. By using two different definitions, we aim to determine the differences between social networks used for money transfers and social networks used for help in other areas. We expect those households with higher network usage indices to have less tendency to obtain formal loan, and if they obtain loan, we expect them to use their networks in obtaining the loan.

Similar to the network usage index, we construct a reciprocity index, which shows how much transfers or help the household provides to its networks. Reciprocity is another indicator showing how connected the household is to its networks, which plays a role in determining the household behavior. Just like the network usage index, reciprocity index is defined in two different ways. Households with higher reciprocity indices are expected to behave similar to those households with higher network usage indices.

The usage of household resources is another explanatory variable. Since households primarily use their own resources to cope with the shocks, we expect those with higher values on this variable to have less tendency to obtain formal loans.

We also include the definition of the shock variable, and sufficiency of

the formal loan obtained variable in our regressions. When faced with unexpected shocks, social networks may be more willing to help households with money transfers, and thus households may have less tendency to obtain formal loans. Finally, we expect those households who use their social networks in obtaining a formal loan to be more likely to obtain sufficient amounts of loan, which means that those households are expected to receive more than 75 percent of the loan they demanded.

For more detailed explanations of the explanatory variables and their calculations, see Appendix A.

4 Results

We run three sets of regressions to analyze our data as discussed in section 2.2. In the first set of regressions, we use all the explanatory variables as described in section 3.4. The networks used for money transfers, and help in other areas need not be identical, therefore including network usage and reciprocity data covering all areas may lead to biased results on the amount of money transfers received and given by the households. Therefore, in the second set of regressions we use the second definitions of these indices. That is, we exclude the network usage and reciprocity indices, but include two

new explanatory variables. The first one is calculated by the principal component analysis, using data on whether households received money transfers from their networks, asked but were rejected, or they did not choose to use networks for money transfers. The second one is simply a dummy variable which is 1 if the household transferred money to networks, and 0 otherwise. The households' ability to receive money transfers from networks may be correlated with their money transfers to the networks. So, in the third set of regressions, we use the same explanatory variables as in second set, but exclude the variable showing households' money transfers to networks.

I. Stage 1:

To investigate the determinants of eligibility for loan approval from a formal credit institution, we use the full data. Dependent variable is 1 if the household is eligible, and 0 otherwise.⁹

[Insert Table 3 about here]

In all three sets of regressions the binomial logit estimation results indicate that material security and number of household members contributing to household income are positively significant at 5 and 10 percent, respectively. Since formal credit institutions require loans to be given on goods

⁹Ineligible, namely Type1 households constitute 23.3 percent of the full sample.

and ask to see payrolls, the significance of these variables on the eligibility of households are positive, as expected. Also, Type1 households are found to have the minimum average number of households contributing to household income, which supports this result.

In all three sets, the usage of household financial resources is negatively significant at 5 percent. That is, those households who are ineligible for formal loan are more inclined to use household resources to cope with the cash shortages.

Network usage is found to be negatively significant at 5 percent only in the first set of regression, and insignificant in others. This result shows that households that are ineligible for a formal loan are more likely to use their networks, but not for money transfers.

Although Type1 households are found to have the minimum average income per household member, and minimum average education level¹⁰, eligibility is found not to depend on education or income. The result is not contradictory since regardless of their education and income levels, any household providing payrolls as proof are able to obtain formal loan. This also explains why eligibility does not depend on the social networks index, reciprocity

¹⁰See Table 2

index, and number of children in the household.

II. Stage 2:

In this stage, we investigate the determinants of formal loan contracting decisions of the eligible households. The dependent variable is 1 if the household obtained formal loan, and 0 otherwise.¹¹

[Insert Table 4 about here]

In all three sets of regressions, definition of the shock and usage of household financial resources are negatively significant at 5 percent. Households are more likely to contract formal loans when faced with expected shocks. Unexpected shocks such as health expenses, death of the person responsible for income earning, and unemployment draw households out of the credit markets due to the increased uncertainty about the future and the possibility of not being able to repay the loan to the formal institutions. Also, those households who decide to contract formal loans are less likely to use household resources to cope with the cash shortages. In other words, formal loan is seen as a substitute for using household financial resources.

Material security and network usage are positively significant at 5 percent in the first set of regressions, and at 10 percent in the second and third

¹¹Type2, Type3, Type4, and Type5 households are eligible. 41.3 percent of eligible households are found to obtain formal loan.

sets. Households with higher levels of material security are more likely to contract formal loans since they feel more secure about future repayments compared to those with lower levels of material security. Also, households contracting formal loans are more likely to use networks for money transfers. This can be interpreted in two ways. First, the households cannot get sufficient amounts of loan and thus also need to get money transfers from their networks. Second, households do not want to get all the money need from formal institutions because they are worried about future payments, thus diversify risk by also using their networks.

Reciprocity is negatively significant at 10 percent in the first set of regressions, and at 5 percent in the second set. This shows that households who helped or transferred money to their social networks in the past are more likely to receive help or money transfers from them. Therefore they choose transfers from social networks over formal loans.

Although Type2 households have the second highest average income per household member, second lowest average education level, and second lowest average number of household members contributing to household income, the decision of contracting a formal loan is found not to depend on these variables. Although higher income level - keeping in mind that this income

is earned by relatively smaller number of household members - signals lower default risk, it also signals that the household may be able to cope with the shock by using this income and not choose to obtain formal loan. So, in contrast to our expectations, the income level is not significant at this stage.

Finally, the social networks index, and number of children in the household do not effect the decisions of the households' to obtain formal loan. The reason is that since the social networks index is not significant, but the network usage index is significant in both the first and second sets, having more networks does not guarantee money transfers from them, thus does not effect the loan contracting decisions of the households. We argued before that those households with more children face more education and health expenditures, thus are expected to choose to obtain formal loans. But, since in our sample households are in need of cash primarily due to debt repayments, number of children in the household is not effective at this stage.

III. Stage 3:

This stage is to investigate the determinants of network usage when contracting a formal loan. The dependent variable is 0 if the household has no networks to get help for loan contracting or was rejected for help, 1 if the household has such networks but does not use them, 2 if the household ob-

tains a formal loan with help from social networks. Basically, we differentiate between Type3, Type4, and Type5 households.¹²

[Insert Table 5 about here]

In all sets of regressions material security and usage of household financial resources are significant at 5 percent, which means that those households with higher levels of material security are more likely to have networks in the credit markets that they can benefit from. That is, social networks tend to help households with loan approval when the material security is high and thus the default risk is lower.

Income is positively significant at 5 percent in the first set, and at 10 percent in the second and third sets for Type4 households. Type4 households also have the maximum average income per household member, and the maximum average number of household members contributing to household income in the full sample. These show that households with higher income levels tend to have more networks in the credit markets but do not benefit from these networks. They are probably able to get a sufficient amounts of formal loan, since formal institutions tend to consider higher income as

¹²Of these households who obtained formal loan, which is 41.3 percent of the total sample, 18.4 percent are Type3, 47.9 percent are Type4, and 33.7 percent are Type5 households.

a signal of lower default risk. This result is also supported by the positive significance of the sufficiency of credit for Type4 households at 5 percent for in the first set of regressions, and at 10 percent in the second and third sets.

In the first set of regressions, network usage is negatively significant at 5 percent for Type4, and at 10 percent for Type5 households. In the second and third set of regressions, it is significant at 5 percent for Type5 households only. The results show that those households who do not choose to use their social networks in credit markets are less likely to use their social networks for money transfers. Since they might already be able to get sufficient amounts of formal loan without network help, they are less likely to ask for money transfers from social networks. On the other hand, those households who get network help in obtaining formal loan also use their social networks for money transfers. Yet, the 10 percent significance shows that these networks are not necessarily the same.

The number of children in the household is significant at 5 percent for Type5 households in the first set of regressions. Considering that those households who have networks for help in loan approval and who use those networks are more likely to receive sufficient amounts of credit, households with more children may be in more need of money and thus use their social networks

to obtain formal loans.

Although Type4 and Type5 households have the highest average social networks indices and highest average education level in the sample, these variables are found not to be effective at this stage. The reason is that the higher number of social networks available in general does not imply their availability in the credit markets. Higher education level may imply more power and prestige, thus enable credit access without any need of asking for help, when in fact help is received implicitly. Therefore effect of education on help granting decision when obtaining a loan is ambiguous in contrast to our earlier expectations. Reciprocity is again found to be insignificant.

IV. Stage 4:

This stage is to confirm our results for the earlier three stages. The dependent variable takes five values according to the types of the households. The significant variables of the earlier stages continue to be significant in determining household types. Moreover, the insignificant variables of the earlier stages turn out to be insignificant in this multivariate logit estimation, too.

[Insert Table 6 about here]

Finally, we run our regressions for the first 3 stages with changing defi-

nitions of some of the explanatory variables. First, we replace the average household education level by a dummy variable, which is 1 if there is any college graduate in the household, and 0 otherwise. Then, we replace the number of household members contributing to household income twice. First, we replace it with a dummy variable, which is 1 if there is any household member working in the formal sector, and 0 otherwise. Second, we replace it with the number of household members contributing to household income divided by number of adults in the household. Finally, we include a new variable representing the average age of adults in the household. In all these new regressions, the insignificant variables of the previous regressions continue to be insignificant.

5 Conclusion

We examined the risk sharing behavior of 600 randomly chosen urban households from the unique setting Istanbul, who had experienced cash shortages due to income or expenditure shocks in the past 2 years. The survey provided detailed information on the usage of formal loans, transfers from networks, usage of household financial resources, various household characteristics, and the shocks faced.

Our results indicate that household financial resources are primarily used in times of cash shortages. Next, money transfers from social networks are mostly used. Money transfers take place mostly within small networks of family and friends. In contrast to the common beliefs on the role of religious networks, we found those networks to be ineffective in times of cash shortages. Religious networks are not used for money transfers or help in credit markets. One reason may be that help received from religious networks are generally in kind. Second, most households may be naming their contacts from religious ties as friends.

Although credit markets are well functioning in Istanbul, more than half of the eligible households are found not to obtain any formal loan. We think that the general mistrust to the banking sector due to the past bank crisis, and credit card repayment difficulties are responsible for this result. Also, formalities in the credit markets may be driving many households out of these markets due to the exaggerated common beliefs about the harshness of the procedures and penalties to obtain and repay the loan. We believe that further developments in the formal credit institutions will be encouraging for households to benefit from these institutions. As more households obtain formal loans and repay their debts without facing any difficulties, their ex-

periences will be effective in loan contracting decisions of households in their social networks.

Yet, the developments in the financial institutions may not be able to cause a decrease in the demand for informal money transfers. Considering the fact that households view their social networks as risk diversifying mechanisms against possible difficulties in the formal credit markets, the demand for both formal and informal loans can be thought to evolve in correlation. Moreover, households in Turkey are not solely characterized by the material security, income or education levels. Social background and network involvement are usually better indicators of a household's identity. Therefore, even if the effect of social networks in loan access may decrease with the improvements in formal institutions, this study shows no evidence that the dependence of households on their social networks for consumption smoothing will diminish in the future. Therefore future studies focusing on the economic development of Turkey should bare in mind that social networks will preserve their role as important risk sharing instruments.

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Appendix

A Explanatory Variables

I. Household characteristics:

i. Average education level: The number of years spent for compulsory education is subtracted from the total years of education for each member. The result gives the education score for each member. In Turkey, compulsory education used to be 5 years before 1997, then this number was increased to 8 years, and we take this information into account too. Then the average education score for the household is constructed according to the weighted household size. The weighted household size is calculated by summing up the weighted values of household members, which is 1 for the first adult, 0.5 for other adults aged 14 and older, and 0.3 for all younger than 14.

ii. Number of household members contributing to household income: All those household members who earn money in the formal or informal sector are scored with 1, and those who only receive retirement pensions are scored with 0.5. The summation of the scores of household members gives the total number of household members contributing to income.

iii. Income per capita: We did not ask respondents how much their

household average monthly expenditures are, instead, we asked how much the average monthly expenditures of a similar household living in the same neighborhood would be. We believe that this indirect approach reduced the pressure on the respondents and bias in the reported amounts. If the household is not paying rent for housing, we add 1/3 of the average rent amount in Istanbul to the reported amount of monthly expenditure. This summation gives the total income of the household. If the household is receiving regular monthly money help from a source outside the household, the total income is multiplied by 1.05. Finally, income per capita for the household is calculated by dividing the total income by the weighted household size.

iv. Material security: The respondents were asked whether their households have certain possessions, such as a television, vcd player, mobile phone, refrigerator, car, lcd television, etc. The items which cause variations in the results are mainly car, lcd tv, and opportunity for vacations outside the country. The respondents were also asked to report the social security contributions, amounts of debts and/or receivables of their households. If the household has any debts and receivables that amount more than 1/3 of the monthly household income, we record that household as debtor, creditor, or both. Using 1 and 0 for each possession, social security contribution, and

debt status, we construct a matrix presenting material security determinants for each household. Using the principal component analysis, we calculate one index showing the material security level of each household.

v. Social networks index: We asked respondents to report which languages are spoken by the majority of the household as an indicator of ethnicity, which religion is commonly practiced, whether and when they have migrated, and whether any members of their households participate in voluntary activities of any organizations or NGOs, neighborhood meetings, family visits, cultural activities, etc. Using the principal component analysis as in the material security index, we construct a social networks index using this data. This index quantifies the networks the household has.

vi. Number of children: All those household members younger than age 14 are considered to be children.

II. Network usage index: We asked respondents whether their household received any money transfers from their networks to cope with the shocks, and we also asked them whether their household received any help from their networks to find new jobs, to gain access to some health services and to register their children to schools of their preferences. Respondents chose one of the following answers: "yes used networks", "no networks available",

and "networks are available but did not use them". Using the principal component analysis and all the data on network usage in different areas, one index showing the network usage of the household is composed.

III. Reciprocity index: We rephrased all the network usage questions in a reciprocal way to learn how much help households provided to their networks in the form of money transfers, and help in employment, education, and health areas. Again, the reciprocity index is constructed by the principal component analysis.

IV. Definition of the shock: We listed nine shocks which were observed to cause cash shortages in Istanbul, and asked respondents to choose which shock they faced. These are: health expenditures, unemployment, business expenditures, establishing a new business, death of the person responsible for earning the household income, education expenditures, marriage, valuable asset purchases, and debt repayments. Of these shocks, health expenditures, unemployment, and death are categorized as unexpected shocks.

V. Usage of household financial resources: We asked respondents what sort of financial resources their households own and which of these they used to smooth consumption when they faced the shock. These resources are monthly income, interest earnings from deposits at banks, savings, asset sales, and

credit card usage. Usage of household financial resources are added as a dummy variable to the regressions.

VI. Sufficiency of formal loan: We asked respondents what percentage of the demanded loan they obtained from formal credit institutions. If they could obtain at least 75 percent of the loan they demanded, we consider the loan to be sufficient and represent it as a dummy variable in the regressions.

B Figures and Tables

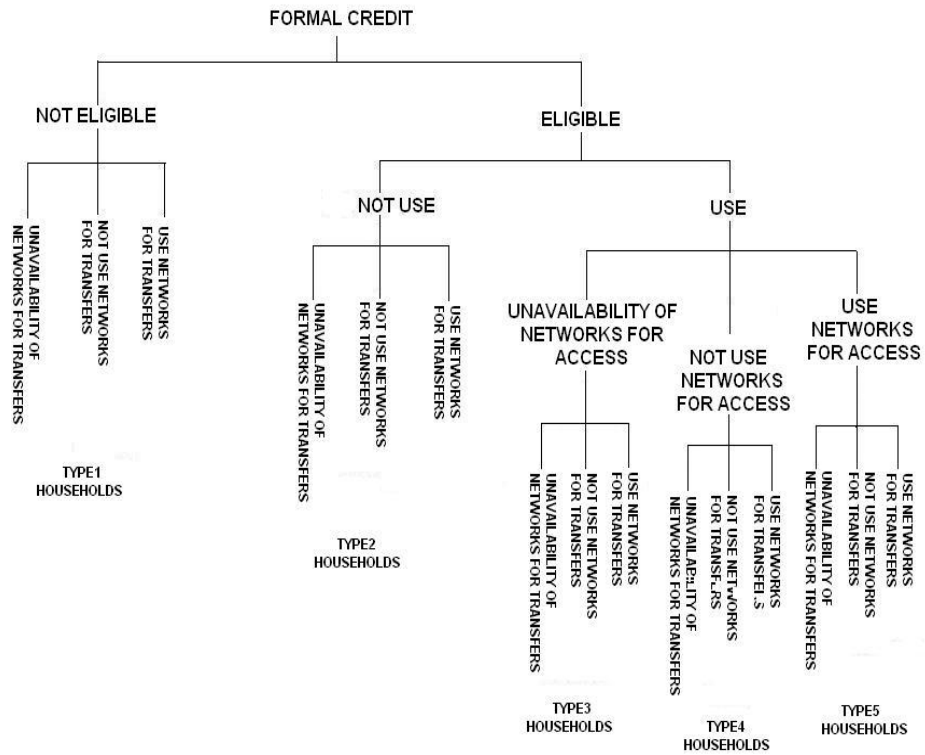


Figure 1: Household Types

Households	Type1	Type2	Type3	Type4	Type5	Total
Health expenditures	18.5	15.9	0	9.9	9.4	14
Unemployment	33.6	16.7	5.7	10.9	7.8	18.2
Business expenditures	2.9	4.4	5.7	7.7	7.8	5.0
Establishing a new business	0	2.2	0	5.5	3.1	2.1
Death	0	0.4	0	0	0	0.2
Education expenditures	7.9	13.7	14.3	8.8	3.1	10.5
Marriage	1.4	3.3	2.9	6.6	4.7	3.5
Valuable Assets	1.4	1.9	20.0	15.4	14.1	6.2
Debt repayments	34.3	41.5	51.4	35.2	50.0	40.3
Unexpected shocks	52.1	33.0	5.7	20.9	17.2	32.3

Table 1: Types of shocks in percentages

Household Types in the Sample					
Households	Type1	Type2	Type3	Type4	Type5
Number	140	270	35	91	64
Percentage	23.3	45.0	5.8	15.2	10.7
Some descriptive data on households reported in averages (Standard deviations are reported in parentheses)					
Households	Type1	Type2	Type3	Type4	Type5
Income per capita	500.61 (345.50)	753.50 (1214.73)	544.57 (461.10)	872.13 (1111.56)	656.30 (364.53)
No. of income earners	1.19 (0.86)	1.42 (0.90)	1.56 (1.03)	1.61 (0.93)	1.56 (1.15)
Education per capita	1.25 (2.68)	2.46 (2.91)	2.50 (2.72)	3.52 (3.15)	3.00 (2.83)
Adult age	36.48 (8.43)	35.49 (7.41)	37.67 (8.32)	37.03 (8.53)	35.05 (8.05)
No. of inc. contr./No. of adults	0.43 (0.28)	0.50 (0.25)	0.47 (0.27)	0.53 (0.26)	0.51 (0.27)
Social networks Index	2.37 (0.93)	2.76 (1.04)	2.64 (0.71)	2.81 (1.05)	2.89 (0.92)
Some of the characteristics of households in percentages					
Households	Type1	Type2	Type3	Type4	Type5
Ethnic	13.6	10.4	5.7	8.8	9.4
Volunteer in organizations	15.7	12.6	5.7	23.1	29.7
Migrated	70.7	66.7	68.6	56.0	54.7
In debt	60.7	54.1	94.2	82.4	90.6
Receiving monthly help	12.9	7.0	2.9	9.9	10.9
Sources of formal loans in percentages					
Households	Type1	Type2	Type3	Type4	Type5
Loan from bank			88.6	82.4	82.8
Loan from credit card			31.4	24.2	23.4
Loan from money lenders			2.9	1.1	0
Sources of money transfers in percentages					
Households	Type1	Type2	Type3	Type4	Type5
Family/Relatives	81.8	78.1	66.7	85.7	78.4
Friends	45.5	43.8	33.3	39.3	32.4
Colocality	1.8	1.6	0	3.6	0
Political	3.6	0	0	0	0
Religious	0	0.8	0	0	0
Money transfers from networks in percentages					
Households	Type1	Type2	Type3	Type4	Type5
Unavailability of networks	39.3	15.2	57.1	14.3	14.1
Not use networks	21.4	37.4	25.7	54.9	28.1
Use networks	39.3	47.4	17.2	30.8	57.8
Sources of network help for obtaining credit					
Households	Type1	Type2	Type3	Type4	Type5
Family/Relatives					62.5
Friends					37.5
Political					3.1

Table 2: Data on Household Types

	Set1		Set2		Set3	
	coef	t-stat	coef	t-stat	coef	t-stat
Constant	4.3070	3.7174*	4.4762	3.8852*	4.5089	3.9242*
No. of income contributors	0.2246	1.7541**	0.2459	1.9082**	0.2501	1.9399**
Education per capita	0.0126	0.2540	0.0098	0.1996	0.0182	0.3729
Income per capita	0.0004	1.3143	0.0005	1.3903	0.0005	1.5078
No. of children	-0.0833	-0.7904	-0.0406	-0.3883	-0.0342	-0.3280
Material security	0.6263	3.9389*	0.7132	4.5757*	0.7297	4.6991*
Social networks index	0.0411	0.3334	0.1116	0.9330	0.1383	1.1862
Network usage index	-0.3106	-2.6009*	0.0684	0.6104	0.0715	0.6399
Reciprocity index	0.1482	1.0846	0.3662	1.2536		
Usage of hh res.	-0.5993	-2.5105*	-0.5724	-2.3713*	-0.5488	-2.2839*

Table 3: Results of Stage1 Regressions

(* significant at 5 percent, ** significant at 10 percent)

	Set1		Set2		Set3	
	coef	t-stat	coef	t-stat	coef	t-stat
Constant	1.8881	1.9733**	1.6284	1.7102**	1.5815	1.6721**
Definition of shock	-0.7949	-3.2488*	-0.8140	-3.3299*	-0.7675	-3.1692*
No. of income contributors	0.1418	1.3247	0.1171	1.0970	0.1220	1.1454
Education per capita.	0.0295	0.6819	0.0328	0.7481	0.0191	0.4443
Income per capita	-0.0001	-0.5846	-0.0001	-0.7090	-0.0001	-0.8175
No. of children	-0.1553	-1.3505	-0.1409	-1.2171	-0.1529	-1.3245
Material security	0.3356	2.4387*	0.2526	1.8724**	0.2321	1.7353**
Social networks index	0.0084	0.0777	-0.0177	-0.1654	-0.0620	-0.5964
Network usage index	0.2368	2.2062*	0.1811	1.7957**	0.1789	1.7836**
Reciprocity index	-0.2019	-1.8422**	-0.4785	-2.0352*		
Usage of hh res.	-0.5557	-2.5651*	-0.6578	-2.9690*	-0.7116	-3.2462*

Table 4: Results of Stage2 Regressions

(* significant at 5 percent, ** significant at 10 percent)

	Set1		Set2		Set3	
	coef	t-stat	coef	t-stat	coef	t-stat
Constant	3.7339	1.5352	3.1418	1.3567	3.2111	1.3895
	1.6351	0.6784	1.7235	0.7180	1.7664	0.7383
Definition of shock	3.0745	3.2150*	2.6402	2.9163*	2.6256	2.9102*
	2.3247	2.4737*	2.2059	2.4032*	2.1868	2.3906*
No. of income contributors	-0.0459	-0.1939	0.1001	0.4083	0.1005	0.4083
	-0.0941	-0.4021	0.0570	0.2289	0.0538	0.2150
Education per capita	0.0355	-0.3223	0.0145	0.1408	0.0132	0.1289
	0.0229	0.2107	0.0575	0.5447	0.0596	0.5686
Income per capita	0.0017	2.1604*	0.0015	1.8664**	0.0015	1.8726**
	0.0012	1.5122	0.0009	1.1612	0.0009	1.1796
No. of children	0.3222	1.0099	0.3672	1.1316	0.3713	1.1524
	0.5405	1.7276**	0.4717	1.4410	0.4864	1.4976
Material security	0.9917	2.9509*	1.0341	3.2087*	1.0440	3.2446*
	0.6473	1.9754*	0.7789	2.3567*	0.7904	2.4013*
Social networks index	-0.2448	-0.8236	-0.0353	-0.1229	-0.0300	-0.1053
	0.0502	0.1697	0.1662	0.5667	0.1825	0.6277
Network usage index	-0.8633	-3.0558*	-0.2066	-0.7899	-0.2073	-0.7929
	-0.4829	-1.7198**	-0.7137	-2.6851*	-0.7146	-2.6910*
Reciprocity index	-0.1133	-0.3895	0.2206	0.3719		
	0.0209	0.0732	0.3317	0.5475		
Usage of hh res.	1.5435	2.9443*	1.3973	2.7876*	1.3993	2.8068*
	1.3658	2.6493*	1.2021	2.3395*	1.2155	2.3790*
Sufficiency of formal loan	1.0809	2.0534*	0.9744	1.9186**	0.9842	1.9388**
	0.5153	1.0039	0.5022	0.9847	0.5267	1.0358

Table 5: Results of Stage3 Regressions

(* significant at 5 percent, ** significant at 10 percent)

	Set1		Set2		Set3	
	coef	t-stat	coef	t-stat	coef	t-stat
Constant	2.7303	2.2239*	3.0316	2.4926*	3.0644	2.5282*
	1.2950	0.5953	1.5482	0.7175	1.3745	0.6394
	5.0335	3.2879*	4.9421	3.2411*	4.9213	3.2386*
	3.1198	1.8766**	3.3619	2.0095*	3.3685	2.0191*
Definition of shock	-0.4200	-1.7925**	-0.4474	-1.9314**	-0.4768	-2.0645*
	-3.0853	-3.9466*	-3.0536	-3.8927*	-3.0353	-3.8722*
	-0.8172	-2.4163*	-0.8758	-2.5854*	-0.8594	-2.5450*
	-1.2298	-3.1284*	-1.2311	-3.1345*	-1.2316	-3.1400*
No. of income contributors	0.1696	1.2448	0.1988	1.4642	0.2037	1.4998
	0.3340	1.5626	0.2832	1.2658	0.2850	1.2709
	0.2745	1.6456	0.2833	1.6816**	0.2927	1.7341**
	0.2710	1.5202	0.2989	1.6672**	0.3055	1.7025**
Education per capita	-0.0065	-0.1225	-0.0099	-0.1872	0.0009	0.0181
	0.0580	0.6418	0.0368	0.4046	0.0358	0.3950
	-0.0049	-0.0730	-0.0045	-0.0669	-0.0044	-0.0659
	0.0375	0.4972	0.0331	0.4399	0.0341	0.4576
Income per capita	0.0005	1.4504	0.0005	1.4882	0.0005	1.6054
	-0.0007	-1.0026	-0.0007	-1.0595	-0.0007	-1.0409
	0.0005	1.4835	0.0005	1.4725	0.0005	1.5535
	0.0001	0.1998	0.0001	0.2108	0.0001	0.2498
No. of children	-0.0447	-0.3966	0.0021	0.0188	0.0098	0.0883
	-0.4510	-1.8208**	-0.4236	-1.6874**	-0.4318	-1.7234**
	-0.2518	-1.4728	-0.1825	-1.0666	-0.1940	-1.1357
	-0.0026	-0.0149	-0.0016	-0.0093	-0.0054	-0.0312
Mat.sec.	0.4222	2.4664*	0.5406	3.2442*	0.5588	3.3694*
	1.4121	0.4830	0.1112	0.3777	0.0886	0.3015
	0.9912	4.5279*	1.0223	4.7434*	1.0196	4.7488*
	0.7393	3.1752*	0.8119	3.5137*	0.8150	3.5392*
Social networks index	0.0590	0.4521	0.1409	1.1184	0.1826	1.4870
	-0.0044	-0.0183	-0.0119	-0.0497	-0.0079	-0.0339
	0.0010	0.0058	0.1070	0.6476	0.1034	0.6437
	0.1751	0.9553	0.1728	0.9607	0.1798	1.0253
Network usage index	-0.3952	-3.1101*	0.0171	0.1428	0.0224	0.1878
	0.2610	1.1142	0.5905	2.5994*	0.5872	2.5987*
	-0.3745	-2.2978*	0.3530	2.2310*	0.3541	2.2418*
	-0.0130	-0.0732	-0.1900	-1.1118	-0.1883	-1.1034
Reciprocity index	0.1993	1.4021	0.4780	1.5690		
	0.0698	0.2374	-0.2454	-0.4397		
	-0.0317	-0.1775	0.0219	0.0575		
	0.1022	0.5412	0.1240	0.3020		
Usage of hh res.	-0.4142	-1.5969	-0.3592	-1.3661	-0.3285	-1.2542
	-2.0058	-4.4942*	-2.1890	-4.7710*	-2.1855	-4.8004*
	-0.7501	-2.2362*	-0.8669	-2.5226*	-0.8791	-2.5683*
	-0.8813	-2.4842*	-0.7600	-2.1033*	-0.7592	-2.1094*

Table 6: Results of Stage4 Regressions

(* significant at 5 percent, ** significant at 10 percent)